DEPARTMENT OF THE NAVY
FISCAL YEAR (FY) 2011
BUDGET ESTIMATES

JUSTIFICATION OF ESTIMATES
FEBRUARY 2010

RESEARCH, DEVELOPMENT, TEST & EVALUATION, NAVY
BUDGET ACTIVITY 4

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Research, Development, Test and Evaluation, Navy

For expenses necessary for basic and applied scientific research, development, test and evaluation, including maintenance, rehabilitation, lease, and operation of facilities and equipment, $17,693,496,000, to remain available for obligation until September 30, 2012.

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Department of the Navy
FY 2011 President's Budget
Exhibit R-1 FY 2011 Base and Overseas Contingency Operations (OCO) Request
Summary
(Dollars in Thousands)

19 Jan 2010

Summary Recap of Budget Activities	FY 2009 (Base & OCO)	FY 2010 Base & OCO Enacted	FY 2010 Supplemental Request	FY 2010 Total	FY 2011 Base	FY 2011 OCO	FY 2011 Total Request
Advanced Component Development & Prototypes	3,384,455	4,364,655		4,364,655	3,914,371	1,000	3,915,371
Total Research, Development, Test & Eval, Navy	3,384,455	4,364,655		4,364,655	3,914,371	1,000	3,915,371

Summary Recap of FYDP Programs

Intelligence and Communications					7,077		7,077
Research and Development	3,384,455	4,364,655		4,364,655	3,907,294	1,000	3,908,294
Total Research, Development, Test & Eval, Navy	3,384,455	4,364,655		4,364,655	3,914,371	1,000	3,915,371

Exhibit R-1G: FY 2011 President's Budget (Published), as of January 19, 2010 at 15:24:40

Department of the Navy
FY 2011 President's Budget
Exhibit R-1 FY 2011 Base and Overseas Contingency Operations (OCO) Request
(Dollars in Thousands)

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

Date: 19 Jan 2010

Line No	Program Element Number	Item	Act	FY 2009 (Base & OCO)	FY 2010 Base & OCO Enacted	FY 2010 Supplemental Request	FY 2010 Total	FY 2011 Base	FY 2011 OCO	FY 2011 Total Request	Sec
26	0603207N	Air/Ocean Tactical Applications	04	65,532	118,495		118,495	123,331		123,331	U
27	0603216N	Aviation Survivability	04	15,373	27,291		27,291	9,480		9,480	U
28	0603237N	Deployable Joint Command and Control	04	6,876	9,034		9,034	4,275		4,275	U
29	0603254N	ASW Systems Development	04	38,370	25,553		25,553	8,249		8,249	U
30	0603261N	Tactical Airborne Reconnaissance	04	5,743	9,662		9,662	6,452		6,452	U
31	0603382N	Advanced Combat Systems Technology	04	12,071	3,662		3,662	1,658		1,658	U
32	0603502N	Surface and Shallow Water Mine Countermeasures	04	94,393	92,334		92,334	81,347		81,347	U
33	0603506N	Surface Ship Torpedo Defense	04	48,215	67,257		67,257	57,796		57,796	U
34	0603512N	Carrier Systems Development	04	178,095	175,823		175,823	93,830		93,830	U
35	0603513N	Shipboard System Component Development	04	35,748	30,224		30,224	51		51	U
36	0603525N	PILOT FISH	04	84,119	78,741		78,741	81,784		81,784	U
37	0603527N	RETRACT LARCH	04	91,183	109,023		109,023	142,858		142,858	U
38	0603536N	RETRACT JUNIPER	04	155,636	114,210		114,210	134,497		134,497	U
39	0603542N	Radiological Control	04	1,069	1,366		1,366	1,358		1,358	U
40	0603553N	Surface ASW	04	47,506	23,497		23,497	21,673		21,673	U
41	0603561N	Advanced Submarine System Development	04	153,783	549,392		549,392	608,566		608,566	U

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Department of the Navy
FY 2011 President's Budget
Exhibit R-1 FY 2011 Base and Overseas Contingency Operations (OCO) Request
(Dollars in Thousands)

Appropriation: 1319N Research, Development, Test & Eval, Navy — Date: 19 Jan 2010

Line No	Program Element Number	Item	Act	FY 2009 (Base & OCO)	FY 2010 Base & OCO Enacted	FY 2010 Supplemental Request	FY 2010 Total	FY 2011 Base	FY 2011 OCO	FY 2011 Total Request	Sec
42	0603562N	Submarine Tactical Warfare Systems	04	13,749	12,520		12,520	5,590		5,590	U
43	0603563N	Ship Concept Advanced Design	04	36,240	22,387		22,387	17,883		17,883	U
44	0603564N	Ship Preliminary Design & Feasibility Studies	04	22,884	38,197		38,197	1,796		1,796	U
45	0603570N	Advanced Nuclear Power Systems	04	157,839	258,808		258,808	366,509		366,509	U
46	0603573N	Advanced Surface Machinery Systems	04	3,192	20,553		20,553	5,459		5,459	U
47	0603576N	CHALK EAGLE	04	236,510	441,112		441,112	447,804		447,804	U
48	0603581N	Littoral Combat Ship (LCS)	04	372,036	422,746		422,746	226,288		226,288	U
49	0603582N	Combat System Integration	04	62,472	22,444		22,444	24,344		24,344	U
50	0603609N	Conventional Munitions	04	6,368	4,241		4,241	5,388		5,388	U
51	0603611M	Marine Corps Assault Vehicles	04	256,042	292,217		292,217	242,765		242,765	U
52	0603635M	Marine Corps Ground Combat/Support System	04	57,718	78,228		78,228	40,505		40,505	U
53	0603654N	Joint Service Explosive Ordnance Development	04	111,850	20,966		20,966	25,873	1,000	26,873	U
54	0603658N	Cooperative Engagement	04	43,424	60,334		60,334	52,282		52,282	U
55	0603713N	Ocean Engineering Technology Development	04	9,492	17,256		17,256	13,560		13,560	U
56	0603721N	Environmental Protection	04	20,557	21,372		21,372	20,207		20,207	U
57	0603724N	Navy Energy Program	04	10,271	18,918		18,918	30,403		30,403	U
58	0603725N	Facilities Improvement	04	18,034	10,039		10,039	3,746		3,746	U

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Department of the Navy
FY 2011 President's Budget
Exhibit R-1 FY 2011 Base and Overseas Contingency Operations (OCO) Request
(Dollars in Thousands)

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

Date: 19 Jan 2010

Line No	Program Element Number	Item	Act	FY 2009 (Base & OCO)	FY 2010 Base & OCO Enacted	FY 2010 Supplemental Request	FY 2010 Total	FY 2011 Base	FY 2011 OCO	FY 2011 Total Request	Sec
59	0603734N	CHALK CORAL	04	105,673	70,327		70,327	71,920		71,920	U
60	0603739N	Navy Logistic Productivity	04	18,514	15,039		15,039	4,139		4,139	U
61	0603746N	RETRACT MAPLE	04	142,877	209,139		209,139	219,463		219,463	U
62	0603748N	LINK PLUMERIA	04	69,044	62,774		62,774	58,030		58,030	U
63	0603751N	RETRACT ELM	04	136,991	150,959		150,959	183,187		183,187	U
64	0603755N	Ship Self Defense	04	9,784	6,931		6,931	4,385		4,385	U
65	0603764N	LINK EVERGREEN	04	21,895	123,147		123,147	41,433		41,433	U
66	0603787N	Special Processes	04	59,413	53,810		53,810	36,457		36,457	U
67	0603790N	NATO Research and Development	04	10,767	10,152		10,152	9,196		9,196	U
68	0603795N	Land Attack Technology	04	15,966	6,809		6,809	905		905	U
69	0603851M	Nonlethal Weapons	04	50,424	49,086		49,086	43,272		43,272	U
70	0603860N	Joint Precision Approach and Landing Systems	04	74,060	149,680		149,680	159,151		159,151	U
71	0603879N	Single Integrated Air Picture (SIAP) System Engineer (SE)	04	40,587	52,497		52,497				U
72	0603889N	Counterdrug RDT&E Projects	04	62,439							U
73	0603925N	Directed Energy and Electric Weapon Systems	04	4,548	19,223		19,223				U
74	0604272N	Tactical Air Directional Infrared Countermeasures (TADIRCM)	04	42,832	50,484		50,484	51,693		51,693	U

Exhibit R-1G: FY 2011 President's Budget (Published), as of January 19, 2010 at 15:24:40

Department of the Navy
FY 2011 President's Budget
Exhibit R-1 FY 2011 Base and Overseas Contingency Operations (OCO) Request
(Dollars in Thousands)

Appropriation: 1319N Research, Development, Test & Eval, Navy — Date: 19 Jan 2010

Line No	Program Element Number	Item	Act	FY 2009 (Base & OCO)	FY 2010 Base & OCO Enacted	FY 2010 Supplemental Request	FY 2010 Total	FY 2011 Base	FY 2011 OCO	FY 2011 Total Request	Sec
75	0604653N	Joint Counter Radio Controlled IED Electronic Warfare (JCREW)	04		55,611		55,611	56,542		56,542	U
76	0604659N	Precision Strike Weapons Development Program	04		40,757		40,757	25,121		25,121	U
77	0604707N	Space and Electronic Warfare (SEW) Architecture/Engineering Support	04	46,251	40,328		40,328	34,793		34,793	U
78	0303354N	ASW Systems Development - MIP	04					2,161		2,161	U
79	0303562N	Submarine Tactical Warfare Systems - MIP	04					4,253		4,253	U
80	0304270N	Electronic Warfare Development - MIP	04					663		663	U
		Advanced Component Development & Prot		3,384,455	4,364,655		4,364,655	3,914,371	1,000	3,915,371	
		Total Research, Development, Test & Eval, Navy		3,384,455	4,364,655		4,364,655	3,914,371	1,000	3,915,371	

Exhibit R-1G: FY 2011 President's Budget (Published), as of January 19, 2010 at 15:24:40

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

Budget Activity 04: Advanced Component Development & Prototypes (ACD&P)

Line Item	Budget Activity	Program Element Number	Program Element Title	Page
26	04	0603207N	Air/Ocean Tactical Applications	1
27	04	0603216N	Aviation Survivability	75
28	04	0603237N	Deployable JT Cmd & Control	107
29	04	0603254N	ASW Systems Development	121
30	04	0603261N	Tactical Airborne Reconnaissance	153
31	04	0603382N	Advanced Combat Systems Tech	175
32	04	0603502N	Surface & Shallow Water MCM	195
33	04	0603506N	Surface Ship Torpedo Defense	267
34	04	0603512N	Carrier Systems Development	281
35	04	0603513N	Shipboard Sys Component Dev	323
39	04	0603542N	Radiological Control	345
40	04	0603553N	Surface ASW	359
41	04	0603561N	Adv Submarine System Dev	373
42	04	0603562N	Submarine Tactical Warfare Sys	427
43	04	0603563N	Ship Concept Advanced Design	443
44	04	0603564N	Ship Prel Design & Feasibility Studies	467

Budget Activity 04: Advanced Component Development & Prototypes (ACD&P)

Line Item	Budget Activity	Program Element Number	Program Element Title	Page
46	04	0603573N	Advanced Surface Machinery Sys	483
48	04	0603581N	Littoral Combat Ship (LCS)	499
49	04	0603582N	Combat System Integration	545
50	04	0603609N	Conventional Munitions	563
51	04	0603611M	Marine Corps Assault Vehicles	579
52	04	0603635M	Marine Corps Grnd Cmbt/Supt Sys	591
53	04	0603654N	JT Service Explosive Ordn Dev	621
54	04	0603658N	Cooperative Engagement	657
55	04	0603713N	Ocean Engineering Tech Dev	677
56	04	0603721N	Environmental Protection	697
57	04	0603724N	Navy Energy Program	735
58	04	0603725N	Facilities Improvement	759
60	04	0603739N	Navy Logistic Productivity	789
64	04	0603755N	Ship Self Defense - DEM/VAL	815
67	04	0603790N	NATO Research and Deve	829
68	04	0603795N	Land Attack Tech	837
69	04	0603851M	Joint Non-Lethal Weapons Testing	849
70	04	0603860N	JT Precision Approach & Ldg Sys	867

Budget Activity 04: Advanced Component Development & Prototypes (ACD&P)

Line Item	Budget Activity	Program Element Number	Program Element Title	Page
71	04	0603879N	Single Int Air Picture (SIAP) Sys Eng	885
72	04	0603889N	Counterdrug RDT&E Projects	893
73	04	0603925N	Directed Energy and Electric Weapon System	897
74	04	0604272N	Tact Air Dir Infrared CM (TADIRCM)	911
75	04	0604653N	JT Cntr Radio Controlled IED Elec War (JCREW)	943
76	04	0604659N	Precison Strike Weapons Development Program	953
77	04	0604707N	SEW Architecture/Eng Support	973
78	04	0303354N	ASW Systems Development - MIP	1011
79	04	0303562N	Submarine Tactical Warfare Systems - MIP	1019
80	04	0304270N	Electronic Warfare Development - MIP	1029

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

Program Element Title	Program Element Number	Line Item	Budget Activity	Page
Advanced Combat Systems Tech	0603382N	31	04	175
Advanced Surface Machinery Sys	0603573N	46	04	483
Adv Submarine System Dev	0603561N	41	04	373
Air/Ocean Tactical Applications	0603207N	26	04	1
ASW Systems Development	0603254N	29	04	121
ASW Systems Development - MIP	0303354N	78	04	1011
Aviation Survivability	0603216N	27	04	75
Carrier Systems Development	0603512N	34	04	281
Combat System Integration	0603582N	49	04	545
Conventional Munitions	0603609N	50	04	563
Cooperative Engagement	0603658N	54	04	657
Counterdrug RDT&E Projects	0603889N	72	04	893
Deployable JT Cmd & Control	0603237N	28	04	107
Directed Energy and Electric Weapon System	0603925N	73	04	897
Electronic Warfare Development - MIP	0304270N	80	04	1029
Environmental Protection	0603721N	56	04	697
Facilities Improvement	0603725N	58	04	759

Program Element Title	Program Element Number	Line Item	Budget Activity	Page
Joint Non-Lethal Weapons Testing	0603851M	69	04	849
JT Cntr Radio Controlled IED Elec War (JCREW)	0604653N	75	04	943
JT Precision Approach & Ldg Sys	0603860N	70	04	867
JT Service Explosive Ordn Dev	0603654N	53	04	621
Land Attack Tech	0603795N	68	04	837
Littoral Combat Ship (LCS)	0603581N	48	04	499
Marine Corps Assault Vehicles	0603611M	51	04	579
Marine Corps Grnd Cmbt/Supt Sys	0603635M	52	04	591
NATO Research and Deve	0603790N	67	04	829
Navy Energy Program	0603724N	57	04	735
Navy Logistic Productivity	0603739N	60	04	789
Ocean Engineering Tech Dev	0603713N	55	04	677
Precison Strike Weapons Development Program	0604659N	76	04	953
Radiological Control	0603542N	39	04	345
SEW Architecture/Eng Support	0604707N	77	04	973
Shipboard Sys Component Dev	0603513N	35	04	323
Ship Concept Advanced Design	0603563N	43	04	443
Ship Prel Design & Feasibility Studies	0603564N	44	04	467
Ship Self Defense - DEM/VAL	0603755N	64	04	815
Single Int Air Picture (SIAP) Sys Eng	0603879N	71	04	885

Program Element Title	Program Element Number	Line Item	Budget Activity	Page
Submarine Tactical Warfare Sys	0603562N	42	04	427
Submarine Tactical Warfare Systems - MIP	0303562N	79	04	1019
Surface & Shallow Water MCM	0603502N	32	04	195
Surface ASW	0603553N	40	04	359
Surface Ship Torpedo Defense	0603506N	33	04	267
Tact Air Dir Infrared CM (TADIRCM)	0604272N	74	04	911
Tactical Airborne Reconnaissance	0603261N	30	04	153

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Exhibit R-2, RDT&E Budget Item Justification: PB 2011 Navy										DATE: February 2010	
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*				R-1 ITEM NOMENCLATURE PE 0603207N: *Air/Ocean Tactical Applications*							
COST ($ in Millions)	**FY 2009 Actual**	**FY 2010 Estimate**	**FY 2011 Base Estimate**	**FY 2011 OCO Estimate**	**FY 2011 Total Estimate**	**FY 2012 Estimate**	**FY 2013 Estimate**	**FY 2014 Estimate**	**FY 2015 Estimate**	**Cost To Complete**	**Total Cost**
Total Program Element	65.532	118.495	123.331	0.000	123.331	113.306	77.992	47.071	47.515	Continuing	Continuing
2341: *METOC Data Acquisition*	19.258	21.930	15.288	0.000	15.288	12.606	13.432	13.819	14.088	Continuing	Continuing
2342: *METOC Data Assimilation and Mod*	17.979	19.336	15.311	0.000	15.311	13.666	13.901	12.860	12.735	Continuing	Continuing
2343: *Tactical METOC Applications*	6.116	16.097	13.736	0.000	13.736	15.729	15.293	12.166	12.418	Continuing	Continuing
2344: *Precise Timing and Astronomy*	19.615	2.249	2.118	0.000	2.118	1.199	1.217	1.243	1.269	Continuing	Continuing
3207: *Fleet Synthetic Training*	0.968	1.004	3.437	0.000	3.437	1.007	1.043	1.067	1.088	Continuing	Continuing
3229: *JMAPS*	0.000	54.971	73.441	0.000	73.441	69.099	33.106	5.916	5.917	Continuing	Continuing
9999: *Congressional Adds*	1.596	2.908	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	16.193

A. Mission Description and Budget Item Justification

The Air Ocean Tactical Applications (AOTA) Program Element is fully aligned with the Navy's maritime strategy to enhance the future mission capabilities of the Navy-Marine Corps Team. New state-of-the art government and commercial technologies are identified, transitioned, demonstrated and then integrated into Combat Systems and programs of record and Tactical Decision Aids that determine in real-time and near-real-time the operational effects of the physical environment on the performance of combat forces and their new and emerging platforms, sensors, systems and munitions. The AOTA program element focuses on sensing and characterizing the littoral and deep-strike battlespace in the context of regional conflicts and crisis response scenarios. Projects in this program element transition state-of-the art sensing, assimilation, modeling and decision aid technologies from Government and commercial sources. Unique project development efforts include atmospheric and oceanographic data assimilation techniques, forecast models, data base management systems and associated software for use in mainframe, desktop and laptop computers. Global Geospatial Information and Services efforts within this program address the bathymetric and gravimetric needs of the Navy. Also developed are algorithms to process new satellite sensor data for integration into Navy and Marine Corps decision support systems and for display as part of the common operational and tactical pictures. In addition, the projects provide for demonstration and validation of specialized atmospheric and oceanographic instrumentation and measurement techniques, new sensors, communications and interfaces. Included are new capabilities to assess, predict and enhance the performance of current and emerging undersea warfare and mine warfare weapons systems. AOTA capabilities are designed to support the latest versions of the Global Command and Control System and specific unit-level combat systems. Finally, this program develops technological upgrades for the U.S. Naval Observatory's

Exhibit R-2, RDT&E Budget Item Justification: PB 2011 Navy	DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603207N: *Air/Ocean Tactical Applications*

Master Clock system to keep pace with the demands of modern military communications, cryptographic, intelligence, geolocation, and targeting systems; develops near-real-time earth orientation predictions; develops very precise determination of positions of both faint and bright stars; and supports satellite tracking and space debris studies.

Major emphasis areas include the Littoral Battlespace Sensors - Unmanned Undersea Vehicle (comprised of ocean Gliders and Autonomous Undersea Vehicles), the Naval Integrated Tactical Environmental System Next Generation, the J-MAPS programs of record, and the Meteorological and Oceanographic Future Mission Capabilities (METOC), the METOC Space-Based Sensing Capabilities, the Precise Timing and Astrometry, the Fleet Synthetic Training and the Tactical Oceanographic Capabilities / Under Sea Warfare projects.

B. Program Change Summary ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
Previous President's Budget	67.531	116.082	0.000	0.000	0.000
Current President's Budget	65.532	118.495	123.331	0.000	123.331
Total Adjustments	-1.999	2.413	123.331	0.000	123.331
• Congressional General Reductions		-0.493			
• Congressional Directed Reductions		0.000			
• Congressional Rescissions	0.000	-0.014			
• Congressional Adds		2.920			
• Congressional Directed Transfers		0.000			
• Reprogrammings	-0.500	0.000			
• SBIR/STTR Transfer	-1.499	0.000			
• Program Adjustments	0.000	0.000	123.331	0.000	123.331

Congressional Add Details ($ in Millions, and Includes General Reductions)	FY 2009	FY 2010
Project: 9999: *Congressional Adds*		
Congressional Add: *Non-Gasoline Burning Outboard Engine*	0.000	1.514
Congressional Add: *Semi-Submersible UUV*	1.596	1.394
Congressional Add Subtotals for Project: 9999	1.596	2.908
Congressional Add Totals for all Projects	1.596	2.908

Exhibit R-2, RDT&E Budget Item Justification: PB 2011 Navy	DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603207N: *Air/Ocean Tactical Applications*

Change Summary Explanation

Technical: Not applicable.

Schedule: Not applicable.

FY11 from previous President's Budget is shown as zero because no FY11-15 data was presented in President's Budget 2010.

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603207N: *Air/Ocean Tactical Applications*	PROJECT 2341: *METOC Data Acquisition*	

COST ($ in Millions)	FY 2009 Actual	FY 2010 Estimate	FY 2011 Base Estimate	FY 2011 OCO Estimate	FY 2011 Total Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
2341: *METOC Data Acquisition*	19.258	21.930	15.288	0.000	15.288	12.606	13.432	13.819	14.088	Continuing	Continuing
Quantity of RDT&E Articles	0	4	0	0	0	0	0	0	0		

A. Mission Description and Budget Item Justification

The major thrust of the Meteorology and Oceanography (METOC) Data Acquisition Project is to provide future mission capabilities to warfighters that will allow them to detect and monitor the conditions of the physical environment throughout the entire battlespace. New sensor technologies (including unmanned vehicles, tactical sensor exploitation, in-situ sensors) identified as the most promising candidates are transitioned from the government's and commercial industry's technology base. These new sensor technologies are demonstrated, validated and integrated into operational programs for warfighters. These new sensor capabilities provide timely and accurate METOC data and products to operational and tactical commanders. METOC data requirements have likewise evolved as the emphasis on naval warfare has evolved from blue water operations to the littoral and deep strike battlespace. The littoral and deep strike regions are dynamic and complex, characterized by strong and variable oceanographic and atmospheric conditions. The need to accurately characterize these conditions is more crucial than ever in planning and executing amphibious warfare, mine warfare, special operations, anti-submarine warfare, and strike warfare operations. Routinely available data sources, such as climatology, oceanographic and meteorological numerical models, and satellite remote sensing are necessary but not sufficient to support these warfare areas in the littoral and deep strike regions. Operational sensors, such as the balloon-launched radiosonde, are deployed great distances from the target area of interest. The challenge is to collect and disseminate METOC data in variable and dynamic littoral environmental conditions or in denied, remote or inaccessible areas over extended periods of time. This project: 1) provides the means to rapidly and automatically acquire a broad array of METOC data using both off-board and on-board sensors; 2) provides an on-scene assessment capability for the tactical commander; 3) provides the tactical commander with real-time METOC data and products for operational use; 4) demonstrates and validate the use of tactical workstations and desktop computers for processing and display of METOC data and products; 5) demonstrates and validates techniques which employ data compression, connectivity and interface technologies to obtain, store, process, distribute and display these METOC data and products; 6) develops new charting and bathymetric survey techniques necessary to reduce the existing shortfall in coastal hydrographic survey requirements; 7) develops an expanded database for predictive METOC models in areas of interest; and 8) supports the development of radar weather using through-the-sensor techniques and development of ocean glider and Autonomous Undersea Vehicles (AUV), sensors, tracking and telemetry, and mission planning system as part of the littoral battlespace sensing, fusion and integration programs.

Major emphasis areas include the Littoral Battlespace Sensors - Unmanned Undersea Vehicle (LBS-UUV) (comprised of ocean Gliders and Autonomous Undersea Vehicles (LBS-AUV)), the Navy Integrated Tactical Environmental System Next Generation, programs of record, and the Meteorological and Oceanographic Future Mission Capabilities, and the Tactical Oceanographic Capabilities / Under Sea Warfare projects.

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
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FY 2011 request provides for continued LBS-UUV (LBS-AUV) System Development and Demonstration phase activities, advanced component and prototype efforts associated with acquiring environmental data, and METOC data transport, storage, delivery, design and development efforts in a Net-centric environment.

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
Acquisition Workforce	0.096	0.000	0.000	0.000	0.000
FY 2009 Accomplishments: Funded acquisition workforce fund.					
Littoral Battlespace Sensing, Unmanned Undersea Vehicles (LBS-UUV)	4.841	8.771	2.465	0.000	2.465
FY 2009 Accomplishments: Began development of end-to-end Littoral Battlespace Sensing, Fusion and Integration Increment 1.0 Littoral Battlespace Sensing - Glider (LBS-G) sensor and support systems (LBS-G Development Contract awarded March 2009). Defined Engineering Change Proposal (ECP) improvements to the LBS-G system including associated support systems (launch and recovery, mission planning, test equipment, etc.). Conducted ECP studies (Analyses of Alternatives, Engineering Studies, etc.) and associated cost estimates as required. Began preparations for the System Development and Demonstration (SDD) phase of the Autonomous Undersea Vehicle (AUV) component of this program. *FY 2010 Plans:* Complete the SDD phase of the LBS-G system (LBS-G Milestone C is scheduled for Q4FY10). Deliver four LBS-G Engineering Design Models (EDMs) and complete at-sea and ashore Development Testing and Evaluation of the complete end-to-end LBS-G system including command and control, mission planning, launch and recovery, mission profile characteristics and other Key Performance Parameters and Key System Parameters. Complete the development of the LBS-G ECP definition and associated engineering studies and analyses of alternatives. Begin the SDD phase of the Littoral Battlespace Sensing - Autonomous Undersea Vehicle (LBS-AUV). Funding increase reflects the beginning of the SDD phase of the LBS-AUV portion of the Littoral Battlespace Sensors - Unmanned Undersea Vehicle (LBS-UUV) program.					

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B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
FY 2011 Base Plans: Update LBS-G Analysis of Alternatives, engineering studies, and cost estimates for the LBS-G ECPs as required. Continue the LBS-AUV SDD Phase (LBS-AUV Milestone C is scheduled for Q1/Q2 FY12). Develop the LBS-AUV Capability Production Document. Conduct the LBS-AUV Critical Design Review. Deliver two LBS-AUV EDMs and begin Developmental Testing and Evaluation of the LBS-AUV systems.					
Meteorological and Oceanographic (METOC) Future Mission Capabilities (FMC)	7.078	8.230	7.369	0.000	7.369
FY 2009 Accomplishments: Continued advanced component and prototype efforts associated with acquiring environmental data. Continued development of advanced data measurement and survey techniques to improve survey planning and execution. Continued development of improved data quality control technologies and the automation of data acquisition processes. Continued to develop advanced technologies and techniques to improve Geospatial Information and Services (GI&S) capabilities within Navy METOC production centers and throughout the fleet user base. Implemented through-the-sensor (TTS) technologies to use tactical detection systems to characterize undersea and atmospheric environment in the battlespace integrate with analysis and C4I distribution systems. Continued development of the SPY-1 Tactical Environmental Processor (TEP) prototype and integration of Hazardous Weather Detection and Display Capability (HWDDC) into the SPS-48G Radar Obsolescence and Availability (ROAR). Developed TEP requirements, specifications, standards and system engineering plans for integration of the TEP algorithms into the Aegis SPY-1 Open Architecture upgrade program. Worked with the SPS-48G program office and prime contractor to integrate HWDDC algorithms into the ROAR system. *FY 2010 Plans:* Continue advanced component and prototype efforts associated with acquiring environmental data. Continue development of advanced data measurement and survey techniques to improve survey					

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B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
planning and execution. Continue development of improved data quality control technologies and the automation of data acquisition processes. Continue to develop advanced technologies and techniques to improve GI&S capabilities within Navy METOC production centers and throughout the fleet user base. Implement TTS technologies to use tactical detection systems to characterize undersea and atmospheric environment in the battlespace integrate with analysis, Command, Control, Communications, Computers and Intelligence (C4I) distribution, and tactical decision systems. Develop TEP requirements, specifications, standards and system engineering plans for integration of the TEP algorithms into the Aegis SPY-1 Open Architecture upgrade program. *FY 2011 Base Plans:* Continue advanced component and prototype efforts associated with acquiring environmental data. Continue development of advanced data measurement and survey techniques to improve survey planning and execution. Continue development of improved data quality control technologies and the automation of data acquisition processes. Continue to develop advanced technologies and techniques to improve GI&S capabilities within Navy METOC production centers and throughout the fleet user base. Implement TTS technologies to use tactical detection systems to characterize undersea and atmospheric environment in the battlespace integrate with analysis, distribution, and tactical decision systems. Develop TEP requirements, specifications, standards and system engineering plans for integration of the TEP algorithms into the Aegis SPY-1 Open Architecture upgrade program. Develop advanced data acquisition and data processing techniques for oceanographic and atmospheric data.					
Naval Integrated Tactical Environmental System Next Generation (NITES-Next) *FY 2009 Accomplishments:* Supported Meteorological and Oceanographic (METOC) data transport, storage, delivery, design and development efforts in a Net-centric environment for pre-Milestone C NITES-Next activities.	2.439	0.094	0.000	0.000	0.000

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B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
FY 2010 Plans: Continue support for METOC data transport, storage, delivery, design and development efforts from FY09 in preparation for Milestone C NITES-Next activities.					
Tactical Environmental Support System/Naval Integrated Tactical Environmental Subsystem (TESS/NITES) *FY 2009 Accomplishments:* Tactical Environmental Support System/Naval Integrated Tactical Environmental Subsystem (TESS/ NITES) software development and testing for technology upgrades, refreshes, migrations, and system engineering efforts.	0.015	0.000	0.000	0.000	0.000
Tactical Oceanography Capabilities / Undersea Warfare (USW) *FY 2009 Accomplishments:* Geo-acoustic data inversion through-the-sensor efforts rolled into the Ocean Bottom Characterization Initiative (OBCI). Continued to develop, test and demonstrate advanced Geographic Information Systems (GIS) in support of world-wide Anti-Submarine Warfare (ASW) operations. Developed mission planning tools in support of littoral combat operations. Developed capability to quickly calculate transmission loss (TL) values in tactical timeframes. Continued data analysis and processing development for environmental characterization for mission planning & tactical decision aid use. Continued development, test/document and quality control fusion and product uncertainty tools and techniques to transform data into information to support product development for mission planners and tactical decision aid (TDA) use. Developed and validate ASW product effectiveness metrics algorithms. Designed the automated model metrics system. Continued to develop and demonstrate advanced processing tools to work with insitu data sources to populate environmental database and support forward deployed oceanographic personnel. Development and demonstration of advanced insitu sensor systems to support very near shore situational awareness in support of Anti-Submarine Warfare missions. Continued development, verify and validate performance and document adaptive geoacoustic survey work for transition to unmanned vehicles and T-AGS 60 class ships. Continued	0.289	4.835	5.454	0.000	5.454

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B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
the development and demonstration of oceanographic and in-situ sensors & systems. Utilized tactical and survey platforms for insitu measurements. *FY 2010 Plans:* Continue FY09 efforts. Continue to develop, test and demonstrate advanced mission planning tools and GIS in support of world-wide Undersea Warfare (USW) operations. Continue to develop capability to calculate TL values in tactical timeframes to include uncertainty quantification of those values. Develop and validate both acoustic and non-acoustic USW product effectiveness algorithms to aid in environmental analysis of Naval exercises. Develop and validate methods for a theater-wide ambient noise planning and forecasting capability. OBCI: Develop and demonstrate advanced in-situ sensor systems to support littoral environmental awareness in support of USW missions. Use operational Navy platforms for in-situ oceanographic and acoustic measurements. Develop Next Generation bottom loss and backscatter databases and database structures. Develop improved techniques to support geoacoustic and oceanographic survey operations. Develop algorithms for inclusion of bioacoustic effects in acoustic surveys. FY09 OBCI efforts were accomplished under the OBCI project. *FY 2011 Base Plans:* Continue FY10 efforts. Develop advanced data collection systems to generate products and populate databases that characterize the acoustic environment in support of ASW missions. Develop autonomous vehicle/system technology demonstrations to measure in-situ oceanographic, acoustic and geoacoustic parameters remotely from Fleet survey vessels. Continue to develop capabilities to calculate acoustic TL values in tactical timeframes to include uncertainty quantification of those values. Continue to develop next generation acoustic bottom loss and backscatter databases and database structures for transition into U.S. Navy ASW TDAs. Conduct Validation and Verification of next generation acoustic models, databases and algorithms. Continue to develop improved techniques to support geoacoustic and oceanographic survey operations. Continue to develop algorithms for inclusion of bioacoustic effects in acoustic surveys and Navy ASW operations. Develop					

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B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
active acoustic sources to aid geoacoustic survey operations. Provide project technical and program management oversight.					
Ocean Bottom Characterization Initiative (OBCI)	4.500	0.000	0.000	0.000	0.000
FY 2009 Accomplishments: Developed capability to rapidly map coastal and deep-water seabed geoacoustic properties through characterization of seabed variability. Designed offboard geo-acoustic survey platform and sensor prototypes for deployment aboard Tactical Auxiliary Command class ships and other Naval Oceanographic Office (NAVOCEANO) assets. Continued development, validation and verification of the delivered Geophysical Acoustic Inversion Toolkit Version 3 bottom loss algorithms for AntiSubmarine Warfare Tactical Decision Aids (ASW TDAs) and NAVOCEANO assets to include active inversion methods. Continued development of a passive seabed classification system. Verified & validated performance of Through The Sensor applications for inclusion in Navy Standard databases. Continued development of advanced geo-acoustic merging algorithms to support inversions. Pursued adaptive sampling techniques for NAVOCEANO geoacoustic survey assets. Characterized backscatter (i.e. reverberation) data for inclusion in NAVOCEANO databases. Adapted ocean glider and autonomous underwater vehicle sensors and behavior algorithms to support NAVOCEANO survey operations. Performed gravity/seismic data set correlation to improve geoacoustic databases. Extended bandwidth of existing bottom loss databases and algorithms to include all active and passive tactical acoustic frequencies. Defined frequency extrapolation limits of existing reverberation data sets. Continued to develop prototype replacement acoustic source for NAVOCEANO survey operations. Began development of active acoustic clutter characterization algorithms into Fleet Synthetic Training systems. Adapted the Generalized Acoustic Bottom Interaction Model to act as the first-order solution for a comprehensive, integrated system to generate an acoustic bottom loss and backscatter database in regions of strategic Navy interest. Provided technical and program management oversight for the OBCI. Continued investigation of Low Frequency Active source to characterize the seabed.					

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B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
Accomplishments/Planned Programs Subtotals	19.258	21.930	15.288	0.000	15.288

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total	FY 2012	FY 2013	FY 2014	FY 2015	Cost To Complete	Total Cost
• OPN/4226: *METEOROLOGICAL EQUIPMENT*	21.169	14.514	25.581	0.592	26.173	24.430	22.430	24.575	25.765	Continuing	Continuing
• RDTEN/0604218N: *Air/Ocean Equipment Engineering*	5.362	7.454	5.735	0.000	5.735	5.993	5.615	5.737	5.852	Continuing	Continuing

D. Acquisition Strategy

Acquisition, management and contracting strategies are to support the meteorological and oceanographic (METOC) Data Acquisition Project to develop, demonstrate, and validate METOC data collection methods and sensors, and to evolve the ability to provide timely and accurate METOC data and products to the Tactical Commander, all with management oversight by the Navy.

E. Performance Metrics

Goal: Develop techniques and tools to acquire METOC data in order to improve the accuracy of global and regional scale meteorological and oceanographic forecast models. Advanced sensor component, data collection, and meteorological, oceanographic and hydrographic survey technique development tasks are directed by Resource Sponsor, with input from external Systems Commands and/or Type Commanders, in response to validated capability gaps or operational fleet requirements. Wherever applicable, and based on favorable Science & Technology (S&T) assessments, tasks shall leverage or transition existing Small Business Innovative Research and/or RDT&E Budget Activity 6.2 - 6.3 S&T work.
Metric -- Tasks will address no less than 75% of applicable capability gaps and requirements.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy		DATE: February 2010
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Product Development ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
METOC Future Mission Capabilities	WR	NRL Washington, DC	47.495	6.487	Oct 2009	4.726	Oct 2010	0.000		4.726	Continuing	Continuing	Continuing
METOC Future Mission Capabilities	WR	SSC California	18.913	2.970	Oct 2009	2.259	Oct 2010	0.000		2.259	Continuing	Continuing	Continuing
METOC Future Mission Capabilities	C/Various	MISC MISC	30.756	12.265	Nov 2009	8.087	Nov 2010	0.000		8.087	Continuing	Continuing	Continuing
LBS-G	C/CPIF	Teledyne Brown Eng Alabama	6.557	0.000		0.000		0.000		0.000	0.000	6.557	Continuing
		Subtotal	103.721	21.722		15.072		0.000		15.072			

Remarks

Support ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
METOC Future Mission Capabilities	C/CPIF	MISC MISC	2.464	0.208	Nov 2009	0.216	Nov 2010	0.000		0.216	Continuing	Continuing	Continuing
		Subtotal	2.464	0.208		0.216		0.000		0.216			

Remarks

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy		DATE: February 2010
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Test and Evaluation ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
METOC Future Mission Capabilities	WR	OPTEVFOR Virginia	0.160	0.000		0.000		0.000		0.000	0.000	0.160	Continuing
METOC Future Mission Capabilities	MIPR	JITC Arizona	0.040	0.000		0.000		0.000		0.000	0.000	0.040	Continuing
		Subtotal	0.200	0.000		0.000		0.000		0.000	0.000	0.200	

Remarks

Management Services ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Acquisistion Workforce	Various/ Various	Not Specified Not Specified	0.096	0.000	Oct 2009	0.000	Nov 2010	0.000		0.000	0.000	0.096	Continuing
		Subtotal	0.096	0.000		0.000		0.000		0.000	0.000	0.096	

Remarks

	Total Prior Years Cost	FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	106.481	21.930		15.288		0.000		15.288			

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy			DATE: February 2010
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	Total Prior Years Cost	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total	Cost To Complete	Total Cost	Target Value of Contract

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2011 Navy		DATE: February 2010
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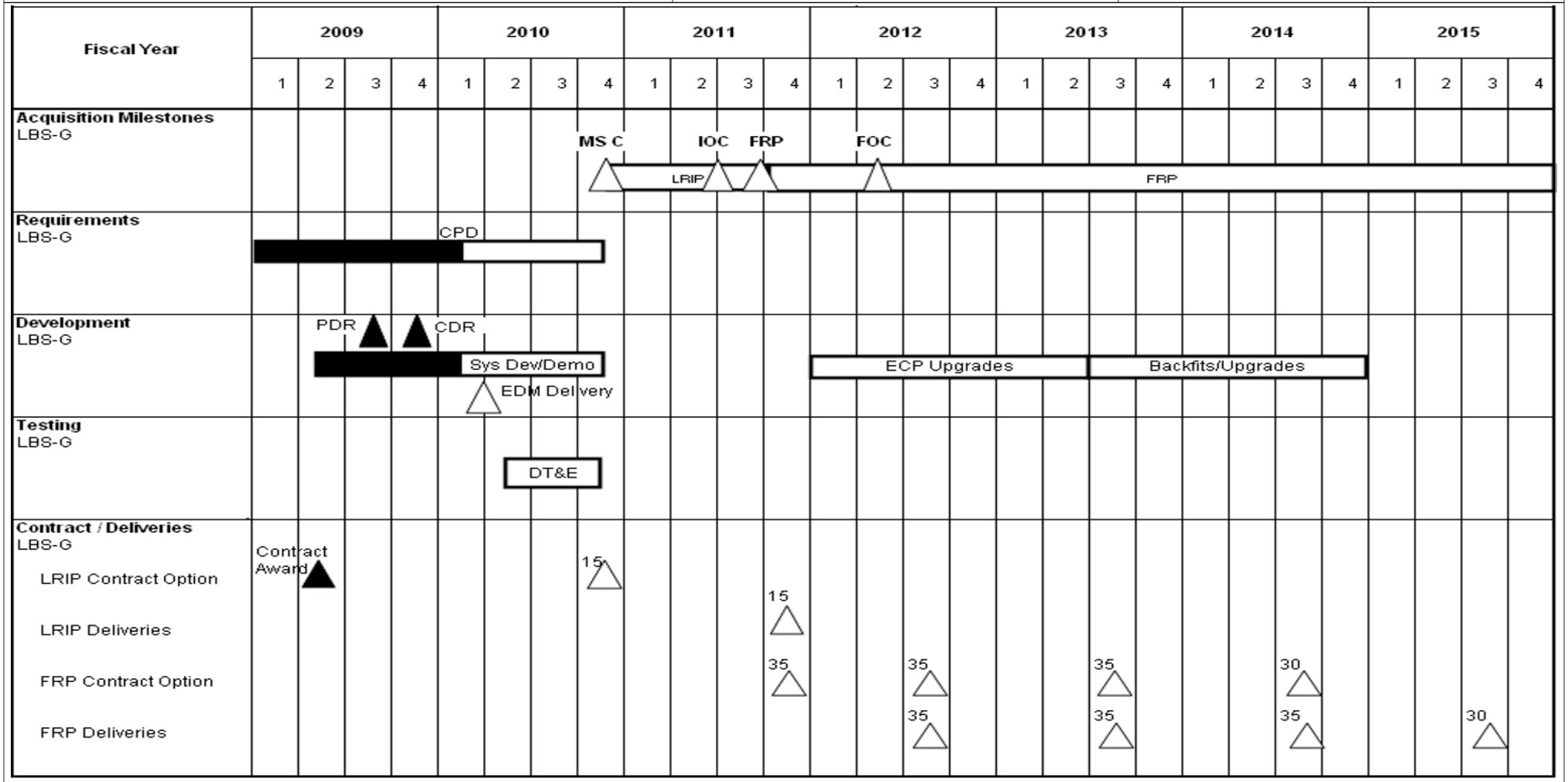

Exhibit R-4, RDT&E Schedule Profile: PB 2011 Navy		DATE: February 2010
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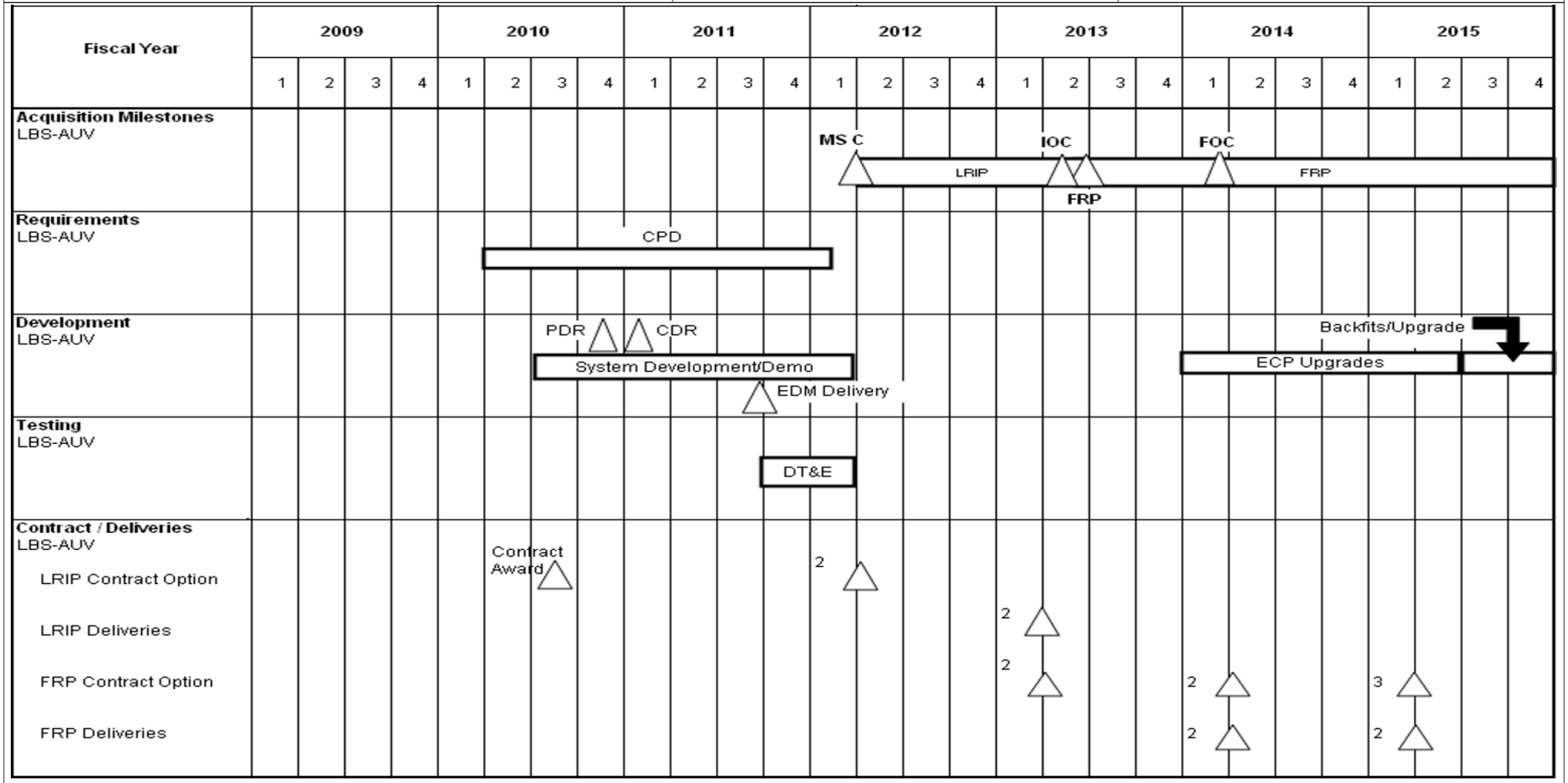

Exhibit R-4, **RDT&E Schedule Profile:** PB 2011 Navy		**DATE:** February 2010
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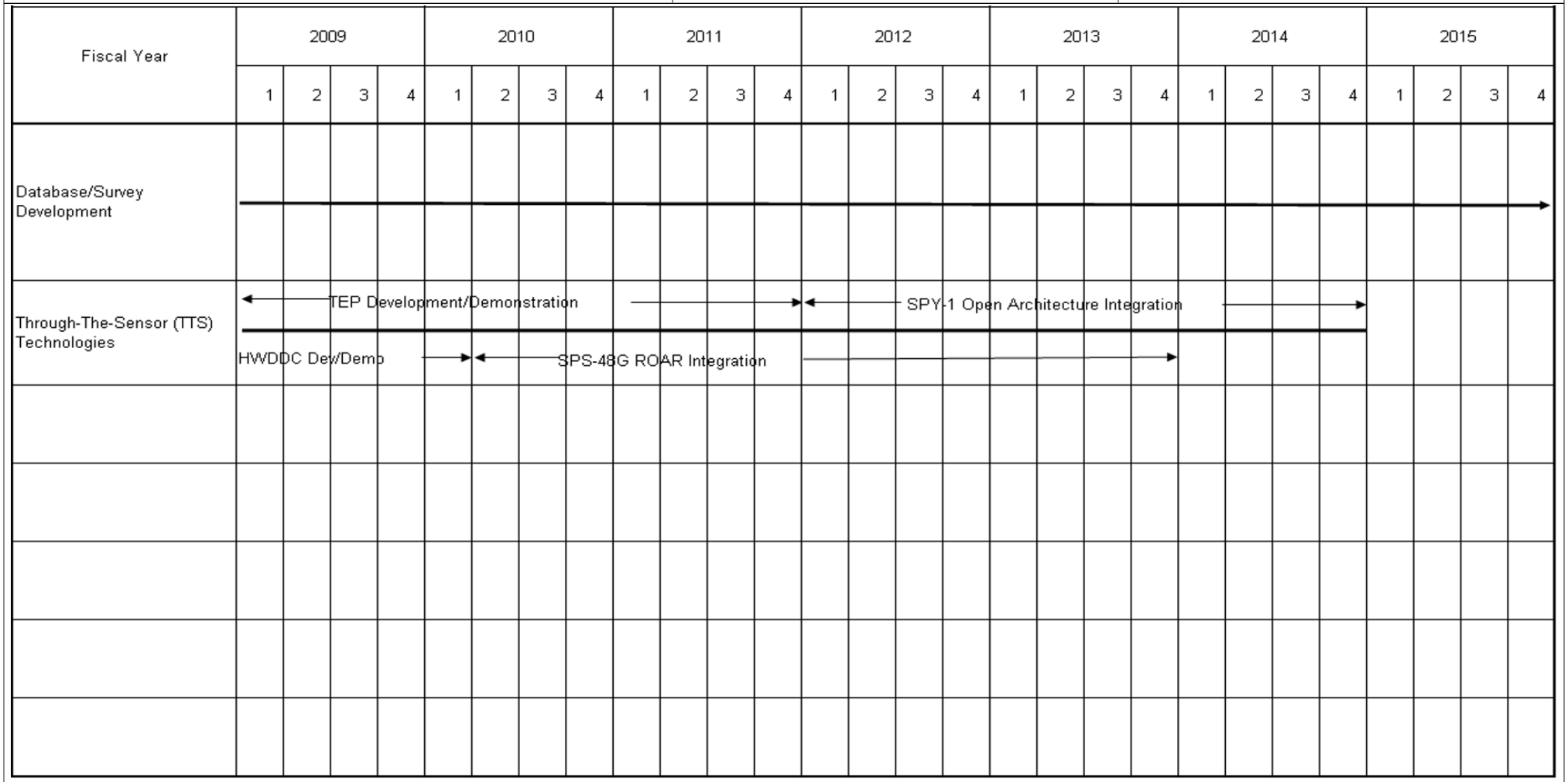

Exhibit R-4, **RDT&E Schedule Profile:** PB 2011 Navy		**DATE:** February 2010
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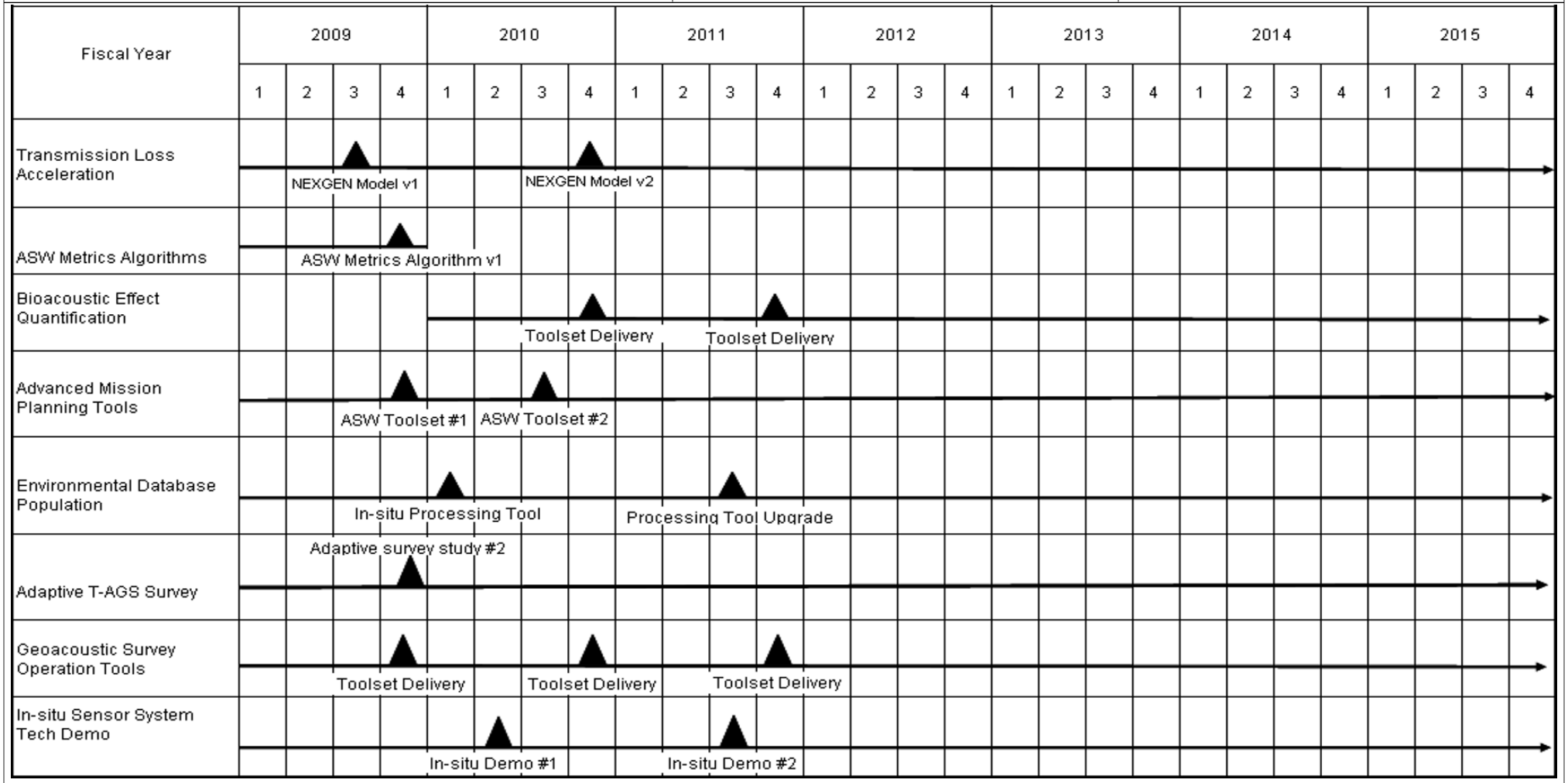

Exhibit R-4A, RDT&E Schedule Details: PB 2011 Navy		DATE: February 2010
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Schedule Details

	Start		End	
Event	Quarter	Year	Quarter	Year
METOC FMC Database/Survey Development	1	2009	4	2015
METOC FMC TEP Development/Demonstration	1	2009	4	2011
METOC FMC HWDDC Dvelopment/Demonstration	1	2009	1	2010
METOC FMC SPS-48G ROAR Integration	2	2010	4	2013
METOC FMC SPY-1 Open Architecture Integration	1	2012	4	2014
TOC USW Transmission Loss Acceleration	1	2009	4	2015
TOC USW NEXGEN Model v1	3	2009	3	2009
TOC USW NEXGEN Model v2	4	2010	4	2010
TOC USW Anti-Submarine Warfare (ASW) Metrics Algorithms	1	2009	4	2009
TOC USW ASW Metrics Algorithm v1	4	2009	4	2009
TOC USW Bioacoustic Effect Quantification	1	2010	4	2015
TOC USW Bioacoustic Effect Quantification Toolset Delivery 1	4	2010	4	2010
TOC USW Bioacoustic Effect Quantification Toolset Delivery 2	4	2011	4	2011
TOC USW Advanced Mission Planning Tools	1	2009	4	2015
TOC USW ASW Toolset #1	4	2009	4	2009
TOC USW ASW Toolset #2	3	2010	3	2010
TOC USW Environmental Database Population	1	2009	4	2015
TOC USW In-situ Processing Tool	1	2010	1	2010

Exhibit R-4A, RDT&E Schedule Details: PB 2011 Navy		DATE: February 2010
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	Start		End	
Event	Quarter	Year	Quarter	Year
TOC USW Processing Tool Upgrade	3	2011	3	2011
TOC USW Adaptive T-AGS Survey	1	2009	4	2015
TOC USW Adaptive Survey Study #2	4	2009	4	2009
TOC USW Geoacoustic Survey Operation Tools	1	2009	4	2015
TOC USW Geoacoustic Survey Operation Toolset Deliver #1	4	2009	4	2009
TOC USW Geoacoustic Survey Operation Toolset Deliver #2	4	2010	4	2010
TOC USW Geoacoustic Survey Operation Toolset Deliver #3	4	2011	4	2011
TOC USW In-situ Sensor System Tech Demo	1	2009	4	2015
TOC USW In-situ Demo #1	2	2010	2	2010
TOC USW In-situ Demo #2	3	2011	3	2011
LBS-Glider Milestone C (MS C)	4	2010	4	2010
LBS-G Low Rate Initial Production (LRIP)	4	2010	3	2011
LBS-G Initial Operational Capability (IOC)	2	2011	3	2011
LBS-G Full Rate Production (FRP)	3	2011	4	2015
LBS-G Full Operational Capability (FOC)	2	2012	2	2012
LBS-G Capabilities Production Document (CPD)	1	2009	4	2010
LBS-G System Development / Demonstration	2	2009	4	2010
LBS-G Preliminary Design Review (PDR)	3	2009	3	2009
LBS-G Critical Design Review (CDR)	4	2009	4	2009
LBS-G Enterprise Data Model (EDM) Delivery	2	2010	2	2010

Exhibit R-4A, RDT&E Schedule Details: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603207N: *Air/Ocean Tactical Applications*	PROJECT 2341: *METOC Data Acquisition*

	Start		End	
Event	Quarter	Year	Quarter	Year
LBS-G Engineering Change Proposals (ECPs) Upgrades	1	2012	2	2013
LBS-G Backfits / Upgrades	3	2013	4	2014
LBS-G Development, Test & Evaluate (DT&E)	2	2010	4	2010
LBS-G Contract Award	2	2009	2	2009
LBS-G LRIP Contract Option: 15	4	2010	4	2010
LBS-G LRIP Deliveries: 15	4	2011	4	2011
LBS-G FRP Contract Option (1): 35	4	2011	4	2011
LBS-G FRP Contract Option (2): 35	3	2012	3	2012
LBS-G FRP Contract Option (3): 35	3	2013	3	2013
LBS-G FRP Contract Option (4): 30	3	2014	3	2014
LBS-G FRP Deliveries (1): 35	3	2012	3	2012
LBS-G FRP Deliveries (2): 35	3	2013	3	2013
LBS-G FRP Deliveries (3): 35	3	2014	3	2014
LBS-G FRP Deliveries (4): 30	3	2015	3	2015
LBS-Autonomous Undersea Vehicles MS C	1	2012	2	2012
LBS-AUV LRIP	1	2012	2	2013
LBS-AUV IOC	2	2013	2	2013
LBS-AUV FRP	2	2013	4	2015
LBS-AUV FOC	1	2014	1	2014
LBS-AUV CPD	2	2010	1	2012

Exhibit R-4A, RDT&E Schedule Details: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603207N: *Air/Ocean Tactical Applications*	**PROJECT** 2341: *METOC Data Acquisition*

	Start		End	
Event	**Quarter**	**Year**	**Quarter**	**Year**
LBS-AUV System Development / Demonstration	3	2010	1	2012
LBS-AUV PDR	4	2010	4	2010
LBS-AUV CDR	1	2011	1	2011
LBS-AUV EDM Delivery	3	2011	4	2011
LBS-AUV ECPs Upgrades	1	2014	2	2015
LBS-AUV Backfits / Upgrades	3	2015	4	2015
LBS-AUV DT&E	4	2011	1	2012
LBS-AUV Contract Award	3	2010	3	2010
LBS-AUV LRIP Contract Option: 2	1	2012	2	2012
LBS-AUV LRIP Delivieries: 2	1	2013	2	2013
LBS-AUV FRP Contract Option (1): 2	1	2013	2	2013
LBS-AUV FRP Contract Option (2): 2	1	2014	2	2014
LBS-AUV FRP Contract Option (3): 3	1	2015	2	2015
LBS-AUV FRP Deliveries (1): 2	1	2014	2	2014
LBS-AUV FRP Deliveries (2): 2	1	2015	2	2015

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy			DATE: February 2010
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COST ($ in Millions)	FY 2009 Actual	FY 2010 Estimate	FY 2011 Base Estimate	FY 2011 OCO Estimate	FY 2011 Total Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
2342: *METOC Data Assimilation and Mod*	17.979	19.336	15.311	0.000	15.311	13.666	13.901	12.860	12.735	Continuing	Continuing
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0		

A. Mission Description and Budget Item Justification

The meteorological and oceanographic (METOC) Data Assimilation Project is a multi-faceted project that provides future mission capabilities for warfighters to characterize the physical environment within their battlespace. This project includes: 1) development, demonstration and validation of atmospheric and oceanographic data assimilation techniques, forecast models, database management systems, and associated software for use in both mainframe and tactical scale computers. Included are numerical oceanographic and atmospheric models for the Large Scale Computers at the Navy Fleet Numerical Meteorology and Oceanography Center (FNMOC), Monterey, CA and the Naval Oceanographic Office (NAVO), Stennis Space Center, MS. These models, combined with a global communications network for data acquisition and distribution, form a prediction system which provides METOC data and products necessary to support naval operations worldwide in virtually every mission area; 2) other models, which focus on ocean thermal structure and circulation, and surf and tide prediction; 3) techniques to process and manage satellite remotely-sensed environmental data at Oceanography Centers ashore and on ships equipped with the AN/SMQ-11 satellite receiver/recorder; 4) National Polar-orbiting Operational Environmental Satellite System (NPOESS) readiness and risk reduction preparations to develop hardware and software that will allow ground stations to receive, ingest and exploit NPOESS data including the NPOESS Preparatory Project. These techniques allow for the integration and tactical application of significant oceanographic and atmospheric data derived from satellite-borne sensors. Included are techniques and algorithms for the processing of sensor measurements, conversion of raw signal data to geophysical information, analysis schemes encompassing Artificial Intelligence and Expert Systems, and other satellite data applications and field validation of end products; and, 5) a family of acoustic system performance models beginning with active system models and databases in the low-, mid-, and high-frequency regimes and culminating with high fidelity simulation products. As weapons and sensors become more sophisticated and complex, the marine environment has an increasingly significant impact on system performance. Operational limitations induced by the ocean and atmosphere must be understood, and the resulting constraints on mission effectiveness and system employment minimized. Hence, the operating forces require more accurate worldwide forecasts of METOC conditions with increased temporal and spatial resolution. An additional challenge is posed by the emergence of new satellite sensor data. In order to fully exploit this dynamic and massive volume of data, modern Data Base Management Systems are required, and must be tailored for individual computer configurations at both FNMOC and NAVO. Improved representation of smaller-scale phenomena, particularly in the littoral, is also an important consideration. Intelligence Preparation of the Environment Sensor R&D to meet Chief of Naval Operations and Commander, Fleet Forces Command requirements for remote autonomous, clandestine, littoral battlespace sensing in near shore areas in support of Sea Shield & Sea Basing.

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
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Major emphasis areas include the Littoral Battlespace Sensors - Unmanned Undersea Vehicle (comprised of ocean Gliders and Autonomous Undersea Vehicles programs of record, and the Meteorological and Oceanographic Future Mission Capabilities (METOC) the Meteorological and Oceanographic (METOC) Space-Based Sensing Capabilities, the Fleet Synthetic Training and the Tactical Oceanographic Capabilities / Under Sea Warfare projects.

FY 2011 request provides for continued advanced component development and prototype efforts associated with advanced data assimilation into environmental prediction systems (to include development of tactical decision aids and asset allocation tools), the continued development of advanced oceanographic and atmospheric prediction systems and architectures to provide improved forecasts and estimates of product accuracies, continued development of improved data fusion techniques, data quality control technologies and accelerate the automation prediction processes, and the development of data assimilation and fusion techniques and technologies for tactical radars, remote sensing and undersea sensor systems.

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
Acquisition Workforce Fund *FY 2009 Accomplishments:* Funded acquisition workforce fund.	0.090	0.000	0.000	0.000	0.000
Littoral Battlespace Sensing, Unmanned Undersea Vehicle (LBS-UUV) *FY 2009 Accomplishments:* Continued, from FY07, the development of advanced data assimilation and fusion algorithms for glider and Autonomous Undersea Vehicles (AUVs) data including, temperature, depth, salinity, optics, hydrographic, bathymetric and other water column and ocean bottom properties. Demonstrated a basic capability to assimilate, database, and relay data and derived products from ocean gliders and AUVs, including optics, bathymetry, temperature, depth, salinity, and currents. Demonstrated prototype mission planning and adaptive sampling capability. Began defining LBSF&I Unmanned Undersea Vehicle (UUV) Engineering Change Proposal (ECP) Fusion and Integration requirements and capabilities. Conducted ECP capability studies and analyses as required.	1.700	1.800	0.473	0.000	0.473

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
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B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
FY 2010 Plans: Demonstrate a basic capability to assimilate, database, and relay data and derived products from ocean gliders, including optics (glider analysis, satellite coupling, Navy Coastal Ocean Model integration, etc.), temperature, depth, salinity, and currents. Demonstrate prototype mission planning and adaptive sampling capability as part of the Littoral Battlespace Sensing - Gliders (LBS-G) System Development and Demonstration (SDD) phase. Continue development of advanced bathymetric data assimilation techniques such as Inertial Navigation Drift, automated fusion, micronavigation, and feature based navigation. Continue to define the LBS-UUV ECP Fusion requirements and capabilities. Integrate advanced quality control algorithms into the LBS-G system as required as part of the SDD phase of the procurement. Complete at-sea and ashore Development Testing and Evaluation of the complete end-to-end glider system including command and control, mission planning, mission profile characteristics and other Key Performance Parameters and Key System Parameters. Begin the SDD phase of the Littoral Battlespace Sensing - Autonomous Undersea Vehicle (LBS-AUV). *FY 2011 Base Plans:* Continue the development of advanced LBS-G and LBS-AUV data fusion efforts. Demonstrate prototype mission planning and adaptive sampling capability as part of the LBS-G SDD phase. Begin integration of advanced quality control algorithms as required into the LBS-AUV program as part of its SDD phase. Continue the LBS-AUV SDD Phase.					
Meteorological and Oceanographic (METOC) Future Mission Capabilities (FMC) *FY 2009 Accomplishments:* Continued advanced component development and prototype efforts associated with advanced data assimilation into environmental prediction systems. Continued development of advanced oceanographic and atmospheric prediction systems and architectures to provide improved forecasts and estimates of product accuracies. Continued development of improved data fusion techniques, data quality control technologies and accelerate the automation prediction processes. Developed	9.517	9.044	6.250	0.000	6.250

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B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
data assimilation and fusion techniques and technologies for tactical radars, remote sensing and undersea sensor systems. Developed atmospheric fusion algorithms and demonstrate Tactical Environmental Processor (TEP) and Hazardous Weather Detection and Display Capability reachback fusion capability. Developed network integration capability and continued to develop systems engineering plans, requirements, standards, studies, and other documentation supporting integration of these products into the SPY-1 Open Architecture and SPS-48G radars. Developed advanced data assimilation and data quality control algorithms for glider and Autonomous Undersea Vehicles (AUVs) data including, temperature, depth, salinity, optics, hydrographic, bathymetric and other water column and ocean bottom properties.					
FY 2010 Plans: Continue advanced component development and prototype efforts associated with advanced data assimilation into environmental prediction systems, to include development of tactical decision aids and asset allocation tools. Continue development of advanced oceanographic and atmospheric prediction systems and architectures to provide improved forecasts and estimates of product accuracies. Continue development of improved data fusion techniques, data quality control technologies and accelerate the automation prediction processes. Develop data assimilation and fusion techniques and technologies for tactical radars, remote sensing and undersea sensor systems. Develop atmospheric fusion algorithms and demonstrate TEP reachback fusion capability. Development of network integration capability and continue to develop systems engineering plans, requirements, standards, studies, and other documentation supporting integration of these products. Development of advanced data assimilation and data quality control algorithms for glider and AUVs data including, temperature, depth, salinity, optics, hydrographic, bathymetric and other water column and ocean bottom properties.					
FY 2011 Base Plans: Continue advanced component development and prototype efforts associated with advanced data assimilation into environmental prediction systems, to include development of tactical decision aids					

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
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B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
and asset allocation tools. Continue development of advanced oceanographic and atmospheric prediction systems and architectures to provide improved forecasts and estimates of product accuracies. Continue development of improved data fusion techniques, data quality control technologies and accelerate the automation prediction processes. Develop data assimilation and fusion techniques and technologies for tactical radars, remote sensing and undersea sensor systems. Develop atmospheric fusion algorithms and demonstrate TEP reachback fusion capability. Development of network integration capability and continue to develop systems engineering plans, requirements, standards, studies, and other documentation supporting integration of these products. Development of advanced data assimilation and data quality control algorithms for glider and AUVs data including, temperature, depth, salinity, optics, hydrographic, bathymetric and other water column and ocean bottom properties.					
Meteorological and Oceanographic (METOC) Space-Based Sensing Capabilities	3.362	5.051	5.008	0.000	5.008
FY 2009 Accomplishments: Continued development of the National Polar-orbiting Operational Environmental Satellite System (NPOESS) data assimilation algorithms and applications previously funded under PE 0305160N, Navy METOC Support (Space), Project 0524 which used simulations and on-orbit heritage sensors. The NPOESS program constellation of satellites included the NPOESS Preparatory Project (NPP) satellite, the NPOESS satellites (C-1, C-2 and replacements) and the European METOC (European Meteorological Operational satellite program) . *FY 2010 Plans:* Continue development of techniques for the assimilation of data from current and future civil, military and international earth observing systems. Develop Naval applications using this data for Naval METOC Production Centers. Funding increase reflects the need for additional data assimilation algorithms and applications resulting from the anticipated launch of the NPP satellite in early FY11.					

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
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B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
FY 2011 Base Plans: Continue development of the NPOESS data assimilation algorithms using NPP data. Continue development of techniques for the assimilation of data from current and future civil, military and international earth observing systems. Continue research and development of data assimilation processes and advanced modeling techniques for ingesting NPOESS sensor data.					
Tactical Oceanographic Capabilities (TOC) / Undersea Warfare (USW)	3.310	3.441	3.580	0.000	3.580
FY 2009 Accomplishments: Continued development of Anti-Submarine Warfare (ASW) mission planning, analysis and reconstruction tools, including Geographic Information Systems, for operational use at the ASW Reachback Cell (RBC). Reconstruction and Analysis (R&A) tool set expanded to support all ASW communities, integrate mission planning functions and contain both acoustic/non-acoustic reconstruction data in a GIS environment. Continued to develop ASW tactical decision aid asset allocation and mission planning tools to optimize deployment of both environmental data collection assets and tactical acoustic and non-acoustic sensors. Developed ASW-related performance surface products for use at the NAVOCEANO ASW Reachback Cell and in mission planning systems to include Probability of Detection maps. Assessed uncertainty values associated with acoustic performance prediction products. Identified, developed and tested environmentally-oriented, mathematically-based decision support tools for application in support of ASW operations and exercises. Began development of models, databases and algorithms to quantify non-acoustic/ acoustic uncertainty. Continue development of algorithms to create area acoustic assessments and analogous exercise area tools. Developed descriptive dynamic oceanography features assessment tool for ocean model accuracy/reliability determination. Continued spiral development of the RAM and Parabolic Equation acoustic models. Integrated upgrade NAUTILUS propagation model into fleet systems. Continued annual upgrades to the Scalable Tactical Acoustic Propagation Loss Engine system. Developed a self-consistent semi-empirical surface loss model. Used reverberation workshop results to develop new Navy Standard active reverberation model. Continued development					

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B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
of algorithms that recommend active sonar waveforms based on the state of the environment and algorithms that validate and improve the quality of modeled low frequency active planning. Developed models that quantify effects of near- surface turbulence and N-gradients on target detection. Developed Fish Scattering Strength algorithm Continued development of a short-term ambient noise forecasting capability using previously collected ambient noise data from tactical sensors. Continued to develop methods and techniques to aid in the collection, archiving/databasing and dissemination of both omni-directional and directional ambient noise data. Developed ambient noise databases for emerging airborne and submarine-based ASW systems. Provided project technical and program management oversight. *FY 2010 Plans:* Continue FY09 efforts. Continue to develop decision tool asset allocation and mission planning modules to optimize deployment of both environmental data collection assets and tactical Undersea Warfare (USW) acoustic and non-acoustic sensors. Continue to refine and validate USW-related performance assessment and decision products for use at the NAVOCEANO ASW RBC and in USW decision tools. Continue spiral development of active and passive acoustic propagation loss models for use in fleet mission planning systems supporting mono- and multistatic Antisubmarine Warfare operations. Continue technology upgrades to transmission loss acceleration algorithms. Develop algorithms that characterize acoustic reverberation as well as boundary and volume loss/ scatter functions as observed by active and passive tactical sonar systems. Develop decision tool algorithms that optimize operational sonar system performance. Continue to develop directional and omnidirectional regional ambient noise characterization tools. Conduct technical demonstration of in-situ ocean parameter collection systems. Populate/upgrade oceanographic and acoustic databases in COCOM areas of interest. Transition algorithms that capture and communicate variability and uncertainty, robustness and sensitivity as input to Fleet USW decision tools and underlying models and data bases. Develop oceanographic operations analysis tools Develop real-time and post-event ASW performance assessment tools. Provide project technical and program management oversight.					

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
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B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
FY 2011 Base Plans: Continue to develop decision tool asset allocation and mission planning modules to optimize deployment of both environmental data collection assets and tactical ASW acoustic and non-acoustic sensors. Continue to refine and validate ASW-related performance assessment and decision products for use at the NAVOCEANO ASW RBC and in ASW decision tools. Develop algorithms for quantification of volume scattering effects on active sonar. Continue spiral development of active and passive acoustic propagation loss models for use in fleet mission planning systems supporting mono- and multistatic ASW operations. Continue technology upgrades to transmission loss acceleration algorithms. Develop algorithms that characterize acoustic volume loss/scatter functions as observed by active tactical sonar systems. Develop sea surface and seabed boundary interaction characterizations to support sensor performance predictions. Expand capabilities and increase access speed of acoustic surface scattering and loss modules. Continue to develop directional and omnidirectional regional ambient noise characterization and forecasting tools. Populate/upgrade oceanographic and acoustic databases in COCOM areas of interest. Transition algorithms that capture and communicate variability and uncertainty, robustness and sensitivity as input to Fleet ASW decision tools and underlying models and data bases. Develop an ASW RBC ocean model assessment toolkit. Develop post-ASW event R&A validation tools and capabilities. Develop ASW Reachback Cell visual analysis toolset. Provide project technical and program management oversight. Continue capability upgrades and validation of Next Generation electro-magnetic and electro-optic performance prediction systems and decision tools. Develop Through-the-Sensor echnologies to characterize atmospheric boundary layer parameters for ASW applications.					
Accomplishments/Planned Programs Subtotals	17.979	19.336	15.311	0.000	15.311

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
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C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total	FY 2012	FY 2013	FY 2014	FY 2015	Cost To Complete	Total Cost
• OPN/4226: *METEOROLOGICAL EQUIPMENT*	21.169	14.514	25.581	0.592	26.173	24.430	22.430	24.575	25.765	Continuing	Continuing
• RDTEN/0604218N: *Air/Ocean Equipment Engineering*	5.362	7.454	5.735	0.000	5.735	5.993	5.615	5.737	5.852	Continuing	Continuing

D. Acquisition Strategy

Acquisition, management and contracting strategies to support the METOC Data Assimilation Project which is a multi-faceted program which includes: 1) development, demonstration and validation of atmospheric and oceanographic data assimilation techniques, forecast models, database management systems, and associated software for use in both mainframe and tactical scale computers; 2) other models, which focus on ocean thermal structure and circulation, and surf and tide prediction; 3) techniques to process and manage satellite remotely-sensed environmental data at Oceanography Centers ashore and on ships equipped with the AN/SMQ-11 satellite receiver/recorder; and, 4) a family of acoustic system performance models beginning with active system models and databases in the low-, mid-, and high-frequency regimes and culminating with high fidelity simulation products.

E. Performance Metrics

Goal: Develop techniques and tools to assimilate meteorological and oceanographic (METOC) data in order to improve the accuracy of global and regional scale meteorological and oceanographic forecast models. Data assimilation is expanded to include new in-situ and remotely-sensed data types, based on operational need. Tasks are directed toward advanced techniques enabling assimilation of disparate sources on non-synoptic time scales. Acoustic, atmospheric, and oceanographic model development, prototyping and transition is focused on improved model physics, increased resolution, and computational efficiency.
Metric -- Tasks will address no less than 75% of applicable capability gaps and requirements.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy		DATE: February 2010
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Product Development ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
METOC Future Mission Capabilities	WR	NRL Washington DC	91.094	11.475	Oct 2009	8.728	Oct 2010	0.000		8.728	Continuing	Continuing	Continuing
METOC Future Mission Capabilities	WR	SSCs California, South Carolina	1.486	0.786	Oct 2009	0.662	Oct 2010	0.000		0.662	Continuing	Continuing	Continuing
METOC Future Mission Capabilities	C/Various	MISC MISC	34.108	7.075	Oct 2009	5.921	Oct 2010	0.000		5.921	Continuing	Continuing	Continuing
METOC Future Mission Capabilities	FFRDC	Univ. S. Miss. Mississippi	2.413	0.000		0.000		0.000		0.000	0.000	2.413	Continuing
		Subtotal	129.101	19.336		15.311		0.000		15.311			

Remarks

Support ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
METOC Future Mission Capabilities	C/CPIF	SSA/CSC MISC	0.295	0.000		0.000		0.000		0.000	0.000	0.295	Continuing
		Subtotal	0.295	0.000		0.000		0.000		0.000	0.000	0.295	

Remarks

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy		DATE: February 2010
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Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	FY 2010 Cost	FY 2010 Award Date	FY 2011 Base Cost	FY 2011 Base Award Date	FY 2011 OCO Cost	FY 2011 OCO Award Date	FY 2011 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Acquisition Workforce	Various/ Various	Not Specified Not Specified	0.090	0.000		0.000		0.000		0.000	0.000	0.090	Continuing
		Subtotal	0.090	0.000		0.000		0.000		0.000	0.000	0.090	

Remarks

	Total Prior Years Cost	FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	129.486	19.336		15.311		0.000		15.311			

Remarks

Exhibit R-4, **RDT&E Schedule Profile:** PB 2011 Navy		**DATE:** February 2010
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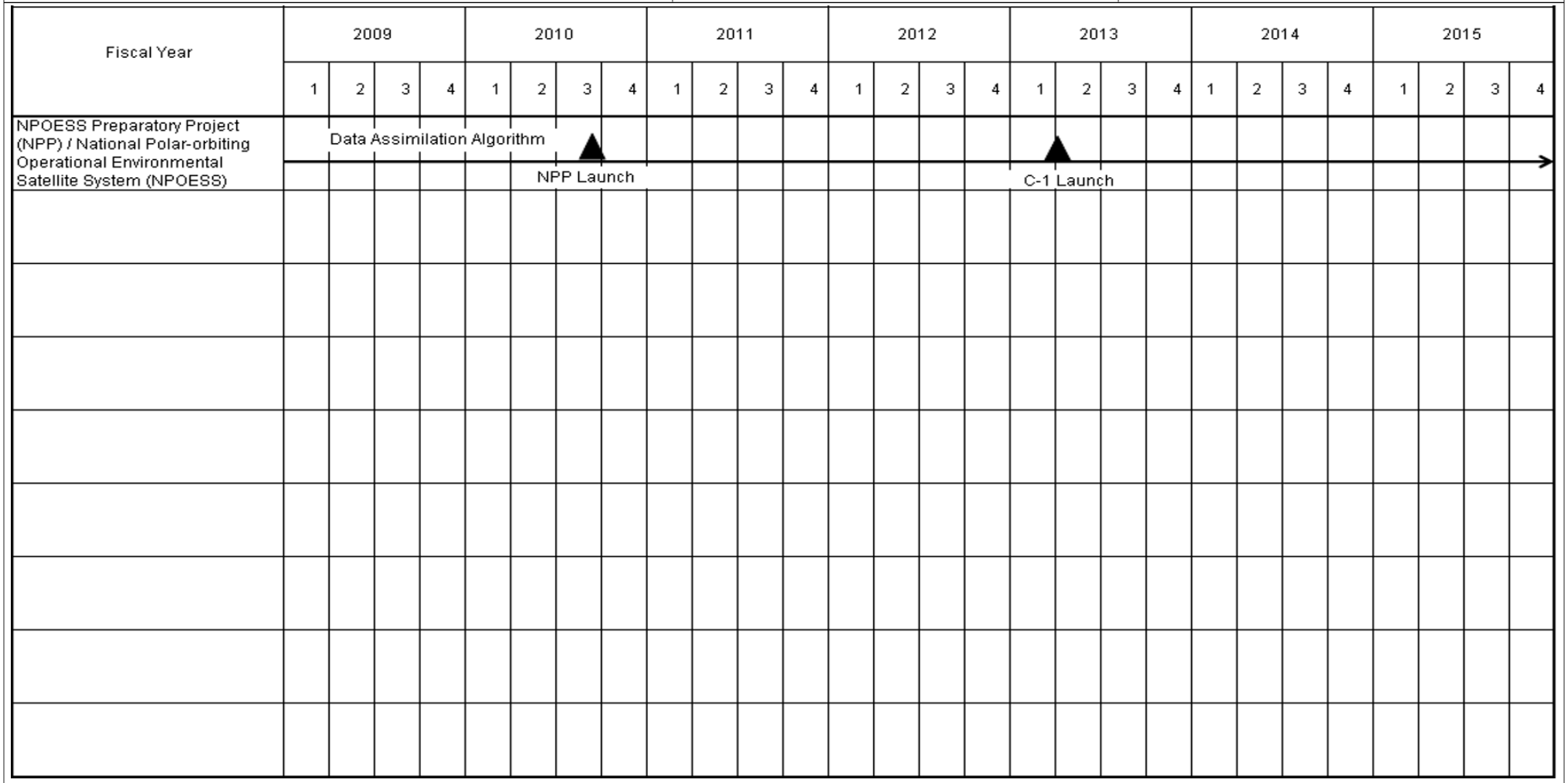

Exhibit R-4, **RDT&E Schedule Profile:** PB 2011 Navy		**DATE:** February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603207N: *Air/Ocean Tactical Applications*	**PROJECT** 2342: *METOC Data Assimilation and Mod*

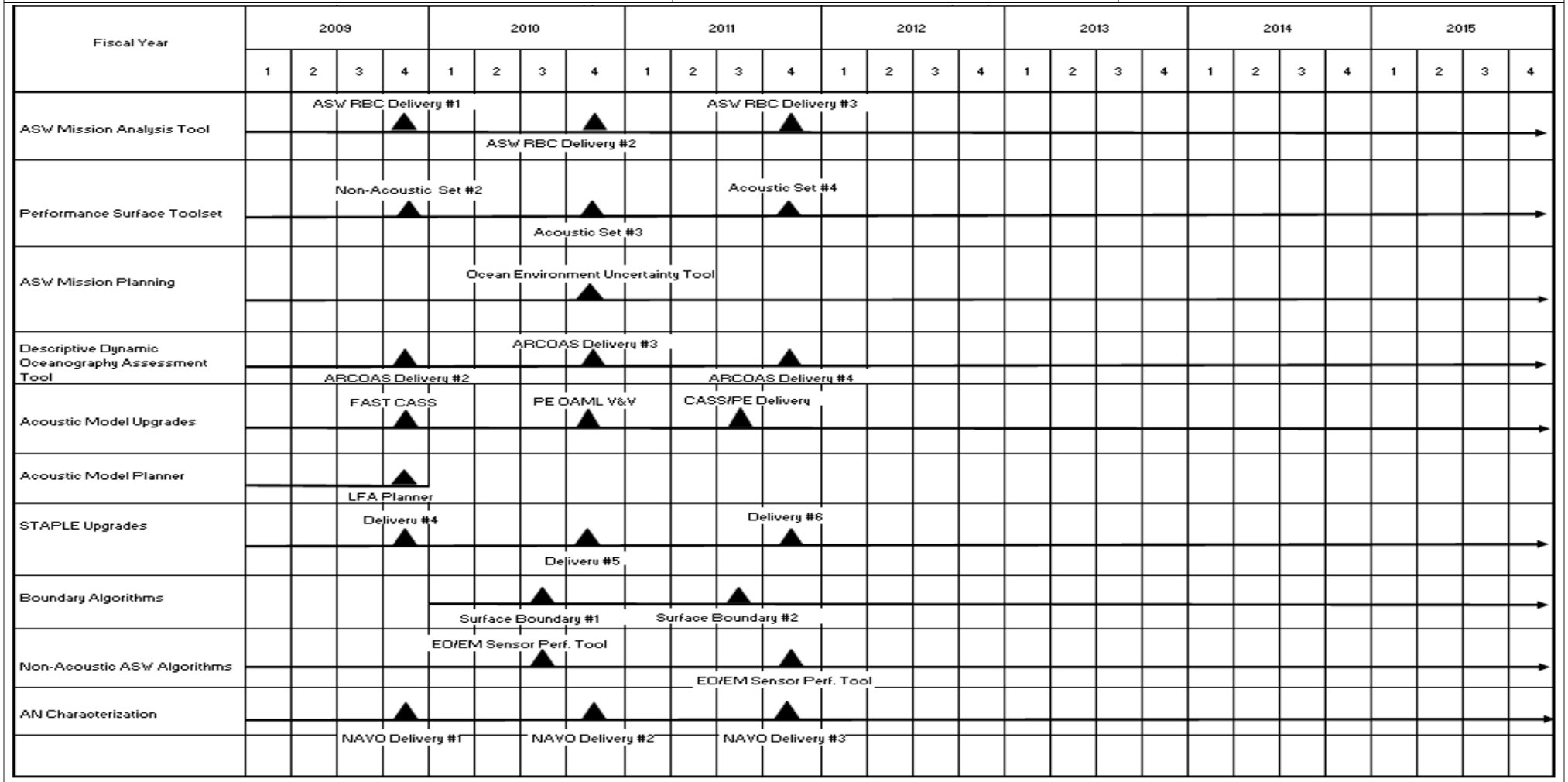

Exhibit R-4A, RDT&E Schedule Details: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603207N: *Air/Ocean Tactical Applications*	**PROJECT** 2342: *METOC Data Assimilation and Mod*

Schedule Details

	Start		End	
Event	**Quarter**	**Year**	**Quarter**	**Year**
TOC USW Anti-Submarine (ASW) Mission Analysis Tool	1	2009	4	2015
TOC USW ASW Reachback (RBC) Delivery #1	4	2009	4	2009
TOC USW ASW RBC Delivery #2	4	2010	4	2010
TOC USW ASW RBC Delivery #3	4	2011	4	2011
TOC USW Performance Surface Toolset	1	2009	4	2015
TOC USW Non-Acoustic Set #2	4	2009	4	2009
TOC USW Acoustic Set #3	4	2010	4	2010
TOC USW Acoustic Set #4	4	2011	4	2011
TOC USW ASW Mission Planning	1	2009	4	2015
TOC USW Ocean Environment Uncertainty	4	2010	4	2010
TOC USW Descriptive Dynamic Oceanography Assessment Tool	1	2009	4	2015
TOC USW ARCOAS Delivery #2	4	2009	4	2009
TOC USW ARCOAS Delivery #3	4	2010	4	2010
TOC USW ARCOAS Delivery #4	4	2011	4	2011
TOC USW Acoutic Model Upgrades	1	2009	4	2015
TOC USW FAST CASS	4	2009	4	2009
TOC USW PE OAML V&V	4	2010	4	2010
TOC USW CASS/PE Delivery	3	2011	3	2011

Exhibit R-4A, RDT&E Schedule Details: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603207N: *Air/Ocean Tactical Applications*	PROJECT 2342: *METOC Data Assimilation and Mod*

	Start		End	
Event	Quarter	Year	Quarter	Year
TOC USW Acoustic Model Planner	1	2009	4	2009
TOC USW LFA Planner	4	2009	4	2009
TOC USW STAPLE Upgrades	1	2009	4	2015
TOC USW Delivery #4	4	2009	4	2009
TOC USW Delivery #5	4	2010	4	2010
TOC USW Delivery #6	4	2011	4	2011
TOC USW Boundary Algorithms	1	2010	4	2015
TOC USW Surface Boundary #1	3	2010	3	2010
TOC USW Surface Boundary #2	3	2011	3	2011
TOC USW Non-Acoustic ASW Algorithms	1	2009	4	2015
TOC USW Electro-Magnetic / Electro-Optic (EO/EM) Sensor Performance Tool	3	2010	3	2010
TOC USW EO/EM Sensor Performance Tool	4	2011	4	2011
TOC USW Ambient Noise (AN) Characterization	1	2009	4	2015
TOC USW NAVO Delivery #1	4	2009	4	2009
TOC USW NAVO Delivery #2	4	2010	4	2010
TOC USW NAVO Delivery #3	4	2011	4	2011

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603207N: *Air/Ocean Tactical Applications*	PROJECT 2343: *Tactical METOC Applications*	

COST ($ in Millions)	FY 2009 Actual	FY 2010 Estimate	FY 2011 Base Estimate	FY 2011 OCO Estimate	FY 2011 Total Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
2343: *Tactical METOC Applications*	6.116	16.097	13.736	0.000	13.736	15.729	15.293	12.166	12.418	Continuing	Continuing
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0		

A. Mission Description and Budget Item Justification

The Tactical Meteorological and oceanographic (METOC) Applications Project provides future operational effects decision aid capabilities for Navy and Marine Corps warfighters in the context of Joint Operations in a net-centric environment. This project identifies and transitions state-of-the-art decision support software technologies from the government's and commercial Industry's technology base and then demonstrates and validates these capabilities before fielding. These software decision support tools provide platform, sensor, communications, and weapon systems performance assessments for warfighters in terms of their littoral and deep-strike battlespace environments. These assessments allow mission planners and warfighters, from the unit to theater level, to optimize their sensor employment on airborne, surface, and subsurface platforms in support of all Naval Composite Warfare mission areas including Undersea Warfare (USW), Anti-Submarine Warfare (ASW), Mine Warfare, Amphibious Warfare (AMW), Anti-Surface Warfare (ASUW), Anti-Air Warfare (AAW), Strike Warfare (STW), and Naval Special Warfare (NSW). Performance assessments leading to improvements in operational and tactical control are conducted through a two-tiered approach: 1) METOC Decision Aids (MDAs) and, 2) Operational Effects Decision Aids (OEDAs). MDAs consist of a series of analysis tools which characterize the physical environment conditions of the battlespace based on the best set of physical environment data available at the time (i.e., some combination of historical and/or real-time (or near real-time) in-situ, and numerically modeled forecast data). OEDAs then use the MDA information by fusing it with relevant, often-classified sensor and target data to predict how own-force weapons and sensor systems will perform against hostile targets. Performance results are displayed in tabular and graphic formats integrated into net-centric visualization tools for use by mission planners and combat/weapon system operators to develop localization plans, USW/AAW/ASUW screens, STW profiles, AMW ingress and egress points, and for other warfare considerations. MDAs and OEDAs typically use data derived from sensors developed in Project 2341 (METOC Data Acquisition) and assimilated by software produced by Project 2342 (METOC Data Assimilation and Modeling). MDAs and OEDAs also use data obtained through direct interfaces to Navy combat systems. A current emphasis area of the project is capabilities required to characterize and/or predict sensor and weapons system performance in the highly complex littoral environments in support of regional conflict scenarios. It addresses multi-warfare areas, particularly shallow water ASW, NSW, and missile and air defense/strike capabilities.

Major emphasis areas include the Naval Integrated Tactical Environmental System Next Generation (NITES-Next) program of record, and the Tactical Oceanographic Capabilities / Under Sea Warfare (USW) project.

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603207N: *Air/Ocean Tactical Applications*	PROJECT 2343: *Tactical METOC Applications*

FY 2011 request provides for the continued development of NITES-Next system architecture, system engineering, and software, including integration with next generation Electromagnetic and Electro-optical EM/EO and performance prediction systems.

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
Acquisition Workforce Fund	0.031	0.000	0.000	0.000	0.000
FY 2009 Accomplishments: Funded acquisition workforce fund.					
Naval Integrated Tactical Environmental System Next Generation (NITES-Next)	6.085	15.821	13.736	0.000	13.736
FY 2009 Accomplishments: Conducted NITES-Next development contract award preparation activities and associated development of system architecture, system engineering, and software development, including development of upgrades to next generation Electromagnetic and Electro-optical (EM/EO) and Advanced Refractive Environmental Prediction System performance prediction systems. Awarded the NITES-Next Release 1 (Ashore requirements and NITES-Fielded legacy software updates) development contract, conducted the Initial Baseline Review. Developed the Mine Warfare and Environmental Data Applications Library to include the incorporation of the new environmental databases and model updates.					
FY 2010 Plans: Continue development of system architecture, system engineering, software development, test and integration activities for NITES-Next System Development and Demonstration, including integration into next generation EM/EO and performance prediction systems. Conduct NITES-Next Release 1 System Readiness Review (SRR)/System Functional Review (SFR), System Design Review (SDR), Preliminary Design Review (PDR) and Critical Design Review (CDR) involving lab, fleet and site testing and early Commander, Operational Test & Evaluation Force (COMOPTEVFOR) involvement. Initiate extensive NITES-Next software development across the multiple Computer Software Configuration Items.					

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603207N: *Air/Ocean Tactical Applications*	PROJECT 2343: *Tactical METOC Applications*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
FY 2011 Base Plans: Conduct NITES-Next Design Readiness Review. Continue the development of NITES-Next Release 1 system architecture, system engineering, and software, including integration with next generation EM/EO and performance prediction systems. Award NITES-Next development contract Option 1 (Release 2 (Afloat and Mobile requirements)). Conduct NITES-Next Release 2 SRR/SFR, SDR, PDR and CDR involving lab, fleet and site testing and early Commander, Operational Test & Evaluation Force involvement. Continue Developmental Test and Evaluation efforts in preparation for Initial Operational Test and Evaluation and Milestone C involving lab, fleet and site testing.					
Tactical Oceanographic Capabilities (TOC) / Undersea Warfare (USW)	0.000	0.276	0.000	0.000	0.000
FY 2010 Plans: Continue capability upgrades and validation of Next Generation electro-magnetic and electro-optic performance prediction systems and decision tools. Develop Through-the-Sensor technologies to characterize atmospheric boundary layer parameters for Anti-Submarine Warefare applications.					
Accomplishments/Planned Programs Subtotals	6.116	16.097	13.736	0.000	13.736

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total	FY 2012	FY 2013	FY 2014	FY 2015	Cost To Complete	Total Cost
• RDTEN/0604218N: *Air/Ocean Equipment Engineering*	5.362	7.454	5.735	0.000	5.735	5.993	5.615	5.737	5.852	Continuing	Continuing

D. Acquisition Strategy

Acquisition, management and contracting strategies are to support the Tactical METOC Applications project to continue the development of state-of-the-art software capabilities that provide sensor, communication, and weapon system performance assessments across the full spectrum of open ocean and littoral operating environments, meteorology and oceanography , all with management oversight incorporating these into the Naval Integrated Tactical Environmental System Next Generation program under JCIDS by the Department of the Navy (DoN).

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603207N: *Air/Ocean Tactical Applications*	**PROJECT** 2343: *Tactical METOC Applications*

E. Performance Metrics

Goal: Develop meteorological and oceanographic (METOC) future operational effects decision aid capabilities for Navy and Marine Corps war fighters in order to facilitate the characterization and prediction of the entire battle space.

Metric: Improve the accuracy of meteorological and oceanographic tactical decision aids and applications in order to address no less than 75% of applicable capability gaps and requirements.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603207N: *Air/Ocean Tactical Applications*	PROJECT 2343: *Tactical METOC Applications*

Product Development ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Product Development	WR	NRL Washington, DC	3.238	0.655	Oct 2009	0.593	Oct 2010	0.000		0.593	Continuing	Continuing	Continuing
NITES/NITES-Next	WR	SSCs California, South Carolina	5.686	1.637	Oct 2009	0.646	Oct 2010	0.000		0.646	Continuing	Continuing	Continuing
NITES/NITES-Next	C/Various	MISC MISC	3.877	1.898	Oct 2009	1.778	Oct 2010	0.000		1.778	Continuing	Continuing	Continuing
NITES	C/Various	MISC MISC	61.400	0.000		0.000		0.000		0.000	0.000	61.400	Continuing
NITES-Next	C/CPIF	GD-IT Viginia	3.508	11.907	Jan 2010	10.719	Nov 2010	0.000		10.719	Continuing	Continuing	Continuing
		Subtotal	77.709	16.097		13.736		0.000		13.736			

Remarks

Support ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Support Cost	C/CPIF	IPD Not Specified	0.595	0.000		0.000		0.000		0.000	0.000	0.595	Continuing
		Subtotal	0.595	0.000		0.000		0.000		0.000	0.000	0.595	

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603207N: *Air/Ocean Tactical Applications*	PROJECT 2343: *Tactical METOC Applications*

Support ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract

Remarks

Management Services ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Acquisition Workforce	Various/ Various	Not Specified Not Specified	0.031	0.000		0.000		0.000		0.000	0.000	0.031	Continuing
		Subtotal	0.031	0.000		0.000		0.000		0.000	0.000	0.031	

Remarks

	Total Prior Years Cost	FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	78.335	16.097		13.736		0.000		13.736			

Remarks

Exhibit R-4, **RDT&E Schedule Profile:** PB 2011 Navy		**DATE:** February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603207N: *Air/Ocean Tactical Applications*	**PROJECT** 2343: *Tactical METOC Applications*

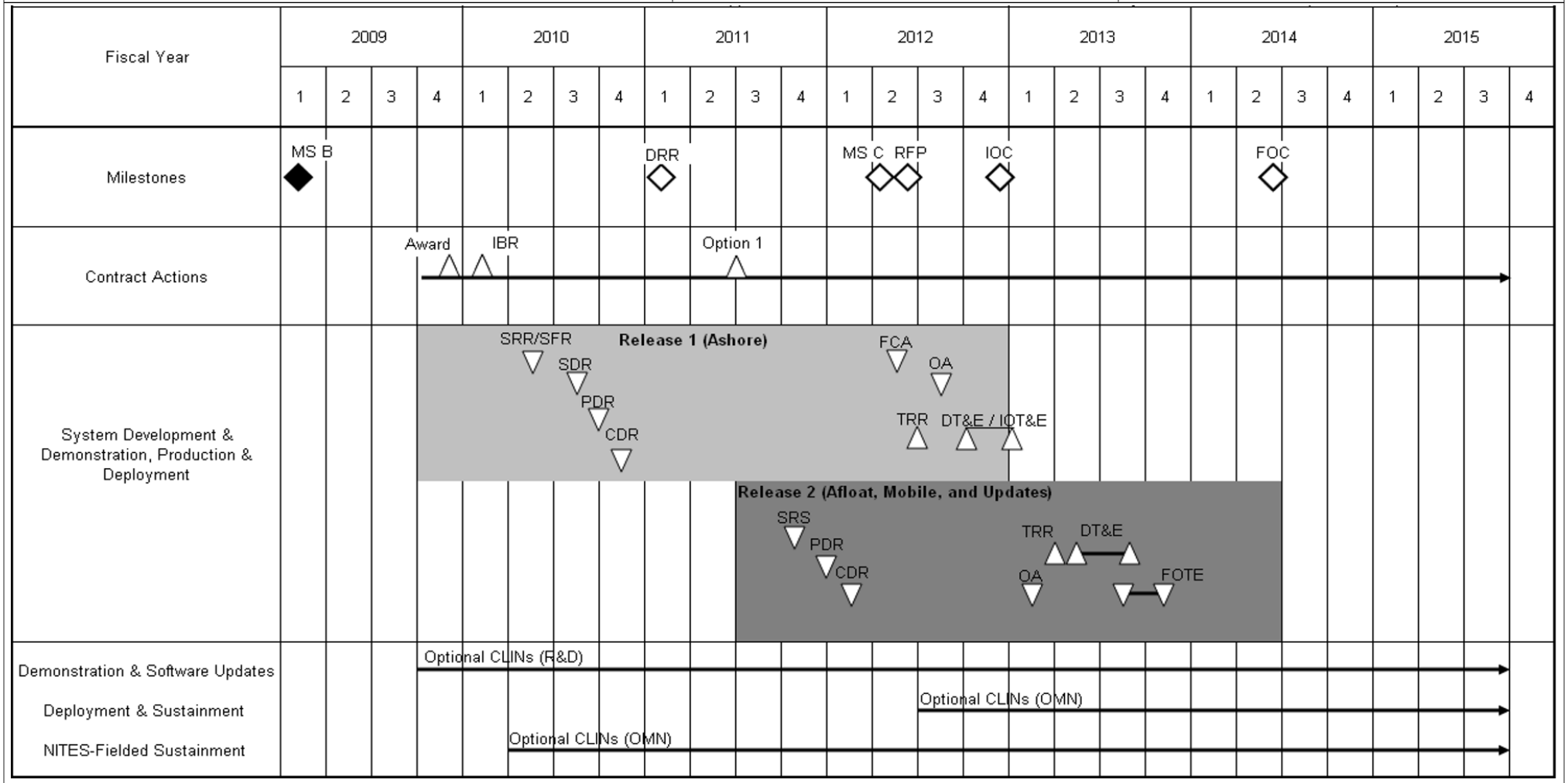

Exhibit R-4A, RDT&E Schedule Details: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603207N: *Air/Ocean Tactical Applications*	**PROJECT** 2343: *Tactical METOC Applications*

Schedule Details

	Start		End	
Event	**Quarter**	**Year**	**Quarter**	**Year**
NITES-Next Milestone B (MS B)	1	2009	1	2009
NITES-Next Design Readiness Review (DRR)	1	2011	1	2011
NITES-Next MS C	1	2012	2	2012
NITES-Next Request for Proposal (RFP)	2	2012	3	2012
NITES-Next Initial Operational Capability (IOC)	4	2012	1	2013
NITES-Next Full Operational Capability (FOC)	2	2014	3	2014
NITES-Next Base Award	4	2009	4	2009
NITES-Next Initial Base Review (IBR)	1	2010	1	2010
NITES-Next Contract Option 1	2	2011	3	2011
NITES-Next Release 1: System Readiness Review (SRR) / SFR	2	2010	2	2010
NITES-Next Release 1: System Design Review (SDR)	3	2010	3	2010
NITES-Next Release 1: Production Design Review (PDR)	3	2010	4	2010
NITES-Next Release 1: Critical Design Review (CDR)	4	2010	4	2010
NITES-Next Release 1: FCA	2	2012	2	2012
NITES-Next Release 1: Technical Readiness Review (TRR)	2	2012	3	2012
NITES-Next Release 1: OA	3	2012	3	2012
NITES-Next Release 1: Development, Test, & Eval (DT&E) / IOT&E	3	2012	1	2013
NITES-Next Release 2: SRS	4	2011	4	2011

Exhibit R-4A, RDT&E Schedule Details: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603207N: *Air/Ocean Tactical Applications*	**PROJECT** 2343: *Tactical METOC Applications*

	Start		End	
Event	**Quarter**	**Year**	**Quarter**	**Year**
NITES-Next Release 2: Production Design Review (PDR)	4	2011	1	2012
NITES-Next Release 2: Critical Design Review (CDR)	1	2012	1	2012
NITES-Next Release 2: OA	1	2013	1	2013
NITES-Next Release 2: Technical Readiness Review (TRR)	1	2013	2	2013
NITES-Next Release 2: Development, Test, & Evaluation (DT&E)	2	2013	3	2013
NITES-Next Release 2: FOT&E	3	2013	4	2013
NITES-Next Demonstration & Software Updates Optional CLINs (R&D)	1	2010	3	2015
NITES-Next Development & Sustainment Option CLINs (OMN)	3	2012	3	2015
NITES-Next NITES-Fielded Sustainment Optional CLINs (OMN)	2	2010	3	2015

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603207N: *Air/Ocean Tactical Applications*	PROJECT 2344: *Precise Timing and Astronomy*	

COST ($ in Millions)	FY 2009 Actual	FY 2010 Estimate	FY 2011 Base Estimate	FY 2011 OCO Estimate	FY 2011 Total Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
2344: *Precise Timing and Astronomy*	19.615	2.249	2.118	0.000	2.118	1.199	1.217	1.243	1.269	Continuing	Continuing
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0		

A. Mission Description and Budget Item Justification

The major thrust of the Precise Timing and Astrometry Project is to provide future capabilities that directly support the mission of the U.S. Naval Observatory (USNO). These future mission capabilities are intended to:
1) address DoD requirements for needed increases in positioning accuracies of modern weapons systems by the determination of star positions (including objects at other than optical wavelengths) and the stellar inertial reference system (to which all navigation, guidance, and positioning systems are ultimately referred); 2) develop techniques for the prediction of the Earth's instantaneous orientation with respect to the stellar inertial reference system; 3) oversee the determination and dissemination of precise time information using the Navy/DoD Master Clock System and precise time distribution networks; and, 4) develop advanced electronic light detectors and interferometry in the optical and infrared wavelength regions for very precise determination of the positions of both faint and bright stars, satellite tracking, and space debris studies. DoD Instruction 5000.2 assigns to the Navy the responsibility for coordinating Precise Time and Time Interval (PTTI) requirements and for maintaining a PTTI reference standard (astronomical and atomic) for use by all DoD Services, Federal agencies, and related scientific laboratories. The Navy is also responsible for providing astronomical data for navigation, positioning, and guidance, including space. Some operational and many emerging requirements surpass current support capabilities. In response to these DoD requirements, this project transitions Research (6.1) and Exploratory Development (6.2) efforts, as well as developments in the civilian sector, into the operational capabilities of the USNO.

FY11 request provides for the installation and operational testing of the complete Master Clock systems installation at USNO.

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
Precise Timing and Astronomy	1.373	2.249	2.118	0.000	2.118

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603207N: *Air/Ocean Tactical Applications*	PROJECT 2344: *Precise Timing and Astronomy*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
FY 2009 Accomplishments: Operational Readiness Review (ORR) for Rubidium (Rb) Fountain at the U.S. Naval Observatory (USNO). Installation and testing for two Rb fountain systems. Continue fabrication of four Rb Fountain Systems . Demo GPS Military (M) Code tracking for Timing Receivers. *FY 2010 Plans:* Complete fabrication of four Rb Fountain systems; complete installation and testing of Alternate Master Clock Fountain environmental systems. Complete contract preparation and award for unique capabilities GPS M Code Timing Receiver. Begin development, installation and testing of electronic Very Long Base-Line Interferometry (eVLBI) wide-band data connectivity capability. *FY 2011 Base Plans:* Complete installation and operational testing of the complete Master Clock systems installation at USNO, DC. Continue development of and begin production of the GPS-III M-Code Timing Receiver. Continue the development, installation and testing of electronic eVLBI wide-band data connectivity capability.					
Joint Milli-Arcsecond Pathfinder Survey (J-MAPS) *FY 2009 Accomplishments:* Joint Milli-Arcsecond Pathfinder Survey (J-MAPS) completed Phase A (conceptual design) and Phase B (preliminary design) of the overall spacecraft and mission. In addition, long lead item developments will began immediately after the System Requirements Review. Developments included focal plane assemblies, readout and processing electronics, and optical components. Delivered a preliminary design for the spacecraft. Beginning in FY10 the resources for the J-MAPS program are budgeted in project 3229.	18.143	0.000	0.000	0.000	0.000
Acquisition Workforce Fund	0.099	0.000	0.000	0.000	0.000

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603207N: *Air/Ocean Tactical Applications*	PROJECT 2344: *Precise Timing and Astronomy*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
FY 2009 Accomplishments: Funded acquisition workforce fund.					
Accomplishments/Planned Programs Subtotals	19.615	2.249	2.118	0.000	2.118

C. Other Program Funding Summary ($ in Millions)

N/A

D. Acquisition Strategy

Acquisition, management and contracting strategies are to support the Precise Timing and Astrometry Project in direct support of the U.S. Naval Observatory in: 1) addressing DoD requirements for needed increases in positioning accuracies of modern weapons systems by the determination of star positions and the stellar inertial reference system ; 2) developing techniques for the prediction of the Earth's instantaneous orientation with respect to the stellar inertial reference system; 3) overseeing the determination and dissemination of precise time information using the Navy/DoD Master Clock System and precise time distribution networks; and, 4) developing advanced electronic light detectors and interferometry in the optical and infrared wavelength regions for very precise determination of the positions of both faint and bright stars, satellite tracking, and space debris studies, all with management oversight by Program Executive Officer for Command, Control, Communications, Computers, and Intelligence.

E. Performance Metrics

Goal: Address Navy/DoD requirements for needed increases in positioning accuracies of modern weapons systems by the determination of star positions, oversee the determination and dissemination of precise time information using the Navy/DoD Master Clock System and precise time distribution networks.

Metric: Measurable progress toward stated GPS-III requirement to meet or exceed a 2 sigma accuracy of 0.5 nanoseconds (ns) for the M Code Rx error and 0.1ns Master Clock error. Improve star position accuracy to within 10 milliarcseconds in support of National Technical Means (classified) program requirements.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603207N: *Air/Ocean Tactical Applications*	PROJECT 2344: *Precise Timing and Astronomy*	

Product Development ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Product Development	WR	Naval Observatory Washington, DC	14.305	2.249	Nov 2009	2.118	Oct 2010	0.000		2.118	0.000	18.672	Continuing
Precise Timing & Astrometry	Various/ Various	Misc VAR	0.438	0.000		0.000		0.000		0.000	0.000	0.438	Continuing
Precise Timing & Astrometry	Various/ Various	VAR Not Specified	18.706	0.000		0.000		0.000		0.000	0.000	18.706	Continuing
		Subtotal	33.449	2.249		2.118		0.000		2.118	0.000	37.816	

Remarks

Management Services ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Acquisition Workforce	Various/ Various	Not Specified Not Specified	0.099	0.000		0.000		0.000		0.000	0.000	0.099	Continuing
		Subtotal	0.099	0.000		0.000		0.000		0.000	0.000	0.099	

Remarks

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603207N: *Air/Ocean Tactical Applications*	PROJECT 2344: *Precise Timing and Astronomy*	

	Total Prior Years Cost	FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	33.548	2.249		2.118		0.000		2.118	0.000	37.915	

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603207N: *Air/Ocean Tactical Applications*	PROJECT 2344: *Precise Timing and Astronomy*

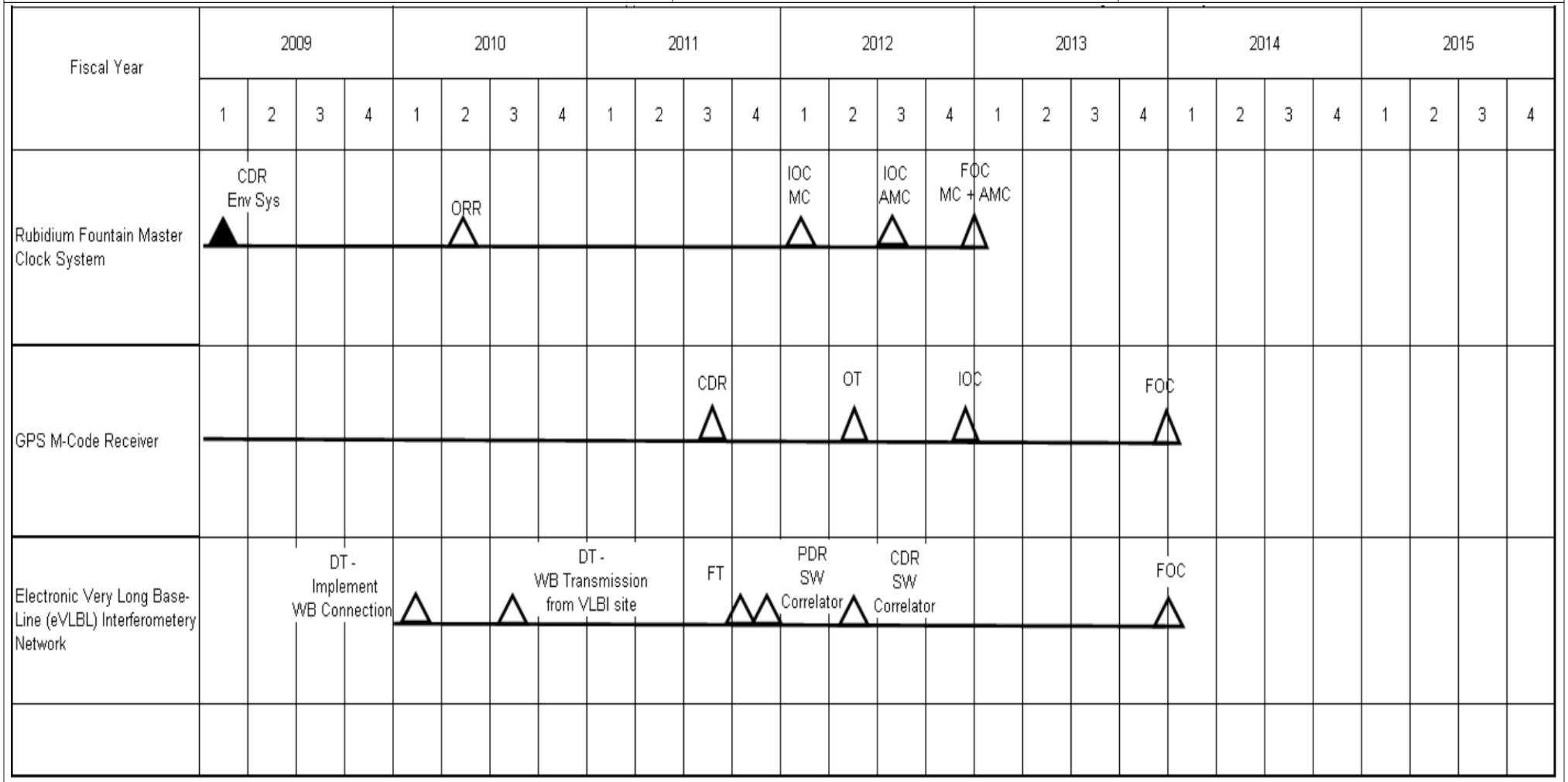

Exhibit R-4A, RDT&E Schedule Details: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603207N: *Air/Ocean Tactical Applications*	**PROJECT** 2344: *Precise Timing and Astronomy*

Schedule Details

	Start		End	
Event	**Quarter**	**Year**	**Quarter**	**Year**
Rubidium Fountain Master Clock System	1	2009	4	2013
Critical Design Review (CDR) - Environmental System	1	2009	1	2009
Operational Readiness Review (ORR)	2	2010	2	2010
Initial Operational Capability (IOC) - Milestone C (MC)	1	2012	1	2012
IOC - AMC	3	2012	3	2013
Full Operational Capability (FOC) - MC	4	2012	4	2012
FOC - AMC	4	2012	4	2012
Critical Design Review (CDR)	3	2011	3	2011
OT	2	2012	2	2012
Contract Award	2	2012	2	2012
IOC	4	2012	4	2012
FOC 1	4	2013	4	2013
DT - Implement WB Connection	1	2010	1	2010
DT - WB Transmission from VLBI site	3	2010	3	2010
PDR SW Correlator	4	2011	4	2011
CDR SW Correlator	2	2012	2	2012
FOC 2	4	2013	4	2013
FT	4	2011	4	2011

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603207N: *Air/Ocean Tactical Applications*	PROJECT 3207: *Fleet Synthetic Training*	

COST ($ in Millions)	FY 2009 Actual	FY 2010 Estimate	FY 2011 Base Estimate	FY 2011 OCO Estimate	FY 2011 Total Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
3207: *Fleet Synthetic Training*	0.968	1.004	3.437	0.000	3.437	1.007	1.043	1.067	1.088	Continuing	Continuing
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0		

A. Mission Description and Budget Item Justification

Fleet Synthetic Training (FST) provides naval forces with an enhanced in-port training capability. Integrating embedded shipboard training devices, aircraft and submarine simulators into an interoperable network with joint, coalition and interagency partners will provide more effective training for our deploying naval forces.

A key factor in achieving this new way of training our naval forces is to ensure that the required training is based on realistic characterizations of the physical environment. This project develops and delivers software that characterizes the ocean and atmospheric environments; adjusts to meet fleet-required training scenarios; allows synthetic training to be conducted in areas of planned and contingency operations; and, provides sufficient detail to simulate the real-world conditions of the physical environment in those areas of interest.

To support Fleet readiness the Navy has established a persistent training environment. It enables the use of modeling and simulation in support of FST. Navy's Fleet Training Continuum (NCTE) satisfies this requirement by providing the infrastructure and connectivity required for distributed simulation-based training, events, and exercises. The JSAF simulation provides the core model for maritime constructive representation and stimulation for Navy Training and Joint Training events.

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
Fleet Synthetic Training	0.968	1.004	3.437	0.000	3.437
The Navy Training Baseline Joint Semi-Automated Forces (JSAF) and other virtual components will connect live players, significantly realism of the exercise. Improved terrain representation is required for every exercise AOR, to augment the limited data provided for the rest of the world representation. This provides higher quality wargaming scenarios for units participating in the training. Order of battle changes are quicker for developers; the ability to use the existing Link-16 model and services to					

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
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B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
represent Link-11 platform operations; and FST events and joint wargames that require the use of unclassified or releasable JSAF can be supported. *FY 2009 Accomplishments:* - Develop environmental archive data for 4/14 Navy Continuous Training Environment (NCTE) exercise. - Develop link between claimancy data architecture and architecture for data provision in support of NCTE. - Develop ocean data query capability. - Refine and automate the process for producing performance surface products used in the anti-submarine warfare white cell. - Develop synthetic bathythermographs and satellite imagery to enhance the training experience. *FY 2010 Plans:* - Develop environmental archive data for 4-6 NCTE exercise areas. - Test and evaluate link between claimancy data architecture and architecture for data provision in support of NCTE. - Develop GCCS-M overlays of performance surface products. - Implement ocean data query capability. - Continue to refine and automate the process for producing performance surface products as required. - Develop additional synthetic point data and field imagery products. *FY 2011 Base Plans:* - Develop environmental archive data for 4-6 additional NCTE exercises areas. - Refine link between claimancy data architecture and architecture for data provision in support of NCTE. - Continue to automate the process for producing performance surface products.					

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603207N: *Air/Ocean Tactical Applications*	PROJECT 3207: *Fleet Synthetic Training*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
- Develop additional synthetic point data and field imagery products. - Research feasibility of providing live data in support of synthetic training events. - Research implementation of climatology products into Fleet Synthetic Training. - Develop fleet-required capabilities and enhancements to the NCTE and JSAF Navy software application baselines - Develop capabilities to address the following requirements: -- JTAC Participation in Synthetic Training (SAT) -- USMC DVTE/MSAT Merge -- JSAF Prediction Aids -- JSAF Inhibit Detection -- Radars & Emitters Parametric Data Refresh -- JSAF P-3 Link-11 LVC Development -- Navy JSAF Unclass/Releasable Version Data Update -- JSAF Unit Creation GUI -- JSAF (PAC-AUS, Treasure Coast, Carribbean, UK/Scotland) Terrain Updates					
Accomplishments/Planned Programs Subtotals	0.968	1.004	3.437	0.000	3.437

C. Other Program Funding Summary ($ in Millions)

N/A

D. Acquisition Strategy

N/A

E. Performance Metrics

1) Produce meteorological and oceanographic environmental databases for 4 or 14 NCTE exercise areas. Will implement, test, and integrate with JSAF and other federates in accordance with requirements.

2) Complete data and architecture integration, including information assurance compliance for provision of synthetic METOC data to the NCTE.

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603207N: *Air/Ocean Tactical Applications*	PROJECT 3207: *Fleet Synthetic Training*

3) Produce bathythermographic data collection based on synthetic ocean environment and synthetic satellite/radar imagery based on meteorological environmental data for 4 of 14 NCTE exercise areas.

4) Initiate improvements in characterization of ambient noise in an effort to enhance ASW operations in live and synthetic events.

5) Research and develop the software and associated efforts to include documentation; will design and implement upgrades to JSAF consistent with approved requirements and CRs and document the effects of JSAF capabilities (robustness) and stability. Will design, implement, test, and integrate JSAF enhancements in accordance with requirements.

6) NWDC will produce releases to include applicable documentation updates for the Guidance, Rational, and Interoperability Manual (GRIM) and Federation Agreement Document (FAD). Will implement JSAF capability enhancements to support evolving joint and Coalition training requirements.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603207N: *Air/Ocean Tactical Applications*	PROJECT 3207: *Fleet Synthetic Training*	

Product Development ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
System Engineering	WR	Alion Fairfax, VA	0.000	0.000		2.600	Oct 2010	0.000		2.600	0.000	2.600	Continuing
		Subtotal	0.000	0.000		2.600		0.000		2.600	0.000	2.600	

Remarks

Support ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Development Support	WR	NRL Not Specified	0.000	0.400	Jan 2010	0.335	Nov 2010	0.000		0.335	0.000	0.735	Continuing
Software Development	WR	NSWC Caderock Not Specified	0.000	0.400	Jan 2010	0.335	Nov 2010	0.000		0.335	0.000	0.735	Continuing
Studies and Analysis	Various/ Various	Various Not Specified	0.000	0.104	Nov 2009	0.067	Nov 2010	0.000		0.067	0.000	0.171	Continuing
Configuration Management	Various/ Various	Various Not Specified	0.000	0.100	Nov 2009	0.100	Nov 2010	0.000		0.100	0.000	0.200	Continuing
		Subtotal	0.000	1.004		0.837		0.000		0.837	0.000	1.841	

Remarks

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603207N: *Air/Ocean Tactical Applications*	PROJECT 3207: *Fleet Synthetic Training*	

	Total Prior Years Cost	FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	1.004		3.437		0.000		3.437	0.000	4.441	

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2011 Navy		**DATE:** February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603207N: *Air/Ocean Tactical Applications*	**PROJECT** 3207: *Fleet Synthetic Training*

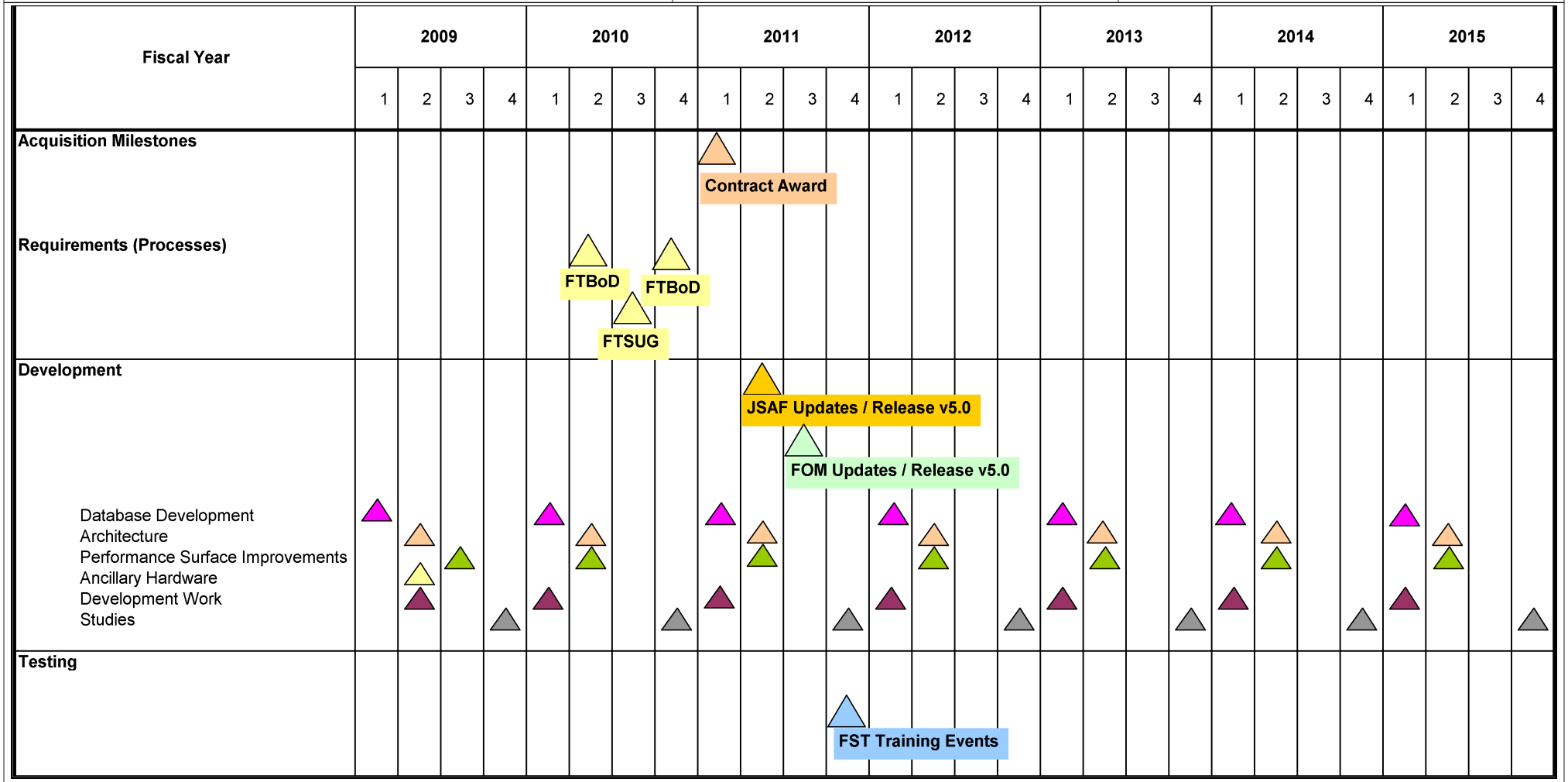


Exhibit R-4A, RDT&E Schedule Details: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603207N: *Air/Ocean Tactical Applications*	**PROJECT** 3207: *Fleet Synthetic Training*

Schedule Details

	Start		End	
Event	**Quarter**	**Year**	**Quarter**	**Year**
Acquisition Milstones - Contract Award	1	2011	1	2011
Requirements - Fleet Training Software Users Group (FTSUG)	2	2010	2	2010
Requirement - Fleet Training Board of Directors (FTBoD)	1	2010	4	2010
Testing - FST Training Event	4	2011	4	2011
Dvelopment - JSAF Update/Release	2	2011	2	2011
Development - JVLC FOM Update/Release	3	2011	3	2011
Development - Database Development	1	2009	1	2015
Development - Architecture	2	2009	2	2015
Development - Performance Surface Improvements	3	2010	2	2015
Development - Ancillary Hardware	2	2009	2	2009
Development - Development Work	2	2009	1	2015
Development - Studies	4	2009	4	2015

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603207N: *Air/Ocean Tactical Applications*	PROJECT 3229: *JMAPS*	

COST ($ in Millions)	FY 2009 Actual	FY 2010 Estimate	FY 2011 Base Estimate	FY 2011 OCO Estimate	FY 2011 Total Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
3229: *JMAPS*	0.000	54.971	73.441	0.000	73.441	69.099	33.106	5.916	5.917	Continuing	Continuing
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0		

Note

FY 2009 efforts were budgeted in Project 2344 (Precise Timing and Astronomy).

A. Mission Description and Budget Item Justification

Joint Milli-Arcsecond Pathfinder Survey (JMAPS) satellite program. Joint strike operations require extremely accurate Positioning, Navigation, and Timing (PNT) systems in order to both: locate hostile threats with space-borne Intelligence Surveillance and Reconnaissance (ISR) systems, and then to deliver ordnance on targets. The Navy provides a key component of PNT - the Celestial Reference Frame. This reference frame is defined in star catalogs that are used in conjunction with star trackers to determine orientation of space-based sensors to minimize location error and the resultant weapon system delivery accuracy. The accuracy of star positions (hence weapon delivery accuracy) is degrading with time due to the movement of stars since the last highly accurate space-based measurements of star positions were made in 1991. The accuracy of the catalog is approaching the minimum necessary to support current requirements, and will not meet the needs for future sensors and weapon systems. Therefore, the Navy, in concert with other agencies in the Space and ISR communities, is developing JMAPS to satisfy the emerging requirements for a new high accuracy star catalog through a space-based astrometry mission. It will also "pathfind" new star tracker technology as a risk reduction for future ISR systems. Producing star catalogs with sufficient accuracy to meet these requirements can only be done from satellites due to atmospheric interference on ground-based systems and the physical limitations of aircraft.

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
JMAPS	0.000	54.971	73.441	0.000	73.441
FY 2010 Plans: Engineering analysis and conceptual design work required for the system requirements review including some risk reduction by maturing a single focal plane array and the astrometric and band					

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603207N: *Air/Ocean Tactical Applications*	PROJECT 3229: *JMAPS*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
pass filters. In addition, the program will begin the preliminary design activities of the instrument, spacecraft and ground systems. Phase A activities planned for System Requirements Review include mission and system requirements analysis, engineering analysis of spacecraft attitude determination and control system and spacecraft design to include preliminary thermal requirements, and detailed system performance specifications from mission concept design and requirements definition. Technology risk reduction activities will include the advanced development of two independent focal plane arrays, as well as the astrometric and band pass filters. Phase B activities planned to support a Preliminary Design Review include maturing the instrument, spacecraft and ground system design and the procurement of long-lead items. Additional engineering analysis to evaluate the developing technologies in the instrument design for performance and mission satisfaction. *FY 2011 Base Plans:* Complete Preliminary Design review, including maturing the instrument, spacecraft, and ground system design and begin the activities and engineering analysis required for the critical design review. Phase C activities will include the completion of a detailed design for the instrument, spacecraft and ground system in support of a Critical Design Review. End to end performance analysis will be conducted to verify the system and new technologies are sufficiently mature to satisfy mission requirements. The program will begin Phase D by initiating the procurement of the sub-system and components of the instrument, spacecraft and ground system.					
Accomplishments/Planned Programs Subtotals	0.000	54.971	73.441	0.000	73.441

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603207N: *Air/Ocean Tactical Applications*	PROJECT 3229: *JMAPS*

C. Other Program Funding Summary ($ in Millions)

N/A

D. Acquisition Strategy

The JMAPS program will not be developed as an Evolutionary Acquisition (EA). JMAPS will begin as an S&T government activity and transition to acquisition at Milestone B. The contract mechanisms at the Naval Research Laboratory and U.S Naval Observatory will support the development of the program. JMAPS will be executed as a class B/C program in accordance with Military handbook DOD-HDBK-343 (USAF) of 01 February 1986, Design Construction and Testing Requirements for One of a Kind Space Equipment. Additionally, JMAPS will adhere to the Key Decision Point and gates established for acquisition programs. Complete traceability will be limited to only key requirements. Technology below TRL 6 at Milestone B will be acceptable by providing risk mitigation strategies and maintaining alternate implementations.

E. Performance Metrics

The JMAPS program will update the currently degrading celestial catalog to meet current and future war fighter requirements. The JMAPS catalog will provide 1 milli-arcsecond position accuracy and 1 milli-arcsecond proper motion on the bright stars, magnitude 1 through 12, no later than 2017. The JMAPS program will provide photometric accuracy better than 7% in three wavelength bands from 450nm to 750nm.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603207N: *Air/Ocean Tactical Applications*	PROJECT 3229: *JMAPS*	

Product Development ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
System Requirements Review (SRR)	Various/ Various	NRL Washington, DC	0.000	10.471	Jan 2010	0.000		0.000		0.000	Continuing	Continuing	Continuing
System Requirements Review (SRR)_1	Various/ CPFF	Comtech AeroAstro Ashburn, VA	0.000	15.000	Jan 2010	0.000		0.000		0.000	Continuing	Continuing	Continuing
System Requirements Review (SRR)_2	SS/CPFF	L3 Communications SSG Tinsley, Wilmington, MA	0.000	3.000	Jan 2010	0.000		0.000		0.000	Continuing	Continuing	Continuing
System Requirements Review (SRR)_3	SS/CPFF	Teledyne Scientific & Imaging: Teledyne Imaging Sensors Camarillo, CA	0.000	3.000	Jan 2010	0.000		0.000		0.000	Continuing	Continuing	Continuing
System Requirements Review (SRR)_4	SS/CPFF	Raytheon Vision Systems Goleta, CA	0.000	3.000	Jan 2010	0.000		0.000		0.000	Continuing	Continuing	Continuing
System Requirements Review (SRR)_5	SS/CPFF	Orbital Science Corporation Various	0.000	10.000	Jan 2010	0.000		0.000		0.000	Continuing	Continuing	Continuing
System Requirements Review (SRR)_6	C/CPFF	Space/Ground System Solutions, Inc West Melbourne, FL	0.000	1.000	Jan 2010	0.000		0.000		0.000	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603207N: *Air/Ocean Tactical Applications*	PROJECT 3229: *JMAPS*	

Product Development ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
System Requirements Review (SRR)_7	C/CPFF	Silver Engineering, Inc. Melbourne, FL	0.000	0.500	Jan 2010	0.000		0.000		0.000	Continuing	Continuing	Continuing
System Requirements Review (SRR)_8	Various/ CPFF	Broadreach Engineering Phoenix, AZ	0.000	1.000	Jan 2010	0.000		0.000		0.000	Continuing	Continuing	Continuing
System Requirements Review (SRR)_9	C/CPFF	Northrop Grumman, Woodland Hills San Bernardino, CA	0.000	1.000	Jan 2010	0.000		0.000		0.000	Continuing	Continuing	Continuing
System Requirements Review (SRR)_10	C/CPFF	L3 Communications Telemetry-West San Diego, CA	0.000	1.000	Jan 2010	0.000		0.000		0.000	0.000	1.000	Continuing
Preliminary Design Review and Critical Design Review (PDR & CDR)	Various/ Various	NRL Washington, DC	0.000	0.000		15.541	Oct 2010	0.000		15.541	Continuing	Continuing	Continuing
Preliminary Design Review and Critical Design Review (PDR & CDR)_1	Various/ CPFF	Comtech AeroAstro Ashburn, VA	0.000	0.000		18.000	Oct 2010	0.000		18.000	Continuing	Continuing	Continuing
Preliminary Design Review and Critical Design Review (PDR & CDR)_2	SS/CPFF	L3 Communications SSG Tinsley, Wilmington, MA	0.000	0.000		2.000	Oct 2010	0.000		2.000	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603207N: *Air/Ocean Tactical Applications*	PROJECT 3229: *JMAPS*	

Product Development ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Preliminary Design Review and Critical Design Review (PDR & CDR)_3	SS/CPFF	Teledyne Scientific & Imaging: Teledyne Imaging Sensors Camarillo, CA	0.000	0.000		4.000	Oct 2010	0.000		4.000	Continuing	Continuing	Continuing
Preliminary Design Review and Critical Design Review (PDR & CDR)_4	SS/CPAF	Raytheon Vision Systems Goleta, CA	0.000	0.000		4.000	Oct 2010	0.000		4.000	Continuing	Continuing	Continuing
Preliminary Design Review and Critical Design Review (PDR & CDR)_5	SS/CPFF	Orbital Science Corporation Various	0.000	0.000		10.000	Oct 2010	0.000		10.000	Continuing	Continuing	Continuing
Preliminary Design Review and Critical Design Review (PDR & CDR)_6	SS/CPFF	Space/Ground System Solutions, Inc. West Melbourne, FL	0.000	0.000		4.000	Oct 2010	0.000		4.000	Continuing	Continuing	Continuing
Preliminary Design Review and Critical Design Review (PDR & CDR)_7	C/FP	Silver Engineering, Inc, Melbourne, FL	0.000	0.000		0.500	Oct 2010	0.000		0.500	Continuing	Continuing	Continuing
Preliminary Design Review and Critical Design Review (PDR & CDR)_9	Various/ CPFF	Northrop Grumman Various, CA	0.000	0.000		1.000	Oct 2010	0.000		1.000	Continuing	Continuing	Continuing
	C/CPFF		0.000	0.000		1.000	Oct 2010	0.000		1.000	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603207N: *Air/Ocean Tactical Applications*	PROJECT 3229: *JMAPS*	

Product Development ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Preliminary Design Review and Critical Design Review (PDR & CDR)_10		L3 Communications Telemetry-West San Diego, CA											
Ground Data Processing Design	Various/ Various	USO Washington, DC	0.000	0.000		3.200	Oct 2010	0.000		3.200	Continuing	Continuing	Continuing
		Subtotal	0.000	48.971		63.241		0.000		63.241			

Remarks

Support ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Requirements and Performance Analysis	Various/ Various	USNO Washington, DC	0.000	4.700	Jan 2010	0.000		0.000		0.000	Continuing	Continuing	Continuing
Requirements and Performance Analysis_1	SS/CPFF	Draper Laboratory Arlington, VA	0.000	0.500	Jan 2010	0.000		0.000		0.000	Continuing	Continuing	Continuing
Performance Analysis	Various/ Various	USNO Washington, DC	0.000	0.000		2.500	Oct 2010	0.000		2.500	Continuing	Continuing	Continuing
Performance Analysis_1	SS/CPFF	Draper Laboratory	0.000	0.000		0.500	Oct 2010	0.000		0.500	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603207N: *Air/Ocean Tactical Applications*	PROJECT 3229: *JMAPS*

Support ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
		Arlington, VA											
		Subtotal	0.000	5.200		3.000		0.000		3.000			

Remarks

Test and Evaluation ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Requirements and Performance Analysis	Various/ Various	NRL Washington, DC	0.000	0.000		6.200	Oct 2011	0.000		6.200	Continuing	Continuing	Continuing
		Subtotal	0.000	0.000		6.200		0.000		6.200			

Remarks

Management Services ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Office Support	C/TBD	ONR	0.000	0.800	Jan 2010	1.000	Oct 2011	0.000		1.000	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603207N: *Air/Ocean Tactical Applications*	PROJECT 3229: *JMAPS*

Management Services ($ in Millions)

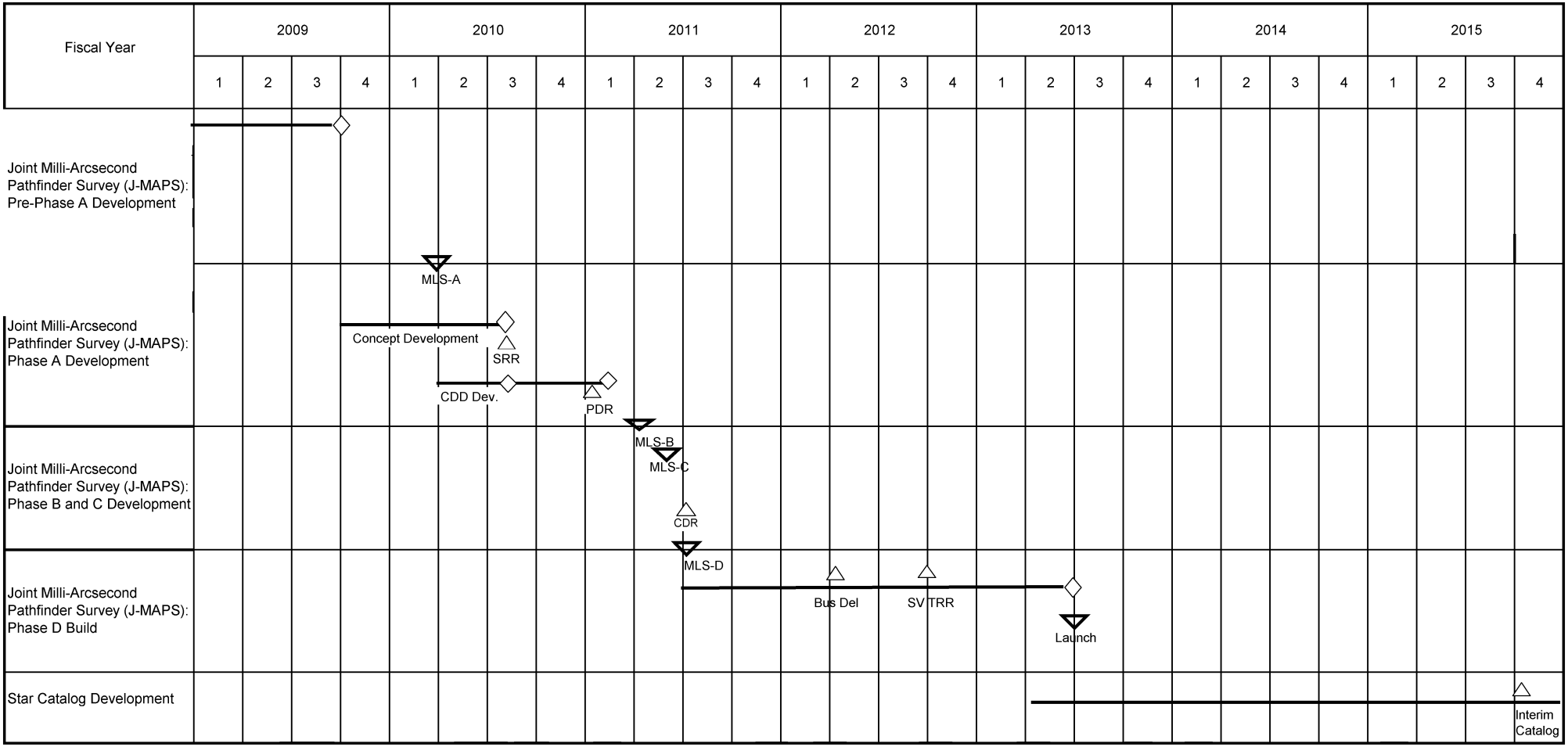
				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
		Arlington, VA											
		Subtotal	0.000	0.800		1.000		0.000		1.000			

Remarks

	Total Prior Years Cost	FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	54.971		73.441		0.000		73.441			

Remarks

Exhibit R-4, **RDT&E Schedule Profile:** PB 2011 Navy		**DATE:** February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603207N: *Air/Ocean Tactical Applications*	**PROJECT** 3229: *JMAPS*



SRR=System Requirements Review, PDR=Preliminary Design Review, MLS=Milestone Reviews, CDR=Critical Design Review, CDD=Capabilities Development Document, TRR=Test Readiness Review, SV=Space Vehicle, TRA=Technology Readiness Assessment, ICE=Independent Cost Evaluation

Exhibit R-4A, RDT&E Schedule Details: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603207N: *Air/Ocean Tactical Applications*	**PROJECT** 3229: *JMAPS*

Schedule Details

	Start		End	
Event	**Quarter**	**Year**	**Quarter**	**Year**
Pre-Phase A Development -- Pre-Milestone A Studies	1	2009	3	2009
Pre-Phase A Development -- Milestone - A	2	2010	2	2010
Phase A Development -- Concept Development	4	2009	3	2010
Phase A Development -- System Requirements Review (SRR)	3	2010	3	2010
Phase A Development -- Capability Development Document (CDD) Development	2	2010	1	2011
Phase A Development -- Preliminary Design Review	1	2011	1	2011
Phase A Development -- Milestone - B	2	2011	2	2011
Phase B Development -- Milestone -C	2	2011	2	2011
Phase C Development -- Critical Design Review	3	2011	3	2011
Phase C Development -- Milestone - D	3	2011	3	2011
Phase D Build -- Bus Delivery	2	2012	2	2012
Phase D Build -- Space Vehicle Test Readiness Review (TRR)	4	2012	4	2012
Phase D Build -- Launch	3	2013	3	2013
Star Catalog Development -- Interim Catalog Delivery	4	2015	4	2015

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603207N: *Air/Ocean Tactical Applications*	PROJECT 9999: *Congressional Adds*	

COST ($ in Millions)	FY 2009 Actual	FY 2010 Estimate	FY 2011 Base Estimate	FY 2011 OCO Estimate	FY 2011 Total Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
9999: *Congressional Adds*	1.596	2.908	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	16.193
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0		

A. Mission Description and Budget Item Justification

Congressional adds.

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010
Congressional Add: Non-Gasoline Burning Outboard Engine *FY 2010 Plans:* Develop a Non-Gasoline Burning Outboard Engine.	0.000	1.514
Congressional Add: Semi-Submersible UUV *FY 2009 Accomplishments:* Continued the design and development efforts for a Semi-Submersible Unmanned Underwater Vehicle. *FY 2010 Plans:* Continue the design and development efforts for a Semi-Submersible Unmanned Underwater Vehicle.	1.596	1.394
Congressional Adds Subtotals	1.596	2.908

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603207N: *Air/Ocean Tactical Applications*	PROJECT 9999: *Congressional Adds*

C. Other Program Funding Summary ($ in Millions)

N/A

D. Acquisition Strategy

Congressional adds.

E. Performance Metrics

Congressional adds.

Exhibit R-2, RDT&E Budget Item Justification: PB 2011 Navy										DATE: February 2010	
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*				R-1 ITEM NOMENCLATURE PE 0603216N: *Aviation Survivability*							
COST ($ in Millions)	**FY 2009 Actual**	**FY 2010 Estimate**	**FY 2011 Base Estimate**	**FY 2011 OCO Estimate**	**FY 2011 Total Estimate**	**FY 2012 Estimate**	**FY 2013 Estimate**	**FY 2014 Estimate**	**FY 2015 Estimate**	**Cost To Complete**	**Total Cost**
Total Program Element	15.373	27.291	9.480	0.000	9.480	11.704	9.552	7.988	7.178	Continuing	Continuing
0584: *Acft Protective Clothing*	3.384	2.497	5.978	0.000	5.978	7.609	5.468	3.988	3.094	Continuing	Continuing
0591: *Acft Survivability, Vulnerability & Safety*	1.557	1.612	1.467	0.000	1.467	1.771	1.771	1.739	1.777	Continuing	Continuing
0592: *Acft & Ordnance Safety*	1.541	1.623	1.393	0.000	1.393	1.538	1.531	1.493	1.524	Continuing	Continuing
1819: *CV Acft Fire Suppress System*	0.715	0.746	0.642	0.000	0.642	0.786	0.782	0.768	0.783	Continuing	Continuing
9999: *Congressional Adds*	8.176	20.813	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	105.149

A. Mission Description and Budget Item Justification

Aviation Survivability addresses the issues of aircrew and platform survivability, focusing on enhancing overall opportunity for aircrew and platform protection and enhanced performance. The capabilities addressed under this program element counter emerging threats of next generation operational weapons systems and enhance combat effectiveness in future operational mission scenarios.

This PE includes $.030 million for the Acquisition Workforce in FY 2009.

Exhibit R-2, RDT&E Budget Item Justification: PB 2011 Navy	DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603216N: *Aviation Survivability*

B. Program Change Summary ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
Previous President's Budget	13.624	6.505	0.000	0.000	0.000
Current President's Budget	15.373	27.291	9.480	0.000	9.480
Total Adjustments	1.749	20.786	9.480	0.000	9.480
• Congressional General Reductions		-0.114			
• Congressional Directed Reductions		0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds		20.900			
• Congressional Directed Transfers		0.000			
• Reprogrammings	1.475	0.000			
• SBIR/STTR Transfer	-0.124	0.000			
• Program Adjustments	0.000	0.000	9.480	0.000	9.480
• Rate/Misc Adjustments	0.000	0.000	0.000	0.000	0.000
• Congressional Recision Adjustments	-0.002	0.000	0.000	0.000	0.000
• Congressional Add Adjustments	0.400	0.000	0.000	0.000	0.000

Congressional Add Details ($ in Millions, and Includes General Reductions)	FY 2009	FY 2010
Project: 9999: *Congressional Adds*		
Congressional Add: *Common Safety System Controller*	0.000	2.390
Congressional Add: *Conformal Ceramics for Enhanced Aviation Armor Systems*	0.000	2.490
Congressional Add: *Improved Capabilities for Irregular Warfare Platforms*	0.000	3.983
Congressional Add: *Integrated Manifold and Tube Ceramic Oxygen Generator*	0.000	4.780
Congressional Add: *Lighter-than-Air Stratospheric Unmanned Aerial Vehicle*	0.000	2.390
Congressional Add: *Military Upset Recovery Training*	0.000	0.797
Congressional Add: *Unmanned Vehicle Sensor Optimization Technologies Program*	0.000	2.390
Congressional Add: *Air Sentinel*	0.997	0.000
Congressional Add: *UNMANNED AIRCRAFT SYS OPTIMIZATION TECH PROGRAM*	1.994	0.000

Exhibit R-2, RDT&E Budget Item Justification: PB 2011 Navy	DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603216N: *Aviation Survivability*

Congressional Add Details ($ in Millions, and Includes General Reductions)	FY 2009	FY 2010
Congressional Add: *UNMANNED FORCE AUGMENTATION SYS*	2.393	0.000
Congressional Add: *MODULAR ADVANCED HELMET VISITION SYSTEM*	1.994	1.593
Congressional Add: *Agile Laser Eye Protection*	0.798	0.000
Congressional Add Subtotals for Project: 9999	8.176	20.813
Congressional Add Totals for all Projects	8.176	20.813

Change Summary Explanation

Technical: Not applicable.

Schedule: Not applicable.

FY11 from previous President's Budget is shown as zero because no FY11-15 data was presented in President's Budget 2010.

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603216N: *Aviation Survivability*	PROJECT 0584: *Acft Protective Clothing*	

COST ($ in Millions)	FY 2009 Actual	FY 2010 Estimate	FY 2011 Base Estimate	FY 2011 OCO Estimate	FY 2011 Total Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
0584: *Acft Protective Clothing*	3.384	2.497	5.978	0.000	5.978	7.609	5.468	3.988	3.094	Continuing	Continuing
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0		

A. Mission Description and Budget Item Justification

Project 0584 develops, demonstrates, and validates technologies designed to enhance warfighter performance, protection, mission effectiveness, and survivability. The project addresses life support equipment, advanced helmet vision systems, escape systems technology, crew centered cockpit design, and control stations. Integrate and use alternative and new technologies for the Pilot Vehicle Integration (PVI), optimization of Intelligence Surveillance and Reconnaissance (ISR), and Forward Air Control-Air (FAC-A) mission areas. Demonstrate innovative tools / approaches to improve situational awareness, new ISR technologies, and graphical User Interfaces (new symbology and optimized logic for system employment). It responds to a number of operational requirements documents, including OR# 210-05-88 for Chemical and Biological (CB) protection, OR# 099-05-087 for Laser Eye Protection, and the joint Air Force/Navy (CAF-208-93) for an Aerospace Control Helmet Mounted Cueing System.

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
Advanced Technology Crew Station	2.633	1.455	4.954	0.000	4.954
FY 2009 Accomplishments: Started system integration and flight testing of the Advanced Helmet Vision System (AHVS) helmet mounted display for rotary platforms. Integrated Super eXtended Graphics Array (SXGA), 60 Hz night cameras into the Modular Advanced Helmet Vision System. Started rotary wing safety of flight work. Developed probabilistic, predictive biofidelic / biodynamic models to support the assessment of integrated aircrew head/neck protection configurations for ejection safe helmet mounted systems. Used Biofidelic model in conjunction with the Parachute Opening Shock Emulator (POSE) to support ejection seat, Helmet Mounted Display, and protective equipment testing.					

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603216N: *Aviation Survivability*	PROJECT 0584: *Acft Protective Clothing*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
FY 2010 Plans: Integrate common symbology in open architecture into a common command and control station for Unmanned Air Vehicles (UAVs). Develop and test side facing seat and improved restraint system. Test new side facing crashworthy troop seating on H-60 platform. Use POSE and the biofidelic models to integrate results of injury prevention research into protective equipment design and testing to include helmet mounted devices and into ejection seat design for improved seat performance, retention, and safety. *FY 2011 Base Plans:* Develop high resolution Ultra eXtended Graphics Array (UXGA, 2K by 2K) CCD (Charge Coupled Device) day / night vision cameras. Begin safety of flight testing on a tactical platform. Migrate crashworthy seating designs to the fast attack boat community. Focus on shock and vibration work.					
Advanced Integrated Life Support System *FY 2009 Accomplishments:* Started final optical characterization of Unity Magnification Goggle. Expected completion late FY09 / beginning FY10. Integrated approach to provide fixed and agile protection for helmet mounted displays underway. Developed personal mounted air conditioning with distribution system. *FY 2010 Plans:* Complete optical design to determine feasibility of integrating the Unity Magnification Goggle into the Advanced Helmet Mounted Display (HMD) system. Complete and demonstrate a split fixed wavelength design for helmet mounted displays. Goal is to provide multi wavelength protection while not impacting visibility of HMD symbology. Develop an aircraft personal air conditioning systems.	0.741	1.042	1.024	0.000	1.024

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603216N: *Aviation Survivability*	PROJECT 0584: *Acft Protective Clothing*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
FY 2011 Base Plans: Complete and standardize fixed wavelength protective technologies to accommodate all substrates (spectacle, visor, goggle, step-in visor). Demonstrate protection in a visor and spectacle format. Finalize design for both man and aircraft mounted cooling systems.					
ACQUISITION WORKFORCE FUND *FY 2009 Accomplishments:* Funded DoD Acquisition Workforce Fund.	0.010	0.000	0.000	0.000	0.000
Accomplishments/Planned Programs Subtotals	3.384	2.497	5.978	0.000	5.978

C. Other Program Funding Summary ($ in Millions)

N/A

D. Acquisition Strategy

Primary Hardware Development for the Navy Advanced Technology Crew Station (ATCS) efforts in FY11 will be performed under a Cost Plus Fixed Fee (CPFF) Indefinite Delivery Indefinite Quantity (IDIQ) contract.

E. Performance Metrics

Complete development of advanced crashworthy system level models, investigate improved visual search methodologies, and improve the ability to assess cockpit compatibility through new analytic approaches to anthropometry.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603216N: *Aviation Survivability*	PROJECT 0584: *Acft Protective Clothing*	

Product Development ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Primary Hardware Development	Various/ TBD	Various Various	3.806	0.929	Jan 2010	2.951	Mar 2011	0.000		2.951	Continuing	Continuing	Continuing
Systems Engineering	WR	NAVAIR Pax River MD	27.383	0.618	Dec 2009	1.111	Dec 2010	0.000		1.111	Continuing	Continuing	Continuing
Systems Engineering	Various/ Various	Various Various	13.900	0.000		0.000		0.000		0.000	0.000	13.900	Continuing
Licenses	Various/ Various	Various Various	0.720	0.180	Dec 2009	0.185	Dec 2010	0.000		0.185	Continuing	Continuing	Continuing
		Subtotal	45.809	1.727		4.247		0.000		4.247			

Remarks

Support ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Configuration Management	WR	NAVAIR Pax River MD	0.532	0.200	Dec 2009	0.496	Dec 2010	0.000		0.496	Continuing	Continuing	Continuing
Configuration Management	Various/ Various	Various Various	3.232	0.000		0.000		0.000		0.000	0.000	3.232	Continuing
		Subtotal	3.764	0.200		0.496		0.000		0.496			

Remarks

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603216N: *Aviation Survivability*	PROJECT 0584: *Acft Protective Clothing*	

Test and Evaluation ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation	WR	NAVAIR Pax River MD	1.618	0.310	Dec 2009	0.855	Dec 2010	0.000		0.855	Continuing	Continuing	Continuing
Developmental Test & Evaluation	Various/ Various	Various Various	18.240	0.000		0.000		0.000		0.000	0.000	18.240	Continuing
		Subtotal	19.858	0.310		0.855		0.000		0.855			

Remarks

Management Services ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Support	WR	NAWCAD Pax River MD	1.580	0.210	Dec 2009	0.330	Dec 2010	0.000		0.330	Continuing	Continuing	Continuing
Travel	PO	NAVAIR Pax River MD	0.285	0.050	Oct 2009	0.050	Oct 2010	0.000		0.050	Continuing	Continuing	Continuing
Acquisition Workforce Fund	Various/ Various	Various Various	0.010	0.000		0.000		0.000		0.000	0.000	0.010	Continuing
		Subtotal	1.875	0.260		0.380		0.000		0.380			

Remarks

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603216N: *Aviation Survivability*	PROJECT 0584: *Acft Protective Clothing*	

	Total Prior Years Cost	FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	71.306	2.497		5.978		0.000		5.978			

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603216N: *Aviation Survivability*	PROJECT 0584: *Acft Protective Clothing*

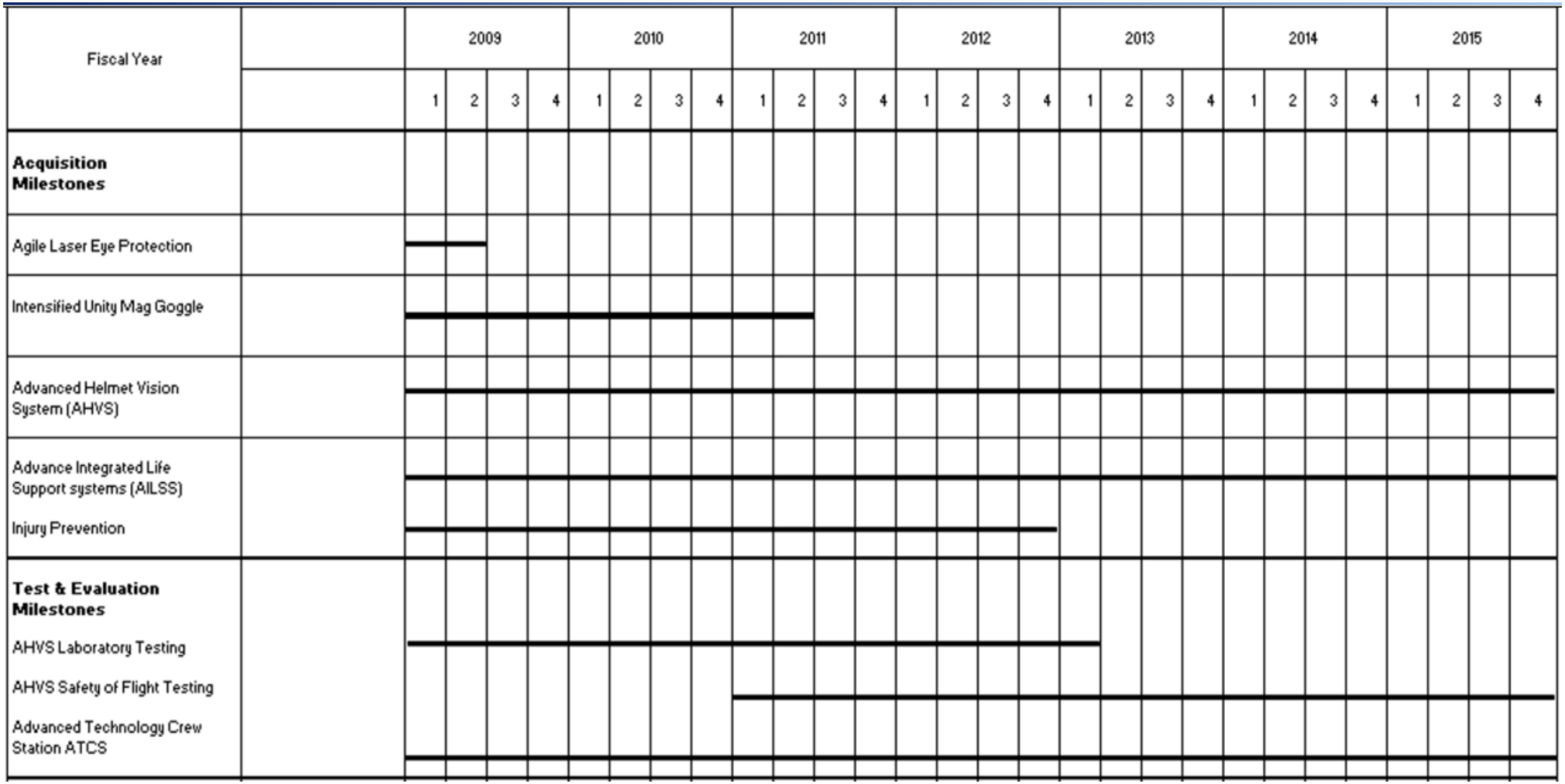


Exhibit R-4A, RDT&E Schedule Details: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603216N: *Aviation Survivability*	**PROJECT** 0584: *Acft Protective Clothing*

Schedule Details

	Start		End	
Event	**Quarter**	**Year**	**Quarter**	**Year**
Agile Laser Eye Protection	1	2009	2	2009
Intensified Unity Mag Goggle	1	2009	2	2011
Advanced Helmet Vision System (AHVS)	1	2009	4	2015
Advanced Integrated Life Support Systems (AILSS)	1	2009	4	2015
Injury Prevention	1	2009	4	2012
AHVS Laboratory Testing	1	2009	1	2013
AHVS Safety of Flight Testing	1	2011	4	2015
Advanced Technology Crew Station (ATCS)	1	2009	4	2015

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603216N: *Aviation Survivability*	PROJECT 0591: *Acft Survivability, Vulnerability & Safety*	

COST ($ in Millions)	FY 2009 Actual	FY 2010 Estimate	FY 2011 Base Estimate	FY 2011 OCO Estimate	FY 2011 Total Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
0591: *Acft Survivability, Vulnerability & Safety*	1.557	1.612	1.467	0.000	1.467	1.771	1.771	1.739	1.777	Continuing	Continuing
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0		

A. Mission Description and Budget Item Justification

Aircraft Survivability, Vulnerability and Safety. This project develops prototype hardware to improve the survivability of Navy and Marine Corps aircraft. This project addresses the likelihood of an aircraft being hit (susceptibility) and the probability of a kill if the aircraft is hit (vulnerability). Types of programs funded under this project include signature reduction efforts, subsystem and component hardening and development of fire and explosion suppression techniques for fuel systems.

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
Technology Requirements	0.158	0.281	0.251	0.000	0.251
FY 2009 Accomplishments: Prepared program master plan updates based on trade studies to determine future technology requirements. Trade studies included transport aircraft infrared signature analysis, rotary wing survivability requirements, advanced threat assessments and methodology improvements. Identified requirements and provided program management support by performing survivability-related systems engineering support.					
FY 2010 Plans: Update program master plan based on trade studies to determine future technology requirements. Planned trade studies include acoustic and infrared signature reduction, rotary wing survivability requirements, fire protection technologies, and threat systems analysis.					

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603216N: *Aviation Survivability*	PROJECT 0591: *Acft Survivability, Vulnerability & Safety*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
FY 2011 Base Plans: Update program master plan based on trade studies to determine future technology requirements. Planned trade studies include acoustic and infrared signature reduction, rotary wing survivability requirements, fire protection technologies, and threat systems analysis.					
Technology Design & Development *FY 2009 Accomplishments:* Began building baseline for platform acoustic/Infra-red (IR) data. Began updating threat databases. Developed mock-up of AH-1W cockpit with transparent armor; evaluated optical qualities and evaluated egress system requirements/options. Identified polymer materials to be used in development of rotary wing gearbox vulnerability reduction effort. Completed proof-of-concept study for Green On-board Inerting Gas Generator System (GOBIGGS). Began evaluating procured advanced threat systems to determine their lethality/capabilities. *FY 2010 Plans:* Identify technology gaps between threat systems and platform signatures and research technology solutions. Develop prototype polymer coating for gearbox application to meet the ballistic 30-minute requirement. Develop platform-specific prototype for the GOBIGGS. *FY 2011 Base Plans:* Develop prototype materials to reduce acoustic/IR footprint of operational platforms. Develop and demonstrate/validate production prototype of transparent armor canopy. Develop platform-specific gearbox polymer modifications.	0.933	0.949	0.807	0.000	0.807
Technology Test & Evaluation *FY 2009 Accomplishments:* Evaluated transparent armor and canopy integration properties based on AH-1W mock-up design.	0.458	0.382	0.409	0.000	0.409

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603216N: *Aviation Survivability*	PROJECT 0591: *Acft Survivability, Vulnerability & Safety*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
FY 2010 Plans: Evaluate alternative materials for design of the advanced survivable canopy. Receive delivery of procured threat systems. Perform live fire testing with threat systems; update threat system databases; evaluate threat systems against platforms *FY 2011 Base Plans:* Flight test armored canopy. Perform live fire testing on platform specific gearbox polymer modifications. Perform live fire test on GOBIGGS prototype.					
ACQUISITION WORKFORCE FUND *FY 2009 Accomplishments:* Funded DoD Acquisition Workforce Fund.	0.008	0.000	0.000	0.000	0.000
Accomplishments/Planned Programs Subtotals	1.557	1.612	1.467	0.000	1.467

C. Other Program Funding Summary ($ in Millions)

N/A

D. Acquisition Strategy

Primary Hardware Development will be performed under a Cost Plus Fixed Fee (CPFF) contract.

E. Performance Metrics

Evaluate 100% of deployed/developmental USN/USMC aircraft platforms for survivability deficiencies using Navy gap analysis as baseline. Identify prototype hardware solutions to address 25% to 50% of deficiencies, and initiate a minimum of two new demonstration projects per year.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603216N: *Aviation Survivability*	PROJECT 0591: *Acft Survivability, Vulnerability & Safety*

Product Development ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Primary Hardware Development	SS/CPFF	Bell Helicopter Dallas, TX	0.907	0.754	Mar 2010	0.646	Mar 2011	0.000		0.646	0.000	2.307	2.307
Primary Hardware Development	Various/ Various	Various Various	9.742	0.000		0.000		0.000		0.000	0.000	9.742	9.742
Systems Engineering	Various/ Various	Various Various	9.925	0.150	Mar 2010	0.465	Mar 2011	0.000		0.465	Continuing	Continuing	Continuing
Systems Engineering (Other Mil Agency)	MIPR	Various Various	0.200	0.050	Mar 2010	0.000		0.000		0.000	0.000	0.250	Continuing
Systems Engineering	WR	NSWC Carderock, MD	4.520	0.000		0.000		0.000		0.000	0.000	4.520	Continuing
		Subtotal	25.294	0.954		1.111		0.000		1.111			

Remarks

Support ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Development Support	WR	NSWC Carderock, MD	2.483	0.000		0.000		0.000		0.000	0.000	2.483	Continuing
Software Development	SS/CPFF	Boeing St. Louis, MO	1.012	0.000		0.000		0.000		0.000	0.000	1.012	1.012

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603216N: *Aviation Survivability*	PROJECT 0591: *Acft Survivability, Vulnerability & Safety*

Support ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Technical Data	WR	Various Various	0.279	0.000		0.000		0.000		0.000	0.000	0.279	Continuing
Studies & Analysis	SS/CPFF	SURVICE MD	0.585	0.000		0.000		0.000		0.000	0.000	0.585	0.585
Systems Engineering	SS/CPFF	SURVICE MD	0.150	0.000		0.000		0.000		0.000	0.000	0.150	0.150
Systems Engineering	Various/ Various	Wyle Labs Lexington Park, MD	0.060	0.000		0.000		0.000		0.000	0.000	0.060	0.060
		Subtotal	4.569	0.000		0.000		0.000		0.000	0.000	4.569	1.807

Remarks

Test and Evaluation ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation	WR	NAVAIR Patuxent River, MD	0.198	0.150	Oct 2009	0.000		0.000		0.000	0.000	0.348	Continuing
Developmental Test & Evaluation	WR	Various Various	2.072	0.066	Mar 2010	0.010	Mar 2011	0.000		0.010	Continuing	Continuing	Continuing
	MIPR		0.232	0.167	Mar 2010	0.164	Jun 2011	0.000		0.164	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603216N: *Aviation Survivability*	PROJECT 0591: *Acft Survivability, Vulnerability & Safety*

Test and Evaluation ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Live Fire Test & Evaluation		Army Research Lab Aberdeen, MD											
Live Fire Test & Evaluation	WR	NAWCWD China Lake, CA	1.495	0.000		0.000		0.000		0.000	0.000	1.495	Continuing
		Subtotal	3.997	0.383		0.174		0.000		0.174			

Remarks

Management Services ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Support	Various/ Various	Various Various	0.703	0.135	Oct 2009	0.041	Oct 2010	0.000		0.041	Continuing	Continuing	Continuing
Program Management Support	Various/ TBD	JF Taylor Lexington Park, MD	0.071	0.130	Oct 2009	0.131	Oct 2010	0.000		0.131	Continuing	Continuing	Continuing
Travel	Various/ Various	NAVAIR Patuxent River, MD	0.304	0.010	Oct 2009	0.010	Oct 2010	0.000		0.010	Continuing	Continuing	Continuing
Acquisition Workforce Fund	Various/ Various	Various Various	0.008	0.000		0.000		0.000		0.000	0.000	0.008	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603216N: *Aviation Survivability*	PROJECT 0591: *Acft Survivability, Vulnerability & Safety*

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	FY 2010 Cost	FY 2010 Award Date	FY 2011 Base Cost	FY 2011 Base Award Date	FY 2011 OCO Cost	FY 2011 OCO Award Date	FY 2011 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Subtotal			1.086	0.275		0.182		0.000		0.182			

Remarks

	Total Prior Years Cost	FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	34.946	1.612		1.467		0.000		1.467			

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603216N: *Aviation Survivability*	PROJECT 0591: *Acft Survivability, Vulnerability & Safety*

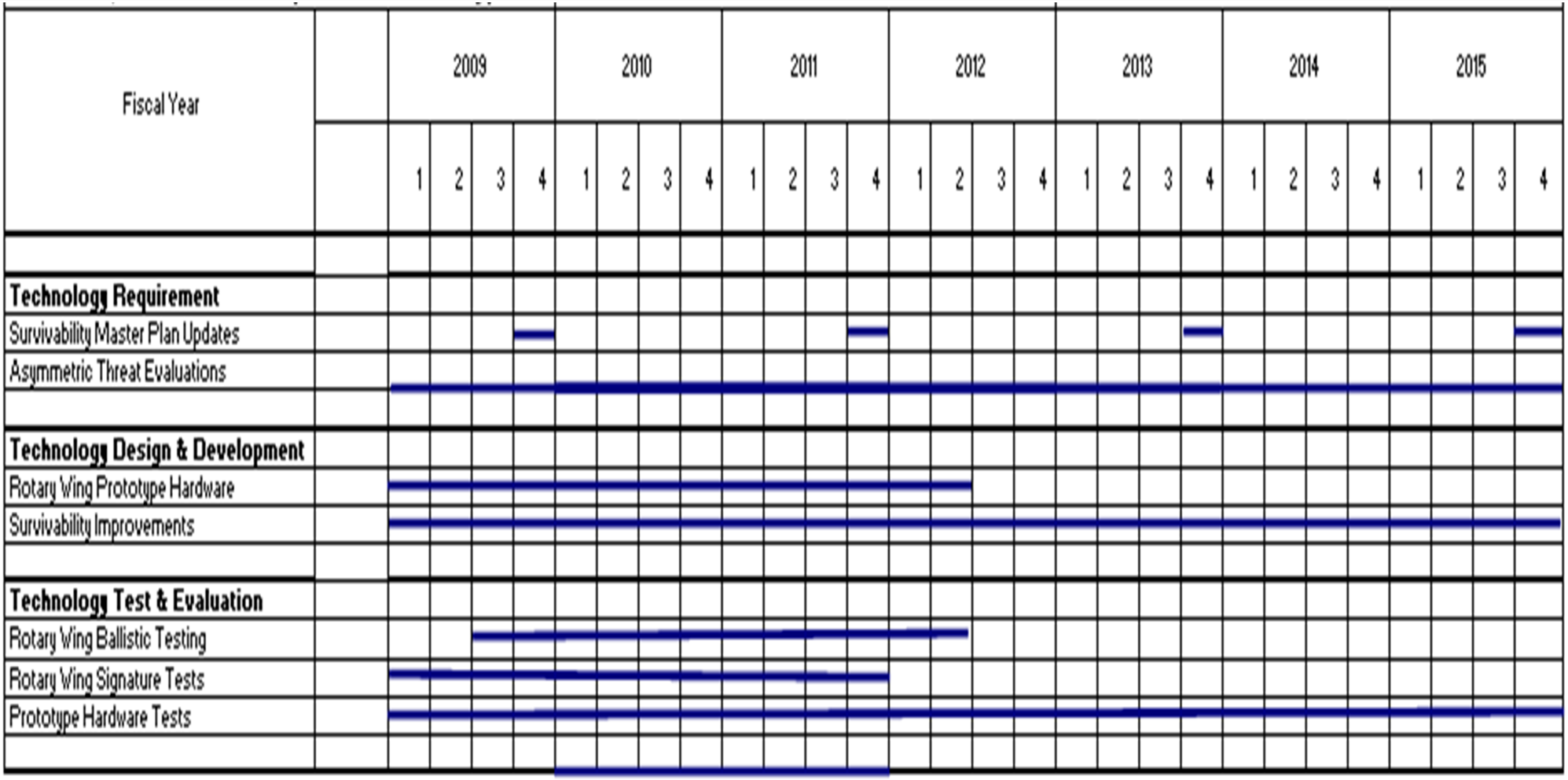


Exhibit R-4A, RDT&E Schedule Details: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603216N: *Aviation Survivability*	**PROJECT** 0591: *Acft Survivability, Vulnerability & Safety*

Schedule Details

	Start		End	
Event	**Quarter**	**Year**	**Quarter**	**Year**
Technology Requirement: Survivability Master Plan Updates 1	4	2009	4	2009
Technology Requirement: Asymmetric Threat Evaluations	1	2009	4	2015
Technology Design & Development: Rotary Wing Prototype Hardware	1	2009	2	2012
Technology Design & Development: Survivability Improvements	1	2009	4	2015
Technology Test & Evaluation: Rotary Wing Ballistic Testing	3	2009	2	2012
Technology Test & Evaluation: Rotary Wing Signature Tests	1	2009	4	2011
Technology Test & Evaluation: Prototype Hardware Tests	1	2009	3	2015
Technology Requirement: Survivability Master Plan Updates 2	4	2011	4	2011
Technology Requirement: Survivability Master Plan Updates 3	4	2013	4	2013
Technology Requirement: Survivability Master Plan Updates 4	4	2015	4	2015

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603216N: *Aviation Survivability*	PROJECT 0592: *Acft & Ordnance Safety*	

COST ($ in Millions)	FY 2009 Actual	FY 2010 Estimate	FY 2011 Base Estimate	FY 2011 OCO Estimate	FY 2011 Total Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
0592: *Acft & Ordnance Safety*	1.541	1.623	1.393	0.000	1.393	1.538	1.531	1.493	1.524	Continuing	Continuing
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0		

A. Mission Description and Budget Item Justification

The Aircraft and Ordnance Safety Program transitions innovative munitions safety technology to Navy and Marine Corps air weapons, to comply with the Chief of Naval Operations direction that all munitions carried aboard Navy ships be insensitive to unplanned stimuli (thermal, impact, and shock events). The Aircraft and Ordnance Safety Program also ensures the safety and protection of personnel, aircraft, ships, and operational facilities, through improved precision targeting, fail-safe ordnance, selective effects munitions and shock/blast force protection technologies.

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
Insensitive Munitions	1.533	1.623	1.393	0.000	1.393
FY 2009 Accomplishments: Conducted improved air-to-air missile propulsion demonstration and testing. Output: baseline insensitive munitions (IM) performance of air-breathing systems. Conducted shock/blast barrier protection demonstration and testing. Demonstrated pumice as a sympathetic detonation barrier for weapon shipping containers. Investigated alternative mitigation materials. Output: Designed, modeled, and demonstrated shock-absorbent materials for the protection of weapons and weapon platforms. Demonstrated improved air-launched munitions for force protection and homeland defense. Analyzed, designed, and demonstrated an improved Navy IM bomb that will mitigate Sympathetic Detonation and cook-off threats. Output: Demonstrated/determined the IM and safety characteristics of improved air launched munitions. Developed and validated IM solutions to advanced energetic material warheads and rocket motors: hyperbaric materials, new binding materials, novel fuses, and high-energy density materials. Continued improved Navy IM bomb analysis/design/demo. Output: Designed, modeled, and demonstrated IM solutions to new, advanced energetic materials. Developed and validated IM					

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603216N: *Aviation Survivability*	PROJECT 0592: *Acft & Ordnance Safety*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
solutions for advanced containment/case/warhead materials: metal matrix composite materials, high temperature cases, reactive warheads, and composite cases. Continued evaluating reactive material warheads for IM compliance. Output: Designed, modeled and demonstrated IM solutions to new, advanced containment/case/warhead materials. *FY 2010 Plans:* Continue FY09 tasking. *FY 2011 Base Plans:* Continue FY10 tasking.					
ACQUISITION WORKFORCE FUND *FY 2009 Accomplishments:* Funded DoD Acquisition Workforce Fund.	0.008	0.000	0.000	0.000	0.000
Accomplishments/Planned Programs Subtotals	1.541	1.623	1.393	0.000	1.393

C. Other Program Funding Summary ($ in Millions)

N/A

D. Acquisition Strategy

Not applicable.

E. Performance Metrics

The Aircraft and Ordnance Safety program will inititate six to nine technology development/maturation efforts to improve insensitive munitions (IM) signature and will work to transition those technologies to weapons programs. The weapons programs will be chosen based on PEO(U&W) weapons portfolio and will focus on the priority weapons as defined in the 2011/2012 IM strategic plan.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603216N: *Aviation Survivability*	PROJECT 0592: *Acft & Ordnance Safety*

Product Development ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Systems Engineering	WR	NAWCWD China Lake, CA	26.645	1.623	Oct 2009	1.393	Nov 2010	0.000		1.393	Continuing	Continuing	Continuing
		Subtotal	26.645	1.623		1.393		0.000		1.393			

Remarks

Management Services ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Acquisition Workforce Fund	Various/ Various	Various Various	0.008	0.000		0.000		0.000		0.000	0.000	0.008	Continuing
		Subtotal	0.008	0.000		0.000		0.000		0.000	0.000	0.008	

Remarks

	Total Prior Years Cost	FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	26.653	1.623		1.393		0.000		1.393			

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603216N: *Aviation Survivability*	PROJECT 0592: *Acft & Ordnance Safety*

Fiscal Year		2009				2010				2011				2012				2013				2014				2015			
		1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Acquisition **Milestones**																													
Air to Air Missile Demo/Testing																													
Improved Air Launched Weapons																													
Advanced Containment/Case/ Warhead Materials																													
Shock/Blast Barrier Protection Modeling and Demo/Testing																													
Advanced Energetic Materials																													

Exhibit R-4A, RDT&E Schedule Details: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603216N: *Aviation Survivability*	**PROJECT** 0592: *Acft & Ordnance Safety*

Schedule Details

	Start		End	
Event	**Quarter**	**Year**	**Quarter**	**Year**
Air-to-Air Missile Demonstration/Testing	1	2009	4	2015
Improved Air-Launched Weapons	1	2009	4	2015
Advanced Containment/Case/Warhead Materials	1	2009	4	2015
Shock/Blast Barrier Protection Modeling Demonstration/Testing	1	2009	4	2015
Advanced Energetic Materials	1	2009	4	2015

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603216N: *Aviation Survivability*	PROJECT 1819: *CV Acft Fire Suppress System*	

COST ($ in Millions)	FY 2009 Actual	FY 2010 Estimate	FY 2011 Base Estimate	FY 2011 OCO Estimate	FY 2011 Total Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
1819: *CV Acft Fire Suppress System*	0.715	0.746	0.642	0.000	0.642	0.786	0.782	0.768	0.783	Continuing	Continuing
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0		

A. Mission Description and Budget Item Justification

This project develops improved fire-fighting systems and fire protective measures for aircraft-related fires on aircraft carriers, including assessment of fire properties, definition of fire threats, improvements to fire-fighting agents and delivery systems, fire detection and suppression system performance evaluations, and fire-fighter training improvements.

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
Fire-Fighting	0.711	0.746	0.642	0.000	0.642
FY 2009 Accomplishments: Completed Halon 1211 replacement Commercial Off-The-Shelf (COTS) agent flight line extinguisher scoping tests. Developed and conducted Initial Fleet testing of proximity suits with replaceable wear surfaces. Completed the improved flow carrier hangar handline nozzle report of findings. Completed scoping tests of portable powered emergency external aircraft canopy opening devices. Authored draft of standardized procedures for mitigation of carrier main deck fuel station fires. Surveyed Self-Contained Breathing Apparatus (SCBA) facilities on Landing Helicopter Assault (LHA) and Landing Helicopter Dock (LHD) in preparation for development of amphibious hangar bay conflagration SCBA Concept Of Operations (CONOPS). Completed survey/inspection/evaluation of LPD17 class flight deck and fire protection facilities in preparation for associated required Naval Air Training and Operating Procedures Standardization (NATOPS) revisions. Authored draft of high occupancy/rolled helicopter rescue procedures.					

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603216N: *Aviation Survivability*	PROJECT 1819: *CV Acft Fire Suppress System*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
FY 2010 Plans: Complete final testing of Halon 1211 COTS replacement agent flight line extinguisher testing. Finalize high-occupancy/rolled helicopter rescue procedures. Develop, construct, and test prototype Halon 1211 COTS replacement extinguisher prototype. Conduct evaluation of high-durability aluminization material for proximity fire fighting. Develop and conduct evaluation of next generation of proximity suits to address wear in crotch areas. Conduct final testing of portable powered emergency external aircraft canopy opening devices on all model carrier aircraft, author/issue report of findings, and complete NATOPS suggested revisions to incorporate use. Author final version of standardized procedures for mitigation of carrier main deck fuel station fires. Author draft and final of standardized procedures for mitigation of carrier gallery deck fuel station fires. Author amphibious hangar bay conflagration SCBA CONOPS. Initiate review of aircraft fire fighting NATOPS, identifying necessary additions and revisions, in preparation for rewrite conference. Initiate development of procedures and hardware for cooling of Joint Strike Fighter internally carried ordnance. Participate in development/testing of new environmentally friendly Aqueous Film-Forming Foam (AFFF) concentrates. *FY 2011 Base Plans:* Test hardware for cooling of Joint Strike Fighter (JSF) internally carried ordnance. Finalize procedures for cooling of JSF internally carried ordnance. Evaluate adequacy of current procedures for handling aircraft composite fires with consideration of new-generation aircraft composites. Evaluate the feasibility/need for a flash hood with composite filtering capability. Author necessary revisions/ additions to the Aircraft Fire-Fighting NATOPS and submit for consideration. Provide subject matter expert support to the aircraft fire fighting NATOPS model manager during rewrite conference proceedings/conference. Initiate development of Electromagnetic Aircraft Launch System (EMALS) through AFFF application nozzle and procedures.					
ACQUISITION WORKFORCE FUND	0.004	0.000	0.000	0.000	0.000

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603216N: *Aviation Survivability*	PROJECT 1819: *CV Acft Fire Suppress System*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
FY 2009 Accomplishments: Funded DoD Acquisition Workforce Fund.					
Accomplishments/Planned Programs Subtotals	0.715	0.746	0.642	0.000	0.642

C. Other Program Funding Summary ($ in Millions)

N/A

D. Acquisition Strategy

Not applicable.

E. Performance Metrics

The Carrier Aircraft Fire Suppression (CAFS) program will, at a minimum, fund 6 to 10 projects per year that investigate and evaluate tactical capability gaps and potential capability improvements regarding shipboard aircraft fire suppression doctrine and equipment. CAFS projects will have a greater than 90% success rate of insertion into DON shipboard aircraft fire-fighting procedures and documentation.

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603216N: *Aviation Survivability*	PROJECT 9999: *Congressional Adds*	

COST ($ in Millions)	FY 2009 Actual	FY 2010 Estimate	FY 2011 Base Estimate	FY 2011 OCO Estimate	FY 2011 Total Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
9999: *Congressional Adds*	8.176	20.813	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	105.149
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0		

A. Mission Description and Budget Item Justification

Congressional Add

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010
Congressional Add: Common Safety System Controller *FY 2010 Plans:* This is a sensor system that will control airbag deployment in the cockpit and on the exterior of rotary wing platforms. Unlike automobile airbag controllers, this will be predictive rather that just solely reactive to achieve required response / activation times.	0.000	2.390
Congressional Add: Conformal Ceramics for Enhanced Aviation Armor Systems *FY 2010 Plans:* New body armor system for the warfighter. The approach will provide lightweight, conformal, body armor using a new ceramic material with unique material properties.	0.000	2.490
Congressional Add: Improved Capabilities for Irregular Warfare Platforms	0.000	3.983

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603216N: *Aviation Survivability*	PROJECT 9999: *Congressional Adds*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010
FY 2010 Plans: This effort will integrate the new common operational picture and emerging situational awareness technologies. Funding will support mission relevant exercises to empirically assess these technologies.		
Congressional Add: Integrated Manifold and Tube Ceramic Oxygen Generator *FY 2010 Plans:* This is a continuation of an earlier add to develop a passive, high purity oxygen generating system to replace the current on board liquid oxygen system.	0.000	4.780
Congressional Add: Lighter-than-Air Stratospheric Unmanned Aerial Vehicle *FY 2010 Plans:* Develop a lighter-than-air, unmanned air vehicle that will fly at 85K feet for 3 to 4 months to provide low cost, persistent surveillance with high bandwidth over the horizon communication capability.	0.000	2.390
Congressional Add: Military Upset Recovery Training *FY 2010 Plans:* Conduct operational testing and analysis of In-Flight Simulation based training of critical piloting skills for upset recovery. The funding will adapt the In-Flight Simulator to exhibit representative characteristics to include control forces and response rates to illustrate the difficulty in recovering. Funding will support initial pilot performance, recovery evaluations.	0.000	0.797
Congressional Add: Unmanned Vehicle Sensor Optimization Technologies Program	0.000	2.390

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603216N: *Aviation Survivability*	**PROJECT** 9999: *Congressional Adds*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010
FY 2010 Plans: Continue the development of next generation systems for Swarming control unmanned vehicle systems.		
Congressional Add: Air Sentinel *FY 2009 Accomplishments:* Funding will develop an automated system that resides in the ground control station of a UAV system for the detection and management of unmanned aircraft emergencies.	0.997	0.000
Congressional Add: UNMANNED AIRCRAFT SYS OPTIMIZATION TECH PROGRAM *FY 2009 Accomplishments:* To optimize the performance of the sensors onboard both manned and unmanned vehicles, stationary systems and smart dust.	1.994	0.000
Congressional Add: UNMANNED FORCE AUGMENTATION SYS *FY 2009 Accomplishments:* To continue research, development and testing of advanced Unmanned Air System technologies that facilitate the rapid transition of Unmanned Air Vehicle systems to the warfighters that offer order-of-magnitude improvements in usability, capability, and operational effectiveness.	2.393	0.000
Congressional Add: MODULAR ADVANCED HELMET VISITION SYSTEM	1.994	1.593

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603216N: *Aviation Survivability*	PROJECT 9999: *Congressional Adds*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010
FY 2009 Accomplishments: The Modular Advanced Helmet Vision Systems (MAVS) will provide significantly improved impact, hearing, laser eye, and chem-bio protection, along with communications and oxygen delivery, in a versatile, low-cost, mission reconfigurable design. *FY 2010 Plans:* Continue with FY09 effort		
Congressional Add: Agile Laser Eye Protection *FY 2009 Accomplishments:* Continue the development of the Unity Magnification Goggle to provide protection against a frequency agile laser and to integrate night vision cameras using an innovative optical design to allow day / night usage that does not reduce day acuity and color perception.	0.798	0.000
Congressional Adds Subtotals	8.176	20.813

C. Other Program Funding Summary ($ in Millions)

N/A

D. Acquisition Strategy

Not required for Congressional Adds

E. Performance Metrics

Not required for Congressional Adds

Exhibit R-2, RDT&E Budget Item Justification: PB 2011 Navy										DATE: February 2010	
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*				R-1 ITEM NOMENCLATURE PE 0603237N: *Deployable JT Cmd & Control*							
COST ($ in Millions)	**FY 2009 Actual**	**FY 2010 Estimate**	**FY 2011 Base Estimate**	**FY 2011 OCO Estimate**	**FY 2011 Total Estimate**	**FY 2012 Estimate**	**FY 2013 Estimate**	**FY 2014 Estimate**	**FY 2015 Estimate**	**Cost To Complete**	**Total Cost**
Total Program Element	6.876	9.034	4.275	0.000	4.275	6.678	6.477	6.091	6.211	Continuing	Continuing
3050: *Deployable JT Command and Control*	5.679	6.007	4.275	0.000	4.275	6.678	6.477	6.091	6.211	Continuing	Continuing
9999: *Congressional Adds*	1.197	3.027	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	4.224

A. Mission Description and Budget Item Justification

Deployable Joint Command and Control (DJC2) is a Secretary of Defense (SecDef) and Chairman, Joint Chiefs of Staff (CJCS) priority DoD transformation initiative that is providing a standardized, integrated, rapidly deployable, modular, scaleable, and reconfigurable joint command and control capability to designated Geographic Combatant Commands (GCCs). DJC2 is the material solution to Defense Planning Guidance (DPG) that called for the development of Standing Joint Task Forces (JTFs) with a deployable C2 capability. DJC2 will ensure that Joint Force Commanders (JFCs) are equipped, as well as trained and organized, to carry out their C2 responsibilities. DJC2 provides GCCs and Joint Force Commanders 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 program addresses both the Quadrennial Defense Review finding that a joint command and control architecture needs to be developed for standing JTFs at each of the GCCs and the need for a deployable Joint Command and Control System described in the Transformation Study Report presented to the Secretary of Defense, April, 2001. It integrates the requirements for and lessons learned from U.S. Central Command's deployable headquarters funded from the FY 2001 Emergency Supplemental Act for Recovery from and Response to Terrorist Attacks on the United States. DJC2 is supported by SecDef and CJCS. The JCS/Joint Requirement Oversight Council has approved the DJC2 Mission Needs Statement and Operational Requirements Document.

Exhibit R-2, RDT&E Budget Item Justification: PB 2011 Navy	DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603237N: *Deployable JT Cmd & Control*

B. Program Change Summary ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
Previous President's Budget	7.073	6.032	0.000	0.000	0.000
Current President's Budget	6.876	9.034	4.275	0.000	4.275
Total Adjustments	-0.197	3.002	4.275	0.000	4.275
• Congressional General Reductions		-0.038			
• Congressional Directed Reductions		0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds		3.040			
• Congressional Directed Transfers		0.000			
• Reprogrammings	-0.163	0.000			
• SBIR/STTR Transfer	-0.034	0.000			
• Program Adjustments	0.000	0.000	4.275	0.000	4.275

Congressional Add Details ($ in Millions, and Includes General Reductions)	FY 2009	FY 2010
Project: 9999: *Congressional Adds*		
Congressional Add: *9D17A Deployable Command and Control Vehicle*	1.197	3.027
Congressional Add Subtotals for Project: 9999	1.197	3.027
Congressional Add Totals for all Projects	1.197	3.027

Change Summary Explanation

Technical: Not applicable.

Schedule: Not applicable.

FY11 from previous President's Budget is shown as zero because no FY11-15 data was presented in President's Budget 2010.

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603237N: *Deployable JT Cmd & Control*	PROJECT 3050: *Deployable JT Command and Control*	

COST ($ in Millions)	FY 2009 Actual	FY 2010 Estimate	FY 2011 Base Estimate	FY 2011 OCO Estimate	FY 2011 Total Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
3050: *Deployable JT Command and Control*	5.679	6.007	4.275	0.000	4.275	6.678	6.477	6.091	6.211	Continuing	Continuing
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0		

A. Mission Description and Budget Item Justification

Deployable Joint Command and Control (DJC2) is a Secretary of Defense (SecDef) and Chairman, Joint Chiefs of Staff (CJCS) priority DoD transformation initiative that is providing a standardized, integrated, rapidly deployable, modular, scaleable, and reconfigurable joint command and control capability to designated Geographic Combatant Commands (GCCs). DJC2 is the material solution to Defense Planning Guidance (DPG) that called for the development of Standing Joint Task Forces (JTFs) with a deployable C2 capability. DJC2 will ensure that Joint Force Commanders (JFCs) are equipped, as well as trained and organized, to carry out their C2 responsibilities. DJC2 provides GCCs and Joint Force Commanders 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 program addresses both the Quadrennial Defense Review finding that a joint command and control architecture needs to be developed for standing JTFs at each of the GCCs and the need for a deployable Joint Command and Control System described in the Transformation Study Report presented to the Secretary of Defense, April, 2001. It integrates the requirements for and lessons learned from U.S. Central Command's deployable headquarters funded from the FY 2001 Emergency Supplemental Act for Recovery from and Response to Terrorist Attacks on the United States. DJC2 is supported by SecDef and CJCS. The JCS/Joint Requirement Oversight Council has approved the DJC2 Mission Needs Statement and Operational Requirements Document.

DJC2 seeks to provide standing, and standardized, joint C2 systems that can be deployed by Regional Combatant Commanders (RCCs) or JTFs and the new Standing Joint Force Headquarters concept and doctrine being developed by Joint Forces Command in coordination with other RCCs and the Joint Staff, as tasked by DPG. RCC and JTF commanders will use a deployable joint command and control capability for day-to-day operations, as well as when deployed for training or contingency operations. The capability is intended for all levels of conflict and will be reconfigurable to meet specific RCC and JTF mission requirements. This capability must be interoperable with higher and adjacent echelons of command (to include coalition allies) as well as with supporting elements to include joint forces.

DJC2 will utilize Global Command and Control System in its core suite of applications, ensuring interoperability with the worldwide-installed base of Global Command and Control System - Joint.

The 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

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603237N: *Deployable JT Cmd & Control*	**PROJECT** 3050: *Deployable JT Command and Control*

upgrades of the systems to maintain currency and maximize operational effectiveness. Maximum use will be made of commercial technologies; technology insertion of each DJC2 suite will be made approximately every three years. The baseline configuration is based upon existing Science and Technology initiatives, Advanced Concepts Technology Demonstration Programs, programs of record, and fielded capabilities of the services and defense agencies, scaled to the Regional Combatant Commander level. Subsequent deliveries will include newly developed capabilities based on emergent, joint requirements and operational feedback from utilization of earlier delivered systems, as well as incorporation of new commercial technologies.

FY11 funds development of increased efforts for systems engineering and integration, and DJC2 Test Bed.

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
Systems Engineering & Integration	1.621	1.991	1.823	0.000	1.823
FY 2009 Accomplishments: Completed Critical Design Reviews for upgrade plan. Continued system engineering analysis and Integration activities. Completed Operational test, technology insertion/technology refresh design modifications.					
FY 2010 Plans: Identify emerging/mandated Key Information Profiles (KIP) migration and impacts to DJC2. Single out improvement in infrastructure equipment to include power generation, soft shelter design and video distribution for design modification. Evaluate Ka Band Super High Frequency radio upgrades to both Early Entry communication package and Rapid Response Kits. Conduct design reviews to reflect outcome of the trade studies/experimentation.					
FY 2011 Base Plans: Continue to identify and incorporate emerging/mandated KIP required by the DJC2 Net-Ready Key Performance Parameter into system design. Update Information Support Plan to reflect system architecture changes and obtain CJCS J6/J2 approval. With validated architecture, obtain renewal of the DJC2 Core System Authority to Operate (ATO) and perform required testing and information assurance mitigation to support ATO approval. Investigate potential hybrid power solutions for diesel generator replacement.					

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603237N: *Deployable JT Cmd & Control*	PROJECT 3050: *Deployable JT Command and Control*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
DJC2 RDT&E Test Bed	2.999	3.421	2.452	0.000	2.452
FY 2009 Accomplishments: Identified and incorporated changes in the DJC2 test bed based upon lessons learned from fielded systems and operational testing *FY 2010 Plans:* Update the DJC2 Test Bed to facilitate testing of new hardware necessary to support trade studies and design reviews for infrastructure and communications refresh. Apply lessons learned from fielded and like systems to assist in driving the revitalized design. *FY 2011 Base Plans:* Complete final testing of revised DJC2 Network System Design. Incorporate fixes to the Network System and validate through regression testing to support fielding decisions by the Program Office. Finalize and test the DJC2 Virtual Machine and Portal Synchronization tool to include server procurement, network support and testing thereby providing the ability to push updated virtual machines and command and control portals to any given DJC2 from either garrison location or the DJC2 Operational Support Center, significantly improving mission tailorability. Conduct trade studies to identify the next generation client for DJC2.					
Acquisition Documentation Activities	0.624	0.000	0.000	0.000	0.000
FY 2009 Accomplishments: Analyzed, prepared, and performed In-Process Review, and Milestone acquisition activities.					
CONOPS Experimentation System	0.406	0.595	0.000	0.000	0.000
FY 2009 Accomplishments: Provided component upgrade for Concept of Operations (CONOPS) System at Joint Forces Command (JFCOM).					

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603237N: *Deployable JT Cmd & Control*	PROJECT 3050: *Deployable JT Command and Control*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
FY 2010 Plans: Continue component upgrades for CONOPS System at JFCOM.					
Acquisition Workforce *FY 2009 Accomplishments:* Funded Acquisition Worforce fund	0.029	0.000	0.000	0.000	0.000
Accomplishments/Planned Programs Subtotals	5.679	6.007	4.275	0.000	4.275

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total	FY 2012	FY 2013	FY 2014	FY 2015	Cost To Complete	Total Cost
• OPN /2804: *DJC2*	9.004	11.085	8.542	0.000	8.542	9.638	9.933	5.105	5.283	Continuing	Continuing

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 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 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 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603237N: *Deployable JT Cmd & Control*	PROJECT 3050: *Deployable JT Command and Control*	

Product Development ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Systems Engineering	WR	NSWC Var	43.093	1.489	Nov 2009	1.510	Nov 2010	0.000		1.510	Continuing	Continuing	Continuing
Engineering Facility Development	WR	NSWC PCD	30.189	2.214	Feb 2010	1.746	Feb 2011	0.000		1.746	Continuing	Continuing	Continuing
Hardware Development	MIPR	USA Var	19.417	0.595	Feb 2010	0.000		0.000		0.000	0.000	20.012	Continuing
		Subtotal	92.699	4.298		3.256		0.000		3.256			

Remarks

Support ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Software Integration	WR	NSWC Var	38.949	0.502	Feb 2010	0.313	Nov 2010	0.000		0.313	Continuing	Continuing	Continuing
Technical Investigations	MIPR	NTA Var	13.426	0.000		0.000		0.000		0.000	0.000	13.426	Continuing
Trade-off Studies & Analyses	MIPR	NTA Var	9.000	0.000		0.000		0.000		0.000	0.000	9.000	Continuing
		Subtotal	61.375	0.502		0.313		0.000		0.313			

Remarks

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603237N: *Deployable JT Cmd & Control*	PROJECT 3050: *Deployable JT Command and Control*

Test and Evaluation ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation	MIPR	46th Test Wing Var	9.360	0.565	Feb 2010	0.321	Feb 2011	0.000		0.321	Continuing	Continuing	Continuing
Operational Test & Evaluation	WR	OPTEVFOR Var	10.314	0.642	Feb 2010	0.385	Feb 2011	0.000		0.385	Continuing	Continuing	Continuing
Test Assets	MIPR	Eglin AFB Var	4.000	0.000		0.000		0.000		0.000	0.000	4.000	Continuing
		Subtotal	23.674	1.207		0.706		0.000		0.706			

Remarks

Management Services ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Support	WR	NSWC, CSS Var	30.365	0.000		0.000		0.000		0.000	0.000	30.365	Continuing
Acquisition Work Force	C/TBD	Not Specified Not Specified	0.029	0.000		0.000		0.000		0.000	0.000	0.029	Continuing
		Subtotal	30.394	0.000		0.000		0.000		0.000	0.000	30.394	

Remarks

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603237N: *Deployable JT Cmd & Control*	PROJECT 3050: *Deployable JT Command and Control*	

	Total Prior Years Cost	FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	208.142	6.007		4.275		0.000		4.275			

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603237N: *Deployable JT Cmd & Control*	**PROJECT** 3050: *Deployable JT Command and Control*

Fiscal Year	2009				2010				2011				2012				2013				2014				2015			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Acquisition Milestones																												
MILESTONE C																												
IOC																												
FDDR																												
Test & Evaluation Milestones																												
Development Test		▲ D / OT					△ D / OT				△ D / OT				△ D / OT				△ D / OT				△ D / OT				△ D / OT	
Operational Test																												
Production Milestones																												
Deliveries																												

Exhibit R-4A, RDT&E Schedule Details: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603237N: *Deployable JT Cmd & Control*	**PROJECT** 3050: *Deployable JT Command and Control*

Schedule Details

	Start		End	
Event	**Quarter**	**Year**	**Quarter**	**Year**
DEVELOPMENTAL TESTa	2	2009	2	2009
DEVELOPMENTAL TESTb	3	2010	3	2010
DEVELOPMENTAL TESTc	3	2011	3	2011
DEVELOPMENTAL TESTd	3	2012	3	2012
DEVELOPMENTAL TESTe	3	2013	3	2013
DEVELOPMENTAL TESTf	3	2014	3	2014
DEVELOPMENTAL TESTg	3	2015	3	2015
OPERATIONAL TESTa	2	2009	2	2009
OPERATIONAL TESTb	3	2010	3	2010
OPERATIONAL TESTc	3	2011	3	2011
OPERATIONAL TESTd	3	2012	3	2012
OPERATIONAL TESTe	3	2013	3	2013
OPERATIONAL TESTf	3	2014	3	2014
OPERATIONAL TESTg	3	2015	3	2015

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603237N: *Deployable JT Cmd & Control*	PROJECT 9999: *Congressional Adds*	

COST ($ in Millions)	FY 2009 Actual	FY 2010 Estimate	FY 2011 Base Estimate	FY 2011 OCO Estimate	FY 2011 Total Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
9999: *Congressional Adds*	1.197	3.027	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	4.224
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0		

A. Mission Description and Budget Item Justification

Congressional add

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010
Congressional Add: 9D17A Deployable Command and Control Vehicle *FY 2009 Accomplishments:* Performed systems engineering & integration and testing activities for U.S. Northern Command Deployable Command and Control Vehicle variant. *FY 2010 Plans:* Continue systems engineering & integration and testing activities for U.S. Northern Command Deployable Command and Control Vehicle variant.	1.197	3.027
Congressional Adds Subtotals	1.197	3.027

C. Other Program Funding Summary ($ in Millions)

N/A

D. Acquisition Strategy

N/A

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603237N: *Deployable JT Cmd & Control*	PROJECT 9999: *Congressional Adds*

E. Performance Metrics

Congressional add

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Exhibit R-2, RDT&E Budget Item Justification: PB 2011 Navy										DATE: February 2010	
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*				R-1 ITEM NOMENCLATURE PE 0603254N: *ASW Systems Development*							
COST ($ in Millions)	**FY 2009 Actual**	**FY 2010 Estimate**	**FY 2011 Base Estimate**	**FY 2011 OCO Estimate**	**FY 2011 Total Estimate**	**FY 2012 Estimate**	**FY 2013 Estimate**	**FY 2014 Estimate**	**FY 2015 Estimate**	**Cost To Complete**	**Total Cost**
Total Program Element	38.370	25.553	8.249	0.000	8.249	8.438	8.663	8.900	9.111	Continuing	Continuing
0490: *Airborne Acoustic Intelligence (AAI)*	3.732	3.547	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	59.118
1292: *Adv ASW Sensors & Proc*	7.068	10.007	5.739	0.000	5.739	5.933	6.162	6.393	6.602	Continuing	Continuing
3222: *Advanced High Altitude ASW*	0.000	2.942	2.510	0.000	2.510	2.505	2.501	2.507	2.509	Continuing	Continuing
9177: *EPAS*	9.375	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	36.085
9347: *Claymore Marine*	4.831	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	14.337
9999: *Congressional Adds*	13.364	9.057	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	49.349

A. Mission Description and Budget Item Justification

Includes RDT&E funds for advanced development and developmental testing of airborne anti-submarine warfare systems, including aircraft, equipment, and devices for use against all types of submarine targets; and advanced, high-performance, underwater, mobile target for use in fleet ASW training exercises and for the operational evaluation of the MK-30 torpedo and the MK-48 torpedo weapons system improvement program; and Project BEARTRAP. Definition of Project BEARTRAP is classified.

Excludes civilian and military manpower and their related costs and military construction cost which are included in appropriated management and support elements in this program. Project 0490 moved to new Military Intelligence Program (MIP) Program Element (0303354N) in FY 2011 and beyond.

Exhibit R-2, RDT&E Budget Item Justification: PB 2011 Navy	DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603254N: *ASW Systems Development*

B. Program Change Summary ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
Previous President's Budget	36.885	16.585	0.000	0.000	0.000
Current President's Budget	38.370	25.553	8.249	0.000	8.249
Total Adjustments	1.485	8.968	8.249	0.000	8.249
• Congressional General Reductions		-0.107			
• Congressional Directed Reductions		0.000			
• Congressional Rescissions	0.000	-0.020			
• Congressional Adds		9.095			
• Congressional Directed Transfers		0.000			
• Reprogrammings	0.000	0.000			
• SBIR/STTR Transfer	-0.510	0.000			
• Program Adjustments	0.000	0.000	8.249	0.000	8.249
• Congressional Recision Adjustments	-0.005	0.000	0.000	0.000	0.000
• Congressional Add Adjustments	2.000	0.000	0.000	0.000	0.000

Congressional Add Details ($ in Millions, and Includes General Reductions)	FY 2009	FY 2010
Project: 9999: *Congressional Adds*		
Congressional Add: *Air Readiness/Effectiveness Measurement Program*	0.000	1.593
Congressional Add: *Marine Mammal Detection System*	0.000	1.992
Congressional Add: *Marine Species Mitigation*	0.000	2.285
Congressional Add: *TACTICAL E FIELD BUOY DEVELOPMENT PROGRAM*	1.596	0.000
Congressional Add: *MARINE MAMMAL ALERT SYSTEM*	2.393	2.390
Congressional Add: *In Buoy Processor for TASS*	1.995	0.000
Congressional Add: *Sonobouy Wave-Energy Module*	2.992	0.797
Congressional Add: *Holographic Optical Filter for Light Detection and*	1.995	0.000
Congressional Add: *Low Cost Multi-channel Camera System*	2.393	0.000

Exhibit R-2, RDT&E Budget Item Justification: PB 2011 Navy	DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603254N: *ASW Systems Development*

Congressional Add Details ($ in Millions, and Includes General Reductions)	FY 2009	FY 2010
Congressional Add Subtotals for Project: 9999	13.364	9.057
Congressional Add Totals for all Projects	13.364	9.057

Change Summary Explanation

Technical: 0490. Defined Active Measurement Validation as a separate cost category for improved programmatic tracking. Active Measurement Validation is an output product of the Active Target Strength (T.S.) project.

Schedule: 1292. Program Growth reduction in 1Q/09, shortened the Multi-Static Target Recognition Performance Assessment from 1Q/09 thru 4Q/10 to 1Q/10 thru 4Q/10. PB-10 budget submission reflected 1Q/10 Experiment/Exercise participation start vice actual 1Q/09 start.

FY11 from previous President's Budget is shown as zero because no FY11-15 data was presented in President's Budget 2010.

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603254N: *ASW Systems Development*	PROJECT 0490: *Airborne Acoustic Intelligence (AAI)*	

COST ($ in Millions)	FY 2009 Actual	FY 2010 Estimate	FY 2011 Base Estimate	FY 2011 OCO Estimate	FY 2011 Total Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
0490: *Airborne Acoustic Intelligence (AAI)*	3.732	3.547	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	59.118
Quantity of RDT&E Articles	2	2	0	0	0	0	0	0	0		

A. Mission Description and Budget Item Justification

The mission of Airborne Acoustic Intelligence (AAI) (CNO Project K-0416) is to provide SPL quality recordings of targets of interest and an associated new technology, rapid prototyping mechanism for the application of state-of-the-art collection sensors. The program will develop and rapidly deploy new technology concepts in hardware and software to effectively address emerging littoral threats and to improve the present Undersea Warfare capability in support of Sea Shield/Sea Trial Initiatives. AAI also provides a measurement analysis capability to reconstruct, analyze and develop active target strength measurement validation. The AAI data collection program provides passive and active acoustic and non-acoustic data essential for the design and development of environmental models, sensors, weapons, software algorithms, and tactical decision aids. AAI employs developmental and prototypical hardware installed in uniquely configured ASW aircraft to collect data of interest, and specially configured ground support facilities to conduct reconstruction and analysis of this data. AAI includes calibrated recording systems, advanced detection and tracking systems, special sensors, advanced processing systems and techniques and specially derived operational tactics. The 4 RDT&E articles consist of aircraft calibration units, Sound Pressure Level (SPL) collection suites, and post mission processors that will support the collection mission.

Military Intelligence Program (MIP) funding previously contained in this PE and Project, moved to a new Program Element (0303354N) in FY 2011 and beyond for enhanced MIP tracking.

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
Systems Engineering / Aircraft Mods Active Acoustic Program	2.582	2.397	0.000	0.000	0.000
FY 2009 Accomplishments: Continued engineering to support SPL Recording. Continued post mission processor upgrade and engineering to support aircraft calibration unit enhancements for active target strength. Engineering					

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603254N: *ASW Systems Development*	PROJECT 0490: *Airborne Acoustic Intelligence (AAI)*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
development of Target Strength processing will continue, however, the prototype processor is on hold due to funding reprioritization. *FY 2010 Plans:* Engineering to support SPL Recording. Post mission processor upgrade and engineering to support aircraft calibration unit enhancements for active target strength. Engineering development of Target Strength processing will continue, however, the prototype processor is on hold due to funding reprioritization.					
Data Collection and Analysis *FY 2009 Accomplishments:* Continued data collection support at Operational Wings. Ongoing collection of high interest acoustic and non-acoustic data in support of Measurement/Measuring and Signature Intelligence (MASINT)/ Office of Naval Intelligence (ONI) threat assessment requirements. Reduction, Analysis and Fleet Rapid Feedback. Conducted airborne special operations support. Essential performance modeling and evaluation for advanced technology sensor systems design and Fleet tactics development. *FY 2010 Plans:* Data collection support at Operational Wings. Ongoing collection of high interest acoustic and non-acoustic data in support of Measurement/Measuring and Signature Intelligence (MASINT)/Office of Naval Intelligence (ONI) threat assessment requirements. Reduction, Analysis and Fleet Rapid Feedback. Conduct airborne special operations support. Essential performance modeling and evaluation for advanced technology sensor systems design and Fleet tactics development.	0.750	0.750	0.000	0.000	0.000
Active Measurement Validation	0.400	0.400	0.000	0.000	0.000

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603254N: *ASW Systems Development*	PROJECT 0490: *Airborne Acoustic Intelligence (AAI)*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
FY 2009 Accomplishments: Continued Active Measurement Validation of targets of interest. Provided the acoustic analysis of echo characterization (which includes: signal excess (SE) measurements, peak frequency (PF), trend analysis and pulse duration measurements) and target strength. *FY 2010 Plans:* Active Measurement Validation of targets of interest. Provides the acoustic analysis of echo characterization (which includes: signal excess (SE) measurements, peak frequency (PF), trend analysis and pulse duration measurements) and target strength.					
Accomplishments/Planned Programs Subtotals	3.732	3.547	0.000	0.000	0.000

C. Other Program Funding Summary ($ in Millions)

N/A

D. Acquisition Strategy

Airborne Acoustic Intelligence (AAI) is a CNO Special Project. The included technology developments are primarily in-house with contractor participation through existing vehicles.

E. Performance Metrics

Continued engineering to support SPL recording. Continued data collection support at Operation Wings. Continued Active Measurement Validation of targets of interest.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603254N: *ASW Systems Development*	PROJECT 0490: *Airborne Acoustic Intelligence (AAI)*

Product Development ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Active Measurement Validation	WR	NAWCAD PATUXENT RIVER, MD	0.400	0.400	Oct 2009	0.000		0.000		0.000	0.000	0.800	Continuing
Ancillary Hdw Development	WR	NAWCAD PATUXENT RIVER, MD	4.819	0.750	Oct 2009	0.000		0.000		0.000	0.000	5.569	Continuing
Systems Eng	WR	NAWCAD PATUXENT RIVER, MD	70.072	2.397	Oct 2009	0.000		0.000		0.000	0.000	72.469	Continuing
		Subtotal	75.291	3.547		0.000		0.000		0.000	0.000	78.838	

Remarks

Military Intelligence Program (MIP) funding previously contained in this PE and Project, moved to a new Program Element (0303354N) for enhanced MIP tracking.

Management Services ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Travel	TM	NAVAIR PATUXENT RIVER, MD	0.095	0.000		0.000		0.000		0.000	0.000	0.095	Continuing
MGT & PROF SPT SVCS (NON-FFRDC)	Various/ Various	VARIOUS VARIOUS	0.898	0.000		0.000		0.000		0.000	0.000	0.898	0.898

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603254N: *ASW Systems Development*	PROJECT 0490: *Airborne Acoustic Intelligence (AAI)*

Management Services ($ in Millions)

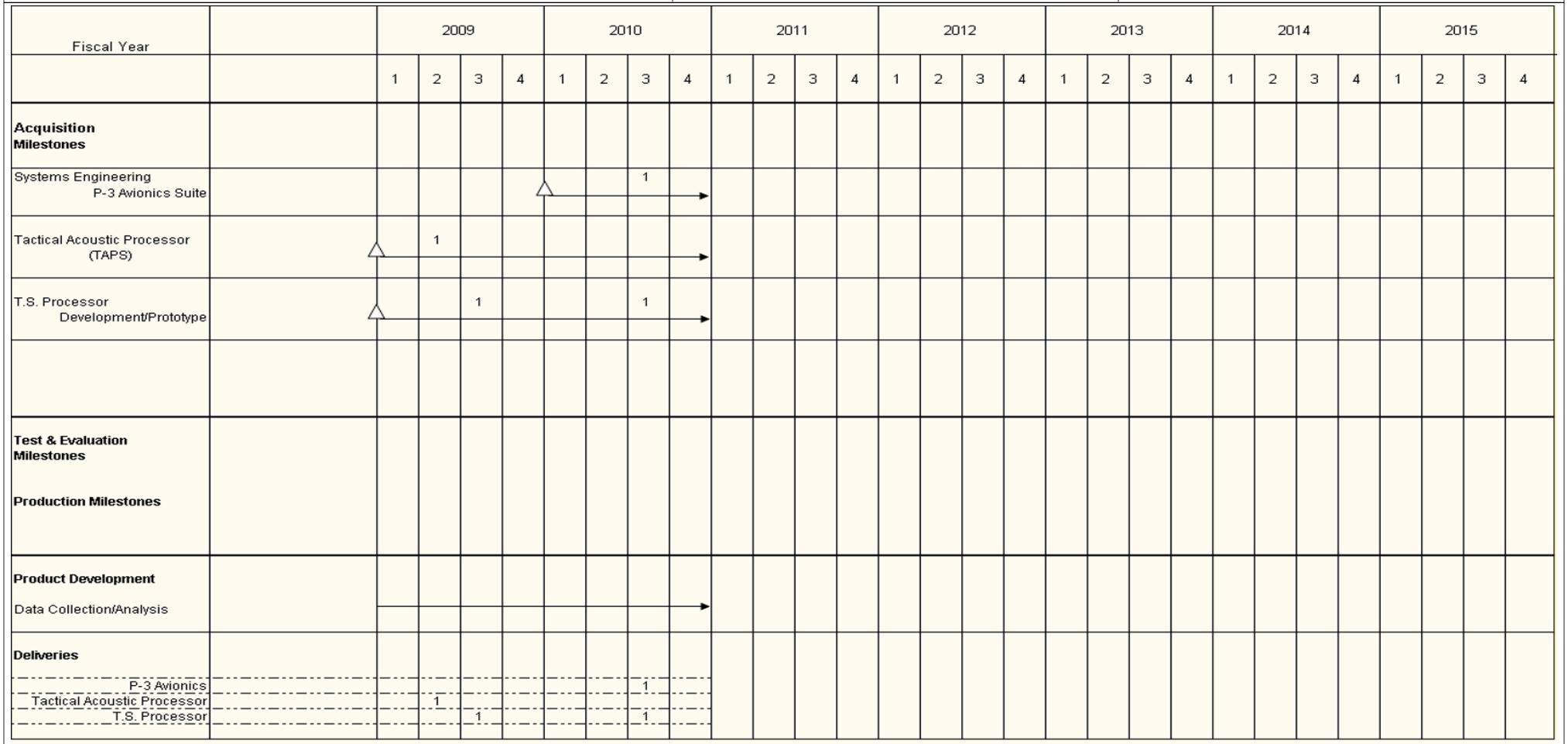
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	FY 2010 Cost	FY 2010 Award Date	FY 2011 Base Cost	FY 2011 Base Award Date	FY 2011 OCO Cost	FY 2011 OCO Award Date	FY 2011 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Subtotal			0.993	0.000		0.000		0.000		0.000	0.000	0.993	0.898

Remarks

	Total Prior Years Cost	FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	76.284	3.547		0.000		0.000		0.000	0.000	79.831	0.898

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2011 Navy		**DATE:** February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603254N: *ASW Systems Development*	**PROJECT** 0490: *Airborne Acoustic Intelligence (AAI)*



Note: Military Intelligence Program (MIP) funding previously contained in this PE and Project, moved to a new Program Element (0303354N) for enhanced MIP tracking.

Exhibit R-4A, RDT&E Schedule Details: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603254N: *ASW Systems Development*	**PROJECT** 0490: *Airborne Acoustic Intelligence (AAI)*

Schedule Details

	Start		End	
Event	**Quarter**	**Year**	**Quarter**	**Year**
Sys Eng Tactical Acoustic Processor (TAPS)	1	2009	4	2010
Target Strength Processor Dev't/Prototype	1	2009	4	2010
Data Collection and Analysis	1	2009	4	2010
Deliveries	2	2009	3	2010
Sys Eng Avionics Suite	1	2010	4	2010

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603254N: *ASW Systems Development*	PROJECT 1292: *Adv ASW Sensors & Proc*	

COST ($ in Millions)	FY 2009 Actual	FY 2010 Estimate	FY 2011 Base Estimate	FY 2011 OCO Estimate	FY 2011 Total Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
1292: *Adv ASW Sensors & Proc*	7.068	10.007	5.739	0.000	5.739	5.933	6.162	6.393	6.602	Continuing	Continuing
Quantity of RDT&E Articles	100	300	100	0	100	0	0	0	0		

A. Mission Description and Budget Item Justification

This program provides Anti-Submarine Warfare (ASW) platform effectiveness through development of advanced hardware and software associated with airborne acoustic and non-acoustic systems. This includes sensors, processing, post-processing, data recording and display capabilities to address regional threat scenarios against surfaced or submerged conventionally and nuclear powered submarines. Key objectives are platform accommodations of advanced active and passive sensors, improved detection, classification, localization, tracking, and increased capacity and flexibility to handle multi-sensor data loads. Programs being funded during the FYDP will investigate technologies such as: Over the Horizon (OTH) Communications, Distributed Netted Sensors, transient signals, and source and receiver improvement technologies that will enhance passive and Multi-static Active Sensor Systems capabilities. Other programs being funded during the FYDP will provide for the development of persistent tactical search technologies that will allow transition to the localization and attack phase in all operationally relevant environments. In addition, the program will provide for the development and subsequent experimentation, including data collection and engineering measurement, of Multi-static Active Coherent (MAC) sources and receivers, laser technologies, electro-optical and Multi-Spectral camera technologies, Radar, and Magnetic Anomaly Detection sensors. The test articles, which consist of passive/active sensors and associated processors, will support at-sea trials and experiments.

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
System performance assessments	7.068	10.007	5.739	0.000	5.739
FY 2009 Accomplishments: Continued system performance assessments for Multi-Static Active (Coherent) ASW algorithms and other Acoustic and Non-Acoustic system enhancements. The test articles, which consist of passive/ active sensors and associated processors, supported at-sea trial and experiments.					

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603254N: *ASW Systems Development*	PROJECT 1292: *Adv ASW Sensors & Proc*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
FY 2010 Plans: System performance assessments for Multi-Static Active (Coherent) ASW algorithms and other Acoustic and Non-Acoustic system enhancements. The test articles, which consist of passive/active sensors and associated processors, will support at-sea trial and experiments. *FY 2011 Base Plans:* System performance assessments for Multi-Static Active (Coherent) ASW algorithms and other Acoustic and Non-Acoustic system enhancements. The test articles, which consist of passive/active sensors and associated processors, will support at-sea trial and experiments.					
Accomplishments/Planned Programs Subtotals	7.068	10.007	5.739	0.000	5.739

C. Other Program Funding Summary ($ in Millions)

N/A

D. Acquisition Strategy

The included technology development are primarily in-house with contractor participation through existing vehicles.

E. Performance Metrics

Perform system assessments for MAC ASW algorithms and other Acoustic and Non-Acoustic system enhancements.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603254N: *ASW Systems Development*	PROJECT 1292: *Adv ASW Sensors & Proc*

Product Development ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Primary Hdw Development	Various/ Various	VARIOUS VARIOUS	0.216	0.300	Nov 2009	0.400	Nov 2010	0.000		0.400	1.350	2.266	2.266
		Subtotal	0.216	0.300		0.400		0.000		0.400	1.350	2.266	2.266

Remarks

Support ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Software Development	WR	NAWCAD PATUXENT RIVER, MD	1.000	2.425	Nov 2009	0.000		0.000		0.000	0.000	3.425	Continuing
Studies & Analysis	WR	NAWCAD PATUXENT RIVER, MD	0.500	4.681	Nov 2009	0.000		0.000		0.000	6.525	11.706	Continuing
		Subtotal	1.500	7.106		0.000		0.000		0.000	6.525	15.131	

Remarks

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603254N: *ASW Systems Development*	PROJECT 1292: *Adv ASW Sensors & Proc*

Test and Evaluation ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Dev Test & Eval	Various/ Various	VARIOUS VARIOUS	14.431	0.500	Nov 2009	0.750	Nov 2010	0.000		0.750	0.000	15.681	15.681
		Subtotal	14.431	0.500		0.750		0.000		0.750	0.000	15.681	15.681

Remarks

Management Services ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Contractor Eng Spt	Various/ Various	VARIOUS VARIOUS	10.930	0.000		3.308	Nov 2010	0.000		3.308	10.488	24.726	24.726
ENG & TECH SVCS (NON-FFRDC)	Various/ Various	VARIOUS VARIOUS	2.272	0.310	Nov 2009	0.100	Nov 2010	0.000		0.100	1.316	3.998	3.998
MGT & PROF SVCS (FFRDC)	Various/ Various	VARIOUS VARIOUS	0.210	0.000		0.214	Nov 2010	0.000		0.214	0.800	1.224	1.224
Government Eng Spt	WR	NAWCAD PATUXENT RIVER, MD	53.349	1.711	Nov 2009	0.892	Nov 2010	0.000		0.892	4.286	60.238	Continuing
Travel	TM	VARIOUS VARIOUS	0.165	0.080	Nov 2009	0.075	Nov 2010	0.000		0.075	0.325	0.645	Continuing
		Subtotal	66.926	2.101		4.589		0.000		4.589	17.215	90.831	29.948

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603254N: *ASW Systems Development*	PROJECT 1292: *Adv ASW Sensors & Proc*	

Management Services ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Remarks													

	Total Prior Years Cost	FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	83.073	10.007		5.739		0.000		5.739	25.090	123.909	47.895

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603254N: *ASW Systems Development*	PROJECT 1292: *Adv ASW Sensors & Proc*

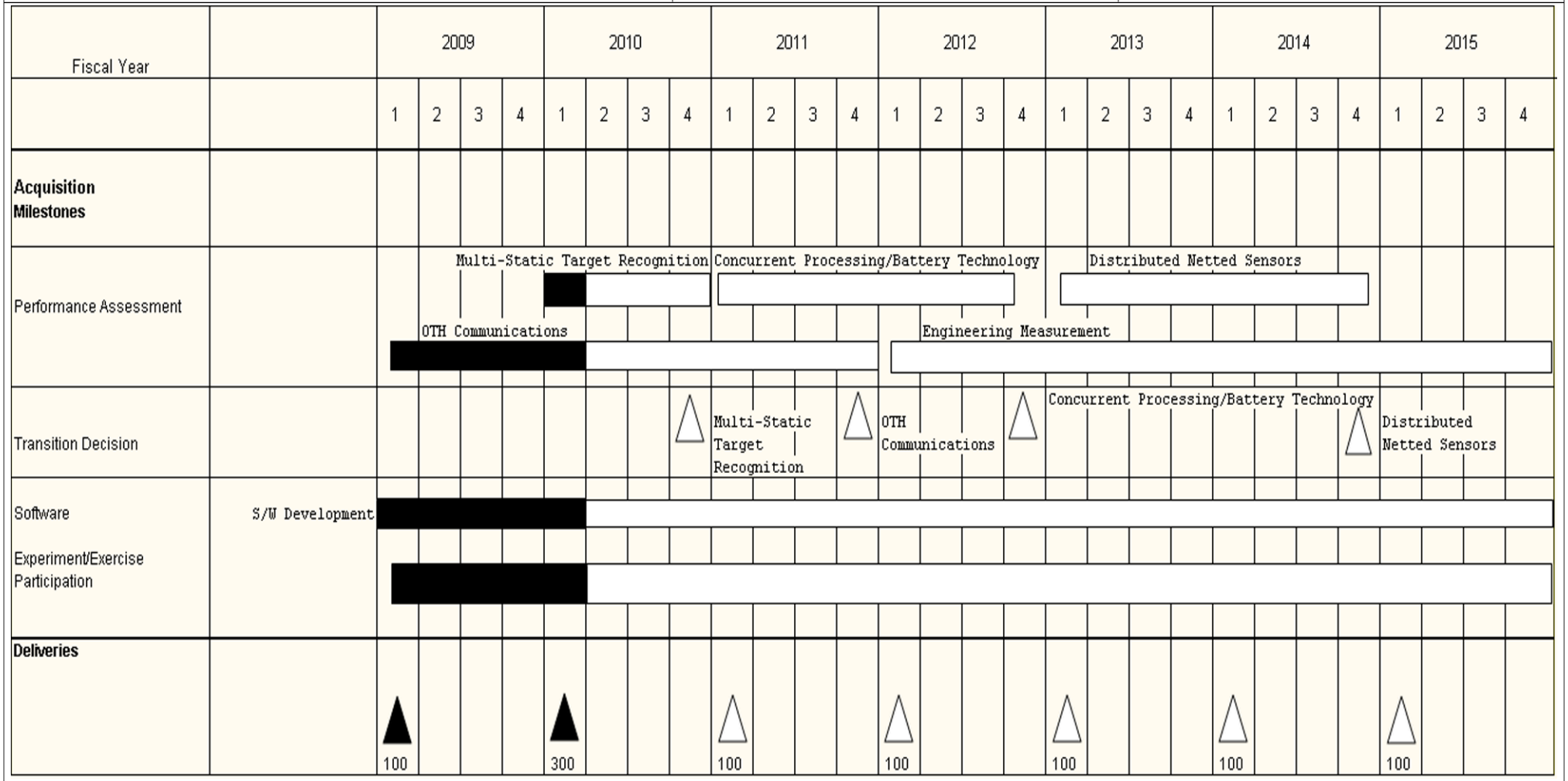


Exhibit R-4A, RDT&E Schedule Details: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603254N: *ASW Systems Development*	**PROJECT** 1292: *Adv ASW Sensors & Proc*

Schedule Details

	Start		End	
Event	**Quarter**	**Year**	**Quarter**	**Year**
Performance Assessment Multi-Static Target Recognition	1	2010	4	2010
Performance Assessment Concurrent Processing/Battery Technology	1	2011	4	2012
Performance Assessment Distributed Netted Sensors	1	2013	4	2014
Performance Assessement OTH Communications	1	2009	4	2011
Performance Assessment Engineering Measurement	1	2012	4	2015
Transition Decision Multi-Static Target Recognition	4	2010	4	2010
Transition Decision OTH Communications	4	2011	4	2011
Transition Decision Concurrent Processing/Battery Technology	4	2012	4	2012
Transition Decision Distributed Netted Sensors	4	2014	4	2014
Software Development	1	2009	4	2015
Experiment/Exercise Participation	1	2009	4	2015
Deliveries	1	2009	1	2015

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603254N: *ASW Systems Development*	PROJECT 3222: *Advanced High Altitude ASW*	

COST ($ in Millions)	FY 2009 Actual	FY 2010 Estimate	FY 2011 Base Estimate	FY 2011 OCO Estimate	FY 2011 Total Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
3222: *Advanced High Altitude ASW*	0.000	2.942	2.510	0.000	2.510	2.505	2.501	2.507	2.509	Continuing	Continuing
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0		

A. Mission Description and Budget Item Justification

The objective of this project is to develop the capability for precision standoff delivery of sonobuoys from high altitude in order to improve tactical flexibility and mission performance of P-8A aircraft. Current NAVAIR Small Business Innovative Research (SBIR) companies are exploring promising technologies and are assessing the feasibility and practicality of proposed solutions for the precision placement of sonobuoys. This program will leverage SBIR technology to refine system concepts and to conduct field experiments and tests to evaluate technology solutions and assess their performance, cost, and producibility. The 200 R&D test articles will be used for concept demonstration. Pending successful demonstration of precision placement technology, design modifications to current sonobuoy sensors will be matured and prototyped for qualification and testing leading to transition into P-8A.

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
Provide precision delivery of sonobuoys	0.000	2.942	2.510	0.000	2.510
FY 2010 Plans: This effort supports improvement in AIR ASW capability by providing for precision delivery of sonobuoys from P-8A Aircraft at high altitude. Various concepts will be analyzed. Prototype methods of sonobuoy delivery will be explored in order to achieve accurate placement from high altitudes. Technology Readiness Level will be improved to support planning for transition to acquisition.					
FY 2011 Base Plans: This effort supports improvement in AIR ASW capability by providing for precision delivery of sonobuoys from P-8A Aircraft at high altitude. Various concepts will be analyzed. Prototype methods					

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603254N: *ASW Systems Development*	PROJECT 3222: *Advanced High Altitude ASW*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
of sonobuoy delivery will be explored in order to achieve accurate placement from high altitudes. Technology Readiness Level will be improved to support planning for transition to acquisition.					
Accomplishments/Planned Programs Subtotals	0.000	2.942	2.510	0.000	2.510

C. Other Program Funding Summary ($ in Millions)

N/A

D. Acquisition Strategy

Various sole source and/or competitive R&D contracts to develop precision placement technologies for sonobuoys. Develop modifications to incorporate capability into current sonobuoy sensors and integration into P-8A as the lead aircraft.

E. Performance Metrics

Demonstrate prototype precision delivery of sonobuoys from P-8A aircraft at high altitude.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603254N: *ASW Systems Development*	PROJECT 3222: *Advanced High Altitude ASW*

Product Development ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Primary Hdw Development	Various/ Various	VARIOUS VARIOUS	0.000	0.000		1.370	Feb 2011	0.000		1.370	3.956	5.326	5.326
A/C HW/SW Integration	Various/ Various	VARIOUS VARIOUS	0.000	0.000		0.000		0.000		0.000	0.600	0.600	0.600
		Subtotal	0.000	0.000		1.370		0.000		1.370	4.556	5.926	5.926

Remarks

Support ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Documentation	Various/ Various	VARIOUS VARIOUS	0.000	0.000		0.000		0.000		0.000	0.500	0.500	0.500
Studies & Analysis	WR	NAWCAD PATUXENT RIVER, MD	0.000	0.700	Jan 2010	0.150	Nov 2010	0.000		0.150	0.100	0.950	Continuing
Studies & Analysis	Various/ Various	VARIOUS VARIOUS	0.000	1.200	Jan 2010	0.300	Nov 2010	0.000		0.300	0.300	1.800	1.800
		Subtotal	0.000	1.900		0.450		0.000		0.450	0.900	3.250	2.300

Remarks

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603254N: *ASW Systems Development*	PROJECT 3222: *Advanced High Altitude ASW*

Test and Evaluation ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Field Tests	WR	NAWCAD PATUXENT RIVER, MD	0.000	0.000		0.050	Aug 2011	0.000		0.050	0.150	0.200	Continuing
Field Tests	Various/ Various	VARIOUS VARIOUS	0.000	0.000		0.000		0.000		0.000	0.500	0.500	0.500
		Subtotal	0.000	0.000		0.050		0.000		0.050	0.650	0.700	0.500

Remarks

Management Services ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Contractor Eng Spt	Various/ Various	VARIOUS VARIOUS	0.000	0.150	Jan 2010	0.050	Nov 2010	0.000		0.050	0.550	0.750	0.750
ENG & TECH SVCS (NON-FFRDC)	Various/ Various	VARIOUS VARIOUS	0.000	0.150	Jan 2010	0.080	Nov 2010	0.000		0.080	0.421	0.651	0.651
Government Eng Spt	WR	NAWCAD PATUXENT RIVER, MD	0.000	0.727	Jan 2010	0.500	Nov 2010	0.000		0.500	2.900	4.127	Continuing
Travel	TM	VARIOUS VARIOUS	0.000	0.015	Jan 2010	0.010	Nov 2010	0.000		0.010	0.045	0.070	Continuing
		Subtotal	0.000	1.042		0.640		0.000		0.640	3.916	5.598	1.401

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603254N: *ASW Systems Development*	PROJECT 3222: *Advanced High Altitude ASW*

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	FY 2010 Cost	FY 2010 Award Date	FY 2011 Base Cost	FY 2011 Base Award Date	FY 2011 OCO Cost	FY 2011 OCO Award Date	FY 2011 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Remarks													

	Total Prior Years Cost	FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	2.942		2.510		0.000		2.510	10.022	15.474	10.127

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603254N: *ASW Systems Development*	**PROJECT** 3222: *Advanced High Altitude ASW*

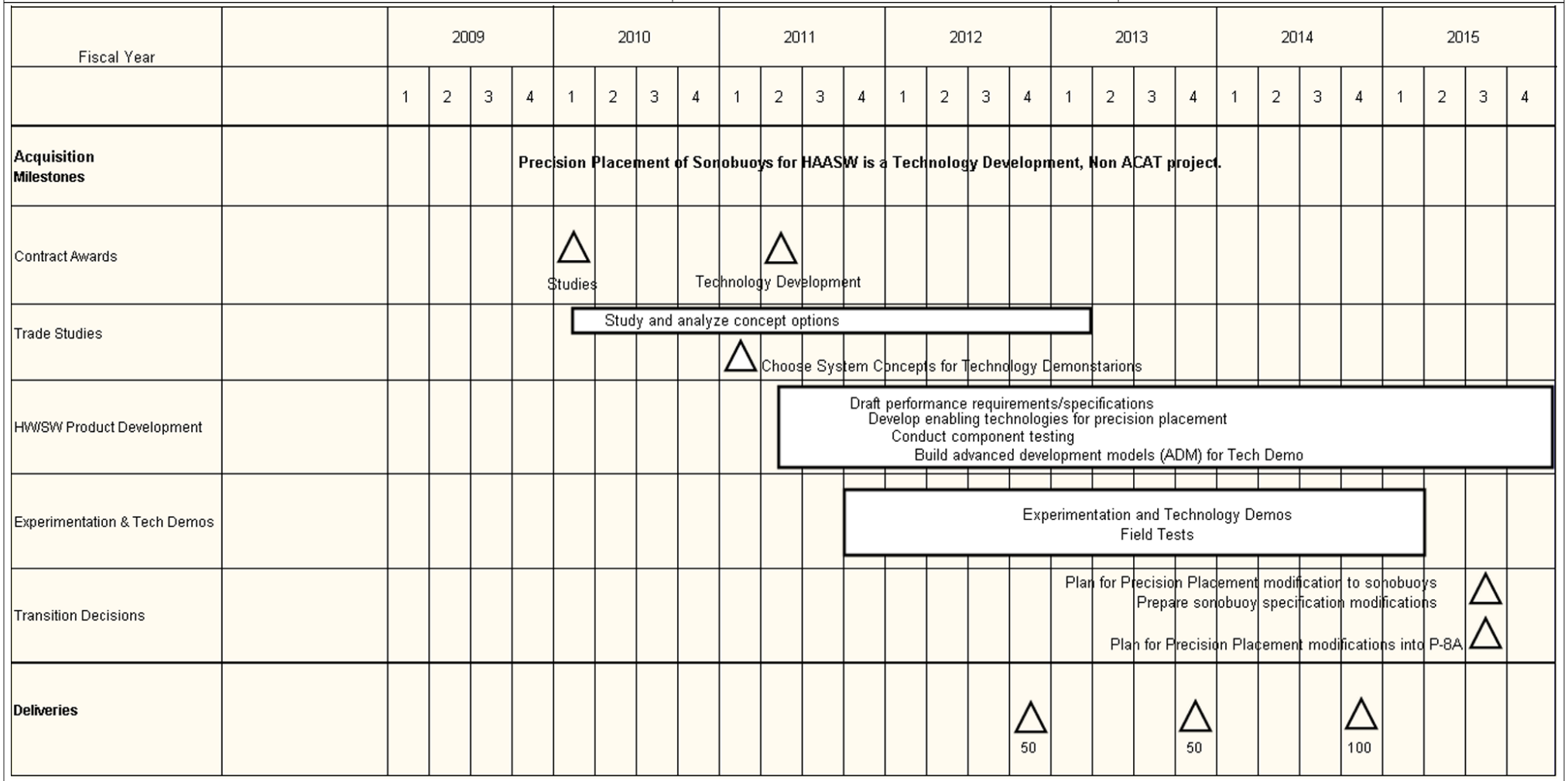


Exhibit R-4A, RDT&E Schedule Details: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603254N: *ASW Systems Development*	**PROJECT** 3222: *Advanced High Altitude ASW*

Schedule Details

	Start		End	
Event	**Quarter**	**Year**	**Quarter**	**Year**
Study Contracts	1	2010	1	2010
Technology Development Contracts	2	2011	2	2011
Trade Studies	1	2010	1	2013
Technology Demonstration Contract	1	2011	1	2011
HW/SW Product Development	2	2011	4	2015
Experimentation and Tech Demo	4	2011	1	2015
Transition Decisions	3	2015	3	2015
Transition Decisions (Plan for Precision Placement modifications into P-8A)	3	2015	3	2015
Deliveries	4	2012	4	2014

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603254N: *ASW Systems Development*	PROJECT 9177: *EPAS*	

COST ($ in Millions)	FY 2009 Actual	FY 2010 Estimate	FY 2011 Base Estimate	FY 2011 OCO Estimate	FY 2011 Total Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
9177: *EPAS*	9.375	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	36.085
Quantity of RDT&E Articles	2	0	0	0	0	0	0	0	0		

A. Mission Description and Budget Item Justification

The objective of this program wasto 1) demonstrate the concept that an integrated suite of non-acoustic sensors will provide an effective real time, day and night air ASW detection, localization and tracking capability in acoustically challenging shallow regions and deep water areas of uncertainty (AOU); 2) develop and demonstrate a cross platform non-acoustic system for fixed wing, helicopter, aerostat, and unmanned aerial vehicle ASW platforms. Navy funding for FY09 supports the development, integration, and demonstration testing of four (4) second generation prototype Electro-Optic Passive ASW Sensor (EPAS) systems (EPAS/Joint Multi-Mission Electro-optic System (JMMES)) with algorithm based integrated sensor operation and ASW automatic target recognition/operator cueing software modules. The EPAS technology and ASW mission module software has been leveraged to develop multi-mission capability for other targets of Naval interest including maritime and overland surface warfare, maritime interdiction operations, mine counter measures.

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
Completed Dev/Demo of EPAS turret	9.375	0.000	0.000	0.000	0.000
FY 2009 Accomplishments: Supported improvement in AIR ASW capability and Naval Multi-Mission Electro-Optic intelligence, surveillance and reconnaissance capability. This effort included building and testing EPAS turret systems.					
Accomplishments/Planned Programs Subtotals	9.375	0.000	0.000	0.000	0.000

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603254N: *ASW Systems Development*	PROJECT 9177: *EPAS*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total	FY 2012	FY 2013	FY 2014	FY 2015	Cost To Complete	Total Cost
• 0603648D8Z: *JCTD*	4.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	4.000

D. Acquisition Strategy

Sole source modification to the existing contract with BAE to add Navy funded system. Issued new sole source contract for EPAS/JMMES development and demonstration.

E. Performance Metrics

Build and test EPAS turret systems.

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603254N: *ASW Systems Development*	PROJECT 9347: *Claymore Marine*	

COST ($ in Millions)	FY 2009 Actual	FY 2010 Estimate	FY 2011 Base Estimate	FY 2011 OCO Estimate	FY 2011 Total Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
9347: *Claymore Marine*	4.831	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	14.337
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0		

A. Mission Description and Budget Item Justification

Funding for FY09 supports development of one blue laser brassboard Laser Identification Detection And Ranging (LIDAR) ASW system for data collections and data reductions to validate phenomena of the environmental detection concept for Claymore Marine signatures.

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
Developed blue laser brassboard LIDAR ASW system *FY 2009 Accomplishments:* Developed blue laser brassboard LIDAR ASW system.	4.831	0.000	0.000	0.000	0.000
Accomplishments/Planned Programs Subtotals	4.831	0.000	0.000	0.000	0.000

C. Other Program Funding Summary ($ in Millions)

N/A

D. Acquisition Strategy

NAWC is the prime system integrator. JF Taylor, Inc. has been contracted to develop the real time processor. BAE, NH has developed and implemented the data collection system. Johns Hopkins APL is developing the detection algorithm that will be supported on the real time processor system. All three contractors are working under NAWC direction as the prime system integrator.

E. Performance Metrics

Develop blue laser brassboard LIDAR ASW system.

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603254N: *ASW Systems Development*	PROJECT 9999: *Congressional Adds*	

COST ($ in Millions)	FY 2009 Actual	FY 2010 Estimate	FY 2011 Base Estimate	FY 2011 OCO Estimate	FY 2011 Total Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
9999: *Congressional Adds*	13.364	9.057	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	49.349
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0		

A. Mission Description and Budget Item Justification

9999. Congressional Adds.

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010
Congressional Add: Air Readiness/Effectiveness Measurement Program *FY 2010 Plans:* Conduct an Air Readiness/Effectiveness Measurement (AIREM) effort, enabling platforms to more effectively counter the current submarine threat.	0.000	1.593
Congressional Add: Marine Mammal Detection System *FY 2010 Plans:* Develop aircraft Intelligence, Surveillance, and Reconnaissance (ISR) systems and acoustics optimized for detecting and tracking marine mammals.	0.000	1.992
Congressional Add: Marine Species Mitigation *FY 2010 Plans:* Deploy acoustic arrays in the pending Shallow Water Test Range planned for construction off the Atlantic coast of Florida.	0.000	2.285

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603254N: *ASW Systems Development*	PROJECT 9999: *Congressional Adds*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010
Congressional Add: TACTICAL E FIELD BUOY DEVELOPMENT PROGRAM *FY 2009 Accomplishments:* Tactical E-Field Buoy Development. Continued development and testing of an air deployable tactical electric field buoy system to detect the electric field (E-Field) signal produced by a submarine.	1.596	0.000
Congressional Add: MARINE MAMMAL ALERT SYSTEM *FY 2009 Accomplishments:* Marine Mammal Awareness & Alert Response System (MMAARS). Supported concept development for demonstration of systems to link airborne sensor data with databases to help predict low risk zones for Airborne ASW testing and training. *FY 2010 Plans:* Marine Mammal Awareness & Alert Response System (MMAARS). Continue supporting concept development for demonstration of systems to link airborne sensor data with databases to help predict low risk zones for Airborne ASW testing and training.	2.393	2.390
Congressional Add: In Buoy Processor for TASS *FY 2009 Accomplishments:* Trigger and Alert Sonobuoy. Supported the development of an in-buoy processor that implements an autonomous trigger and alert sonobuoy system.	1.995	0.000
Congressional Add: Sonobouy Wave-Energy Module	2.992	0.797

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603254N: *ASW Systems Development*	**PROJECT** 9999: *Congressional Adds*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010
FY 2009 Accomplishments: Sonobuoy Wave-Energy Module. Supported development of a wave-energy module to harvest energy from ocean waves to replace or supplement sonobuoy batteries to extend the life of ocean sensing sonobuoy systems. *FY 2010 Plans:* Sonobuoy Wave-Energy Module. Continue supporting the development of a wave-energy module to harvest energy from ocean waves to replace or supplement sonobuoy batteries to extend the life of ocean sensing sonobuoy systems.		
Congressional Add: Holographic Optical Filter for Light Detection and *FY 2009 Accomplishments:* Holographic Optical Filter for Light Detection and Ranging. Supported development of optical filter technology to block out interfering sunlight in order to enable daytime operation of LIDAR sensor systems and enhance ASW performance.	1.995	0.000
Congressional Add: Low Cost Multi-channel Camera System *FY 2009 Accomplishments:* Low Cost Multi-Channel Camera System. Supported maturation of the Mission Adaptable Narrowband Tunable Imaging Sensor (MANTIS) to achieve a lighter and smaller Multi-channel Camera System (MCS) for greater utility on smaller airborne platforms such as UAV's.	2.393	0.000
Congressional Adds Subtotals	13.364	9.057

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603254N: *ASW Systems Development*	PROJECT 9999: *Congressional Adds*

C. Other Program Funding Summary ($ in Millions)

N/A

D. Acquisition Strategy

Not required for Congressional Adds.

E. Performance Metrics

Congressional Adds.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2011 Navy										DATE: February 2010	
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*				R-1 ITEM NOMENCLATURE PE 0603261N: *Tactical Airborne Reconnaissance*							
COST ($ in Millions)	**FY 2009 Actual**	**FY 2010 Estimate**	**FY 2011 Base Estimate**	**FY 2011 OCO Estimate**	**FY 2011 Total Estimate**	**FY 2012 Estimate**	**FY 2013 Estimate**	**FY 2014 Estimate**	**FY 2015 Estimate**	**Cost To Complete**	**Total Cost**
Total Program Element	5.743	9.662	6.452	0.000	6.452	6.522	6.616	6.760	6.867	Continuing	Continuing
2467: *UAV Conops*	5.743	5.955	4.791	0.000	4.791	4.837	4.896	5.002	5.071	Continuing	Continuing
2910: *Joint Tech Center/System Integ Lab*	0.000	1.715	1.661	0.000	1.661	1.685	1.720	1.758	1.796	Continuing	Continuing
9999: *Congressional Adds*	0.000	1.992	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.992

A. Mission Description and Budget Item Justification

This PE funds efforts to develop Concept of Operations (CONOPS) in support of the Navy's overall UAS strategy that integrate UASs into the Chief of Naval Operations (CNO)/Navy Vision of Sea Power 21 (Sea Shield, Sea Strike, Sea Basing, and FORCEnet). Also funds Navy's contribution supporting the Joint Technology Center / System Integration Laboratory (JTC/SIL) providing experimentation for UAV technology assessment, insertion, demonstration, transfer, as well as simulation and exercise support.

In FY09 and prior, JTC/SIL is funded under PE 0305204N.

B. Program Change Summary ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
Previous President's Budget	4.243	7.713	0.000	0.000	0.000
Current President's Budget	5.743	9.662	6.452	0.000	6.452
Total Adjustments	1.500	1.949	6.452	0.000	6.452
• Congressional General Reductions		-0.040			
• Congressional Directed Reductions		0.000			
• Congressional Rescissions	0.000	-0.011			
• Congressional Adds		2.000			
• Congressional Directed Transfers		0.000			
• Reprogrammings	1.500	0.000			
• SBIR/STTR Transfer	0.000	0.000			
• Program Adjustments	0.000	0.000	6.452	0.000	6.452

Exhibit R-2, RDT&E Budget Item Justification: PB 2011 Navy	DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603261N: *Tactical Airborne Reconnaissance*

Congressional Add Details ($ in Millions, and Includes General Reductions)	FY 2009	FY 2010
Project: 9999: *Congressional Adds*		
Congressional Add: *Precision Engagement Technologies for Unmanned Systems*	0.000	1.992
Congressional Add Subtotals for Project: 9999	0.000	1.992
Congressional Add Totals for all Projects	0.000	1.992

Change Summary Explanation

Technical: Not applicable.

Schedule: Not applicable.

FY11 from previous President's Budget is shown as zero because no FY11-15 data was presented in President's Budget 2010.

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603261N: *Tactical Airborne Reconnaissance*	PROJECT 2467: *UAV Conops*	

COST ($ in Millions)	FY 2009 Actual	FY 2010 Estimate	FY 2011 Base Estimate	FY 2011 OCO Estimate	FY 2011 Total Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
2467: *UAV Conops*	5.743	5.955	4.791	0.000	4.791	4.837	4.896	5.002	5.071	Continuing	Continuing
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0		

A. Mission Description and Budget Item Justification

The Naval Unmanned Aircraft Systems (UAS) Strategy employs a family of UASs to perform tactical, persistent and - penetrating Intelligence, Surveillance, and Reconnaissance (ISR) in support of Naval and Joint missions from forward bases/platforms and naval ships.

UAV CONOPS - In support of the Navy's overall Unmanned Aerial System (UAS) strategy, this program develops Concept of Operations (CONOPS) that integrate UASs into the Chief of Naval Operations (CNO) Navy Vision of Sea Power 21 (Sea Shield, Sea Strike, Sea Basing, and FORCEnet). By providing fleet input based on current operations with UASs in a simulated combat environment, this CONOPS development investment is the foundation of how the Carrier Strike Group (CSG) and the Expeditionary Strike Group (ESG) will operate a combined Manned and Unmanned Naval Air Force. Specifically:
- Provides studies and demonstrations in support of the Naval UAS Family of Systems (FoS) CONOPS development.
- Horizontally integrates across the Naval UAS FoS for the Naval Aviatioin Enterprise through interoperability and common system solutions.
- Develops the Naval UAS FoS Architecture to support integration into USN battle space dominance operations and network centric warfare.
- Provides Naval support for development of Standards across DOD UASs and NATO, emphasizing standardization and interoperability.
- Conducts CONOPS studies, demonstrations, and exercises for Vehicle Control, Targeting, and weapons, sensor, and payload employment.

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
Studies and Demonstrations	2.100	0.664	0.885	0.000	0.885
Studies and demonstrations to develop CONOPS for manned-unmanned integration of UAS and aircraft systems. Build a UAS simulation environment for Modeling and Simulation and a repository of common UAS components in representative battlespace architectures. Design, manufacture, and integrate two Software Reprogrammable Payload - Lite units for the MQ-8 Firescout UAV.					

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603261N: *Tactical Airborne Reconnaissance*	**PROJECT** 2467: *UAV Conops*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
FY 2009 Accomplishments: Developed Demonstration plans in coordination with Naval Sea Systems Command. Developed Memorandum of Agreement. Demonstrated the MQ-8 UAV Automatic Identification System on USS McInerney. *FY 2010 Plans:* Continue Studies and Demonstrations to further develop CONOPS for manned-unmanned integration of UAS and aircraft systems. Build a UAS simulation environment for Modeling and Simulation and a repository of common UAS components in representative battlespace architectures. *FY 2011 Base Plans:* Continue FY10 efforts and support the maintenance and continued development of the UAS simulation environment.					
Shipboard CONOPS Conduct studies, demonstrations, and exercises for data relay, comm relay, targeting, vehicle control, and weapons, sensor, and payload employment. *FY 2009 Accomplishments:* Developed Navy Interoperability profiles for UAS and common system development approach. *FY 2010 Plans:* Continue studies, demonstrations, and exercises for data relay, comm relay, targeting, vehicle control, and weapons, sensor, and payload employment. *FY 2011 Base Plans:* Continue FY10 efforts.	1.245	1.310	0.500	0.000	0.500
Engineering and Program Support	1.027	0.915	0.943	0.000	0.943

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603261N: *Tactical Airborne Reconnaissance*	PROJECT 2467: *UAV Conops*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
Provide government engineering support, program office travel, and contract support services for OSD UAS task force and other services on common UAS solutions. *FY 2009 Accomplishments:* Providee Navy inputs to OSD UAS task force UAS common architecture. Led and managed subgroups for architecture and payload. *FY 2010 Plans:* Provide government engineering support, program office travel, and contract support services for OSD UAS task force and other services on common UAS solutions. *FY 2011 Base Plans:* Continue FY10 efforts.					
NATO STANAG and Interoperability Conduct CONOPS studies for interoperability and development of standards across UASs and NATO emphazing standardization and interoperability. Continue to develop Unmanned System Interoperability profiles and Navy implementation conventions Naval UAS FoS Architecture. *FY 2009 Accomplishments:* Developed Navy inputs for Unmanned Systems Interoperability Profile and follow-on revisions. Unmanned Systems Interoperability Profile (USIP) accepted into DoD Information Technology Standards and Profile Registry (DISR) and standardized processes used by UAS programs. Supported NATO STANAG Interoperability revisions, configuration management and provide leadership for standards development and generation of STANAG products.	1.371	1.158	1.163	0.000	1.163

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603261N: *Tactical Airborne Reconnaissance*	**PROJECT** 2467: *UAV Conops*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
FY 2010 Plans: Continue CONOPS studies for interoperability and development of standards across UASs and NATO emphazing standardization and interoperability. Continue to develop Unmanned System Interoperability profiles and Navy implementation conventions Naval UAS FoS Architecture. *FY 2011 Base Plans:* Continue FY10 efforts.					
Architecture Support /Common Ground Station Develop a Joint Service revision and configuration management of UAS interoperability profiles and Joint Common Ground Station Architecture and related government engineering support. *FY 2010 Plans:* Support the revision and configuration management of interoperability profiles and efforts to support development of a common ground station architecture. *FY 2011 Base Plans:* Continue FY10 efforts.	0.000	1.908	1.300	0.000	1.300
Accomplishments/Planned Programs Subtotals	5.743	5.955	4.791	0.000	4.791

C. Other Program Funding Summary ($ in Millions)

N/A

D. Acquisition Strategy

The program office will leverage existing Government facilities (e.g., Joint Technology Center/System Integration Laboratory (JTC/SIL)) and Naval UAS Program of Record assets (as available) to develop and demonstrate Naval UAS CONOPS. Government engineering support will be used for Modeling and Simulation (M&S) efforts.

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603261N: *Tactical Airborne Reconnaissance*	**PROJECT** 2467: *UAV Conops*

E. Performance Metrics

UAS operations and interoperability for systems delivered to the warfighter are continually improved upon increasing the level of integration, standardization and effective employment in maritime battle space dominance.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603261N: *Tactical Airborne Reconnaissance*	PROJECT 2467: *UAV Conops*

Product Development ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Primary Hardware Development	SS/FPI	AAI Hunt Valley, MD	2.800	0.000		0.000		0.000		0.000	0.000	2.800	2.800
Ship Integration	Various/ Various	Various Various	5.462	0.768	Nov 2009	0.782	Nov 2010	0.000		0.782	Continuing	Continuing	Continuing
Systems Engineering	WR	NAWCAD Pax River, MD	1.760	0.282	Nov 2009	0.290	Nov 2010	0.000		0.290	Continuing	Continuing	Continuing
		Subtotal	10.022	1.050		1.072		0.000		1.072			

Remarks

Primary Hardware Development contract type is SS/FPIF.

Support ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Development Support	Various/ Various	Various Various	12.500	0.432	Feb 2010	0.433	Dec 2010	0.000		0.433	Continuing	Continuing	Continuing
Software Development	MIPR	JTC/SIL Redstone Arsenal, AL	2.250	1.908	Feb 2010	1.300	Feb 2011	0.000		1.300	Continuing	Continuing	Continuing
Studies & Analysis	WR	NAWCWD China Lake, CA	1.738	0.347	Dec 2009	0.351	Dec 2010	0.000		0.351	Continuing	Continuing	Continuing
Studies & Analysis	WR	NAWCAD	1.589	0.994	Dec 2009	0.403	Dec 2010	0.000		0.403	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603261N: *Tactical Airborne Reconnaissance*	PROJECT 2467: *UAV Conops*

Support ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
		Pax River, MD											
		Subtotal	18.077	3.681		2.487		0.000		2.487			

Remarks

Test and Evaluation ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Interoperability	WR	NAWCWD China Lake, CA	1.965	0.217	Dec 2009	0.220	Dec 2010	0.000		0.220	Continuing	Continuing	Continuing
		Subtotal	1.965	0.217		0.220		0.000		0.220			

Remarks

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603261N: *Tactical Airborne Reconnaissance*	PROJECT 2467: *UAV Conops*

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	FY 2010 Cost	FY 2010 Award Date	FY 2011 Base Cost	FY 2011 Base Award Date	FY 2011 OCO Cost	FY 2011 OCO Award Date	FY 2011 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Government Engineering Support	Various/ Various	Various Various	3.997	0.614	Dec 2009	0.625	Dec 2010	0.000		0.625	Continuing	Continuing	Continuing
Program Management Support	Various/ Various	Various Various	1.735	0.358	Dec 2009	0.367	Dec 2010	0.000		0.367	Continuing	Continuing	Continuing
Travel	WR	NAVAIR HQ Pax River, MD	0.364	0.035	Oct 2009	0.020	Oct 2010	0.000		0.020	Continuing	Continuing	Continuing
		Subtotal	6.096	1.007		1.012		0.000		1.012			

Remarks

Travel contract type is TO.

	Total Prior Years Cost	FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	36.160	5.955		4.791		0.000		4.791			

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603261N: *Tactical Airborne Reconnaissance*	PROJECT 2467: *UAV Conops*

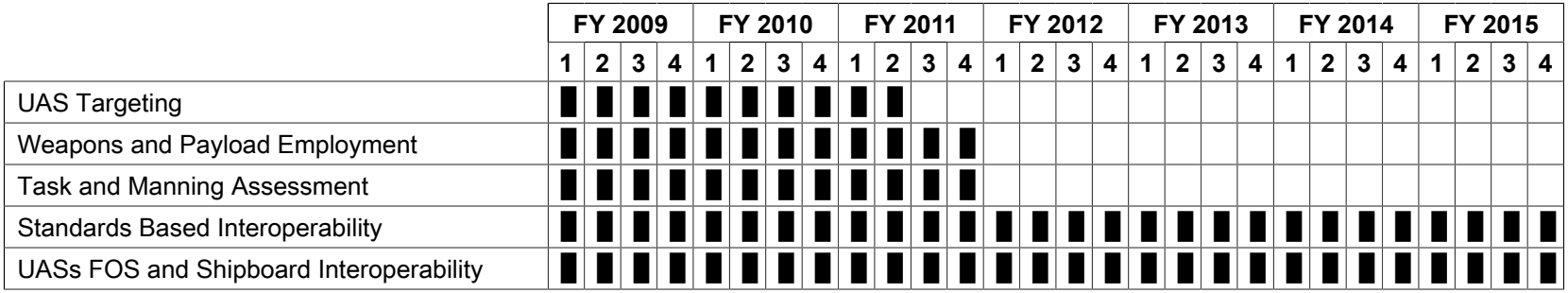

Exhibit R-4A, RDT&E Schedule Details: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603261N: *Tactical Airborne Reconnaissance*	**PROJECT** 2467: *UAV Conops*

Schedule Details

	Start		End	
Event	**Quarter**	**Year**	**Quarter**	**Year**
UAS Targeting	1	2009	2	2011
Weapons and Payload Employment	1	2009	4	2011
Task and Manning Assessment	1	2009	4	2011
Standards Based Interoperability	1	2009	4	2015
UASs FOS and Shipboard Interoperability	1	2009	4	2015

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603261N: *Tactical Airborne Reconnaissance*	PROJECT 2910: *Joint Tech Center/System Integ Lab*	

COST ($ in Millions)	FY 2009 Actual	FY 2010 Estimate	FY 2011 Base Estimate	FY 2011 OCO Estimate	FY 2011 Total Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
2910: *Joint Tech Center/System Integ Lab*	0.000	1.715	1.661	0.000	1.661	1.685	1.720	1.758	1.796	Continuing	Continuing
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0		

Note

In FY09 and prior, JTC/SIL is funded under PE 0305204N.

A. Mission Description and Budget Item Justification

The Joint Technology Center/Systems Integration Laboratory (JTC/SIL) is a center of technical excellence to support all Unmanned Air Vehicle (UAV) programs within the services. The mission includes Service-specific and Joint Command, Control, Communications, Computers and Intelligence, Surveillance, and Reconnaissance (C4ISR) programs throughout DoD. The JTC/SIL provides a Government test bed for rapid prototyping, technology insertion and transition, systems engineering, modeling/simulation, training and Command and Control, Communications, Computers, Intelligence, Surveillance, and Reconnaissance (C4ISR) optimization. The cornerstone of JTC/SIL's diverse tool set is the Multiple Unified Simulation Environment (MUSE), which is the Department's simulation/training system of choice for ISR systems, sensors, and platforms.

The Services and Warfighting Commanders have a requirement for the capability to train with a system that provides a real-time simulation environment containing multiple intelligence systems that can be integrated with larger force-on-force simulations. The MUSE creates a realistic operational environment which supports the ability to assess military utility, architecture and CONOPS development, Tactics, Techniques, and Procedures (TTP) development and refinement, conduct emerging concepts experimentation, and C4ISR optimization within warfighting exercises and experiments. It is the only simulation system used by the Combat Commanders and Joint Services to support command and battle staff C4ISR training; there is no alternative available to satisfy those requirements.

The MUSE also creates a realistic operational environment that supports an embedded training capability for multiple Program Managers; tools to minimize acquisition and life cycle cost and schedule impacts; the ability to conduct emerging concepts experimentation, future systems exploration, systems integration, and technology insertion; applications for Joint and Service-specific warfighting exercises; and C4ISR optimization.

MUSE is currently in use within all services and unified commands simulating Predator, Global Hawk (RQ-4), Hunter, and RQ-7 Shadow (MCTUAS) national and commercial satellite collectors, P-3, and the U-2. During warfighting exercises, the JTC/SIL integrates imagery simulations with associated C4ISR systems to support execution of critical imagery processes. For those assets normally not available for training, the JTC/SIL provides surrogate systems and interfaces. Distributed

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603261N: *Tactical Airborne Reconnaissance*	PROJECT 2910: *Joint Tech Center/System Integ Lab*

training environments, virtually linking participants from various locations worldwide, are routinely supported within the MUSE architecture. The MUSE is also used as a mission rehearsal tool for current, on-going military combat operations.

Additionally, the JTC/SIL supports a range of materiel developers, integrating prototypes and trainers into the C4ISR and training environments of supported units. The Tactical UAV (TUAV) ground station developed by the JTC/SIL includes an embedded MUSE trainer, and is planned to be incorporated into the MQ-8 Ground Control Station (GCS). Interim training capabilities for the Tactical Exploitation System (TES) are currently employed in the joint exercises.

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
MUSE Development	0.000	0.843	0.779	0.000	0.779
The Multiple Unified Simulation Environment (MUSE) creates a realistic operational environment which supports the ability to assess military utility, architecture and CONOPS development, Tactics, Techniques, and Procedures (TTP) development and refinement, conduct emerging concepts experimentation, and C4ISR optimization within warfighting exercises and experiments. *FY 2010 Plans:* Provides for the continued development of the VTUAV model, a Common Trainer for current platforms, C4ISR simulation to support major exercises and demonstrations, complete integration of Tactical Exploitation of National Capabilities (TENCAP) simulation into PC-based MUSE, complete development of virtual Signals Intelligence (SIGINT) platform, continue development of Laser Designator capability, upgrade of National Space Assets Enhancements, C4I Enhancements, and initial Fixed Target Damage simulation. *FY 2011 Base Plans:* Continues those efforts ongoing but not yet completed from FY10.					
Engineering and Maintenance	0.000	0.500	0.500	0.000	0.500

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603261N: *Tactical Airborne Reconnaissance*	PROJECT 2910: *Joint Tech Center/System Integ Lab*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
Maintenance, Licenses and Equipment Purchases to include the day-to-day maintenance of lab equipment, license maintenance and license renewals from vendors for individual pieces of equipment, purchases of equipment to support the MUSE, and purchases to upgrade the MUSE capability. *FY 2010 Plans:* Provides for the continued maintenance and required equipment purchases and upgrades to support the MUSE. *FY 2011 Base Plans:* Continues the maintenance and upkeep of the MUSE facility.					
Program Management Includes government management, contracts administration, cost accounting, configuration management, administrative support of the lab, MUSE architecture development, property management/accountability, and procurement of equipment. *FY 2010 Plans:* Provides for the continued Laboratory Sustainment with government management and overhead support services, architecture development and equipment purchases. *FY 2011 Base Plans:* Continues Laboratory Sustainment with government management and overhead support services, architecture development and equipment purchases.	0.000	0.372	0.382	0.000	0.382
Accomplishments/Planned Programs Subtotals	0.000	1.715	1.661	0.000	1.661

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603261N: *Tactical Airborne Reconnaissance*	**PROJECT** 2910: *Joint Tech Center/System Integ Lab*

C. Other Program Funding Summary ($ in Millions)

N/A

D. Acquisition Strategy

Established for the DoD family of UAVs as a center of technical excellence for tactical, medium altitude endurance and future UAVs to provide a cost-effective testbed for UAV technology assessment, insertion, demonstration, and transfer. JTC/SIL technical experts serve as facilitators of action for PEOs and UAV PMs as well as the respective users and prime contractors.

E. Performance Metrics

Improve the assessment of military utility, Tactics, Techniques and Procedures (TTPs) and C4ISR optimization through realistic training of command and battle staffs.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603261N: *Tactical Airborne Reconnaissance*	PROJECT 2910: *Joint Tech Center/System Integ Lab*

Support ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Software Development	MIPR	JTC/SIL Redstine Arsenal, AL	0.000	1.343	Feb 2010	1.279	Feb 2011	0.000		1.279	Continuing	Continuing	Continuing
		Subtotal	0.000	1.343		1.279		0.000		1.279			

Remarks

FY09 and prior JTC/SIL is funded under PE 0305204N.

Management Services ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Government Engineering Support	MIPR	JTC/SIL Redstone Arsenal, AL	0.000	0.372	Nov 2009	0.382	Nov 2010	0.000		0.382	Continuing	Continuing	Continuing
		Subtotal	0.000	0.372		0.382		0.000		0.382			

Remarks

FY09 and prior JTC/SIL is funded under PE 0305204N.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603261N: *Tactical Airborne Reconnaissance*	PROJECT 2910: *Joint Tech Center/System Integ Lab*	

	Total Prior Years Cost	FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	1.715		1.661		0.000		1.661			

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603261N: *Tactical Airborne Reconnaissance*	PROJECT 2910: *Joint Tech Center/System Integ Lab*	

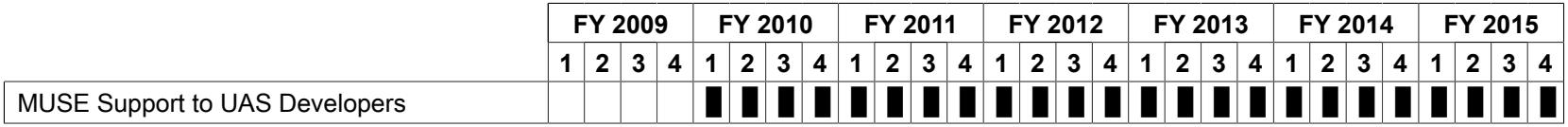

Exhibit R-4A, RDT&E Schedule Details: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603261N: *Tactical Airborne Reconnaissance*	**PROJECT** 2910: *Joint Tech Center/System Integ Lab*

Schedule Details

	Start		End	
Event	**Quarter**	**Year**	**Quarter**	**Year**
MUSE Support to UAS Developers	1	2010	4	2015

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603261N: *Tactical Airborne Reconnaissance*	PROJECT 9999: *Congressional Adds*	

COST ($ in Millions)	FY 2009 Actual	FY 2010 Estimate	FY 2011 Base Estimate	FY 2011 OCO Estimate	FY 2011 Total Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
9999: *Congressional Adds*	0.000	1.992	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.992
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0		

A. Mission Description and Budget Item Justification

Congressional Add. Support development of the Precision Engagement Technologies Required for Unmanned Systems (PETRUS). The intent of PETRUS is to develop and implement the technologies required to compress the timeline associated with Finding, Fixing, Tracking, Targeting, Engaging and Assessing targets of interest.

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010
Congressional Add: Precision Engagement Technologies for Unmanned Systems *FY 2010 Plans:* Develop, integrate, and demonstrate the necessary enabling technologies that will permit compression of the find and fix timeline. These technologies include: georegistration (high fidelity coordinates), sensor advancement, target tracking and targeting algorithms, system miniaturization and micro-munitions integration.	0.000	1.992
Congressional Adds Subtotals	0.000	1.992

C. Other Program Funding Summary ($ in Millions)

N/A

D. Acquisition Strategy

Not required for Congressional Adds.

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603261N: *Tactical Airborne Reconnaissance*	**PROJECT** 9999: *Congressional Adds*

E. Performance Metrics

Not required for Congressional Adds.

Exhibit R-2, RDT&E Budget Item Justification: PB 2011 Navy										DATE: February 2010	
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*				R-1 ITEM NOMENCLATURE PE 0603382N: *Advanced Combat Systems Tech*							
COST ($ in Millions)	**FY 2009 Actual**	**FY 2010 Estimate**	**FY 2011 Base Estimate**	**FY 2011 OCO Estimate**	**FY 2011 Total Estimate**	**FY 2012 Estimate**	**FY 2013 Estimate**	**FY 2014 Estimate**	**FY 2015 Estimate**	**Cost To Complete**	**Total Cost**
Total Program Element	12.071	3.662	1.658	0.000	1.658	1.677	1.776	1.865	2.047	Continuing	Continuing
0324: *Adv Combat System Technology*	9.279	1.670	1.658	0.000	1.658	1.677	1.776	1.865	2.047	Continuing	Continuing
9999: *Congressional Adds*	2.792	1.992	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	12.175

A. Mission Description and Budget Item Justification

The Advanced Combat System Technology line is intended to evolve the technical and business practices for programs to change to an open architecture construct. The program was constructed to mature both technical and business model integration for warfare systems programs of record in an open architecture environment. The original priority was the design of incorporating the principles of modular design and design disclosure, reusable application software, interoperability and secure information exchange, lifecycle affordability and encouraging competition and collaboration.

Project Unit 0324: Funding is limited to maintaining a repository environment that is intended to improve transparency of design disclosure and to support the principle of cross-domain reuse. The other elements of the Naval Open Architectures (OA) transformation effort are only to be accomplished as efficiencies in managing the repository are achieved. Those elements include; ensuring that all Naval systems, family of systems, and programs move to modular OA in accordance with Department of Defense (DOD) 5000.1 dated 12 May 2003 which mandates all DOD programs to utilize open systems architecture in order to rapidly field affordable, interoperable systems. By direction of the Navy Service Acquisition Executive (SAE), PEO IWS is assigned overall responsibility and authority to direct the Navy's OA effort. That policy established a need to coordinate acquisition strategies, develop guidance, and develop analysis of alternatives to determine OA software reuse practices within and across all Navy Communities of Interest (COI - Surface, Subsurface, Air, Space, and C4I). This project was also to work closely with the T&E and certification communities in defining regression testing and certification requirements for all OA Commercial Off-the-Shelf upgrades and software reuse applications. This project seeks to create a strategic shift in the acquisition process to facilitate cooperative cross-domain/COI business relationships. This will improve economies of scale throughout the Navy. This development effort will identify the business case and return on investment for moving the Navy towards an open systems approach, support the development of open systems technologies, and integrate best practices for open systems development within Naval acquisition. This Naval OA project would have ensured Navy-wide system architectures would become extensible and scalable in function, capacity, and workload to meet Joint warfighting requirements. This also includes the identification and development of common software components, functions, and reuse methodologies. In summary, this funding supports only the management of a reuse repository and can be used to evolve business, systems engineering and cultural changes required across all Naval programs as they are migrated to function in a joint net
centric warfare environment.

Exhibit R-2, RDT&E Budget Item Justification: PB 2011 Navy	DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603382N: *Advanced Combat Systems Tech*

B. Program Change Summary ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
Previous President's Budget	7.121	1.677	0.000	0.000	0.000
Current President's Budget	12.071	3.662	1.658	0.000	1.658
Total Adjustments	4.950	1.985	1.658	0.000	1.658
• Congressional General Reductions		-0.015			
• Congressional Directed Reductions		0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds		2.000			
• Congressional Directed Transfers		0.000			
• Reprogrammings	4.994	0.000			
• SBIR/STTR Transfer	-0.044	0.000			
• Program Adjustments	0.000	0.000	1.658	0.000	1.658

Congressional Add Details ($ in Millions, and Includes General Reductions)	FY 2009	FY 2010
Project: 9999: *Congressional Adds*		
Congressional Add: *OpenArchitecture/Maintenance Free Operating Period*	2.792	1.992
Congressional Add Subtotals for Project: 9999	2.792	1.992
Congressional Add Totals for all Projects	2.792	1.992

Change Summary Explanation

Technical: Not applicable.

Schedule: Not applicable.

FY11 from previous President's Budget is shown as zero because no FY11-15 data was presented in President's Budget 2010.

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603382N: *Advanced Combat Systems Tech*	PROJECT 0324: *Adv Combat System Technology*	

COST ($ in Millions)	FY 2009 Actual	FY 2010 Estimate	FY 2011 Base Estimate	FY 2011 OCO Estimate	FY 2011 Total Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
0324: *Adv Combat System Technology*	9.279	1.670	1.658	0.000	1.658	1.677	1.776	1.865	2.047	Continuing	Continuing
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0		

A. Mission Description and Budget Item Justification

Project Unit 0324: Funding is limited to maintaining a repository environment that is intended to improve transparency of design disclosure and to support the principle of cross-domain reuse. The other elements of the Naval Open Architectures (OA) transformation effort are only to be accomplished as efficiencies in managing the repository are achieved. Those elements include; ensuring that all Naval systems, family of systems, and programs move to modular OA in accordance with Department of Defense (DOD) 5000.1 dated 12 May 2003 which mandates all DOD programs to utilize open systems architecture in order to rapidly field affordable, interoperable systems. By direction of the Navy Service Acquisition Executive (SAE), PEO IWS is assigned overall responsibility and authority to direct the Navy's OA effort. That policy established a need to coordinate acquisition strategies, develop guidance, and develop analysis of alternatives to determine OA software reuse practices within and across all Navy Communities of Interest (COI - Surface, Subsurface, Air, Space, and C4I). This project was also to work closely with the T&E and certification communities in defining regression testing and certification requirements for all OA Commercial Off-the-Shelf upgrades and software reuse applications. This project seeks to create a strategic shift in the acquisition process to facilitate cooperative cross-domain/COI business relationships. This will improve economies of scale throughout the Navy. This development effort will identify the business case and return on investment for moving the Navy towards an open systems approach, support the development of open systems technologies, and integrate best practices for open systems development within Naval acquisition. This Naval OA project would have ensured Navy-wide system architectures would become extensible and scalable in function, capacity, and workload to meet Joint warfighting requirements. This also includes the identification and development of common software components, functions, and reuse methodologies. In summary, this funding supports only the management of a reuse repository and can be used to evolve business, systems engineering and cultural changes required across all Naval programs as they are migrated to function in a joint net
centric warfare environment.

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
Align the Naval Enterprise Across All Domains to Implement OA	5.571	0.170	0.200	0.000	0.200

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603382N: *Advanced Combat Systems Tech*	PROJECT 0324: *Adv Combat System Technology*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
FY 2009 Accomplishments: OA Enterprise Alignment: This funding supports the preparation and execution of the quarterly OA Executive Team Lead Council meetings and reporting requirements of the OA Executive Team (OAET). Specifically, this includes OA Executive Committee reporting of action items to DASN, monthly reports from the OA Chairman, fleet bi-weekly reports, report to Congress, quarterly domain execution reports, coordinating with OPNAV to review SPII efforts, as well as the annual OA budget submission and financial reporting for this project. Alignment across the Enterprise also includes the development and management of Implementation Road maps to ensure integration. *FY 2010 Plans:* OA Enterprise Alignment: This funding supports the preparation and execution of the quarterly OA Executive Team Lead Council meetings and reporting requirements of the OA Executive Team (OAET). Specifically, this includes OA Executive Committee reporting of action items to DASN, monthly reports from the OA Chairman, fleet bi-weekly reports, report to Congress, quarterly domain execution reports, coordinating with OPNAV to review SPII efforts, as well as the annual OA budget submission and financial reporting for this project. Alignment across the Enterprise also includes the development and management of Implementation Road maps to ensure integration. *FY 2011 Base Plans:* OA Enterprise Alignment: This funding supports the preparation and execution of the quarterly OA Executive Team Lead Council meetings and reporting requirements of the OA Executive Team (OAET). Specifically, this includes OA Executive Committee reporting of action items to DASN, monthly reports from the OA Chairman, fleet bi-weekly reports, report to Congress, quarterly domain execution reports, coordinating with OPNAV to review SPII efforts, as well as the annual OA budget submission and financial reporting for this project. Alignment across the Enterprise also includes the development and management of Implementation Road maps to ensure integration.					
Change the Naval and Marine Corps Cultures to Institutionalize OA Principle	0.868	0.350	0.335	0.000	0.335

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603382N: *Advanced Combat Systems Tech*	PROJECT 0324: *Adv Combat System Technology*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
FY 2009 Accomplishments: OA Enterprise Communications and Training: This funding supports the activities to enable the cultural adoption of OA principles and practices through stakeholder management, communications, training, and OA Knowledge Management. Key activities include the development on an enterprise workforce training and education program and establishment of professional curricula (OA modular acquisition and OA systems engineering) with academia and Naval Institutes. This program plan includes participation, liaison, and coordination with multiple stakeholders including the OSD Open Systems Joint Task Force (OSJTF), Naval Post Graduate School, Defense Acquisition University (DAU), FORCEnet, Industry Days, and other communication vehicles, to ensure the optimal OA standards and technologies are identified and incorporated into Naval system acquisition. *FY 2010 Plans:* OA Enterprise Communications and Training: This funding supports the activities to enable the cultural adoption of OA principles and practices through stakeholder management, communications, training, and OA Knowledge Management. Key activities include the development on an enterprise workforce training and education program and establishment of professional curricula (OA modular acquisition and OA systems engineering) with academia and Naval Institutes. This program plan includes participation, liaison, and coordination with multiple stakeholders including the OSD Open Systems Joint Task Force (OSJTF), Naval Post Graduate School, Defense Acquisition University (DAU), FORCEnet, Industry Days, and other communication vehicles, to ensure the optimal OA standards and technologies are identified and incorporated into Naval system acquisition. *FY 2011 Base Plans:* OA Enterprise Communications and Training: This funding supports the activities to enable the cultural adoption of OA principles and practices through stakeholder management, communications, training, and OA Knowledge Management. Key activities include the development on an enterprise workforce training and education program and establishment of professional curricula (OA modular acquisition and OA systems engineering) with academia and Naval Institutes. This program plan					

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603382N: *Advanced Combat Systems Tech*	PROJECT 0324: *Adv Combat System Technology*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
includes participation, liaison, and coordination with multiple stakeholders including the OSD Open Systems Joint Task Force (OSJTF), Naval Post Graduate School, Defense Acquisition University (DAU), FORCEnet, Industry Days, and other communication vehicles, to ensure the optimal OA standards and technologies are identified and incorporated into Naval system acquisition.					
OA Systems Engineering Leadership	0.582	0.450	0.450	0.000	0.450
FY 2009 Accomplishments: Systems Engineering: This funding supports systems engineering collaboration across the enterprise to facilitate the fielding of interoperable capabilities including a) the alignment of PEO architectures (i.e. PEO IWS and PEO C4I); b) overseeing OA implementation efforts ensuring standardized and disciplined processes are utilized across domains (e.g. standards and interfaces, services); c) identifying and fostering "quick win" candidates and near-term proofs of concept for OPNAV to field additional capabilities at reduced costs; d) working with the S&T community to ensure OA remains relevant and coordinating on emerging technologies; and e) working with the T&E community and academia/industry partners to identify opportunities to reduce T&E expenses as a result of OA.					
FY 2010 Plans: Systems Engineering: This funding supports systems engineering collaboration across the enterprise to facilitate the fielding of interoperable capabilities including a) the alignment of PEO architectures (i.e. PEO IWS and PEO C4I); b) overseeing OA implementation efforts ensuring standardized and disciplined processes are utilized across domains (e.g. standards and interfaces, services); c) identifying and fostering "quick win" candidates and near-term proofs of concept for OPNAV to field additional capabilities at reduced costs; d) working with the S&T community to ensure OA remains relevant and coordinating on emerging technologies; and e) working with the T&E community and academia/industry partners to identify opportunities to reduce T&E expenses as a result of OA.					

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603382N: *Advanced Combat Systems Tech*	PROJECT 0324: *Adv Combat System Technology*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
FY 2011 Base Plans: Systems Engineering: This funding supports systems engineering collaboration across the enterprise to facilitate the fielding of interoperable capabilities including a) the alignment of PEO architectures (i.e. PEO IWS and PEO C4I); b) overseeing OA implementation efforts ensuring standardized and disciplined processes are utilized across domains (e.g. standards and interfaces, services); c) identifying and fostering "quick win" candidates and near-term proofs of concept for OPNAV to field additional capabilities at reduced costs; d) working with the S&T community to ensure OA remains relevant and coordinating on emerging technologies; and e) working with the T&E community and academia/industry partners to identify opportunities to reduce T&E expenses as a result of OA.					
Change Naval Processes and Business Practices Naval Business Practices: This funding supports the required activities of the OA Enterprise Team necessary to change Naval Business Practices including a) the development and refinement of policies, guidance and terminology required to establish a consistent approach for OA across the enterprise; b) the development and maintenance of analytical toolsets (i.e. OA Assessment Tool) to assist the Milestone Decision Authority, PM, and Resource Sponsor in assessing a programs openness, where appropriate, to make informed OA investment decisions; c) the implementation and refinement of OA Contract Guidance to be used in applicable procurements tailored as necessary to meet domain specific requirements; and d) the facilitation of design disclosure and cross-domain component reuse to reduce costs and enable more effective technology insertion including the development of an OA Enterprise Asset Repository Capability that incorporates a common end-user licensing agreement and enterprise configuration management processes that are open and accessible to all Naval and Joint programs and qualified vendors. During FY10 the funding will cover the Software Hardware Asset Reuse Enterprise (SHARE) effort. SHARE establishes a functional process and asset repository to publish government owned assets central to the OA strategy. This repository is key to the health and maturity of the Navy OA effort and serves as a pilot project that will ultimately spiral to an enterprise wide asset. Repository efforts are being transitioned to leverage lower cost alternatives.	2.237	0.700	0.673	0.000	0.673

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603382N: *Advanced Combat Systems Tech*	PROJECT 0324: *Adv Combat System Technology*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
FY 2009 Accomplishments: Naval Business Practices: This funding supports the required activities of the OA Enterprise Team necessary to change Naval Business Practices including a) the development and refinement of policies, guidance and terminology required to establish a consistent approach for OA across the enterprise; b) the development and maintenance of analytical toolsets (i.e. OA Assessment Tool) to assist the Milestone Decision Authority, PM, and Resource Sponsor in assessing a programs openness, where appropriate, to make informed OA investment decisions; c) the implementation and refinement of OA Contract Guidance to be used in applicable procurements tailored as necessary to meet domain specific requirements; and d) the facilitation of design disclosure and cross-domain component reuse to reduce costs and enable more effective technology insertion including the development of an OA Enterprise Asset Repository Capability that incorporates a common end-user licensing agreement and enterprise configuration management processes that are open and accessible to all Naval and Joint programs and qualified vendors.					
FY 2010 Plans: Naval Business Practices: This funding supports the required activities of the OA Enterprise Team necessary to change Naval Business Practices including a) the development and refinement of policies, guidance and terminology required to establish a consistent approach for OA across the enterprise; b) the development and maintenance of analytical toolsets (i.e. OA Assessment Tool) to assist the Milestone Decision Authority, PM, and Resource Sponsor in assessing a programs openness, where appropriate, to make informed OA investment decisions; c) the implementation and refinement of OA Contract Guidance to be used in applicable procurements tailored as necessary to meet domain specific requirements; and d) the facilitation of design disclosure and cross-domain component reuse to reduce costs and enable more effective technology insertion including the development of an OA Enterprise Asset Repository Capability that incorporates a common end-user licensing agreement and enterprise configuration management processes that are open and accessible to all Naval and Joint programs and qualified vendors. During FY10 the funding will cover the Software Hardware Asset Reuse Enterprise (SHARE) effort. SHARE establishes a functional					

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603382N: *Advanced Combat Systems Tech*	PROJECT 0324: *Adv Combat System Technology*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
process and asset repository to publish government owned assets central to the OA strategy. This repository is key to the health and maturity of the Navy OA effort and serves as a pilot project that will ultimately spiral to an enterprise wide asset. Repository efforts are being transitioned to leverage lower cost alternatives. *FY 2011 Base Plans:* Naval Business Practices: This funding supports the required activities of the OA Enterprise Team necessary to change Naval Business Practices including a) the development and refinement of policies, guidance and terminology required to establish a consistent approach for OA across the enterprise; b) the development and maintenance of analytical toolsets (i.e. OA Assessment Tool) to assist the Milestone Decision Authority, PM, and Resource Sponsor in assessing a programs openness, where appropriate, to make informed OA investment decisions; c) the implementation and refinement of OA Contract Guidance to be used in applicable procurements tailored as necessary to meet domain specific requirements; and d) the facilitation of design disclosure and cross-domain component reuse to reduce costs and enable more effective technology insertion including the development of an OA Enterprise Asset Repository Capability that incorporates a common end-user licensing agreement and enterprise configuration management processes that are open and accessible to all Naval and Joint programs and qualified vendors. During FY10 the funding will cover the Software Hardware Asset Reuse Enterprise (SHARE) effort. SHARE establishes a functional process and asset repository to publish government owned assets central to the OA strategy. This repository is key to the health and maturity of the Navy OA effort and serves as a pilot project that will ultimately spiral to an enterprise wide asset. Repository efforts are being transitioned to leverage lower cost alternatives.					
DAWDF Defense Acquisition Workforce Development Fund	0.021	0.000	0.000	0.000	0.000

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603382N: *Advanced Combat Systems Tech*	PROJECT 0324: *Adv Combat System Technology*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
FY 2009 Accomplishments: Defense Acquisition Workforce Development Fund					
Accomplishments/Planned Programs Subtotals	9.279	1.670	1.658	0.000	1.658

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total	FY 2012	FY 2013	FY 2014	FY 2015	Cost To Complete	Total Cost
• R&D/0604307N /1447: *AEGIS Surf Combatant Combat Sys Imp*	192.206	177.699	193.933	0.000	193.933	212.064	223.936	219.051	179.551	Continuing	Continuing
• R&D/0604755N /2178: *Ship Self Defense System*	29.533	25.296	36.594	0.000	36.594	33.300	32.226	32.329	32.995	Continuing	Continuing
• R&D/0603582N /0164: *Common Network Interface*	13.500	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	13.500
• R&D/0603658N /2039: *Cooperative Engagement Capability*	38.637	56.351	52.282	0.000	52.282	45.559	44.614	45.621	46.492	Continuing	Continuing

D. Acquisition Strategy

This risk reduction effort evolved and shifted from a PEO IWS 1.0 task to Naval Surface Warfare Center (NSWC)/Dahlgren to an Assistant Secretary of the Navy, Research, Development & Acquisition (ASN-RDA) directed task to fund the Navy's OA Enterprise effort from this core OA. Budget line (policy statement dated 5 August 2004). The strategy was further refined in the Deputy Chief of Naval Operations (DCNO) requirement of 23 December 2005 (N6/7) with guidance for this effort to assist the Milestone Decision Authority (MDA), program managers, and resource sponsors in assessing enterprise program assets where appropriate. Office of the Chief of naval Operations (OPNAV) has directed this program to provide objective, measurable, performance based assessments as baselines for future system changes and spiral developments.

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603382N: *Advanced Combat Systems Tech*	**PROJECT** 0324: *Adv Combat System Technology*

E. Performance Metrics

Successfully Manage the Open Architecture Enterprise Team and the OAET Lead Council. Change Naval Processes and business practices to utilize OA; Provide OA Systems Engineering to field common, interoperable capabilities; Change Navy and Marine Corps Cultures to Institutionalize OA Principles.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603382N: *Advanced Combat Systems Tech*	PROJECT 0324: *Adv Combat System Technology*	

Product Development ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
SE/OA Domain Support	C/TBD	APL / Baltimore, MD Not Specified	0.725	0.000		0.000		0.000		0.000	0.000	0.725	Continuing
Systems Engineering	WR	NSWC / Dahlgren, VA Not Specified	11.253	0.700	Jan 2010	0.705	Nov 2010	0.000		0.705	Continuing	Continuing	Continuing
Systems Engineering	WR	NSWC/CRANE & Carderock Not Specified	2.062	0.000		0.000		0.000		0.000	0.000	2.062	Continuing
Systems Engineering	C/CPAF	Miscellaneous Not Specified	4.363	0.300	Dec 2009	0.253	Dec 2010	0.000		0.253	0.000	4.916	Continuing
OA DOMAIN SUPPORT	WR	NUWC/Newport, Spawar, Navair Not Specified	11.931	0.000		0.000		0.000		0.000	0.000	11.931	Continuing
SE/Signal Processor	C/CPAF	Lockheed Martin Not Specified	6.000	0.000		0.000		0.000		0.000	0.000	6.000	Continuing
SE/Signal Processor	C/CPAF	BAE Not Specified	0.300	0.000		0.000		0.000		0.000	0.000	0.300	Continuing
SE/Signal Processor	C/CPAF	Raytheon Not Specified	0.100	0.000		0.000		0.000		0.000	0.000	0.100	Continuing
SE/Signal Processor	WR	NSWC/DD, NRL, PHD Not Specified	0.600	0.000		0.000		0.000		0.000	0.000	0.600	Continuing
		Subtotal	37.334	1.000		0.958		0.000		0.958			

Remarks

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603382N: *Advanced Combat Systems Tech*	PROJECT 0324: *Adv Combat System Technology*

Support ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Industry Development	C/FP	IBM, ANGLE Not Specified	7.893	0.500	Jan 2010	0.500	Dec 2010	0.000		0.500	0.000	8.893	Continuing
Technical Data-Academia	WR	NPS-Monterey/ DAU Not Specified	1.876	0.000		0.000		0.000		0.000	0.000	1.876	Continuing
Software Development	C/FP	MITRE, SEI Not Specified	0.309	0.000		0.000		0.000		0.000	0.000	0.309	Continuing
		Subtotal	10.078	0.500		0.500		0.000		0.500	0.000	11.078	

Remarks

Test and Evaluation ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Operational Test & Evaluation	WR	NSWC/DD Not Specified	2.216	0.000		0.000		0.000		0.000	0.000	2.216	Continuing
OA Asset Repository (SBIR Account)	WR	Miscellaneous Not Specified	0.150	0.000		0.000		0.000		0.000	0.000	0.150	Continuing
		Subtotal	2.366	0.000		0.000		0.000		0.000	0.000	2.366	

Remarks

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603382N: *Advanced Combat Systems Tech*	PROJECT 0324: *Adv Combat System Technology*

Management Services ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Support	C/CPAF	Miscellaneous Not Specified	2.651	0.170	Dec 2009	0.200	Dec 2010	0.000		0.200	Continuing	Continuing	Continuing
SBIR Assessment (Cong Add)	WR	NSWC/DD Not Specified	4.748	0.000		0.000		0.000		0.000	0.000	4.748	Continuing
DAWDF	C/TBD	Not Specified Not Specified	0.021	0.000		0.000		0.000		0.000	0.000	0.021	Continuing
		Subtotal	7.420	0.170		0.200		0.000		0.200			

Remarks

	Total Prior Years Cost	FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	57.198	1.670		1.658		0.000		1.658			

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603382N: *Advanced Combat Systems Tech*	PROJECT 0324: *Adv Combat System Technology*

Fiscal Year	2009				2010				2011				2012				2013				2014				2015			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Acquisition Milestones																												
Incorporate OA Principles in Strategies, Contracts, Reviews, Requirements, & Other Documentation	△	△	△	△	△		△		△		△		△		△		△		△		△		△		△		△	
Change Culture through OA Education, Outreach, & Training	△	△	△	△		△		△		△		△		△		△		△		△		△		△		△		△
Conduct Program Assessments	△	△	△	△		△				△				△				△				△				△		
Adapt ONR Technologies	△	△	△	△	△		△		△		△		△		△		△		△		△		△		△		△	
OA Collaboration with Information Technology Management Council	△	△	△	△																								
Update Naval OA/FN Technical Stds																												
Publish Contract Guidebook Update				△				△				△				△				△				△				△
Host Contracting/Industry Symposium	△				△				△				△				△				△				△			
Deliver Report to Congress	△	△	△	△	△	△	△	△	△	△	△	△	△	△	△	△	△	△	△	△	△	△	△	△	△	△	△	△
Conduct Lifecycle Affordability Pilot	△	△	△	△																								
Host OA Lead Council Meetings	△	△	△	△	△	△	△	△	△	△	△	△	△	△	△	△	△	△	△	△	△	△	△	△	△	△	△	△
OA Enterprise Asset Repository	△	△	△	△																								

Exhibit R-4A, RDT&E Schedule Details: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603382N: *Advanced Combat Systems Tech*	**PROJECT** 0324: *Adv Combat System Technology*

Schedule Details

	Start		End	
Event	**Quarter**	**Year**	**Quarter**	**Year**
Incorporate OA Principles in Acquisition Strategies and Contracts	1	2009	3	2015
Change Culture through OA Education, Outreach and Training	1	2009	4	2015
Conduct Program Assessments	1	2009	2	2015
Adapt ONR Technologies	1	2009	3	2015
OA Collaboration with Information Technology Management Council	1	2009	4	2009
Publish Contract Guidebook Update	4	2009	4	2015
Host Contracting/Industry Symposium	1	2009	1	2015
Deliver Report to Congress	1	2009	4	2015
Conduct Lifecycle Affordability Pilot	1	2009	4	2009
Host OA Lead Council Meeting	1	2009	4	2015
OA Enterprise Asset Repository Updates	1	2009	4	2009

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603382N: *Advanced Combat Systems Tech*	PROJECT 9999: *Congressional Adds*	

COST ($ in Millions)	FY 2009 Actual	FY 2010 Estimate	FY 2011 Base Estimate	FY 2011 OCO Estimate	FY 2011 Total Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
9999: *Congressional Adds*	2.792	1.992	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	12.175
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0		

A. Mission Description and Budget Item Justification

Open Architecture/Maintenance Free Operating Period (MFOP)- This funding supports the pilot program for AN/BSY-10, co-sponsored with ASN (RDA), it incorporates software tools and hardware redundancy into Commercial Off-The-Shelf (COTS) based open architected systems such that the system self-checking and self-healing capabilities virtually eliminate at-sea open cabinet maintenance. This funding extends the application of OA/MFOP to investigate the adoption of MFOP tools in other Navy National Security Systems as an OA reusable component.

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010
Congressional Add: OpenArchitecture/Maintenance Free Operating Period	2.792	1.992
FY 2009 Accomplishments: 1) Synthesized the MFOP system design and complete design review. 2) Integrated the Common Network Interface (CNI) situational awareness application software to demonstrate tactical software reuse in the OA/MFOP platform 3) Integrated the Remote Off Hull Maintenance Support (ROHMS) application software to demonstrate distance support IT networking reuse in the OA/MFOP platform 4) Initiated and processed the TEMPALT (SCD 8375) for installation on USS IWO JIMA 5) Initiated collaboration with SPAWAR to determine Information Assurance (IA) requirements		
FY 2010 Plans: 1) Complete the OA/MFOP System Verification Testing 2) Obtain IATO (IA Certification) allowing the OA/MFOP Demonstration system to connect to the Navy's SIPRnet for distance support communications.		

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
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B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010
3) Finish Installation of the Demonstration System aboard LHD 7 4) Conduct the live Demonstration on a combatant platform (6 Month Test) 5) Report Lessons Learned		
Congressional Adds Subtotals	2.792	1.992

C. Other Program Funding Summary ($ in Millions)

N/A

D. Acquisition Strategy

N/A

E. Performance Metrics

Successfully establish new methods for reducing lifecycle costs.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603382N: *Advanced Combat Systems Tech*	PROJECT 9999: *Congressional Adds*

Product Development ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Systems Engineering	WR	NSWC Caderock Bethesda MD	0.000	1.992	Mar 2010	0.000		0.000		0.000	0.000	1.992	-0.001
		Subtotal	0.000	1.992		0.000		0.000		0.000	0.000	1.992	-0.001

Remarks

	Total Prior Years Cost	FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	1.992		0.000		0.000		0.000	0.000	1.992	-0.001

Remarks

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Exhibit R-2, RDT&E Budget Item Justification: PB 2011 Navy										DATE: February 2010	
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*				R-1 ITEM NOMENCLATURE PE 0603502N: *Surface & Shallow Water MCM*							
COST ($ in Millions)	**FY 2009 Actual**	**FY 2010 Estimate**	**FY 2011 Base Estimate**	**FY 2011 OCO Estimate**	**FY 2011 Total Estimate**	**FY 2012 Estimate**	**FY 2013 Estimate**	**FY 2014 Estimate**	**FY 2015 Estimate**	**Cost To Complete**	**Total Cost**
Total Program Element	94.393	92.334	81.347	0.000	81.347	88.515	86.941	58.184	48.461	Continuing	Continuing
0260: *Remote Minehunting Systems*	6.000	5.906	19.691	0.000	19.691	18.820	20.717	8.295	7.563	Continuing	Continuing
1233: *Surface MCM Mid-life Upgrade*	24.736	21.380	13.479	0.000	13.479	20.622	24.484	24.723	24.918	Continuing	Continuing
2094: *Unmanned Underwater Vehicle*	3.744	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	442.442
2131: *Assault Breaching System*	42.437	30.743	31.245	0.000	31.245	30.942	26.125	12.957	13.259	Continuing	Continuing
3123: *SMCM UUV*	3.389	15.525	12.732	0.000	12.732	18.131	10.810	7.431	2.721	Continuing	Continuing
4025: *Expendable Mine Neutralization System*	6.908	2.846	4.200	0.000	4.200	0.000	4.805	4.778	0.000	0.000	53.103
9999: *Congressional Adds*	7.179	15.934	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	30.517

A. Mission Description and Budget Item Justification

The program provides for developments to combat the threat of known and projected foreign mines against U.S. Naval and merchant shipping in harbors, channels, choke points, sea lines of communications and amphibious and other fleet operating areas. It develops: (1) organic remote minehunting capability for surface platforms; (2) the integration and improvement of systems and support for systems which will detect, localize, classify, and neutralize moored, bottom, and close-tethered mines for use in Mine Countermeasure (MCM) MCM-1 Class and other surface ships; (3) systems for neutralizing mines and light obstacles from shallow water, very shallow water, surf zones, and beach landing craft zones in support of amphibious operations; (4) Unmanned Undersea Vehicle (UUV) systems for clandestine mine reconnaissance.

Congressional plus-up for the AN/SQQ-32 Mine Hunting Sonar development for High Frequency Wide Band.

Congressional plus-up for the Unmannned Undersea Vehicles Near Term Interim Capability to develop interim UUV capability, with common and modular architecture.

Exhibit R-2, RDT&E Budget Item Justification: PB 2011 Navy	DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603502N: *Surface & Shallow Water MCM*

(U) B. JUSTIFICATION FOR BUDGET ACTIVITY:

This program is funded under DEMONSTRATION AND VALIDATION because it develops and integrates hardware for experimental testing related to specific ship or aircraft applications.

B. Program Change Summary ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
Previous President's Budget	123.022	76.739	0.000	0.000	0.000
Current President's Budget	94.393	92.334	81.347	0.000	81.347
Total Adjustments	-28.629	15.595	81.347	0.000	81.347
• Congressional General Reductions		-0.385			
• Congressional Directed Reductions		0.000			
• Congressional Rescissions	0.000	-0.020			
• Congressional Adds		16.000			
• Congressional Directed Transfers		0.000			
• Reprogrammings	-5.800	0.000			
• SBIR/STTR Transfer	-2.830	0.000			
• Program Adjustments	0.000	0.000	81.347	0.000	81.347
• Rate/Misc Adjustments	0.001	0.000	0.000	0.000	0.000
• Congressional Recision Adjustments	-20.000	0.000	0.000	0.000	0.000

Congressional Add Details ($ in Millions, and Includes General Reductions)	FY 2009	FY 2010
Project: 9999: *Congressional Adds*		
Congressional Add: *RMS Prog - Cong*	0.000	7.967
Congressional Add: *Persistent Autonomous Maritime Surveillance*	0.000	4.979
Congressional Add: *Mine Hunting Sonar Prog - Cong*	0.000	2.988
Congressional Add: *Unmannned Undersea Vehicles Near Term Interim Capa*	3.988	0.000
Congressional Add: *AN/SQQ-32 Mine Hunting Sonar Upgrade*	3.191	0.000
Congressional Add Subtotals for Project: 9999	7.179	15.934

Exhibit R-2, RDT&E Budget Item Justification: PB 2011 Navy	DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603502N: *Surface & Shallow Water MCM*

Congressional Add Details ($ in Millions, and Includes General Reductions)	FY 2009	FY 2010
Congressional Add Totals for all Projects	7.179	15.934

Change Summary Explanation

Program Adjustments: FY09 -$3,900K Below Threshold Reprogramming to Maritime Domain Awareness Program as a result to the cancellation of the Mission Reconfigurable Unmanned Undersea Vehicle System (MRUUVS).

FY11 from previous President's Budget is shown as zero because no FY11-15 data was presented in President's Budget 2010.

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603502N: *Surface & Shallow Water MCM*	PROJECT 0260: *Remote Minehunting Systems*	

COST ($ in Millions)	FY 2009 Actual	FY 2010 Estimate	FY 2011 Base Estimate	FY 2011 OCO Estimate	FY 2011 Total Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
0260: *Remote Minehunting Systems*	6.000	5.906	19.691	0.000	19.691	18.820	20.717	8.295	7.563	Continuing	Continuing
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0		

A. Mission Description and Budget Item Justification

The AN/WLD-1(V)(1), Remote Minehunting System (RMS), consists of a diesel powered semi-submersible Remote Multi-Mission Vehicle (RMMV) that tows a Variable Depth Sensor (VDS, AN/AQS-20A). It also includes shipboard equipment consisting of a command control combat system, launch and recovery system, radio antennas and support equipment. RMS can operate from the DDG-51 Class Flight IIA ships (DDG-91-96) and Littoral Combat Ships (LCS). The system determines the presence or absence of mines to an acceptable level of confidence to enable ships to operate in or avoid specific areas. Future funding will be used to begin development of emerging technologies for incorporation into the AN/WLD-1(V)(1) Remote Minehunting System and Littoral Combat Ship (LCS) Reconfigurable Mission Capabilities (Multi-Mission - MM).

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
Product Development:	3.600	3.893	8.941	0.000	8.941
FY 2009 Accomplishments: Conducted accelerated life testing and root cause analysis, as part of the RMMV Reliability Growth Program. *FY 2010 Plans:* Conduct accelerated life testing, as part of the RMMV Reliability Growth Program. *FY 2011 Base Plans:* Conduct accelerated life testing, as part of the RMMV Reliability Growth Program.					
Support:	1.900	1.513	3.000	0.000	3.000

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603502N: *Surface & Shallow Water MCM*	PROJECT 0260: *Remote Minehunting Systems*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
FY 2009 Accomplishments: Provided engineering, logistic and programmtic support for RMMV accelerated life and confidence testing. *FY 2010 Plans:* Provide engineering, logistic and programmatic support for RMMV accelerated life and confidence testing. *FY 2011 Base Plans:* Provide engineering, logistic and programmatic support for RMMV accelerated life and confidence testing.					
T&E: *FY 2011 Base Plans:* Conduct shock/vibration testing, acoustic/magnetic testing and conduct reliability assessment in advance of LCS DT and OT in FY12.	0.000	0.000	7.250	0.000	7.250
Management: *FY 2009 Accomplishments:* Provided program managment and travel for RMMV Spiral testing. *FY 2010 Plans:* Provided program managment and travel for RMMV Spiral testing. *FY 2011 Base Plans:* Provided program managment and travel for RMMV Spiral testing.	0.500	0.500	0.500	0.000	0.500
Accomplishments/Planned Programs Subtotals	6.000	5.906	19.691	0.000	19.691

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603502N: *Surface & Shallow Water MCM*	PROJECT 0260: *Remote Minehunting Systems*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total	FY 2012	FY 2013	FY 2014	FY 2015	Cost To Complete	Total Cost
• OPN/2622: *Minesweeping System Replacement*	2.703	0.000	5.027	0.000	5.027	11.390	10.500	10.600	10.840	Continuing	Continuing
• OPN/1600: *LCS Modules*	0.000	0.000	0.000	0.000	0.000	0.000	24.000	24.400	49.600	Continuing	Continuing

D. Acquisition Strategy

The RMS(V)3 focused on a prototype development, and was competitively awarded to Lockheed Martin in August 1996. The RMS(V)4, officially designated the AN/WLD-1(V)(1), was awarded as a sole source contract to Lockheed Martin in 2002. MS C on 1 July 2005 authorized procurement of three (3) LRIPs in FY05. Conducted Operational Assessment in August 2006 to support FY06 (2nd) LRIP Decision. ASN(RDA) approved FY06 (2nd) LRIP up to 4 units. This decision was documented in Acquisition Decision Memorandum (ADM) dated 21 Sep 2006. The Program Decision Memorandum (PDM) authorizing production of LRIP #8, FY08 LRIP Option was issued by ASN(RDA) on 2 Apr 08. An Operational Assessment (OA) was conducted in 4th Qtr FY08. Conduct reliability improvement program to return to OT in FY12, as well as transition from DDG to LCS platform.

E. Performance Metrics

Complete RGP.
Complete DT and OT.
Begin FRP in FY14.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603502N: *Surface & Shallow Water MCM*	PROJECT 0260: *Remote Minehunting Systems*

Product Development ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Hardware Development & Integration 1	C/CPIF	LOCKHEED MARTIN RIVIERA BEACH, FL	97.283	0.000		0.000		0.000		0.000	0.000	97.283	Continuing
Hardware Development & Integration 2	C/CPIF	LOCKHEED MARTIN RIVIERA BEACH, FL	95.993	0.000		0.000		0.000		0.000	0.000	95.993	Continuing
Hardware Development & Integration	WR	NSWC. PC PANAMA CITY, FL	7.140	0.000		0.000		0.000		0.000	0.000	7.140	Continuing
Systems Engineering 1	C/CPIF	LOCKHEED MARTIN RIVIERA BEACH, FL	5.465	0.000		0.000		0.000		0.000	0.000	5.465	Continuing
Systems Engineering 2	C/CPIF	LOCKHEED MARTIN RIVIERA BEACH, FL	6.486	3.725	Dec 2009	6.000	Dec 2010	0.000		6.000	0.000	16.211	Continuing
Systems Engineering 3	WR	NSWC, PC PANAMA CITY, FL	2.185	0.168	Nov 2009	2.941	Nov 2010	0.000		2.941	0.000	5.294	Continuing
Award Fees	SS/CPIF	LOCKHEED MARTIN RIVIERA BEACH, FL	5.485	0.000		0.000		0.000		0.000	0.000	5.485	Continuing
		Subtotal	220.037	3.893		8.941		0.000		8.941	0.000	232.871	

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603502N: *Surface & Shallow Water MCM*	PROJECT 0260: *Remote Minehunting Systems*	

Product Development ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Remarks													

Support ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Software Development 1	C/CPIF	LOCKHEED MARTIN RIVIERA BEACH, FL	7.092	0.000		0.000		0.000		0.000	0.000	7.092	Continuing
Software Development 2	C/CPIF	LOCKHEED MARTIN RIVIERA BEACH, FL	6.961	0.000		0.000		0.000		0.000	0.000	6.961	Continuing
Software Development 3	WR	NSWC, PC RIVIERA BEACH, FL	2.142	0.000		0.000		0.000		0.000	0.000	2.142	Continuing
ILS 1	C/CPIF	LOCKHEED MARTIN RIVIERA BEACH, FL	5.682	0.000		0.000		0.000		0.000	0.000	5.682	Continuing
ILS 2	C/CPIF	LOCKHEED MARTIN	11.404	0.750	Dec 2009	2.000	Dec 2010	0.000		2.000	0.000	14.154	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603502N: *Surface & Shallow Water MCM*	PROJECT 0260: *Remote Minehunting Systems*

Support ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
		RIVIERA BEACH, FL											
ILS 3	WR	NSWC, PC PANAMA CITY, FL	3.557	0.500	Nov 2009	1.000	Nov 2010	0.000		1.000	0.000	5.057	Continuing
ILS 4	Various/ Various	VARIOUS VARIOUS	1.125	0.000		0.000		0.000		0.000	0.000	1.125	Continuing
Ship Integration 1	C/CPIF	LOCKHEED MARTIN RIVIERA BEACH, FL	1.258	0.000		0.000		0.000		0.000	0.000	1.258	Continuing
Ship Integration 2	C/CPIF	LOCKHEED MARTIN RIVIERA BEACH, FL	11.938	0.000		0.000		0.000		0.000	0.000	11.938	Continuing
Ship Integration 3	Various/ Various	VARIOUS VARIOUS	13.451	0.263	Jan 2010	0.000		0.000		0.000	0.000	13.714	Continuing
		Subtotal	64.610	1.513		3.000		0.000		3.000	0.000	69.123	

Remarks

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603502N: *Surface & Shallow Water MCM*	PROJECT 0260: *Remote Minehunting Systems*

Test and Evaluation ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation 1	C/CPIF	LOCKHEED MARTIN RIVIERA BEACH, FL	18.470	0.000		0.000		0.000		0.000	0.000	18.470	Continuing
Developmental Test & Evaluation 2	C/CPIF	LOCKHEED MARTIN RIVIERA BEACH, FL	25.171	0.000		2.500	Dec 2010	0.000		2.500	0.000	27.671	Continuing
Developmental Test & Evaluation 3	WR	NSWC, PC PANAMA CITY, FL	9.244	0.000		4.750	Nov 2010	0.000		4.750	0.000	13.994	Continuing
Developmental Test & Evaluation 4	WR	COTF NORFOLK, VA	0.300	0.000		0.000		0.000		0.000	0.000	0.300	Continuing
Developmental Test & Evaluation 5	Various/ Various	VARIOUS VARIOUS	5.298	0.000		0.000		0.000		0.000	0.000	5.298	Continuing
		Subtotal	58.483	0.000		7.250		0.000		7.250	0.000	65.733	

Remarks

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603502N: *Surface & Shallow Water MCM*	PROJECT 0260: *Remote Minehunting Systems*

Management Services ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Contractor Engineering Support	C/CPIF	LOCKHEED MARTIN RIVIERA BEACH, FL	6.569	0.000		0.000		0.000		0.000	0.000	6.569	Continuing
Government Engineering Support1	WR	NSWC, PC PANAMA CITY, FL	22.996	0.000		0.000		0.000		0.000	0.000	22.996	Continuing
Government Engineering Support2	WR	NSWC, PC PANAMA CITY, FL	0.137	0.050	Nov 2009	0.050	Nov 2010	0.000		0.050	0.000	0.237	Continuing
Program Management Support	C/CPFF	CACI WASHINGTON, DC	4.358	0.000		0.000		0.000		0.000	0.000	4.358	Continuing
Travel	WR	NAVSEA WNY, DC	0.566	0.050	Nov 2009	0.050	Nov 2010	0.000		0.050	0.000	0.666	Continuing
SBIR Assessment	Various/ Various	VARIOUS VARIOUS	6.361	0.400	Jan 2010	0.400	Jan 2011	0.000		0.400	0.000	7.161	Continuing
		Subtotal	40.987	0.500		0.500		0.000		0.500	0.000	41.987	

Remarks

	Total Prior Years Cost	FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	384.117	5.906		19.691		0.000		19.691	0.000	409.714	

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603502N: *Surface & Shallow Water MCM*	PROJECT 0260: *Remote Minehunting Systems*	

	Total Prior Years Cost	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total	Cost To Complete	Total Cost	Target Value of Contract
Remarks								

Exhibit R-4, RDT&E Schedule Profile: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603502N: *Surface & Shallow Water MCM*	PROJECT 0260: *Remote Minehunting Systems*

AN/WLD-1(V)(1) PROGRAM SCHEDULE

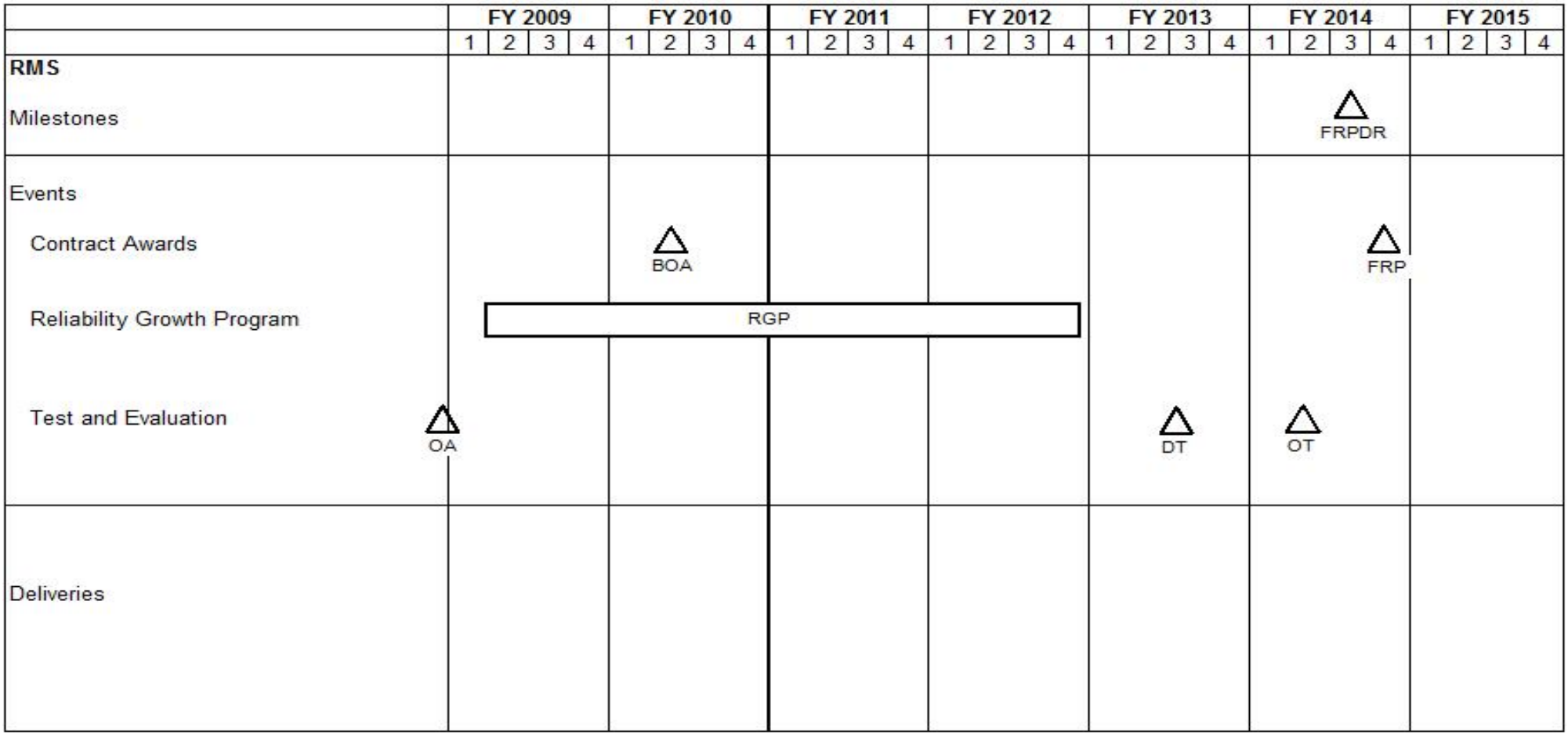

Exhibit R-4A, RDT&E Schedule Details: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603502N: *Surface & Shallow Water MCM*	**PROJECT** 0260: *Remote Minehunting Systems*

Schedule Details

	Start		End	
Event	**Quarter**	**Year**	**Quarter**	**Year**
Full Rate Production Decision Review	3	2014	3	2014
BOA Award	2	2010	2	2010
FRP Award	4	2014	4	2014
Reliability Growth Program	2	2009	4	2012
DT	3	2013	3	2013
OT	2	2014	2	2014

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603502N: *Surface & Shallow Water MCM*	PROJECT 1233: *Surface MCM Mid-life Upgrade*	

COST ($ in Millions)	FY 2009 Actual	FY 2010 Estimate	FY 2011 Base Estimate	FY 2011 OCO Estimate	FY 2011 Total Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
1233: *Surface MCM Mid-life Upgrade*	24.736	21.380	13.479	0.000	13.479	20.622	24.484	24.723	24.918	Continuing	Continuing
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0		

A. Mission Description and Budget Item Justification

(1) AN/SQQ-32(V)4 High-Frequency, Wide Band (HFWB) is a technology upgrade to the SQQ-32 Towed Body which will incorporate HFWB technology into the detection sonar to address performance deficiencies against new mine threats in the littorals. This upgrade will be installed on MCM-1 Class ships with the SQQ-32(V)3 and will develop new transducer modules, fiber optic cable and modify topside processing and display software. 2) Mine Warfare and Environmental Decision Aids Library (MEDAL) is a software segment on the Global Command and Control System - Maritime (GCCS-M). MEDAL provides mine and mine warfare planning and evaluation tools and databases to the MCM Commander. 3) Develop and implement Mine Countermeasures Commander's Estimate of the Situation (MCM CES). 4) Unmanned Surface Sweep System (US3) is a magnetic/acoustic sweep system developed to sweep acoustic/magnetic influence mines from an unmanned surface platform deployed from the Littoral Combat Ship (LCS).

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
ACQUISITION WORKFORCE FUND	0.122	0.000	0.000	0.000	0.000
FY 2009 Accomplishments: Funded DoD Acquisition Workforce Fund.					
MCM CES/PRODUCT DEVELOPMENT:	0.060	0.152	0.100	0.000	0.100
FY 2009 Accomplishments: Development of CES functionality in a MEDAL EA environment.					
FY 2010 Plans: Development of CES functionality in a MEDAL EA environment.					

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603502N: *Surface & Shallow Water MCM*	PROJECT 1233: *Surface MCM Mid-life Upgrade*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
FY 2011 Base Plans: Development of CES functionality in a MEDAL EA environment.					
MCM CES/SUPPORT: *FY 2009 Accomplishments:* Oversee technical integration of developed algorithms and models that have demonstrated their effectiveness in reducing the complexity of the MCM planning problem into a manageable set of options depending on the operational objective. Support effort to include communication with activities such as ONR and NSWC-PC to coordinate the incorporation of validated algorithms and models into MEDAL with the CES framework in order to effectively simplify the MCM planning problem for CSG and ESG staffs and therefore provide the speed, agility, adaptability, and flexibility required for modern MCM operations. Validate Fleet usability of Planning on Risk (PoR) module. *FY 2010 Plans:* Oversee technical integration of developed algorithms and models that have demonstrated their effectiveness in reducing the complexity of the MCM planning problem into a manageable set of options depending on the operational objective. Support effort to include communication with activities such as ONR and NSWC-PC to coordinate the incorporation of validated algorithms and models into MEDAL with the CES framework in order to effectively simplify the MCM planning problem for CSG and ESG staffs and therefore provide the speed, agility, adaptability, and flexibility required for modern MCM operations. Validate Fleet usability of Planning on Risk (PoR) module. *FY 2011 Base Plans:* Oversee technical integration of developed algorithms and models that have demonstrated their effectiveness in reducing the complexity of the MCM planning problem into a manageable set of options depending on the operational objective. Support effort to include communication with activities such as ONR and NSWC-PC to coordinate the incorporation of validated algorithms and models into MEDAL with the CES framework in order to effectively simplify the MCM planning problem for CSG	0.100	0.076	0.069	0.000	0.069

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603502N: *Surface & Shallow Water MCM*	PROJECT 1233: *Surface MCM Mid-life Upgrade*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
and ESG staffs and therefore provide the speed, agility, adaptability, and flexibility required for modern MCM operations. Validate Fleet usability of Planning on Risk (PoR) module.					
MCM CES/TEST AND EVALUATION: *FY 2009 Accomplishments:* Complete testing of Build 1 with MEDAL EA. *FY 2010 Plans:* Conduct integration testing with MEDAL EA v1. *FY 2011 Base Plans:* Conduct integration testing with MEDAL EA v1.	0.120	0.127	0.126	0.000	0.126
MCM CES/MANAGEMENT: *FY 2009 Accomplishments:* Program management shall include overall technical guidance and leadership for the program. Other ongoing PM support includes oversight of financial and logistics efforts and adequate coordination with MEDAL. Other PM tasking to include briefings, demonstrations, and project planning as required. *FY 2010 Plans:* Program management shall include overall technical guidance and leadership for the program. Other ongoing PM support includes oversight of financial and logistics efforts and adequate coordination with MEDAL. Other PM tasking to include briefings, demonstrations, and project planning as required. *FY 2011 Base Plans:* Program management shall include overall technical guidance and leadership for the program. Other ongoing PM support includes oversight of financial and logistics efforts and adequate coordination with MEDAL. Other PM tasking to include briefings, demonstrations, and project planning as required.	0.020	0.026	0.026	0.000	0.026

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603502N: *Surface & Shallow Water MCM*	**PROJECT** 1233: *Surface MCM Mid-life Upgrade*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
HFWB/PRODUCT DEVELOPMENT: FY=09-FY11 Program management shall include overall technical guidance and leadership for the program. Other ongoing PM support includes oversight of financial and logistics efforts and adequate coordination with MEDAL. Other PM tasking to include briefings, demonstrations, and project planning as required. *FY 2009 Accomplishments:* Towed body; common navigation console and auxiliary equipment integration *FY 2010 Plans:* Began system engineering, requirements analysis and design for HFWB P3I effort. *FY 2011 Base Plans:* Continue system engineering, requirements analysis, design and development for HFWB P3I effort.	1.557	2.500	1.612	0.000	1.612
HFWB/SUPPORT: *FY 2009 Accomplishments:* Complete documentation development and ILS documents. *FY 2010 Plans:* Began software requirements, configuration, and software integration for P3I effort. *FY 2011 Base Plans:* Continue system engineering and requirements analysis for HFWB P3I effort.	0.500	0.370	0.353	0.000	0.353
HFWB/TEST AND EVALUATION:	2.416	0.100	0.100	0.000	0.100

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B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
FY 2009 Accomplishments: Complete in water testing; At sea testing; operation assessment and Environmental Qualification testing (EQT). *FY 2010 Plans:* Perform lab testing for HFWB P3I effort. *FY 2011 Base Plans:* Continue to perform lab testing for HFWB P3I effort.					
HFWB/MANAGEMENT: *FY 2009 Accomplishments:* Provide program management support and travel for AN/SQQ-32 HFWB Upgrade program. *FY 2010 Plans:* Provide program management support and travel for AN/SQQ-32 HFWB Upgrade program. *FY 2011 Base Plans:* Provide program management support and travel for AN/SQQ-32 HFWB Upgrade program.	0.260	0.158	0.136	0.000	0.136
MEDAL/PRODUCT DEVELOPMENT: *FY 2009 Accomplishments:* Complete Iteration 2 and 3. Initiate Iteration 4. *FY 2010 Plans:* Complete Iteration 4 and 5. Complete development and test of EA v1 and initiate development of EA v2. Complete IOC EA v1.	6.000	5.168	3.708	0.000	3.708

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B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
FY 2011 Base Plans: Complete Iteration 4 and 5. Complete development and test of EA v1 and initiate development of EA v2. Complete IOC EA v1.					
MEDAL/SUPPORT: *FY 2009 Accomplishments:* Oversee technical integration of developed algorithms and models that have demonstrated their effectiveness with respect to their objectives. Support effort to include communication with activities such as applied labs, government activities, and designated contractors. Assist in providing the speed, agility, adaptability, and flexibility required for modern MCM operations. *FY 2010 Plans:* Oversee technical integration of developed algorithms and models that have demonstrated their effectiveness with respect to their objectives. Support effort to include communication with activities such as applied labs, government activities, and designated contractors. Assist in providing the speed, agility, adaptability, and flexibility required for modern MCM operations. *FY 2011 Base Plans:* Oversee technical integration of developed algorithms and models that have demonstrated their effectiveness with respect to their objectives. Support effort to include communication with activities such as applied labs, government activities, and designated contractors. Assist in providing the speed, agility, adaptability, and flexibility required for modern MCM operations.	0.400	0.463	0.435	0.000	0.435
MEDAL/TEST AND EVALUATION: *FY 2009 Accomplishments:* Conduct DT on Iteration 2 and 3.	0.130	1.322	1.965	0.000	1.965

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B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
FY 2010 Plans: Conduct DT on Iteration 4 and 5. *FY 2011 Base Plans:* Conduct DT on Iteration 4 and 5.					
MEDAL/MANAGEMENT: *FY 2009 Accomplishments:* Provide program management support and travel for MEDAL program. Program management shall include overall technical guidance and leadership for the program. Oversight of financial and logistics efforts and coordination with Navy and other DoD organizations and contractors as required to ensure successful execution of the program. As part of the systems engineering element of PM, communicate and coordinate with MIW C4ISR, ICWS, Organic MCM, Mainstreaming MIW, Expeditionary Warfare C4ISR, tactics development, long term planning, Naval Special Clearance Team (NSCT)-1, Assault Breaching Systems of Systems (ABSoS), LCS, and other programs as they relate to MEDAL and MIW Mission Planning, Evaluation, and C4ISR. Other PM tasking to include briefings, demonstrations, and project planning as required. *FY 2010 Plans:* Provide program management support and travel for MEDAL program. Program management shall include overall technical guidance and leadership for the program. Oversight of financial and logistics efforts and coordination with Navy and other DoD organizations and contractors as required to ensure successful execution of the program. As part of the systems engineering element of PM, communicate and coordinate with MIW C4ISR, ICWS, Organic MCM, Mainstreaming MIW, Expeditionary Warfare C4ISR, tactics development, long term planning, Naval Special Clearance Team (NSCT)-1, Assault Breaching Systems of Systems (ABSoS), LCS, and other programs as they relate to MEDAL and MIW Mission Planning, Evaluation, and C4ISR. Other PM tasking to include briefings, demonstrations, and project planning as required.	0.395	0.572	0.519	0.000	0.519

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B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
FY 2011 Base Plans: Provide program management support and travel for MEDAL program. Program management shall include overall technical guidance and leadership for the program. Oversight of financial and logistics efforts and coordination with Navy and other DoD organizations and contractors as required to ensure successful execution of the program. As part of the systems engineering element of PM, communicate and coordinate with MIW C4ISR, ICWS, Organic MCM, Mainstreaming MIW, Expeditionary Warfare C4ISR, tactics development, long term planning, Naval Special Clearance Team (NSCT)-1, Assault Breaching Systems of Systems (ABSoS), LCS, and other programs as they relate to MEDAL and MIW Mission Planning, Evaluation, and C4ISR. Other PM tasking to include briefings, demonstrations, and project planning as required.					
US3/PRODUCT DEVELOPMENT: *FY 2009 Accomplishments:* Product improvement efforts. Hardware and Software Development for the Unmanned Surface Sweep System (US3). *FY 2010 Plans:* Final design changes. Preparation of Milestone B documentation. *FY 2011 Base Plans:* Conduct Milestone B.	4.382	2.184	0.780	0.000	0.780
US3/SUPPORT: *FY 2009 Accomplishments:* Engineering and ILS support for required documentation to accomplish Milestone B. *FY 2010 Plans:* Engineering and ILS support for documentation to support Milestone B.	5.633	3.179	1.847	0.000	1.847

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B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
FY 2011 Base Plans: Completion of Milestone B, engineering support for engineering and manufacturing development.					
US3/TEST AND EVALUATION: *FY 2009 Accomplishments:* Mission module compatibility testing. *FY 2010 Plans:* Correct deficiencies from mission module compatibility and conduct certification testing. *FY 2011 Base Plans:* Testing to support EMD development.	1.398	3.898	0.809	0.000	0.809
US3/MANAGEMENT: *FY 2009 Accomplishments:* Program support and management necessary to monitor contractor progress; review system capabilities; monitor cost and schedule; monitor contractor deliverables. *FY 2010 Plans:* Program support for Milestone B documentation. *FY 2011 Base Plans:* Complete Milestone B in 1st Qtr; award EMD contract.	1.243	1.085	0.894	0.000	0.894
Accomplishments/Planned Programs Subtotals	24.736	21.380	13.479	0.000	13.479

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C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total	FY 2012	FY 2013	FY 2014	FY 2015	Cost To Complete	Total Cost
• OPN/2622: *LV075/LV078/LV080*	22.092	42.960	55.450	0.000	55.450	47.483	0.961	0.960	1.150	0.000	171.056

D. Acquisition Strategy

HFWB - Naval Surface Warfare Center, Panama City (NSWC, PC) will team with a ARL UT to design and develop the HFWB upgrade to the AN/SQQ-32.
Mine Warfare and Environmental Decision Aids Library (MEDAL) - requirements for MEDAL Builds are generated through a formal requirements process. Requirements conferences gather a list of candidate functions based on a logical sequence to fully implement the overall software architecture. The fleet is presented with a recommended list of candidate capabilities based on this program plan, doctrine, fleet comments, and technology. These capability items are then prioritized by the fleet representatives (coordinated by Commander Mine Warfare Command (COMINEWARCOM)). The fleet inputs are then consolidated by COMINEWARCOM into an overall list which is then presented to Navy leadership for pricing and final selection. The selection is based on price, risk, available funding, and possibly by other program factors (e.g., ensure that MEDAL supports other program delivery schedules). Selection balances immediate needs, long term objectives, technical maturity and other programmatic factors. A verification and validation process is applied to any algorithms, tactics, or models to be incorporated in the software. MEDAL development to include integration of data fusion techniques and incorporation of Data Access Layer (DAL) architecture to meet FORCEnet requirements. Acquisition strategy for Mine Countermeasures Commander's Estimate of the situation (MCM CES) is to deliver the software module within MEDAL builds by implementing the CES framework into the MEDAL software.
US3- The Unmanned Surface Sweep System (US3) effort was transferred from ONR to PMS495 in FY07. Program transferred to PMS403 in FY09. PMS403 will award an EMD contract to continue development of the system. US3 will be capable of sweeping mines in the littoral waters. The EMD phase will include a Milestone C LRIP decision in FY14 and then LRIP and a Full Rate Production Decision (FRPD) in FY15.

E. Performance Metrics

Successfully reach Milestone B in FY11
Complete PDR and CDR technical reviews in FY11
Successfully reach Milestone C in FY14

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy			DATE: February 2010
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Product Development ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
BSP: Develop Bottom Sediment Classifier	WR	NRL WASHINGTON, DC	0.258	0.000		0.000		0.000		0.000	0.000	0.258	Continuing
Systems Engineering and Integration	WR	NSWC, PC PANAMA CITY, FL	0.306	0.000		0.000		0.000		0.000	0.000	0.306	Continuing
System Development 1	WR	NSWC, PC SAN DIEGO, CA	0.373	0.000		0.000		0.000		0.000	0.000	0.373	Continuing
Systems Engineering 2	WR	NSWC, PC PANAMA CITY, FL	2.915	0.000		0.000		0.000		0.000	0.000	2.915	Continuing
Systems Engineering 3	WR	NSWC, PC PANAMA CITY, FL	1.136	0.152	Nov 2009	0.100	Nov 2010	0.000		0.100	0.000	1.388	Continuing
Primary Hardware Development 1	C/Various	NSWC, PC/ARL UT FLORIDA/TEXAS	15.511	0.000		0.000		0.000		0.000	0.000	15.511	Continuing
Primary Hardware Development 2	WR	ARL-UT AUSTIN, TX	0.000	0.000		0.000		0.000		0.000	0.000	0.000	Continuing
Tow Cable Development	C/Various	NSWC, PC/ARL UT FLORIDA/TEXAS	1.399	0.000		0.000		0.000		0.000	0.000	1.399	Continuing
Ship Integration	WR	NSWC, PC PANAMA CITY, FL	1.697	0.000		0.000		0.000		0.000	0.000	1.697	Continuing
SYSTEM ENGINEER	C/Various	NSWC/ARL UT	0.000	2.500	Nov 2009	1.612	Nov 2010	0.000		1.612	0.000	4.112	Continuing

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Product Development ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
		FLORIDA/TEXAS											
Software Development	C/CPFF	SAIC SAN DIEGO, CA	16.967	5.168	Nov 2009	3.708	Nov 2010	0.000		3.708	0.000	25.843	Continuing
US3: Product Development 1	C/TBD	ITT PANAMA CITY, FL	3.198	2.000	Nov 2009	0.000		0.000		0.000	0.000	5.198	Continuing
US3: Product Development 2	WR	NSWC, PC PANAMA CITY, FL	1.276	0.184	Nov 2009	0.350	Nov 2010	0.000		0.350	0.000	1.810	Continuing
US3: Product Development 3	C/TBD	TBD TBD	0.000	0.000		0.430	Dec 2010	0.000		0.430	0.000	0.430	Continuing
		Subtotal	45.036	10.004		6.200		0.000		6.200	0.000	61.240	

Remarks

Support ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Develop Logistics Products	WR	NSWC, PC PANAMA CITY, FL	0.160	0.000		0.000		0.000		0.000	0.000	0.160	Continuing
Software Development 1	C/CPFF	SAIC	0.350	0.000		0.000		0.000		0.000	0.000	0.350	Continuing

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Support ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
		SAN DIEGO, CA											
Software Development 2	C/CPFF	SAIC SAN DIEGO, CA	0.769	0.076	Nov 2009	0.069	Nov 2010	0.000		0.069	0.000	0.914	Continuing
HFWB Software Development	WR	NSWC, PC/ARL-UT FLORIDA/TEXAS	7.462	0.300	Nov 2009	0.300	Nov 2010	0.000		0.300	0.000	8.062	Continuing
HFWB Integrated Logistics Support	WR	NSWC, PC PANAMA CITY, FL	2.600	0.070	Nov 2009	0.053	Nov 2010	0.000		0.053	0.000	2.723	Continuing
Software Engineering 1	WR	SPAWAR SAN DIEGO, CA	0.364	0.208	Nov 2009	0.206	Nov 2010	0.000		0.206	0.000	0.778	Continuing
Software Engineering 2	WR	NSWC, PC PANAMA CITY, FL	0.438	0.255	Nov 2009	0.229	Nov 2010	0.000		0.229	0.000	0.922	Continuing
US3: Engineering 1	C/TBD	ITT PANAMA CITY, FL	1.477	0.800	Dec 2009	0.000		0.000		0.000	0.000	2.277	Continuing
US3: Integrated Logistics1	C/TBD	ITT PANAMA CITY, FL	0.979	0.429	Dec 2009	0.000		0.000		0.000	0.000	1.408	Continuing
US3: Engineering 2	WR	NSWC, PC PANAMA CITY, FL	2.680	1.144	Nov 2009	0.788	Nov 2010	0.000		0.788	0.000	4.612	Continuing
US3: Integrated Logistics 2	WR	NSWC, PC PANAMA CITY, FL	1.421	0.806	Nov 2009	0.318	Nov 2010	0.000		0.318	0.000	2.545	Continuing

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Support ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
US3: Engineering3	C/TBD	TBD TBD	0.000	0.000		0.741	Dec 2010	0.000		0.741	0.000	0.741	Continuing
		Subtotal	18.700	4.088		2.704		0.000		2.704	0.000	25.492	

Remarks

Test and Evaluation ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Test and Evaluation 1	C/Various	VARIOUS VARIOUS	0.220	0.127	Nov 2009	0.126	Nov 2010	0.000		0.126	0.000	0.473	Continuing
Developmental Test and Evaluation	WR	NSWC, PC/ARL-UT FLORIDA/TEXAS	3.899	0.100	Nov 2009	0.100	Nov 2010	0.000		0.100	0.000	4.099	Continuing
Test and Evaluation 2	C/Various	VARIOUS VARIOUS	0.630	1.322	Dec 2009	1.965	Dec 2010	0.000		1.965	0.000	3.917	Continuing
US3: Test and Evaluation 3	C/TBD	ITT PANAMA CITY, FL	0.559	1.559	Dec 2009	0.000		0.000		0.000	0.000	2.118	Continuing
US3: Test and Evaluation 4	WR	NSWC, PC PANAMA CITY, FL	1.007	2.339	Nov 2009	0.809	Nov 2010	0.000		0.809	0.000	4.155	Continuing

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Test and Evaluation ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
		Subtotal	6.315	5.447		3.000		0.000		3.000	0.000	14.762	

Remarks

Management Services ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Support 1	C/CPFF	CACI WASHINGTON, DC	0.263	0.000		0.000		0.000		0.000	0.000	0.263	Continuing
Travel 1	WR	NAVSEA WNY, DC	0.084	0.000		0.000		0.000		0.000	0.000	0.084	Continuing
Government Engineering Support1	WR	NSWC, PC PANAMA CITY, FL	0.271	0.000		0.000		0.000		0.000	0.000	0.271	Continuing
Program Management Support 2	Various/ Various	VARIOUS VARIOUS	0.157	0.000		0.000		0.000		0.000	0.000	0.157	Continuing
SBIR Assessment 2	Various/ Various	VARIOUS VARIOUS	0.019	0.000		0.000		0.000		0.000	0.000	0.019	Continuing
Program Management Support 3	C/CPFF	CACI WASHINGTON, DC	0.855	0.265	Feb 2010	0.221	Feb 2011	0.000		0.221	0.000	1.341	Continuing

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Management Services ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
US3: Contractor Management 3	WR	ITT PANAMA CITY, FL	0.466	0.310	Dec 2009	0.000		0.000		0.000	0.000	0.776	Continuing
US3: Government Management Support2	Various/ Various	VARIOUS VARIOUS	1.308	0.750	Nov 2009	0.620	Nov 2010	0.000		0.620	0.000	2.678	Continuing
US3: Travel 2	WR	NAVSEA WNY, DC	0.050	0.025	Nov 2009	0.025	Nov 2010	0.000		0.025	0.000	0.100	Continuing
Program Management Support 4	C/CPFF	CACI WASHINGTON, DC	0.080	0.000		0.000		0.000		0.000	0.000	0.080	Continuing
Government Engineering Support3	WR	NSWC, PC PANAMA CITY, FL	0.090	0.000		0.000		0.000		0.000	0.000	0.090	Continuing
Travel 3	C/TBD	NAVSEA WNY, DC	0.256	0.000		0.000		0.000		0.000	0.000	0.256	Continuing
Program Management Support 5	C/CPFF	CACI WASHINGTON, DC	0.115	0.026	Nov 2009	0.026	Nov 2010	0.000		0.026	0.000	0.167	Continuing
Government Engineering Support4	WR	NSWC, PC PANAMA CITY, FL	0.010	0.000		0.000		0.000		0.000	0.000	0.010	Continuing
Travel4	C/TBD	NSWC, PC PANAMA CITY, FL	0.069	0.000		0.000		0.000		0.000	0.000	0.069	Continuing
Program Management Support 6	C/Various	VARIOUS VARIOUS	1.094	0.148	Jan 2010	0.126	Jan 2011	0.000		0.126	0.000	1.368	Continuing

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Management Services ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Government Engineering Support5	WR	NSWC, PC PANAMA CITY, FL	0.750	0.000		0.000		0.000		0.000	0.000	0.750	Continuing
Travel 5	C/TBD	NAVSEA WNY, DC	0.040	0.010	Nov 2009	0.010	Nov 2010	0.000		0.010	0.000	0.060	Continuing
Government Engineering Support6	WR	NSWC, PC PANAMA CITY, FL	0.796	0.282	Nov 2009	0.274	Nov 2010	0.000		0.274	0.000	1.352	Continuing
Travel 6	C/TBD	NAVSEA WNY, DC	0.189	0.025	Nov 2009	0.024	Nov 2010	0.000		0.024	0.000	0.238	Continuing
SBIR Assessment 6	Various/ Various	VARIOUS VARIOUS	0.054	0.000		0.000		0.000		0.000	0.000	0.054	Continuing
Program Management Support 7	C/Various	VARIOUS VARIOUS	0.350	0.000		0.000		0.000		0.000	0.000	0.350	Continuing
US3: Contractor Management 7	C/TBD	TBD TBD	0.000	0.000		0.249	Dec 2010	0.000		0.249	0.000	0.249	Continuing
Acquisition Workforce Fund	Various/ Various	VARIOUS VARIOUS	0.122	0.000		0.000		0.000		0.000	0.000	0.122	Continuing
		Subtotal	7.488	1.841		1.575		0.000		1.575	0.000	10.904	

Remarks

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603502N: *Surface & Shallow Water MCM*	PROJECT 1233: *Surface MCM Mid-life Upgrade*	

	Total Prior Years Cost	FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	77.539	21.380		13.479		0.000		13.479	0.000	112.398	

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603502N: *Surface & Shallow Water MCM*	**PROJECT** 1233: *Surface MCM Mid-life Upgrade*

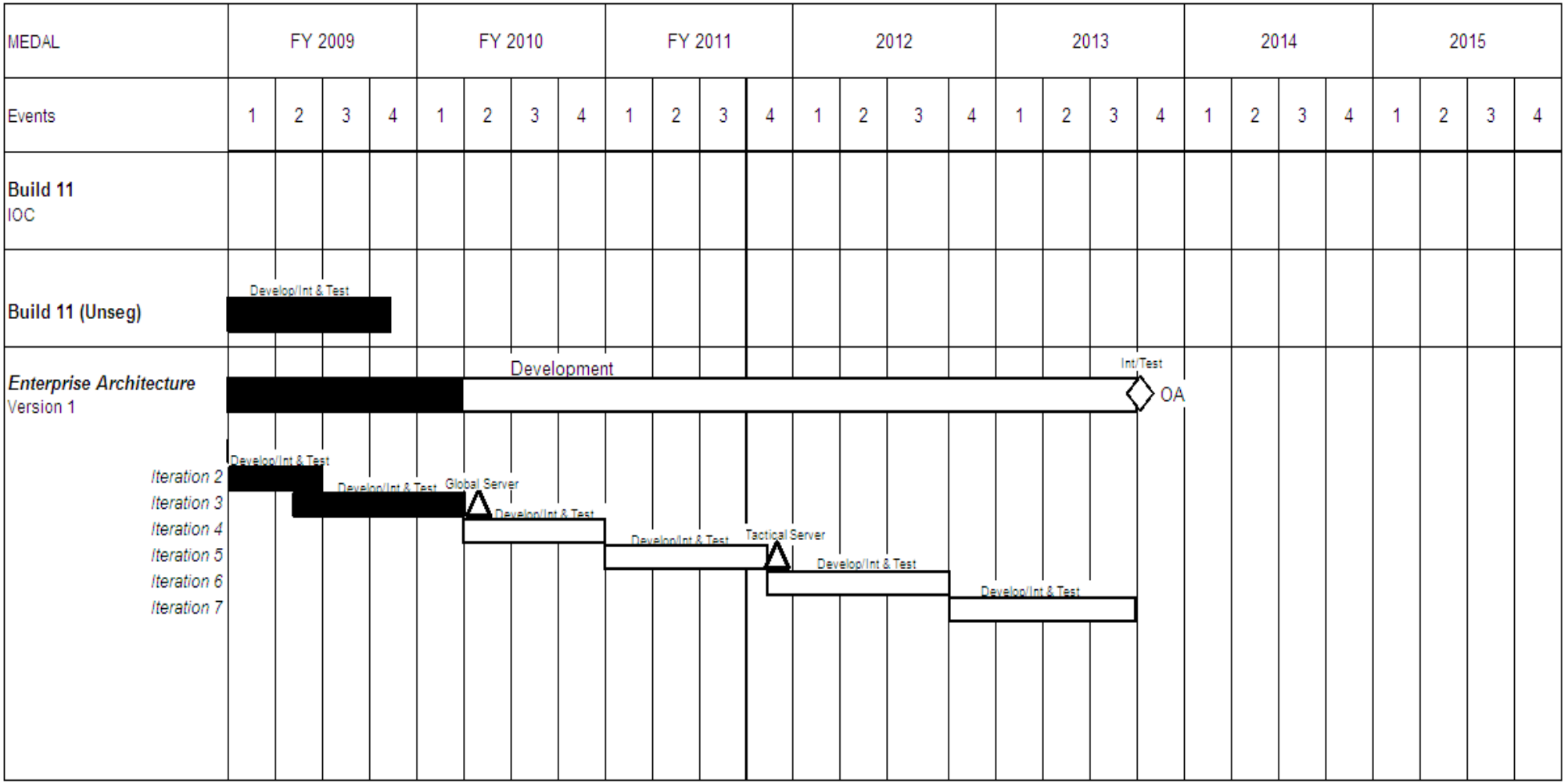

Exhibit R-4, RDT&E Schedule Profile: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603502N: *Surface & Shallow Water MCM*	PROJECT 1233: *Surface MCM Mid-life Upgrade*

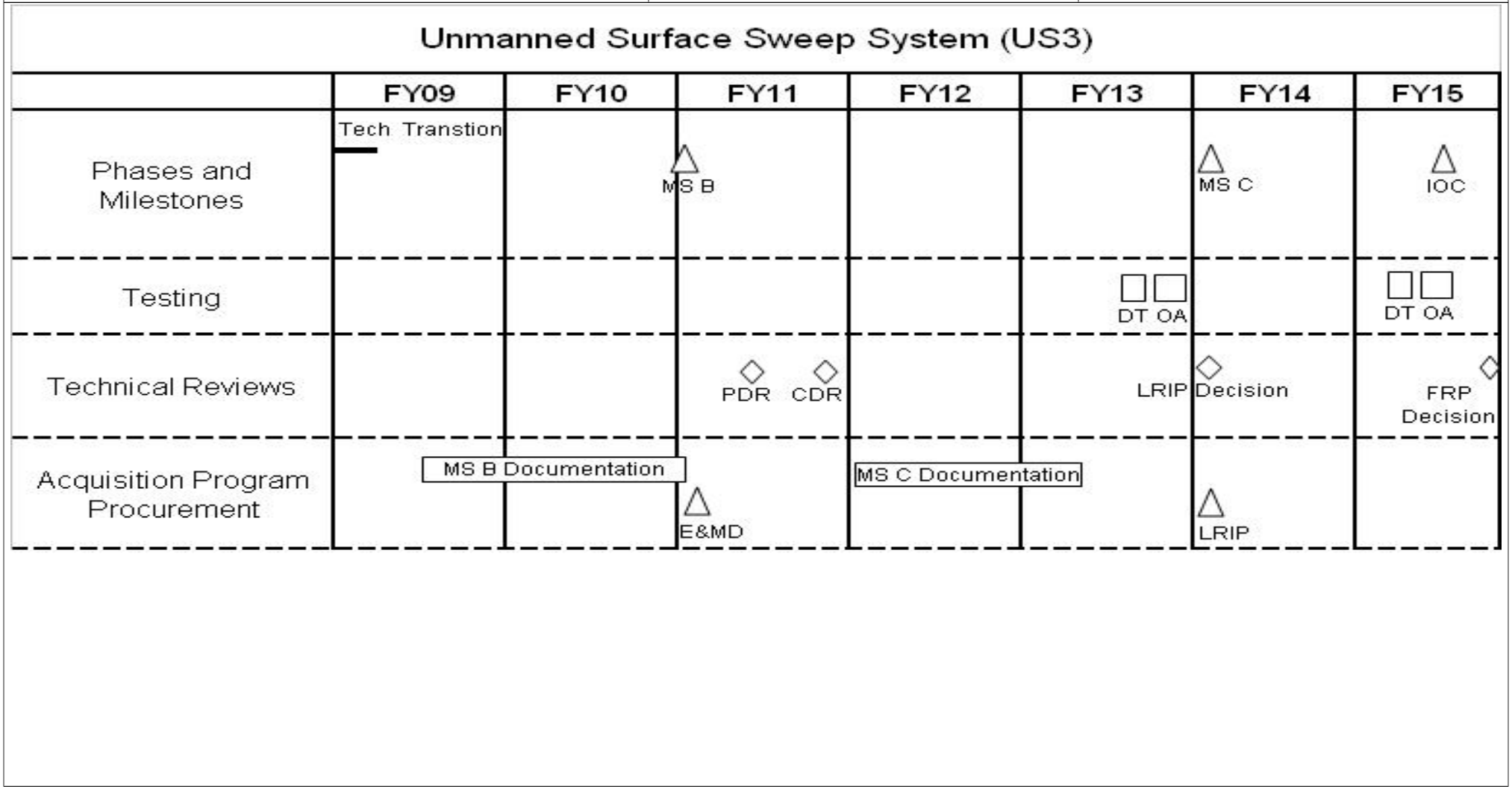

Exhibit R-4, RDT&E Schedule Profile: PB 2011 Navy		**DATE:** February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603502N: *Surface & Shallow Water MCM*	**PROJECT** 1233: *Surface MCM Mid-life Upgrade*

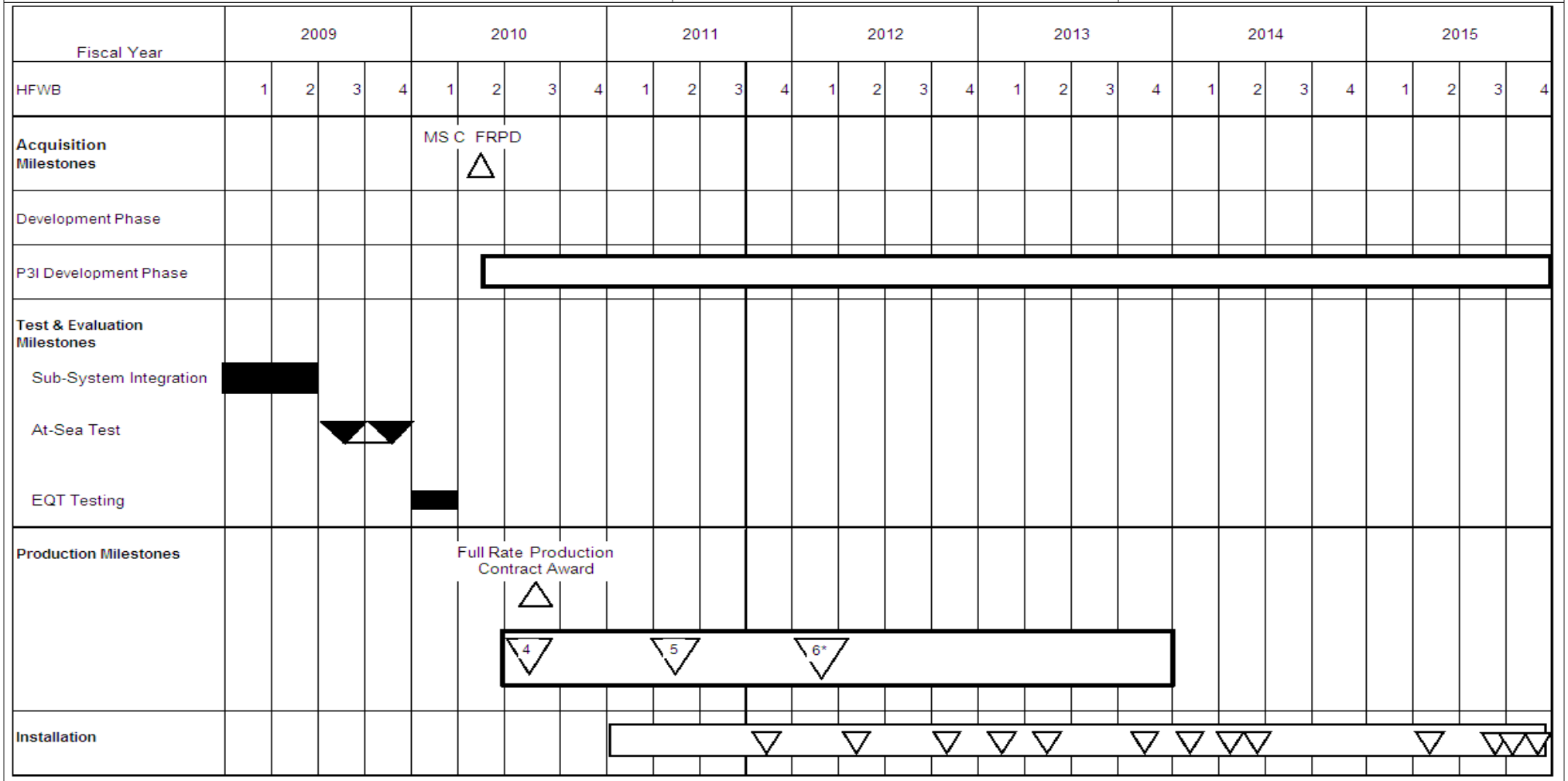

Exhibit R-4, **RDT&E Schedule Profile:** PB 2011 Navy		**DATE:** February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603502N: *Surface & Shallow Water MCM*	**PROJECT** 1233: *Surface MCM Mid-life Upgrade*

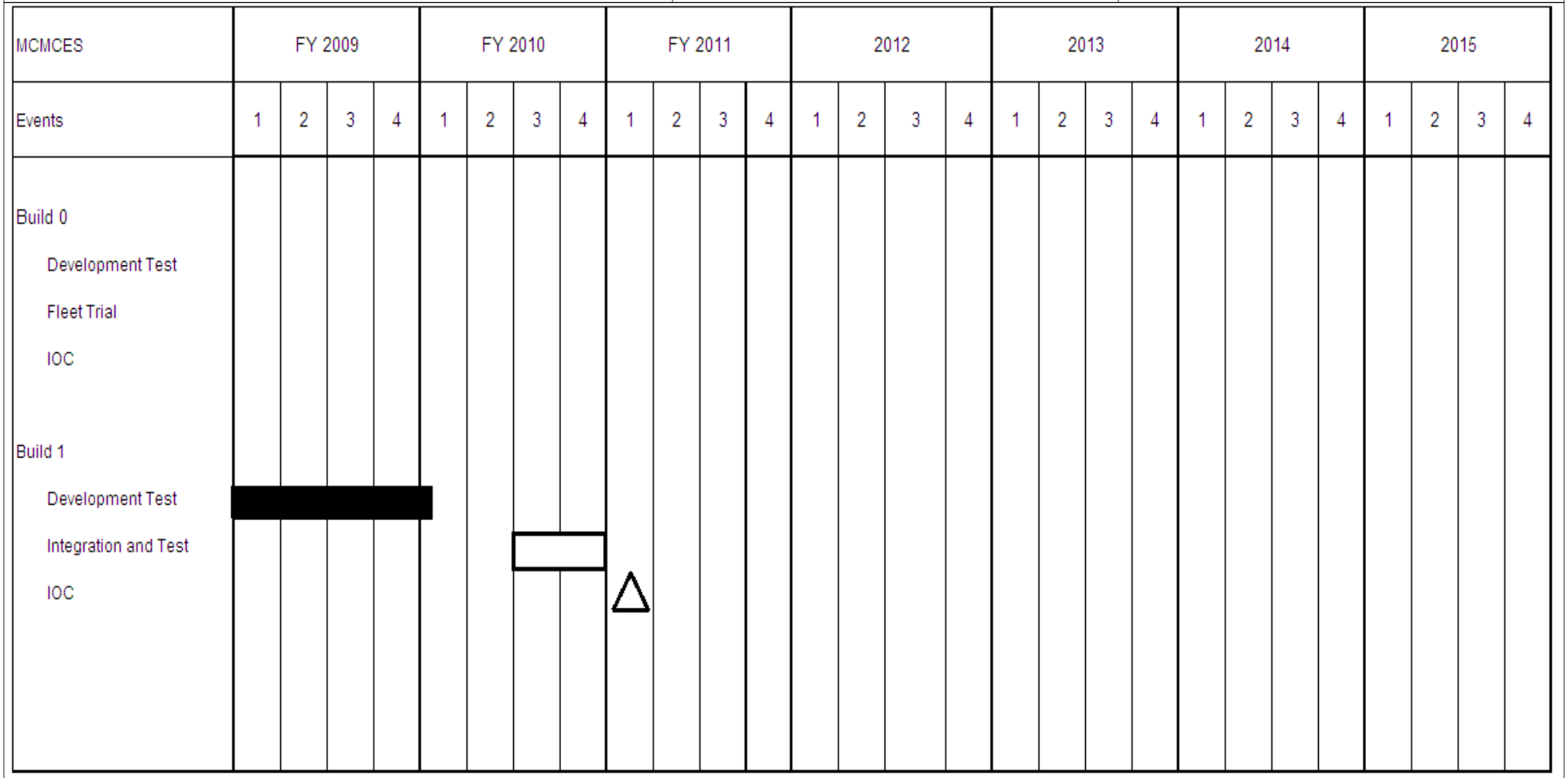

Exhibit R-4A, RDT&E Schedule Details: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603502N: *Surface & Shallow Water MCM*	PROJECT 1233: *Surface MCM Mid-life Upgrade*

Schedule Details

	Start		End	
Event	Quarter	Year	Quarter	Year
MCM CES: Build 1 Development and Test	1	2009	1	2010
MCM CES: Build 1 Integration and Test	3	2010	4	2010
MCM CES: IOC	1	2011	1	2011
HFWB: Milestone C/FRPD	2	2010	2	2010
HFWB: Subsystem Integration	1	2009	2	2009
HFWB: At-SEA Test	3	2009	4	2009
HFWB: EQT Testing	1	2010	1	2010
HFWB: Contract Award	3	2010	3	2010
HFWB: Full Rate Production	3	2010	4	2013
HFWB: P3I Development	2	2010	4	2015
HFWB: Installation	1	2011	4	2015
Build 11 Develop Integration and Test	1	2009	4	2009
MEDAL: Enterprise Arch (EA) v.1 Development and Test	1	2009	3	2013
MEDAL: EA v.1 Iteration 2	1	2009	2	2009
MEDAL: EA v.1 Iteration 3	2	2009	2	2010
MEDAL: EA v.1 Iteration 4	2	2010	4	2010
MEDAL: EA v.1 Iteration 5	1	2011	4	2011
MEDAL: EA v.1 Iteration 6	4	2011	3	2012

Exhibit R-4A, RDT&E Schedule Details: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603502N: *Surface & Shallow Water MCM*	PROJECT 1233: *Surface MCM Mid-life Upgrade*

	Start		End	
Event	Quarter	Year	Quarter	Year
MEDAL: EA v.1 Iteration 7	4	2012	3	2013
US3: Milestone B Documentation	2	2009	1	2011
US3: Milestone B	1	2011	1	2011
US3: E&MD Contract Award	1	2011	1	2011
US3: PDR Decision	2	2011	2	2011
US3: CDR Decision	4	2011	4	2011
US3: Milestone C Documentation	1	2012	2	2013
US3: DT Testing	3	2013	3	2013
US3: DT Testing (cont.)	2	2015	2	2015
US3: Operational Assessment	4	2013	4	2013
US3: Milestone C	1	2014	1	2014
US3: LRIP Decision	1	2014	1	2014
US3: LRIP Contract Award	1	2014	1	2014
US3: Operational Assessment (Cont.)	3	2015	3	2015
US3: IOC	3	2015	3	2015
US3: Full Rate Production Decision	4	2015	4	2015

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603502N: *Surface & Shallow Water MCM*	PROJECT 2094: *Unmanned Underwater Vehicle*	

COST ($ in Millions)	FY 2009 Actual	FY 2010 Estimate	FY 2011 Base Estimate	FY 2011 OCO Estimate	FY 2011 Total Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
2094: *Unmanned Underwater Vehicle*	3.744	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	442.442
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0		

A. Mission Description and Budget Item Justification

The November 2004 UUV Master Plan established Intelligence, Surveillance, and Reconnaissance (ISR), and clandestine Mine Countermeasures (MCM) as top priorities. The Mission Reconfigurable Unmanned Undersea Vehicle System (MRUUVS) will provide these capabilities to the warfighter. The MRUUVS Capability Development Document (CDD) was approved by the Joint Requirements Oversight Council (JROC) in June 2007.

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
MRUUVS *FY 2009 Accomplishments:* Completed close-out efforts for MRUUVS program.	3.599	0.000	0.000	0.000	0.000
ACQUISITION WORKFORCE FUND *FY 2009 Accomplishments:* Funded DoD Acquisition Workforce Fund.	0.145	0.000	0.000	0.000	0.000
Accomplishments/Planned Programs Subtotals	3.744	0.000	0.000	0.000	0.000

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603502N: *Surface & Shallow Water MCM*	**PROJECT** 2094: *Unmanned Underwater Vehicle*

C. Other Program Funding Summary ($ in Millions)

N/A

D. Acquisition Strategy

In FY09, complete the integration of LPUMA into LMRS EDM vehicles and complete integration testing. In early FY10 complete a SSN demonstration at Navy ranges. Prepare for safety certification for installation on-board an attack submarine, and install system on attack submarine for at-sea demonstration of LPUMA mine detection, obstacle avoidance, UUV recovery on board attack submarine, and real-time merging of LPUMA data with submarine High Frequency sensor database for complete battlespace preparation.

E. Performance Metrics

required

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603502N: *Surface & Shallow Water MCM*	PROJECT 2131: *Assault Breaching System*	

COST ($ in Millions)	FY 2009 Actual	FY 2010 Estimate	FY 2011 Base Estimate	FY 2011 OCO Estimate	FY 2011 Total Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
2131: *Assault Breaching System*	42.437	30.743	31.245	0.000	31.245	30.942	26.125	12.957	13.259	Continuing	Continuing
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0		

A. Mission Description and Budget Item Justification

This program provides for a combination of U.S. Navy projects planned to counter the threat to amphibious landing forces from known and projected foreign land/sea mines, obstacles in the beach zone and surf zone approaches to amphibious assault areas. The Assault Breaching System (ABS) of Systems (Countermine/Counter Obstacle, Intelligence/Surveillance/Reconnaissance/Targeting (ISR/T), Precision Navigation/Virtual Marking/Integration, C4I/Data Fusion) provides a full assault breaching capability which is an essential element to the Ship To Objective Maneuver (STOM) Concept of Operations.
Countermine/Counter Obstacle (CM/CO) - Far term - Counter Mine System (CMS) - transitioned from a 6.3 S&T Concept Demonstration effort to a 6.4 development program after a concept decision/AoA in FY06.
ISR/T - Coastal Battlefield Reconnaissance and Analysis (COBRA) is the ISR/T part of the ABS of systems. One system consists of two Airborne Payloads and one Post Mission Analysis Station. Under the umbrella of evolutionary acquisition, three increments of development are planned; Block I introduces a daytime, surface laid minefield and obstacle detection capability for the Beach Zone. Blocks II and III will incorporate technology being developed by 6.3.
S&T. Block II adds a surfzone and night (darkness) detection capability. Block III adds a buried mine detection capability and on-board Near-Real-Time processing of Multi Spectral Imagery data.
COBRA will be a modular payload architecture of and integrated with the MQ-8B Fire Scout Vertical Takeoff and Landing Unmanned Aerial Vehicle (VTUAV) and will serve as the "detect" mission module of the Littoral Combat Ship (LCS) Mine Warfare mission package.

Precision Navigation/Virtual Marking- The navigation effort involves requirements development and program planning to choose the navigational upgrades for the Landing Craft, Air Cushion (LCAC) and Landing Craft, Utility (LCU), and Amphibious Assault Vehicle (AAV) to enable the craft to safely navigate the neutralized assault lanes. A system of virtual or physical lane marking is to be developed to guide the assault craft through the neutralized assault lanes. OPN will fund the CRAFTALTS to upgrade the navigation systems.
LCU Navigation Upgrade: Modernized the navigation system to enable safe transit through the breached lane.
LCAC Autopilot Upgrade: An integrated improvement to the LCAC (Service Life Extension Program (SLEP) navigation system for craft control that allows precise navigation and hovering within the breached lane. These software upgrades and backfits will occur during scheduled LCAC SLEPs.
AAV Navigation Upgrade : Modernize the navigation system to enable precise transit through the breached lane.

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603502N: *Surface & Shallow Water MCM*	**PROJECT** 2131: *Assault Breaching System*

Command, Control, Computers, Communications and Intelligence (C4I) - System will tie all of the above systems together under an integrated ABS architecture and also tie in with the integrated Mine Warfare architecture.

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
ACQUISITION WORKFORCE FUND *FY 2009 Accomplishments:* Funded DoD Acquisition Workforce Fund.	0.211	0.000	0.000	0.000	0.000
Product Development: *FY 2009 Accomplishments:* Exercising contract options for CMS and awarding COBRA Block II contract and conducting system technical reviews on COBRA Block II and CMS. *FY 2010 Plans:* Conduct CMS Preliminary Design Review (PDR). Down selection of alternate neutralizer and neutralizer material at PDR solid reactive and liquid reactive candidates. Conduct CMS technical reviews. Begin neutralizer testing of 100 darts. *FY 2011 Base Plans:* FY 11: Conduct CMS Critical Design Review (CDR). Down selection between high explosive (HE) neutralizer and alternative neutralizer selected at PDR. Conduct system technical reviews for CMS and COBRA Block II. Continue neutralizer testing.	35.450	24.309	25.647	0.000	25.647
Support: *FY 2009 Accomplishments:* ISR/T - Technical analysis, modeling and simulation.	0.999	0.961	0.844	0.000	0.844

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603502N: *Surface & Shallow Water MCM*	PROJECT 2131: *Assault Breaching System*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
FY 2010 Plans: Conduct Weapon System Explosive Safety Requirements Board (WSESRB) Review; evaluate Flight Certification for Non-Navy Aircraft. *FY 2011 Base Plans:* Begin work on CMS LRIP solicitation.					
Test and Evaluation: *FY 2009 Accomplishments:* Complete Breaching System Effectiveness Simulation and ABS Effectiveness Tool. *FY 2010 Plans:* Complete Integrated Test Phase I and II associated with Neutralizer and Sled Tests. *FY 2011 Base Plans:* Conduct CMS Inert Flight Test in preparation for Live-Live Tests.	0.206	0.167	0.147	0.000	0.147
Management: *FY 2009 Accomplishments:* Mine magazine inventory management and shipping, contract management and tests/studies, C4I/ Data fusion. *FY 2010 Plans:* Mine magazine inventory management and shipping, contract management and tests/studies, C4I/ Data fusion.	5.571	5.306	4.607	0.000	4.607

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603502N: *Surface & Shallow Water MCM*	PROJECT 2131: *Assault Breaching System*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
FY 2011 Base Plans: Mine magazine inventory management and shipping, contract management and tests/studies, C4I/ Data fusion.					
Accomplishments/Planned Programs Subtotals	42.437	30.743	31.245	0.000	31.245

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total	FY 2012	FY 2013	FY 2014	FY 2015	Cost To Complete	Total Cost
• OPN/2624: *SHALLOW WATER MCM SHIP*	7.297	7.811	9.236	0.000	9.236	10.877	25.114	25.548	25.994	0.000	111.877
• OPN/1600: *LCS MODULES*	0.000	3.267	4.095	0.000	4.095	4.100	4.285	4.377	8.916	0.000	29.040
• WPN/4225: *AIRBORNE MCM*	0.000	0.000	0.000	0.000	0.000	0.000	1.309	49.867	61.790	0.000	112.966

D. Acquisition Strategy

Countermine/Counter Obstacle (CM/CO) is a two phased approach, near term and far term solutions. The near term approach for CM/CO is JDAM Assault Breaching System (JABS) and ABS Tactical Decision Aid and this effort has been completed. The far term solution is CMS, which transitioned from ONR in 2nd QTR 07 followed by MS B decision in 3rd QTR 07 and SD&D contract in 4th QTR 08.

Intelligence/Surveillance/Reconnaissance/Targeting (ISR/T) - COBRA Block I achieved MS C in 3rd QTR FY09. COBRA Block II technology will transfer from ONR and achieve MS B in 1st QTR FY10. COBRA Block III technology will transition in FY12 with a MS B decision scheduled for 4th QTR FY15.

Precision Navigation/Virtual Marking - The navigation upgrades for the Landing Craft, Air Cushion (LCAC) and Landing Craft, Utility (LCU) are in progress. AAV enhancements will be achieved through an ECP (PMA AAV (Marine Corps)) in 4th QTR FY10.

E. Performance Metrics

Successful COBRA integration, flight tests and Operational Assessment (OA) into the Verticle Take-off Unmanned Arial Vehicle (VTUAV). CMS successful design analysis with the down selection of the dart.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603502N: *Surface & Shallow Water MCM*	PROJECT 2131: *Assault Breaching System*	

Product Development ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Primary Hardware Dev, COBRA	WR	NORTHRUP GRUMMAN MELBOURNE, FL	101.700	6.893	Feb 2010	4.669	Feb 2011	0.000		4.669	0.000	113.262	Continuing
Primary Hardware Dev, CMS	WR	Unknown Not Specified	32.660	5.041	Feb 2010	13.487	Feb 2011	0.000		13.487	0.000	51.188	Continuing
Ancillary Hardware Dev, JABS	WR	Unknown Not Specified	9.222	0.000		0.000		0.000		0.000	0.000	9.222	Continuing
Systems Engineering, COBRA	WR	NSWC, PC PANAMA CITY, FL	12.460	4.823	Nov 2009	3.577	Nov 2010	0.000		3.577	0.000	20.860	Continuing
Software Dev, COBRA	WR	NAVAIR SAN DIEGO, CA	9.646	3.212	Nov 2009	0.100	Nov 2010	0.000		0.100	0.000	12.958	Continuing
Systems Engineering, CMS	WR	NSWC, IH INDIAN HEAD, MD	22.069	1.824	Nov 2009	1.603	Nov 2010	0.000		1.603	0.000	25.496	Continuing
Training Dev, COBRA	WR	NSWC, IH NDIAN HEAD, MD	4.368	0.848	Nov 2009	0.745	Nov 2010	0.000		0.745	0.000	5.961	Continuing
Tooling	WR	NSWC, IH NDIAN HEAD, MD	0.860	0.000		0.000		0.000		0.000	0.000	0.860	Continuing
ABS IPT/Test Assets/ Proj Eng	WR	NSWC, IH NDIAN HEAD, MD	6.117	0.361	Nov 2009	0.317	Nov 2010	0.000		0.317	0.000	6.795	Continuing
Precision Navigation & Marking	WR	NSWC, IH	2.485	1.307	Nov 2009	1.149	Nov 2010	0.000		1.149	0.000	4.941	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603502N: *Surface & Shallow Water MCM*	PROJECT 2131: *Assault Breaching System*	

Product Development ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
		NDIAN HEAD, MD											
		Subtotal	201.587	24.309		25.647		0.000		25.647	0.000	251.543	

Remarks

Support ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Development Support Equipment	WR	NSWC, PC PANAMA CITY, FL	14.199	0.753	Nov 2009	0.662	Nov 2010	0.000		0.662	0.000	15.614	Continuing
Software Development	WR	NSWC, PC PANAMA CITY, FL	8.037	0.000		0.000		0.000		0.000	0.000	8.037	Continuing
Integrated Logistics Support	WR	NSWC, IH NDIAN HEAD, MD	2.712	0.000		0.000		0.000		0.000	0.000	2.712	Continuing
Configuration Management	WR	NSWC, PC PANAMA CITY, FL	3.744	0.000		0.000		0.000		0.000	0.000	3.744	Continuing
Technical Data	WR	NSWC, PC	2.588	0.000		0.000		0.000		0.000	0.000	2.588	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603502N: *Surface & Shallow Water MCM*	PROJECT 2131: *Assault Breaching System*

Support ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
		PANAMA CITY, FL											
Studies & Analysis	WR	NSWC, PC PANAMA CITY, FL	4.580	0.208	Nov 2009	0.182	Nov 2010	0.000		0.182	0.000	4.970	Continuing
GFE	WR	NSWC, PC PANAMA CITY, FL	0.400	0.000		0.000		0.000		0.000	0.000	0.400	Continuing
		Subtotal	36.260	0.961		0.844		0.000		0.844	0.000	38.065	

Remarks

Test and Evaluation ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Development Test & Evaluation	WR	NSWC, IH NDIAN HEAD, MD	30.159	0.167	Nov 2009	0.147	Nov 2010	0.000		0.147	0.000	30.473	Continuing
Operational Test & Evaluation	WR	NSWC/ IH, PC NDIAN HEAD, PANAMA CITY	8.655	0.000		0.000		0.000		0.000	0.000	8.655	Continuing
Tooling	WR	NSWC/ IH, PC	0.700	0.000		0.000		0.000		0.000	0.000	0.700	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603502N: *Surface & Shallow Water MCM*	PROJECT 2131: *Assault Breaching System*

Test and Evaluation ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
		NDIAN HEAD, PANAMA CITY											
GFE	WR	NSWC/ IH, PC NDIAN HEAD, PANAMA CITY	0.400	0.000		0.000		0.000		0.000	0.000	0.400	Continuing
		Subtotal	39.914	0.167		0.147		0.000		0.147	0.000	40.228	

Remarks

Management Services ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Contractor Engineering Support	C/CPFF	CACI, Norhtrup Grumman DC, FL	7.321	1.122	Nov 2009	0.912	Nov 2010	0.000		0.912	0.000	9.355	Continuing
Government Engineering Support	WR	NSWC, IH NDIAN HEAD, MD	28.201	2.094	Nov 2009	1.840	Nov 2010	0.000		1.840	0.000	32.135	Continuing
Program Management Support	WR	NSWC/ IH, PC NDIAN HEAD, PANAMA CITY	19.904	2.090	Nov 2009	1.781	Nov 2010	0.000		1.781	0.000	23.775	Continuing
Travel	WR	NAVSEA	1.213	0.000		0.074	Nov 2010	0.000		0.074	0.000	1.287	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603502N: *Surface & Shallow Water MCM*	PROJECT 2131: *Assault Breaching System*

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	FY 2010 Cost	FY 2010 Award Date	FY 2011 Base Cost	FY 2011 Base Award Date	FY 2011 OCO Cost	FY 2011 OCO Award Date	FY 2011 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
		WNY, DC											
Assessment/BTR	C/Various	VARIOUS VARIOUS	1.434	0.000		0.000		0.000		0.000	0.000	1.434	Continuing
Acquisition Workforce	Various/ Various	VARIOUS VARIOUS	0.211	0.000		0.000		0.000		0.000	0.000	0.211	Continuing
		Subtotal	58.284	5.306		4.607		0.000		4.607	0.000	68.197	

Remarks

	Total Prior Years Cost	FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	336.045	30.743		31.245		0.000		31.245	0.000	398.033	

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603502N: *Surface & Shallow Water MCM*	PROJECT 2131: *Assault Breaching System*

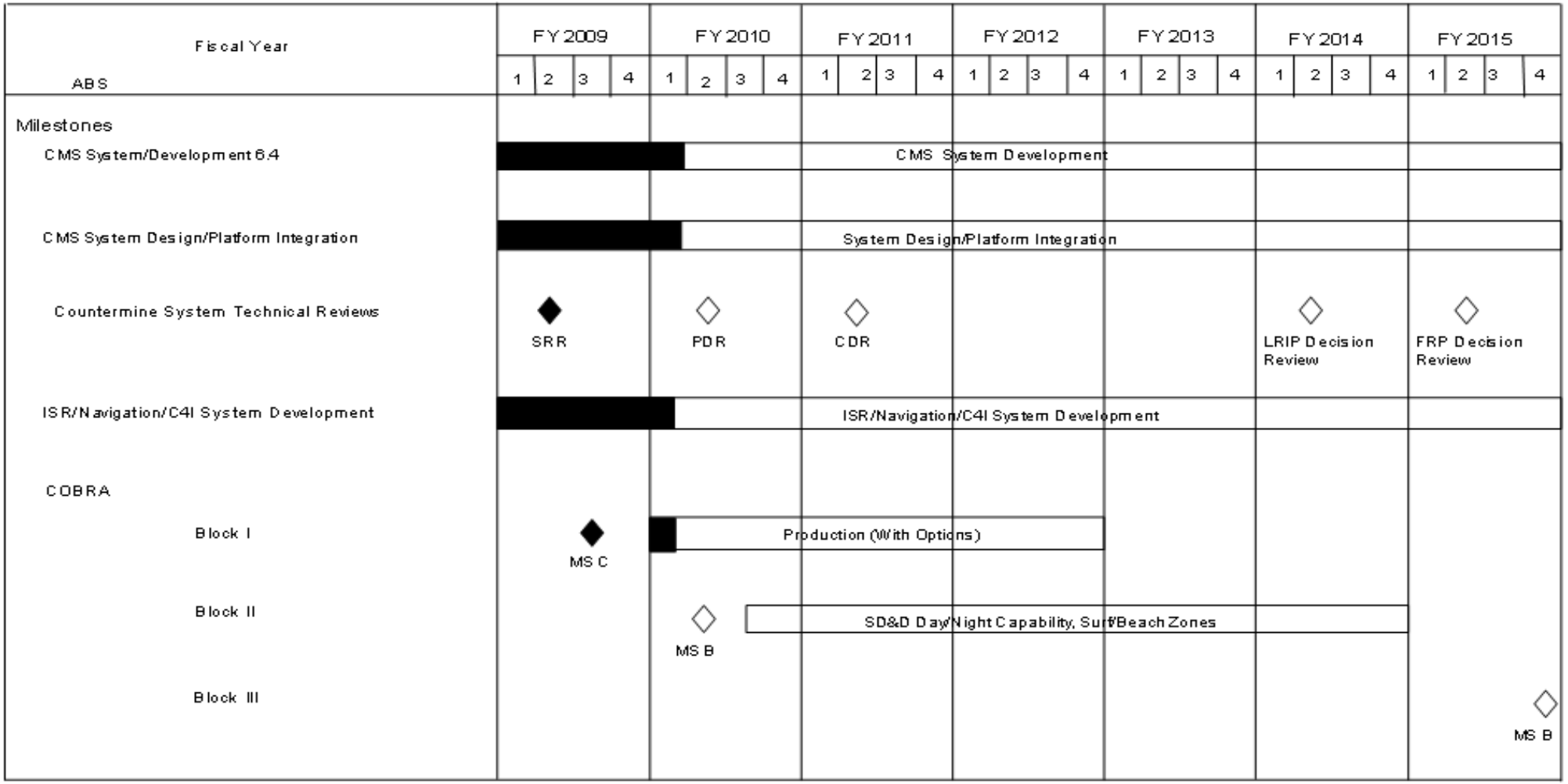

Exhibit R-4A, RDT&E Schedule Details: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603502N: *Surface & Shallow Water MCM*	**PROJECT** 2131: *Assault Breaching System*

Schedule Details

	Start		End	
Event	**Quarter**	**Year**	**Quarter**	**Year**
CMS System Development 6.4	1	2009	4	2015
CMS System Design/Platform Integration	1	2009	4	2015
SRR - System Requirements Review	2	2009	2	2009
PDR - Preliminary Design Review	2	2010	2	2010
CDR - Critical Design Review	2	2011	2	2011
LRIP Decision Review	2	2014	2	2014
FRP Decision Review	2	2015	2	2015
ISR/Navigation/C4I System Development	1	2009	4	2015
COBRA Block I Milestone MS C	3	2009	3	2009
COBRA Block I Production (With Options)	1	2010	4	2012
COBRA Block II Milestone B	2	2010	2	2010
COBRA Block II SD&D	2	2010	4	2014
COBRA Block III Milestone B	4	2015	4	2015

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603502N: *Surface & Shallow Water MCM*	PROJECT 3123: *SMCM UUV*	

COST ($ in Millions)	FY 2009 Actual	FY 2010 Estimate	FY 2011 Base Estimate	FY 2011 OCO Estimate	FY 2011 Total Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
3123: *SMCM UUV*	3.389	15.525	12.732	0.000	12.732	18.131	10.810	7.431	2.721	Continuing	Continuing
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0		

A. Mission Description and Budget Item Justification

The Surface Mine Countermeasure Unmanned Undersea Vehicle (SMCM UUV) procures Unmanned Underwater Vehicles to support dedicated mine countermeasure operations, including buried mine detection. Equipment includes vehicles and associated systems support equipment. Potential P3I candidates include communications upgrades, on-board sonar processing and target recognition, command and control improvements, and other smaller tasks.

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
ACQUISITION WORKFORCE: *FY 2009 Accomplishments:* Funded DoD Acquisition Workforce Fund.	0.047	0.000	0.000	0.000	0.000
SMCM UUV *FY 2009 Accomplishments:* Prepare for Milestone B and development contract award. LFBB development continues in FY09. *FY 2010 Plans:* Milestone B. Development contract award. Preliminary Design Review (PDR), Critical Design Review (CDR) preparation. *FY 2011 Base Plans:* Critical Design Review and vehicle fabrication.	3.342	15.525	12.732	0.000	12.732
Accomplishments/Planned Programs Subtotals	3.389	15.525	12.732	0.000	12.732

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603502N: *Surface & Shallow Water MCM*	PROJECT 3123: *SMCM UUV*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total	FY 2012	FY 2013	FY 2014	FY 2015	Cost To Complete	Total Cost
• OPN/2622: *Minesweeping Sys Replacement, LV079*	0.000	0.000	0.000	0.000	0.000	0.000	21.165	24.710	29.450	0.000	75.325
• OPN/1600: *LCS MODULES, LM001*	0.000	0.000	0.000	0.000	0.000	0.000	10.000	10.200	20.810	0.000	41.010

D. Acquisition Strategy

An acquisition program will be initiated in FY09 to develop Surface Mine Countermeasure Unmanned Undersea Vehicles (SMCM UUV) equipped with Low Frequency Broadband (LFBB) sonar that provides buried mine detection capability. Initial procurement of the SMCM UUV with LFBB begins in FY13.

E. Performance Metrics

Successful Milestone C in Q4 FY13.
Reach Full Rate Production Decision in Q4 FY14.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603502N: *Surface & Shallow Water MCM*	PROJECT 3123: *SMCM UUV*

Product Development ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
SMCM UOES Development	C/CPAF	BLUEFIN CAMBRIDGE, MA	13.644	0.600	Dec 2009	0.605	Dec 2010	0.000		0.605	Continuing	Continuing	Continuing
SMCM UUV Development	C/CPIF	TBD Not Specified	9.334	10.121	May 2010	8.302	Dec 2010	0.000		8.302	Continuing	Continuing	Continuing
Software Development	WR	NSWC, PC PANAMA CITY, FL	0.805	0.000		0.000		0.000		0.000	Continuing	Continuing	Continuing
		Subtotal	23.783	10.721		8.907		0.000		8.907			

Remarks

Support ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Engineering Support 1	WR	NSWC, PC PANAMA CITY, FL	3.674	2.612	Dec 2009	1.572	Dec 2010	0.000		1.572	Continuing	Continuing	Continuing
Engineering Support 2	WR	NUWC, Newport NEWPORT, RI	0.763	0.839	Dec 2009	0.827	Dec 2010	0.000		0.827	Continuing	Continuing	Continuing
Engineering Support 3	WR	VARIOUS VARIOUS	0.080	0.728	Dec 2009	0.788	Dec 2010	0.000		0.788	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603502N: *Surface & Shallow Water MCM*	PROJECT 3123: *SMCM UUV*	

Support ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
		Subtotal	4.517	4.179		3.187		0.000		3.187			

Remarks

Test and Evaluation ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation	WR	NOMWC STENNIS, MI	0.247	0.066	Dec 2009	0.068	Dec 2010	0.000		0.068	Continuing	Continuing	Continuing
Government T&E Support	WR	VARIOUS VARIOUS	0.583	0.192	Dec 2009	0.197	Dec 2010	0.000		0.197	Continuing	Continuing	Continuing
Test and Evaluation	WR	COMOPTEVFOR NORFOLK, VA	0.085	0.056	Dec 2009	0.057	Dec 2010	0.000		0.057	Continuing	Continuing	Continuing
		Subtotal	0.915	0.314		0.322		0.000		0.322			

Remarks

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603502N: *Surface & Shallow Water MCM*	PROJECT 3123: *SMCM UUV*

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	FY 2010 Cost	FY 2010 Award Date	FY 2011 Base Cost	FY 2011 Base Award Date	FY 2011 OCO Cost	FY 2011 OCO Award Date	FY 2011 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Support	C/CPFF	VARIOUS WASHINGTON, DC	0.532	0.261	Dec 2009	0.266	Dec 2010	0.000		0.266	Continuing	Continuing	Continuing
Travel	WR	NAVSEA WNY, DC	0.050	0.050	Nov 2009	0.050	Nov 2010	0.000		0.050	Continuing	Continuing	Continuing
Acquisition Workforce	Various/ Various	VARIOUS VARIOUS	0.047	0.000		0.000		0.000		0.000	0.000	0.047	Continuing
		Subtotal	0.629	0.311		0.316		0.000		0.316			

Remarks

	Total Prior Years Cost	FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	29.844	15.525		12.732		0.000		12.732			

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603502N: *Surface & Shallow Water MCM*	**PROJECT** 3123: *SMCM UUV*

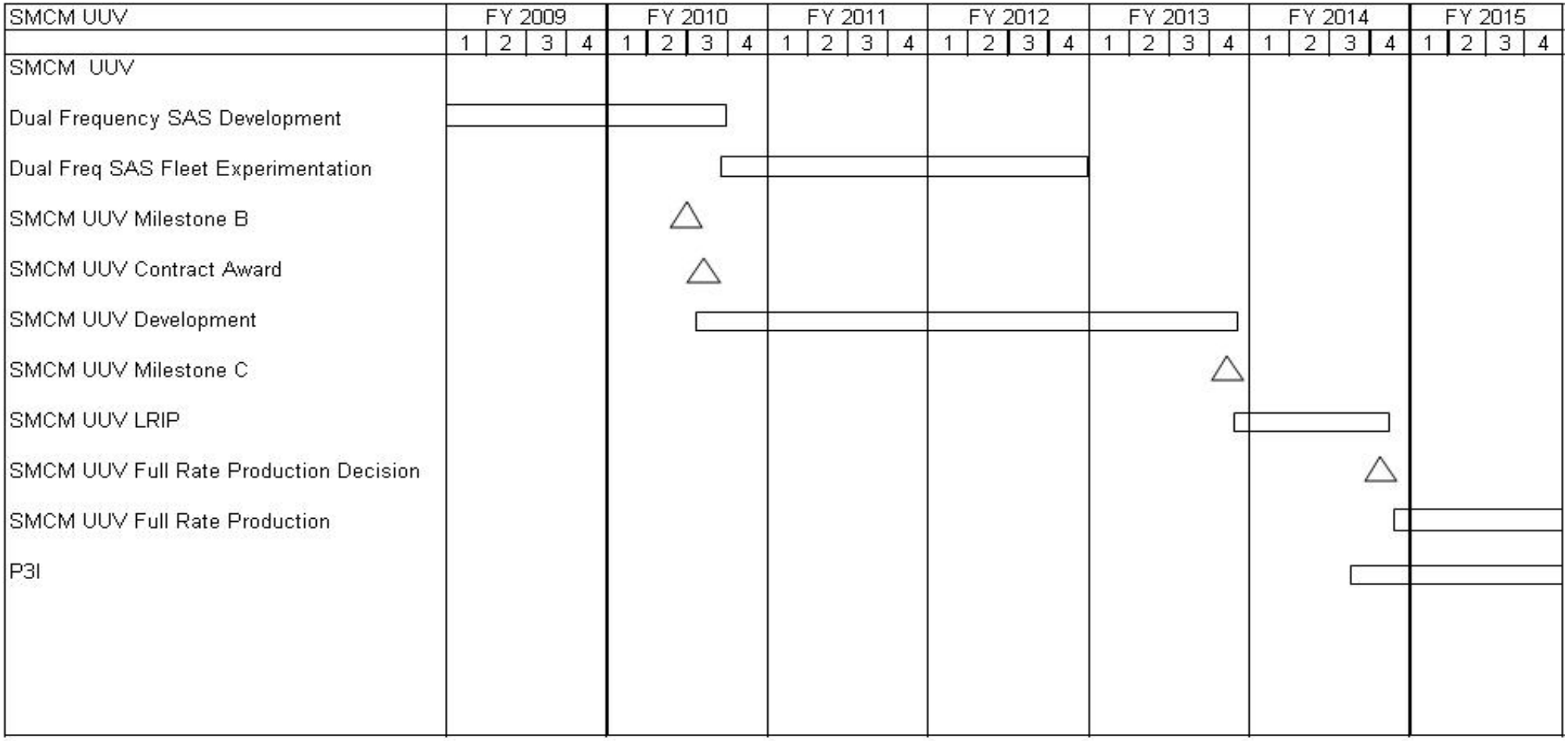

Exhibit R-4A, RDT&E Schedule Details: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603502N: *Surface & Shallow Water MCM*	**PROJECT** 3123: *SMCM UUV*

Schedule Details

	Start		End	
Event	**Quarter**	**Year**	**Quarter**	**Year**
Dual Frequency SAS Development	1	2009	3	2010
Dual Frequency SAS Fleet Experimentation	3	2010	4	2012
SMCM UUV Milestone B	3	2010	3	2010
SMCM UUV Contract Award	3	2010	3	2010
SMCM UUV/SMCM Development	3	2010	4	2013
SMCM UUV Milestone C	4	2013	4	2013
SMCM UUV LRIP	4	2013	4	2014
SMCM UUV Full Rate Production Decision	4	2014	4	2014
SMCM UUV Full Rate Production	4	2014	4	2015
P3I	3	2014	4	2015

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603502N: *Surface & Shallow Water MCM*	PROJECT 4025: *Expendable Mine Neutralization System*	

COST ($ in Millions)	FY 2009 Actual	FY 2010 Estimate	FY 2011 Base Estimate	FY 2011 OCO Estimate	FY 2011 Total Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
4025: *Expendable Mine Neutralization System*	6.908	2.846	4.200	0.000	4.200	0.000	4.805	4.778	0.000	0.000	53.103
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0		

A. Mission Description and Budget Item Justification

Expendable Mine Neutralization System (EMNS) is a replacement to the existing AN/SLQ-48 Mine Neutralization System (MNS). The current program replaces the MNS with EMNS on the 14 MCM Avenger Class Ships. EMNS will leverage off of on-going efforts in the Airborne Mine Countermeasures Program to develop an Airborne Mine Neutralization System (AMNS).

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
ACQUISITION WORKFORCE FUND *FY 2009 Accomplishments:* Funded DoD Acquisition Workforce Fund.	0.034	0.000	0.000	0.000	0.000
Hardware/Software Development *FY 2009 Accomplishments:* Award Development Contract for Expendable Mine Neutralization System (EMNS) integrator. Initiate hardware design and development to include launcher, control console, and MCM-1 Class ship integration. Modify software for use on an MCM-1 class ship. Integrate EMNS Engineering Development Model (EDM) aboard MCM-1 Class Ship. Award contract for Common Neutralizer support. Provide test articles and technical support throughout EMNS development.	1.110	0.407	0.000	0.000	0.000

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603502N: *Surface & Shallow Water MCM*	PROJECT 4025: *Expendable Mine Neutralization System*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
FY 2010 Plans: Award Development Contract for Expendable Mine Neutralization System (EMNS) integrator. Initiate hardware design and development to include launcher, control console, and MCM-1 Class ship integration. Modify software for use on an MCM-1 class ship. Integrate EMNS Engineering Development Model (EDM) aboard MCM-1 Class Ship. Award contract for Common Neutralizer support. Provide test articles and technical support throughout EMNS development.					
Engineering Development *FY 2009 Accomplishments:* Develop logistics products, including training materials and interactive technical manual. Provide Engineering support, including review for product development and ship integration. *FY 2010 Plans:* Develop logistics products, including training materials and interactive technical manual. Provide Engineering support, including review for product development and ship integration. *FY 2011 Base Plans:* Provide Engineering support, including review for product development, ship integration and OT engineering support.	3.103	1.188	1.973	0.000	1.973
Test Events *FY 2009 Accomplishments:* EMNS developmental testing including environmental and shock testing, safety testing, and contractor testing. Develop Test and Evaluation Master Plan (TEMP) and test reports. Conduct DT/OT. *FY 2010 Plans:* EMNS developmental testing including environmental and shock testing, safety testing, and contractor testing. Develop Test and Evaluation Master Plan (TEMP) and test reports. Conduct DT.	2.525	0.862	1.832	0.000	1.832

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603502N: *Surface & Shallow Water MCM*	PROJECT 4025: *Expendable Mine Neutralization System*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
FY 2011 Base Plans: EMNS operational testing including environmental and shock testing, safety testing and test reports. Conduct OT.					
Management *FY 2009 Accomplishments:* Provide program management support and travel for EMNS. *FY 2010 Plans:* Provide program management support and travel for EMNS. *FY 2011 Base Plans:* Provide program management support and travel for EMNS.	0.136	0.389	0.395	0.000	0.395
Accomplishments/Planned Programs Subtotals	6.908	2.846	4.200	0.000	4.200

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total	FY 2012	FY 2013	FY 2014	FY 2015	Cost To Complete	Total Cost
• OPN/2622: *MINESWEEPING SYS REPLACEMENT, LV076 (EMNS)*	7.218	6.300	12.423	0.000	12.423	12.258	0.000	0.000	0.000	0.000	38.199
• WPN/4225: *AIRBORNE MCM, am080 (EMNS)*	0.000	7.832	4.071	0.000	4.071	8.521	14.194	0.000	0.000	0.000	34.618

D. Acquisition Strategy

Based on the approved Common Neutralizer Strategy, the Archerfish neutralizer will be integrated on the MCM-1 Avenger Class Ships. The acquisition strategy will be full and open competition for non-neutralizer hardware development and system integration with a directed contractual relationship with VCT (flight control software).

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603502N: *Surface & Shallow Water MCM*	PROJECT 4025: *Expendable Mine Neutralization System*

The Navy awarded a sole source contract to BAE Systems for Common Neutralizer support, integration, and hardware manufacturing/delivery. All EMNS neutralizer equipment and support will be provided by BAE Systems to the Navy. The Navy will provide these assets as GFE to the integration contractor.

E. Performance Metrics

Successfully complete DT and OT and receive FRPD in FY11.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603502N: *Surface & Shallow Water MCM*	PROJECT 4025: *Expendable Mine Neutralization System*

Product Development ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Develop Technical and Aquisition Documentation	WR	NSWC, PC Panama City, FL	1.649	0.407	Nov 2009	0.000		0.000		0.000	0.000	2.056	Continuing
Hardware/Software Development	C/CPIF	Lockheed Martin Syracuse, NY	10.185	0.000		0.000		0.000		0.000	0.000	10.185	Continuing
Common Neutralizer Development	C/CPIF	Raytheon Portsmouth, RI	2.431	0.000		0.000		0.000		0.000	0.000	2.431	Continuing
Deep Water Neutralizer Development	WR	NSWC, PC Panama City, FL	0.000	0.000	Oct 2009	0.000		0.000		0.000	0.300	0.300	Continuing
Deep Water Neutralizer Development	C/CPIF	BAE Systems Not Specified	0.000	0.000	Oct 2009	0.000		0.000		0.000	3.000	3.000	Continuing
		Subtotal	14.265	0.407		0.000		0.000		0.000	3.300	17.972	

Remarks

Support ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Develop Logistics Products	C/CPIF	Lockheed Martin Syracuse, NY	2.641	0.000		0.437	Nov 2010	0.000		0.437	0.000	3.078	Continuing
Develop Logistics Products	WR	NSWC Not Specified	0.966	0.000		0.236	Nov 2010	0.000		0.236	0.000	1.202	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603502N: *Surface & Shallow Water MCM*	PROJECT 4025: *Expendable Mine Neutralization System*

Support ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Engineering Support	C/CPIF	Lockheed Martin Syracuse, NY	2.444	0.230		0.548	Nov 2010	0.000		0.548	0.000	3.222	Continuing
Engineering Support	C/CPIF	NSWC Not Specified	6.498	0.958		0.752	Nov 2010	0.000		0.752	0.000	8.208	Continuing
Deep Water Neutralizr ILS	C/CPIF	BAE Systems Not Specified	0.000	0.000		0.000		0.000		0.000	0.252	0.252	Continuing
Deep Water Neutralizr ILS	C/FP	NSWC, PC Panama, City	0.000	0.000		0.000		0.000		0.000	0.186	0.186	Continuing
Deep Water Neutralizer Engineering	C/CPIF	BAE Systems Not Specified	0.000	0.000		0.000		0.000		0.000	2.200	2.200	Continuing
Deep Water Neutralizer Engineering	WR	NSWC, PC Panama, City	0.000	0.000		0.000		0.000		0.000	0.860	0.860	Continuing
		Subtotal	12.549	1.188		1.973		0.000		1.973	3.498	19.208	

Remarks

Test and Evaluation ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Develop TEMP	WR	NSWC, PC Panama City, FL	0.100	0.000		0.000		0.000		0.000	0.000	0.100	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603502N: *Surface & Shallow Water MCM*	PROJECT 4025: *Expendable Mine Neutralization System*

Test and Evaluation ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
CT/DT	C/CPIF	Lockheed Martin Syracuse, NY	1.272	0.000		0.000		0.000		0.000	0.000	1.272	Continuing
CT/DT	WR	NSWC, PC Panama City, FL	1.272	0.000		0.000		0.000		0.000	0.000	1.272	Continuing
Operational Test & Evaluation	WR	COTF Norfolk, VA	0.000	0.862		1.832	Oct 2010	0.000		1.832	0.000	2.694	Continuing
Common Neutralizer Testing	C/CPIF	Raytheon Portsmouth, RI	0.000	0.000		0.000		0.000		0.000	0.000	0.000	Continuing
Common Neutralizer Test Sets	C/CPIF	Raytheon Portsmouth, RI	0.000	0.000		0.000		0.000		0.000	0.000	0.000	Continuing
Deep Water Neutralizer T&E	C/CPIF	BAE System Not Specified	0.000	0.000		0.000		0.000		0.000	0.995	0.995	Continuing
Deep Water Neutralizer T&E	WR	NSWC, PC Panama City, FL	0.000	0.000		0.000		0.000		0.000	2.295	2.295	Continuing
		Subtotal	2.644	0.862		1.832		0.000		1.832	3.290	8.628	

Remarks

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603502N: *Surface & Shallow Water MCM*	PROJECT 4025: *Expendable Mine Neutralization System*

Management Services ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Support	C/CPFF	CACI Arlington, VA	0.967	0.349	Oct 2009	0.355	Nov 2010	0.000		0.355	0.000	1.671	Continuing
Travel	WR	NAVSEA Washington, DC	0.210	0.040	Oct 2009	0.040	Nov 2010	0.000		0.040	0.000	0.290	Continuing
		Subtotal	1.177	0.389		0.395		0.000		0.395	0.000	1.961	

Remarks

	Total Prior Years Cost	FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	30.635	2.846		4.200		0.000		4.200	10.088	47.769	

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2011 Navy		**DATE:** February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603502N: *Surface & Shallow Water MCM*	**PROJECT** 4025: *Expendable Mine Neutralization System*

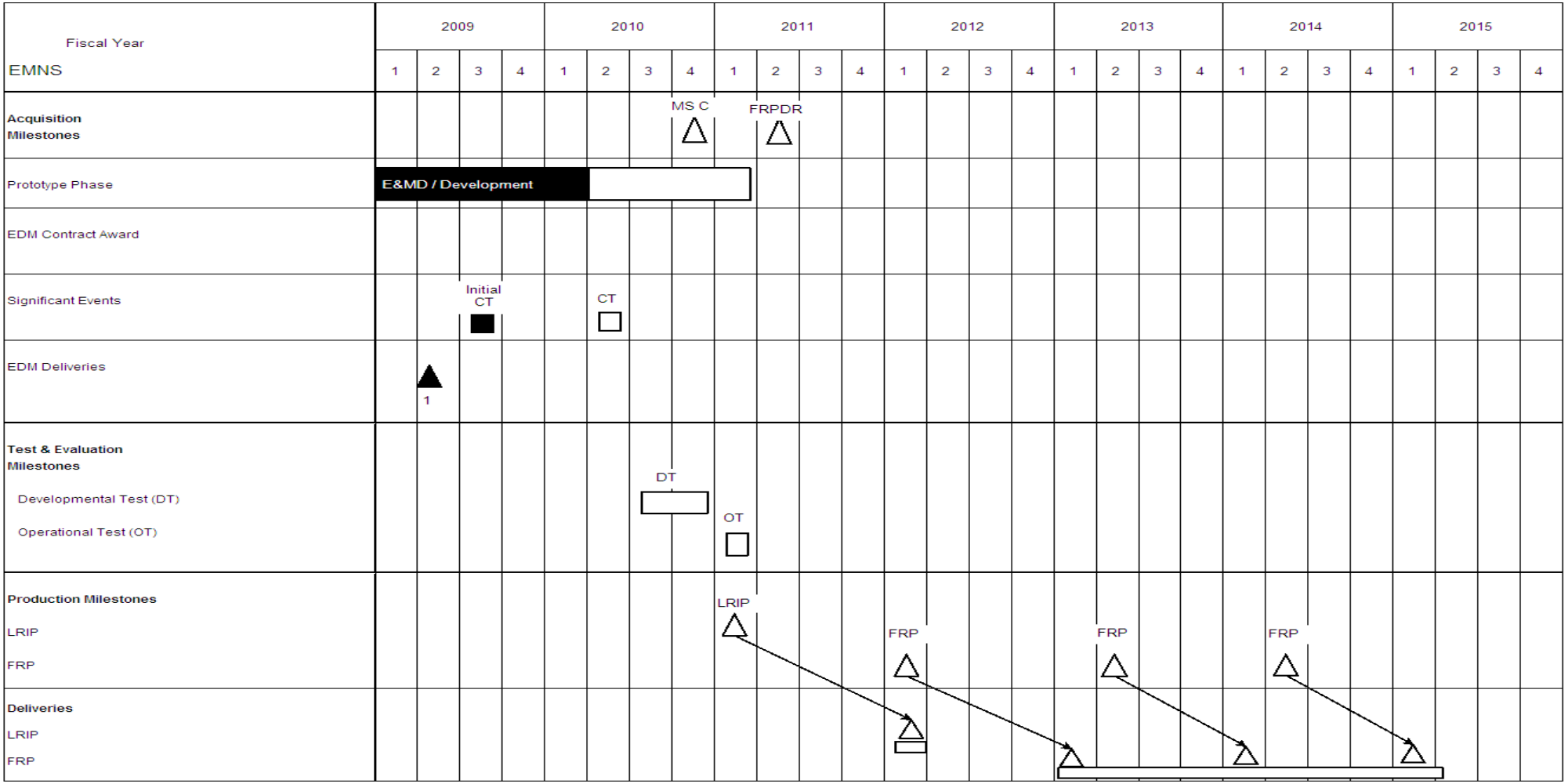

Exhibit R-4A, RDT&E Schedule Details: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603502N: *Surface & Shallow Water MCM*	**PROJECT** 4025: *Expendable Mine Neutralization System*

Schedule Details

	Start		End	
Event	**Quarter**	**Year**	**Quarter**	**Year**
Integration Development	1	2009	1	2011
EDM Deliveries	2	2009	2	2009
Contractor Testing	3	2009	3	2009
Contractor Testing (Continue)	2	2010	2	2010
Milestone C	4	2010	4	2010
LRIP Start	1	2011	1	2011
Developmental Testing DT	3	2010	4	2010
Operational Testing OT	1	2011	1	2011
FDR/PDR	2	2011	2	2011
FRP Start	1	2012	1	2012

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603502N: *Surface & Shallow Water MCM*	PROJECT 9999: *Congressional Adds*	

COST ($ in Millions)	FY 2009 Actual	FY 2010 Estimate	FY 2011 Base Estimate	FY 2011 OCO Estimate	FY 2011 Total Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
9999: *Congressional Adds*	7.179	15.934	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	30.517
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0		

A. Mission Description and Budget Item Justification

Congressional interest

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010
Congressional Add: RMS Prog - Cong *FY 2010 Plans:* Congressional Add to continue development of the Remote Minehunting System (RMS) during the RMS reliability growth program.	0.000	7.967
Congressional Add: Persistent Autonomous Maritime Surveillance *FY 2010 Plans:* Congressional Add to develop prototype for a persistant maritime surveillance system, and demonstrate technology feasibility for fleet applications.	0.000	4.979
Congressional Add: Mine Hunting Sonar Prog - Cong	0.000	2.988

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603502N: *Surface & Shallow Water MCM*	PROJECT 9999: *Congressional Adds*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010
FY 2010 Plans: Congressional Add to upgrade AN/SQQ-32(V)3 Classification Sonar, and to provide detection transducer development, design and quality sonar operator equipment consoles applicable to High Frequency Wide Band.		
Congressional Add: Unmannned Undersea Vehicles Near Term Interim Capa *FY 2009 Accomplishments:* Congressional Add to develop interim UUV capability, with common and modular architecture, to the Submarine Force and Surface Fleet that would allow for the development of CONOPS, and Training Tactics.	3.988	0.000
Congressional Add: AN/SQQ-32 Mine Hunting Sonar Upgrade *FY 2009 Accomplishments:* Congressional Add to upgrade AN/SQQ-32(V)3 Classification Sonar, and to provide detection transducer development, design and quality sonar operator equipment consoles applicable to High Frequency Wide Band.	3.191	0.000
Congressional Adds Subtotals	7.179	15.934

C. Other Program Funding Summary ($ in Millions)

N/A

D. Acquisition Strategy

congressional add

E. Performance Metrics

congressional add

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603502N: *Surface & Shallow Water MCM*	PROJECT 9999: *Congressional Adds*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	FY 2010 Cost	FY 2010 Award Date	FY 2011 Base Cost	FY 2011 Base Award Date	FY 2011 OCO Cost	FY 2011 OCO Award Date	FY 2011 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
RMS Congressional Add	C/FP	Not Specified Not Specified	0.000	7.967		0.000		0.000		0.000	0.000	7.967	Continuing
MAritime Autonomous	C/FP	Not Specified Not Specified	0.000	4.979		0.000		0.000		0.000	0.000	4.979	Continuing
HFWB Q-32	C/FP	Not Specified Not Specified	0.000	2.988		0.000		0.000		0.000	0.000	2.988	Continuing
		Subtotal	0.000	15.934		0.000		0.000		0.000	0.000	15.934	

Remarks

	Total Prior Years Cost	FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	15.934		0.000		0.000		0.000	0.000	15.934	

Remarks

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Exhibit R-2, RDT&E Budget Item Justification: PB 2011 Navy										DATE: February 2010	
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*				R-1 ITEM NOMENCLATURE PE 0603506N: *Surface Ship Torpedo Defense*							
COST ($ in Millions)	**FY 2009 Actual**	**FY 2010 Estimate**	**FY 2011 Base Estimate**	**FY 2011 OCO Estimate**	**FY 2011 Total Estimate**	**FY 2012 Estimate**	**FY 2013 Estimate**	**FY 2014 Estimate**	**FY 2015 Estimate**	**Cost To Complete**	**Total Cost**
Total Program Element	48.215	67.257	57.796	0.000	57.796	60.842	51.937	43.003	32.091	Continuing	Continuing
0225: *Surface Ship Torpedo Defense (SSTD)*	45.662	57.299	57.796	0.000	57.796	60.842	51.937	43.003	32.091	Continuing	Continuing
9999: *Congressional Adds*	2.553	9.958	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	45.729

A. Mission Description and Budget Item Justification

The Surface Ship Torpedo Defense (STTD), Project 0225, develops a detect to engage hardkill torpedo defense system called the Anti-Torpedo Torpedo Defense System (ATTDS) as specified in the Draft ATTDS Capability Development Document (CDD). This program uses an evolutionary acquisition strategy of providing incremental surface ship torpedo defense
capability by implementing first on Cruisers and Destroyers (CRUDES) already equipped with sonar systems, fire control systems and launchers.
At-sea demonstrations of the Torpedo Detection Classification and Localization (TDCL) systems conducted FY06 through FY09 led to a CRUDES TDCL draft system specification in FY09.
At sea testing of the EDM-1 design of the Anti-Torpedo Torpedo (ATT) variant of the Common Very Lightweight Torpedo (CVLWT) in FY07 through FY09 facilitates completion of the EDM-2 design in FY10. The ATT will be shipped, stowed and launched from an all up round canister known as the Countermeasure Anti-Torpedo (CAT).
In FY10, an EDM of the CRUDES ship systems will be developed. The systems will include, a command and control system with user interface, a modified Surface Vessel Torpedo Tube launcher, and a canistered ATT. The TDCL system will utilize a sensor set added to the AN/SLQ-25 (NIXIE) System, processing in the AN/SQQ-89, as well as the hull mounted sonar already employed on these ships. The development of the ATT is the first derivative of the CVLWT as an acquisition program. The CAT and the TDCL development are closely linked with the ONR Sea Shield Future Naval Capability (FNC) programs that provide advanced technology inserts at key transition points.

FY09 Congressional Add-Project 9D21A: Develop the Open Architecture (OA) supportability processes, methods, and tools required to facilitate the real-time capture and cataloging of sailor training, performance, and vocational skills data.

FY09 Congressional Add-Project 9D22A: Expand technology development of mobile countermeasures used for Surface Ship Torpedo Defense including device engineering, fabrication and testing capabilities to assess the effectiveness of Next Generation (mobile) Countermeasures.

Exhibit R-2, RDT&E Budget Item Justification: PB 2011 Navy	DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603506N: *Surface Ship Torpedo Defense*

FY10 Congressional Add-Project 10C097, Continuous Active Sonar for Torpedo DCL Systems: Adapt Continuous Active Sonar (CAS) and other active and passive sonar technologies that have proved very effective for active ASW applications, to improve TDCL capabilities and extend ATTDS coverage against most stressing emergent threats.

FY10 Congressional Add-Project 10C096, AN/SLQ-25D Integration: Provide integration of the SLQ-25D countermeasure system with the Anti-Torpedo Torpedo Defense System. This integration includes development of interfaces with Ship's Sonar and Fire Control systems, as well as integration with new towed sensors and integration with the ship itself.

B. Program Change Summary ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
Previous President's Budget	51.545	57.538	0.000	0.000	0.000
Current President's Budget	48.215	67.257	57.796	0.000	57.796
Total Adjustments	-3.330	9.719	57.796	0.000	57.796
• Congressional General Reductions		-0.281			
• Congressional Directed Reductions		0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds		10.000			
• Congressional Directed Transfers		0.000			
• Reprogrammings	-2.115	0.000			
• SBIR/STTR Transfer	-1.215	0.000			
• Program Adjustments	0.000	0.000	57.796	0.000	57.796

Congressional Add Details ($ in Millions, and Includes General Reductions)	FY 2009	FY 2010
Project: 9999: *Congressional Adds*		
Congressional Add: *AN/SLQ-25D Integration*	0.000	6.373
Congressional Add: *Continuous Active Sonar for Torpedo DCL Systems*	0.000	3.585
Congressional Add: *Supportability Training Services Infrastructure*	1.596	0.000
Congressional Add: *Mobile Acoustic Decoys for Surface Ship Defense*	0.957	0.000
Congressional Add Subtotals for Project: 9999	2.553	9.958

Exhibit R-2, RDT&E Budget Item Justification: PB 2011 Navy	DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603506N: *Surface Ship Torpedo Defense*

Congressional Add Details ($ in Millions, and Includes General Reductions)	FY 2009	FY 2010
Congressional Add Totals for all Projects	2.553	9.958

Change Summary Explanation

Technical: Not applicable.
Schedule: Not applicable.

FY11 from previous President's Budget is shown as zero because no FY11-15 data was presented in President's Budget 2010.

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603506N: *Surface Ship Torpedo Defense*	PROJECT 0225: *Surface Ship Torpedo Defense (SSTD)*	

COST ($ in Millions)	FY 2009 Actual	FY 2010 Estimate	FY 2011 Base Estimate	FY 2011 OCO Estimate	FY 2011 Total Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
0225: *Surface Ship Torpedo Defense (SSTD)*	45.662	57.299	57.796	0.000	57.796	60.842	51.937	43.003	32.091	Continuing	Continuing
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0		

A. Mission Description and Budget Item Justification

Surface Ship Torpedo Defense, Project 0225, develops a detect to engage hardkill torpedo defense system called the Anti-Torpedo Torpedo Defense System (ATTDS) as specified in the Capability Development Document (CDD) for a Cruiser and Destroyer (CRUDES) based Torpedo Defense System. This development approach uses an Evolutionary Acquisition strategy of providing incremental surface ship torpedo defense capability by implementing first on ships already equipped with sonar and fire control systems and launchers.

Subsequent increments will install this capability on high value units.

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
ANTI-TORPEDO TORPEDO (ATT):	36.425	41.299	41.796	0.000	41.796
FY 2009 Accomplishments: Continue ATT EDM-2 Design. Continue ATT Launcher development. Continue CDD signature process, PLCCE/ICE, and Acquisition Program Baseline. *FY 2010 Plans:* Begin ATT EDM-2 Builds. Perform Critical Design Review (CDR). Achieve Milestone B. Complete TEMP signature process, demonstrate ATT Technology Readiness Level. *FY 2011 Base Plans:* Continue ATT EDM-2 Builds.					
SHIP SYSTEMS:	9.000	16.000	16.000	0.000	16.000

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603506N: *Surface Ship Torpedo Defense*	**PROJECT** 0225: *Surface Ship Torpedo Defense (SSTD)*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
FY 2009 Accomplishments: Conduct DDG-51 and HVU TDCL test events. Initiate Ship System EDM Design. Generate ATTDS Draft Spec. Initiate Ship System EDM Build. Complete ATT EDM-1 testing. *FY 2010 Plans:* Conduct additional DDC-51 and HVU TDCL test events. Complete Ship Systems EDM Design. Continue Ship System EDM Build. Conduct ATTDS Critical Design Review (CDR). *FY 2011 Base Plans:* Complete Ship System EDM build. Prepare for System Level Testing.					
DEFENSE ACQUISITION WORKFORCE FUND *FY 2009 Accomplishments:* Funded Defense Acquisition Workforce Fund (DAWDF)	0.237	0.000	0.000	0.000	0.000
Accomplishments/Planned Programs Subtotals	45.662	57.299	57.796	0.000	57.796

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total	FY 2012	FY 2013	FY 2014	FY 2015	Cost To Complete	Total Cost
• WPN/311300: *Surface Ship Torpedo Defense*	0.000	0.000	0.000	0.000	0.000	12.430	15.875	23.438	38.709	0.000	90.452
	20.821	10.153	2.206	0.000	2.206	8.310	18.011	19.748	19.844	0.000	99.093

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603506N: *Surface Ship Torpedo Defense*	PROJECT 0225: *Surface Ship Torpedo Defense (SSTD)*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total	FY 2012	FY 2013	FY 2014	FY 2015	Cost To Complete	Total Cost
• OPN/221300: *Surface Ship Torpedo Defense*											

D. Acquisition Strategy

The project develops Surface Ship Torpedo Defense (SSTD) capabilities using an evolutionary acquisition incremental development approach. OPN: In the FY07 - FY09 time frame, the OPN funding upgrades the existing AN/SLQ-25A to an AN/SLQ-25C NIXIE through Engineering Change Proposals (ECPs) performed by the Original Equipment Manufacture (OEM) and includes
procurement and installation. The FY10 Milestone B approves the ATTDS as a system of systems to bring a hard kill torpedo defense system to surface ships. The EDM-1 Common Very Lightweight Torpedo (CVLWT) design brings in the hard-kill component of the ATTDS. The EDM-2 design, which began in FY08 and continues through FY09 and into FY10 will develop
the Canistered ATT as a Countermeasure Anti-Torpedo (CAT). EDM-2 units to support the System Development and demonstration phase of the program will be built by Applied Research Laboratory/Penn State University (ARL/PSU).

E. Performance Metrics

Probability of kill for the ATT
Torpedo Detection Classification and Localization (TDCL) False Alert Rate
TDCL probability of correct classification
ATTDS System Availability

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603506N: *Surface Ship Torpedo Defense*	PROJECT 0225: *Surface Ship Torpedo Defense (SSTD)*

Product Development ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Systems Engineering	WR	NUWC Newport, RI	17.889	8.400	Feb 2010	8.400	Dec 2010	0.000		8.400	Continuing	Continuing	Continuing
Systems Engineering ATT Dev.	C/CPFF	PSU/ARL State College, PA	74.746	28.799	Feb 2010	29.396	Feb 2011	0.000		29.396	Continuing	Continuing	Continuing
Systems Engineering	C/CPFF	JHU/APL Baltimore , MD	1.270	0.300	Feb 2010	0.300	Feb 2011	0.000		0.300	Continuing	Continuing	Continuing
Systems Engineering Warhead Dev.	WR	NSWC Indian Head, MD	20.300	7.800	Nov 2009	9.000	Dec 2010	0.000		9.000	Continuing	Continuing	Continuing
Systems Engineering	WR	NUWC Keyport,WA	10.126	3.300	Oct 2009	4.300	Dec 2010	0.000		4.300	Continuing	Continuing	Continuing
Systems Engineering TDCL	C/CPFF	Ultra Braintree, MA	10.800	3.000	Feb 2010	3.000	Feb 2011	0.000		3.000	0.000	16.800	Continuing
Systems Engineering ATT	WR	ONR Not Specified	1.235	0.100	Jan 2010	0.100	Jan 2011	0.000		0.100	Continuing	Continuing	Continuing
Systems Engineering TDCL	C/CPFF	AAC Hauppage, NY	0.830	3.000	Feb 2010	3.000	Feb 2011	0.000		3.000	0.000	6.830	Continuing
Systems Engineering	WR	OPTEVFOR Norfolk, VA	0.273	0.150	Feb 2010	0.150	Feb 2011	0.000		0.150	Continuing	Continuing	Continuing
Systems Engineering	C/CPFF	ArgonST Manassas, VA	0.800	0.000		0.000		0.000		0.000	0.000	0.800	Continuing
Systems Engineering TDCL	WR	NSWC Dahlgren, VA	3.122	1.400	Dec 2009	0.000		0.000		0.000	0.000	4.522	Continuing
Systems Engineering TDCL	WR	SPAWAR San Diego, CA	0.225	0.075	Oct 2009	0.075	Dec 2010	0.000		0.075	0.000	0.375	Continuing
Systems Engineering	C/CPFF	UT/ARL	0.300	0.200	Jan 2010	0.000		0.000		0.000	0.000	0.500	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603506N: *Surface Ship Torpedo Defense*	PROJECT 0225: *Surface Ship Torpedo Defense (SSTD)*

Product Development ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
		Not Specified											
		Subtotal	141.916	56.524		57.721		0.000		57.721			

Remarks

Management Services ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Support	C/FFP	EG&G Gaithersburg, Md.	2.846	0.000		0.000		0.000		0.000	0.000	2.846	Continuing
DAWDF	C/TBD	Not Specified Not Specified	0.237	0.000		0.000		0.000		0.000	0.000	0.237	Continuing
Program Management Support	C/CPAF	Tech-Marine Burke, VA	0.700	0.700	Jan 2010	0.000		0.000		0.000	0.000	1.400	Continuing
Travel	C/TBD	PMS 415 Not Specified	0.335	0.075	Feb 2010	0.075	Nov 2010	0.000		0.075	0.000	0.485	Continuing
		Subtotal	4.118	0.775		0.075		0.000		0.075	0.000	4.968	

Remarks

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603506N: *Surface Ship Torpedo Defense*	PROJECT 0225: *Surface Ship Torpedo Defense (SSTD)*	

	Total Prior Years Cost	FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	146.034	57.299		57.796		0.000		57.796			

Remarks

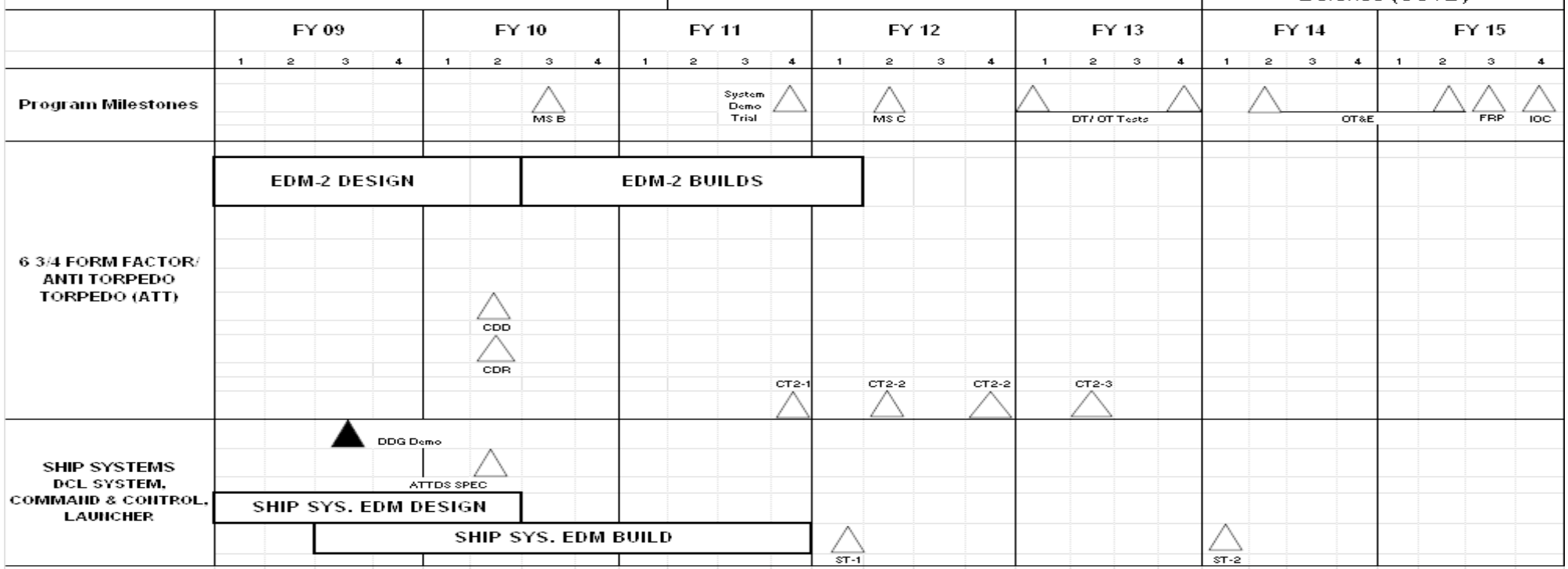
Exhibit R-4, **RDT&E Schedule Profile:** PB 2011 Navy		**DATE:** February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603506N: *Surface Ship Torpedo Defense*	**PROJECT** 0225: *Surface Ship Torpedo Defense (SSTD)*

CLASSIFICATION: UNCLASSIFIED

EXHIBIT R-4, SCHEDULE PROFILE (page 1)

DATE: February 2010

APPROPRIATION/ BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND NAME
RDTEN/ BA 4	0603506N/ SURFACE SHIP TORPEDO DEFENSE	0225/Surface Ship Torpedo Defense (SSTD)



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CLASSIFICATION: UNCLASSIFIED

EXHIBIT R-4 SCHEDULE PROFILE

Exhibit R-4A, RDT&E Schedule Details: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603506N: *Surface Ship Torpedo Defense*	**PROJECT** 0225: *Surface Ship Torpedo Defense (SSTD)*

Schedule Details

	Start		End	
Event	**Quarter**	**Year**	**Quarter**	**Year**
MILESTONE B	3	2010	3	2010
-SYSTEM DEMO TRIAL	4	2011	4	2011
MILESTONE C	2	2012	2	2012
DT/OT TESTS	1	2013	4	2013
OT&E	2	2014	2	2015
FRP	3	2015	3	2015
IOC	4	2015	4	2015
CAPABILITIES DEVELOPMENT DOCUMENT (CDD)	2	2010	2	2010
CDR	2	2010	2	2010
EDM-2 DESIGN	1	2009	2	2010
IN-WATER TRIALS (CT)	4	2011	2	2013
EDM-2 BUILD	2	2010	1	2012
DDG DEMO	3	2009	3	2009
ATTDS SPEC	2	2010	2	2010
EDM DESIGN	1	2009	2	2010
EDM BUILD	3	2009	4	2011
SYSTEM LEVEL TESTS (ST)	1	2012	1	2014

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603506N: *Surface Ship Torpedo Defense*	PROJECT 9999: *Congressional Adds*	

COST ($ in Millions)	FY 2009 Actual	FY 2010 Estimate	FY 2011 Base Estimate	FY 2011 OCO Estimate	FY 2011 Total Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
9999: *Congressional Adds*	2.553	9.958	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	45.729
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0		

A. Mission Description and Budget Item Justification

Congressional Adds

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010
Congressional Add: AN/SLQ-25D Integration *FY 2010 Plans:* Provide integration of the SLQ-25D countermeasure system with the Anti-Torpedo Torpedo Defense System. This integration includes development of interfaces with Ship's Sonar and Fire Control systems, as well as integration with new towed sensors and integration with the ship itself.	0.000	6.373
Congressional Add: Continuous Active Sonar for Torpedo DCL Systems *FY 2010 Plans:* Adapt Continuous Active Sonar (CAS) and other active and passive sonar technologies that have proved very effective for active ASW applications, to improve Torpedo Detection, Classification, and Localization capabilities and extend ATTDS coverage against most stressing emergent threats.	0.000	3.585
Congressional Add: Supportability Training Services Infrastructure	1.596	0.000

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
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B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010
FY 2009 Accomplishments: Develop the Open Architecture (OA) supportability processes, methods and tools required to facilitate the real-time capture and cataloging of sailor training, performance and vocational skills data.		
Congressional Add: Mobile Acoustic Decoys for Surface Ship Defense *FY 2009 Accomplishments:* Expand technology development of mobile countermeasures used for Surface Ship Torpedo Defense including device engineering, fabrication and testing capabilities to assess the effectiveness of Net Generation (mobile) Countermeasures.	0.957	0.000
Congressional Adds Subtotals	2.553	9.958

C. Other Program Funding Summary ($ in Millions)

N/A

D. Acquisition Strategy

N/A

E. Performance Metrics

Congressional Adds

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Exhibit R-2, RDT&E Budget Item Justification: PB 2011 Navy										DATE: February 2010	
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*				R-1 ITEM NOMENCLATURE PE 0603512N: *Carrier Systems Development*							
COST ($ in Millions)	**FY 2009 Actual**	**FY 2010 Estimate**	**FY 2011 Base Estimate**	**FY 2011 OCO Estimate**	**FY 2011 Total Estimate**	**FY 2012 Estimate**	**FY 2013 Estimate**	**FY 2014 Estimate**	**FY 2015 Estimate**	**Cost To Complete**	**Total Cost**
Total Program Element	178.095	175.823	93.830	0.000	93.830	65.502	52.306	50.878	52.513	Continuing	Continuing
2208: *CVN 21*	61.701	57.303	33.278	0.000	33.278	38.383	40.777	41.764	42.660	6,869.600	7,992.261
3216: *Tactical Support Center-Integration*	0.000	5.133	8.583	0.000	8.583	2.349	5.067	4.002	5.199	Continuing	Continuing
3217: *KU-Band Common Data Link*	0.000	14.502	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	14.502
4004: *EMALS*	87.284	94.143	50.341	0.000	50.341	22.999	4.670	3.274	2.775	Continuing	Continuing
4005: *Smart Carrier*	1.585	1.794	1.628	0.000	1.628	1.771	1.792	1.838	1.879	Continuing	Continuing
9999: *Congressional Adds*	27.525	2.948	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	39.731

A. Mission Description and Budget Item Justification

This Navy unique program addresses all technology areas associated with Navy/Marine Corps aircraft operations aboard ships. The program includes:

- (U)(2208) - Development of ship hull, mechanical, propulsion, electrical, aviation, and combat support systems, subsystems and components to significantly improve aircraft carrier affordability, manpower requirements, survivability, and operational capabilities, and to meet the requirements of existing and pending regulations and statutes critical to the operation of existing and future aircraft carriers.

- (U)(3216) - Development of block upgrades of the MH-60R sensor suite into the AN/SQQ-34 Aircraft Carrier Tactical Support Center (CV-TSC). The CV-TSC provides increased situational awareness to the Carrier Strike Group (CSG) in support of force protection, primarily in the area of Anti Submarine Warfare (ASW). Through the integration of
off-board sensors and signal, data and display processors, the AN/SQQ-34 is utilized in detecting, classifying, and localizing threats. An integrated element of the Carrier Combat System, the AN/SQQ-34 supports the tactical deployment of embarked ASW and Surface Warfare (SUW) assets (S-3B until retirement, SH-60F helicopter). This project provides the development and engineering foundation to refresh legacy AN/SQQ-34 systems on all Carriers and shore sites in support of fleet introduction and shipboard integration of the MH-60R Multi Mission Helicopter. Upgrades to legacy systems will enable exchange of sensor, tactical and imagery data with the MH-60R initially and eventually with P-8 and Broad Area
Maritime Surveillance (BAMS) aircraft.

Exhibit R-2, RDT&E Budget Item Justification: PB 2011 Navy	DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603512N: *Carrier Systems Development*

- (U)(3217) - Development of multi-mission shipboard high data rate Ku-Band data link between the embarked air assets and the Carrier combat system, enabling exchange of sensor, tactical and imagery data initially with the MH-60R Multi Mission Helicopter. It also provides capability for on-the-deck mission synchronization with MH-60R. Eventually, the
KU-band data link will support other Ku-Band equipped aircraft, including the P-8 and Broad Area Maritime Surveillance (BAMS). This effort will provide the Carrier with the capability to support multiple aircraft simultaneously on different missions, and completing the Kill Chain by linking sensor platform to sensor controllers and the ASW/SUW warfare commanders.

- (U)(4004) - Development of an advanced technology aircraft launch system in support of the CVN 78 Class design and construction schedule. The Electro Magnetic Aircraft Launch System (EMALS) will replace the current steam catapult on CVN 78 Class ships. EMALS provides better control of applied forces, both peak and transient dynamic, improved
reliability and maintainability, increased operational availability and reduced operator and maintainer workload.

- (U)(4005) - The Smart Carrier Demonstration and Validation program exploits available technologies to deliver an affordable, robust, operator-friendly automation control environment for Navy Aircraft Carrier shipboard equipment. The program provides the system architecture, requirements/specification development, technology selection, software
development (including software baseline), as well as land-based and shipboard testing of new technologies to improve shipboard operations and to reduce workload, manpower requirements, and Total Ownership Costs (TOC).

- (U)(9B58A) - Funding will be used to continue ongoing corrosion testing at Ocean City Research Testing facility in NJ. Various coupons and coatings have been exposed up to 7 months now and will continue to be evaluated over the next three years of exposure under simulated flight deck conditions. The funding will also be used to initiate phase 2 study
into the development of a corrosion inhibitor addition to the armature cooling to extend the armatures life. Phase one identified several candidates which look promising. The remainder of the funds will be utilized to interrogate and document the material properties of the alloys selected for use on EMALS. Fatigue and fracture data will be compiled
under the unique conditions of the EMALS for the in-service support of the EMALS system.

- (U) (9D23A) - Funds will be used to incorporate National Sensors data into a fusion engine in order to provide a complete and accurate Common Tactical Picture (CTP) of the surface and subsurface threat environment to the at-sea Warfare Commanders. The National Sensor Fusion Configuration Item (NSFCI), as an integral part of the Undersea Warfare

Exhibit R-2, RDT&E Budget Item Justification: PB 2011 Navy	DATE: February 2010
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Decision Support System (USW-DSS - AN/UYQ-100), has demonstrated the capability to collect and integrate a wide variety of disparate geospatial and sensor data, to fuse the available data sources into real time vessel tracks and to provide military commanders with the CTP they need to support critical battle-space decisions. The NSF for Puget Sound
Port Security (PSPS) is being developed as an application within the Service Oriented Architecture (SOA) of USW-DSS.

- (U) (9D24A) - Development of an advanced technology aircraft launch system in support of the CVN 78 Class design and construction schedule. The Electro Magnetic Aircraft Launch System (EMALS) will replace the current steam catapult on CVN 78 Class ships. EMALS provides better control of applied forces, both peak and transient dynamic, improved reliability and maintainability, increased operational availability and reduced operator and maintainer workload.

- (U) 10C098 - Develop and validate a full scale composite aircraft carrier topside structure, providing a lightweight fragmentation/structural/fire integrated technology solution that can meet/exceed current performance requirements while reducing costs.

B. Program Change Summary ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
Previous President's Budget	147.205	173.594	0.000	0.000	0.000
Current President's Budget	178.095	175.823	93.830	0.000	93.830
Total Adjustments	30.890	2.229	93.830	0.000	93.830
• Congressional General Reductions		-0.731			
• Congressional Directed Reductions		0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds		2.960			
• Congressional Directed Transfers		0.000			
• Reprogrammings	33.629	0.000			
• SBIR/STTR Transfer	-2.739	0.000			
• Program Adjustments	0.000	0.000	93.830	0.000	93.830

Congressional Add Details ($ in Millions, and Includes General Reductions)	FY 2009	FY 2010
Project: 9999: *Congressional Adds*		
Congressional Add: *Composite Mast for CVNs*	0.000	2.948
Congressional Add: *IMPROVED CORROSION PROTECTION FOR ELECTROMAGNETIC*	1.995	0.000
Congressional Add: *National Sensor Fusion Support for Puget Sound Por*	1.596	0.000

Exhibit R-2, RDT&E Budget Item Justification: PB 2011 Navy	DATE: February 2010
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Congressional Add Details ($ in Millions, and Includes General Reductions)	FY 2009	FY 2010
Congressional Add: *EMALS*	23.934	0.000
Congressional Add Subtotals for Project: 9999	27.525	2.948
Congressional Add Totals for all Projects	27.525	2.948

Change Summary Explanation

Technical: Not applicable.

Schedule: Not applicable.

FY11 from previous President's Budget is shown as zero because no FY11-15 data was presented in President's Budget 2010.

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy			DATE: February 2010
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COST ($ in Millions)	FY 2009 Actual	FY 2010 Estimate	FY 2011 Base Estimate	FY 2011 OCO Estimate	FY 2011 Total Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
2208: *CVN 21*	61.701	57.303	33.278	0.000	33.278	38.383	40.777	41.764	42.660	6,869.600	7,992.261
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0		

A. Mission Description and Budget Item Justification

This project provides for the development of aircraft carrier specific technologies, the infusion of the ship technology base into existing and future aircraft carriers, and the potential realization of subsystem design capabilities not currently feasible. This project transitions the most promising technologies from the Navy technology base, other government laboratories, and the private sector into specific advanced development efforts. All systems developed in this project have the potential to support emerging requirements and other promising systems technologies for insertion into new aircraft carrier designs. The emphasis is directed toward developing ship hull, mechanical, propulsion, electrical, aviation, warfare systems, and combat support systems, sub-systems and components to significantly improve aircraft carrier affordability, manpower requirements, survivability, and operational capabilities and to meet the requirements of existing and pending regulations and statutes critical to the operation of future aircraft carriers. This project also encompasses those tasks required to support CVN 78 procurement, including, but not limited to engineering support, programmatic and program support, logistics support, modeling and simulation, manpower and program related studies, and design support systems, such as the Integrated Digital Environment (IDE).

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
CVN 21 Advanced Technology Design & Development	46.528	49.271	24.403	0.000	24.403
- (U) CVN 21 Advanced Technology Design & Development: Continue development and transition of technologies to support CVN 21 Key Performance Parameters (KPPs): maintain sortie generation rate, reductions in manpower, and further recovery of weight and stability service life margins. Continue design activities to integrate the new technologies, such as the new propulsion plant and Electromagnetic Aircraft Launch System into the ship.					

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
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B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
FY 2009 Accomplishments: Technologies and design efforts include continuation of transition planning and execution, including finishing development work, certification / qualification testing, in-service testing, integrated logistics support, and design integration tasks for all projects in the Critical and Non-Critical Technology portfolios. Efforts also encompass those tasks required to support CVN 78 procurement, including, but not limited to, engineering support, programmatic and program support, logistics support, modeling and simulation, manpower and program related studies, and design support systems, such as the Integrated Digital Environment (IDE). *FY 2010 Plans:* Technologies and design efforts include continuation of transition planning and execution, including finishing development work, certification / qualification testing, in-service testing, integrated logistics support, and design integration tasks for all projects in the Critical and Non-Critical Technology portfolios. Efforts also encompass those tasks required to support CVN 78 procurement, including, but not limited to, engineering support, programmatic and program support, logistics support, modeling and simulation, manpower and program related studies, and design support systems, such as the Integrated Digital Environment (IDE). *FY 2011 Base Plans:* Technologies and design efforts include continuation of transition planning and execution, including finishing development work, certification / qualification testing, in-service testing, integrated logistics support, and design integration tasks for all projects in the Critical and Non-Critical Technology portfolios. Efforts also encompass those tasks required to support CVN 78 procurement, including, but not limited to, engineering support, programmatic and program support, logistics support, modeling and simulation, manpower and program related studies, and design support systems, such as the Integrated Digital Environment (IDE).					
CVN 21 - Test & Evaluation (T&E)	14.898	8.032	8.875	0.000	8.875

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B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
- (U) CVN 21 - Test & Evaluation (T&E) - *FY 2009 Accomplishments:* Execute an alternative to fulfill the requirements of the Full Ship Shock Trial (FSST). Continue DT-B1 efforts to include as assessment of results that will demonstrate the CVN 78 design will meet requirements. Conclude DT-B1 in late FY 09 with a test report. Commence Developmental Test (DT) planning on Command, Control, Communications, Computers, and Intelligence (C4I) equipment and sensors to define and implement interoperability testing. Conduct Operational Test Readiness Review (OTRR) to signal readiness to commence OT-B3 phase design assessments by Commander, Operational Test and Evaluation Force (COMOPTEVFOR). Continue planning / execution of Sortie Generation Rate Modeling and Simulation (SGR M&S) improvements to the Virtual Carrier Vessel Nuclear (VCVN) Model. Continue planning of post delivery test and trials (PDT&T) with various working groups, COMOPTEVFOR and Director, Operational Test and Evaluation (DOT&E) to ensure requirements are met. Finalize Test and Evaluation Master Plan (TEMP) 1610 Revision C. Continue to evaluate Topside Electromagnetic Environmental Effects (E3) risk. Complete updates to Warfare Systems (WS) Test, Evaluation and Certification (TE&C) plan. Conduct Mission Level Integration / Interoperability Test (MLI2T) definition. Finalize Verification Validation and Accreditation (VV&A). Conduct Working Integrated Product Team (WIPT) meetings. *FY 2010 Plans:* Commence OT-B3 and continue DT-B2 T&E planning efforts. Plan / execute alternative to fulfill the requirements of the FSST. Commence DT on C4I equipment and sensors to define and implement interoperability testing to support Joint Interoperability Test Command (JITC) certification. Continue collaboration with the various working groups, PARMS, COMOPTEVFOR, and DOT&E to ensure requirements are met for planning of PDT&T. Continue PDT&T schedule development. Continue planning / execution of SGR M&S improvements to the VCVN Model to ensure COMOPTEVFOR Initial Operational Test and Evaluation (IOT&E) requirements are met. Continue Topside E3 risk evaluation and testing. Commence planning					

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
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B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
for DT-B2i Net-Ready / Interoperability event. Finalize WS TE&C Plan for signature. Finalize Dynamic System Mechanics Advanced Simulation (DYSMAS) accreditation. Conduct WIPT meetings. *FY 2011 Base Plans:* Complete OT-B3 and continue DT-B2 T&E planning efforts. Plan / execute alternative to fulfill the requirements of the FSST. Continue planning for and execute DT-B2i Net-Ready / Interoperability event. Commence DT on NAVAIR and C4I equipment and sensors to define and implement interoperability testing to support JITC certification. Continue collaboration with the various working groups, COMOPTEVFOR, and DOT&E to ensure requirements are met for planning of PDT&T. Continue planning / execution of SGR M&S improvements to the VCVN Model to ensure COMOPTEVFOR IOT&E requirements are met. Continue Topside E3 risk evaluation and testing.					
Defense Acquisition Workforce Fund (DAWF) *FY 2009 Accomplishments:* Funded Defense Acquisition Workforce Fund	0.275	0.000	0.000	0.000	0.000
Accomplishments/Planned Programs Subtotals	61.701	57.303	33.278	0.000	33.278

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total	FY 2012	FY 2013	FY 2014	FY 2015	Cost To Complete	Total Cost
• BLI 200100: *Carrier Replacement Program*	3,915.642	1,219.927	2,639.569	0.000	2,639.569	494.823	2,418.293	3,386.556	2,284.498	Continuing	Continuing

D. Acquisition Strategy

The CVN 78 will be the first ship of the CVN 78 Class of aircraft carriers designed to replace USS ENTERPRISE and the ships of the NIMITZ Class. The CVN 78 will feature a new nuclear propulsion and electrical generation/distribution system, new electromagnetic aircraft launching system, advanced arresting gear system, all electric auxiliaries,

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
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warfare system improvements, survivability enhancements, improved weapons handling, and improved aircraft servicing. These design features will result in lower manpower and total ownership costs as compared to the NIMITZ Class. Additionally, the following war fighting benefits will be realized: increased sortie generation rate, improved ship
self defense capability, increased launch and recovery capability/flexibility, increased operational availability, and increased flexibility to support future upgrades.

E. Performance Metrics

Successfully complete Developmental Test - B2 (DT-B2) Net Ready / Interoperability Event. Successfully complete Operational Test - B3 (OT-B3). Successfully complete Operational Test (OT) Report. Successfully complete Operational Test Readiness Review (OTRR). Successfully conduct and support feasibility and tradeoff studies and data packages on new and modified shipboard systems, technologies and proposed modification. Data packages shall include information to support program decisions to integrate these efforts into the whole ship design efforts. Successfull conduct IDC shock testing and reporting in order to finalize IDC R&D efforts. Successfully complete Advanced Weapons Elevator Shock and EMI Test qualifications. Successfully complete PLASMA ARC Waste Destruction System Land Basted Test. Successfully create and deliver 21 Decision Memorandums (DM) for Bents/Bays 1-21.on the 03 Level (Gallery Deck) with Layer 31 information. This effort includes comment and adjudication for each ODWG delivered DM. Successfully develop the baseline Technical Data Packages for 39 systems and mature packages in preparation for final GFI arrival.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy			DATE: February 2010
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Product Development ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Propulsion Plant Development	SS/CPFF	Bettis PA	71.627	0.000		0.000		0.000		0.000	0.000	71.627	Continuing
Propulsion Plant Development	C/CPFF	NGSB-NN VA	164.409	0.000		0.000		0.000		0.000	0.000	164.409	Continuing
Propulsion Plant Development	Various/ Various	Miscellaneous Various	10.562	0.000		0.000		0.000		0.000	0.000	10.562	Continuing
Propulsion Plant Development	WR	NSWC Carderock MD	0.050	0.000		0.000		0.000		0.000	0.000	0.050	Continuing
Advanced Design & Development	C/CPAF	NGSB-NN VA	138.814	16.066	Nov 2009	6.494	Oct 2010	0.000		6.494	0.000	161.374	Continuing
Advanced Design & Development	WR	NSWC Carderock MD	71.598	0.290	Oct 2009	0.045	Oct 2010	0.000		0.045	0.000	71.933	Continuing
Advanced Design & Development	C/CPFF	SAIC Not Specified	49.070	0.000		0.000		0.000		0.000	0.000	49.070	Continuing
Advanced Design & Development	WR	NAWCAD Patuxent River MD	37.311	8.046	Oct 2009	1.495	Oct 2010	0.000		1.495	0.000	46.852	Continuing
Advanced Design & Development	WR	NAWC Lakehurst NJ	8.189	0.000		0.000		0.000		0.000	0.000	8.189	Continuing
Advanced Design & Development	WR	NSWC Dahlgren VA	18.934	4.711	Oct 2009	3.928	Oct 2010	0.000		3.928	0.000	27.573	Continuing
Advanced Design & Development	C/CPAF	Raytheon Not Specified	20.653	5.505	Dec 2009	4.107	Dec 2010	0.000		4.107	0.000	30.265	Continuing
Advanced Design & Development	WR	NSWC Port Hueneme CA	5.643	0.297		0.068	Oct 2010	0.000		0.068	0.000	6.008	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy		DATE: February 2010
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Product Development ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Advanced Design & Development	WR	SPAWAR CA	8.682	1.812	Oct 2009	0.550	Oct 2010	0.000		0.550	0.000	11.044	Continuing
Advanced Design & Development	C/CPFF	NAVSEA Seaport Not Specified	23.982	5.051	Dec 2009	2.259	Dec 2010	0.000		2.259	0.000	31.292	Continuing
Advanced Design & Development	Various/ Various	Miscellaneous Various	39.807	7.493	Dec 2009	5.456	Oct 2010	0.000		5.456	0.000	52.756	Continuing
		Subtotal	669.331	49.271		24.402		0.000		24.402	0.000	743.004	

Remarks

Test and Evaluation ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation	C/CPAF	NGSB-NN VA	7.134	1.354	Nov 2009	2.923	Nov 2010	0.000		2.923	0.000	11.411	Continuing
Developmental Test & Evaluation	WR	NAWCAD Patuxent River MD	11.997	1.754	Oct 2009	1.794	Oct 2020	0.000		1.794	0.000	15.545	Continuing
Developmental Test & Evaluation	WR	NSWC Dahlgren VA	3.206	0.474	Oct 2009	0.182	Oct 2010	0.000		0.182	0.000	3.862	Continuing
Developmental Test & Evaluation	WR	NSWC Carderock MD	7.098	1.522	Oct 2009	1.040	Oct 2010	0.000		1.040	0.000	9.660	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy		DATE: February 2010
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Test and Evaluation ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation	WR	SPAWAR CA	2.878	0.379	Oct 2009	0.500	Oct 2010	0.000		0.500	0.000	3.757	Continuing
Developmental Test & Evaluation	C/CPFF	NAVSEA SeaPort Not Specified	0.143	0.000		0.000		0.000		0.000	0.000	0.143	Continuing
Developmental Test & Evaluation	C/CPAF	Raytheon Not Specified	0.984	0.299	Dec 2009	0.091	Dec 2010	0.000		0.091	0.000	1.374	Continuing
Developmental Test & Evaluation	Various/ Various	Miscellaneous Various	5.674	1.487	Oct 2009	1.301	Oct 2010	0.000		1.301	0.000	8.462	Continuing
Operational Test & Evaluation	WR	COMOPTEVFOR VA	3.607	0.763	Oct 2009	1.045	Oct 2010	0.000		1.045	0.000	5.415	Continuing
		Subtotal	42.721	8.032		8.876		0.000		8.876	0.000	59.629	

Remarks

Management Services ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
DAWF	Various/ Various	Various Various	0.275	0.000		0.000		0.000		0.000	0.000	0.275	Continuing
		Subtotal	0.275	0.000		0.000		0.000		0.000	0.000	0.275	

Remarks

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603512N: *Carrier Systems Development*	PROJECT 2208: *CVN 21*	

	Total Prior Years Cost	FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	712.327	57.303		33.278		0.000		33.278	0.000	802.908	

Remarks

Exhibit R-4, **RDT&E Schedule Profile:** PB 2011 Navy		**DATE:** February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603512N: *Carrier Systems Development*	**PROJECT** 2208: *CVN 21*

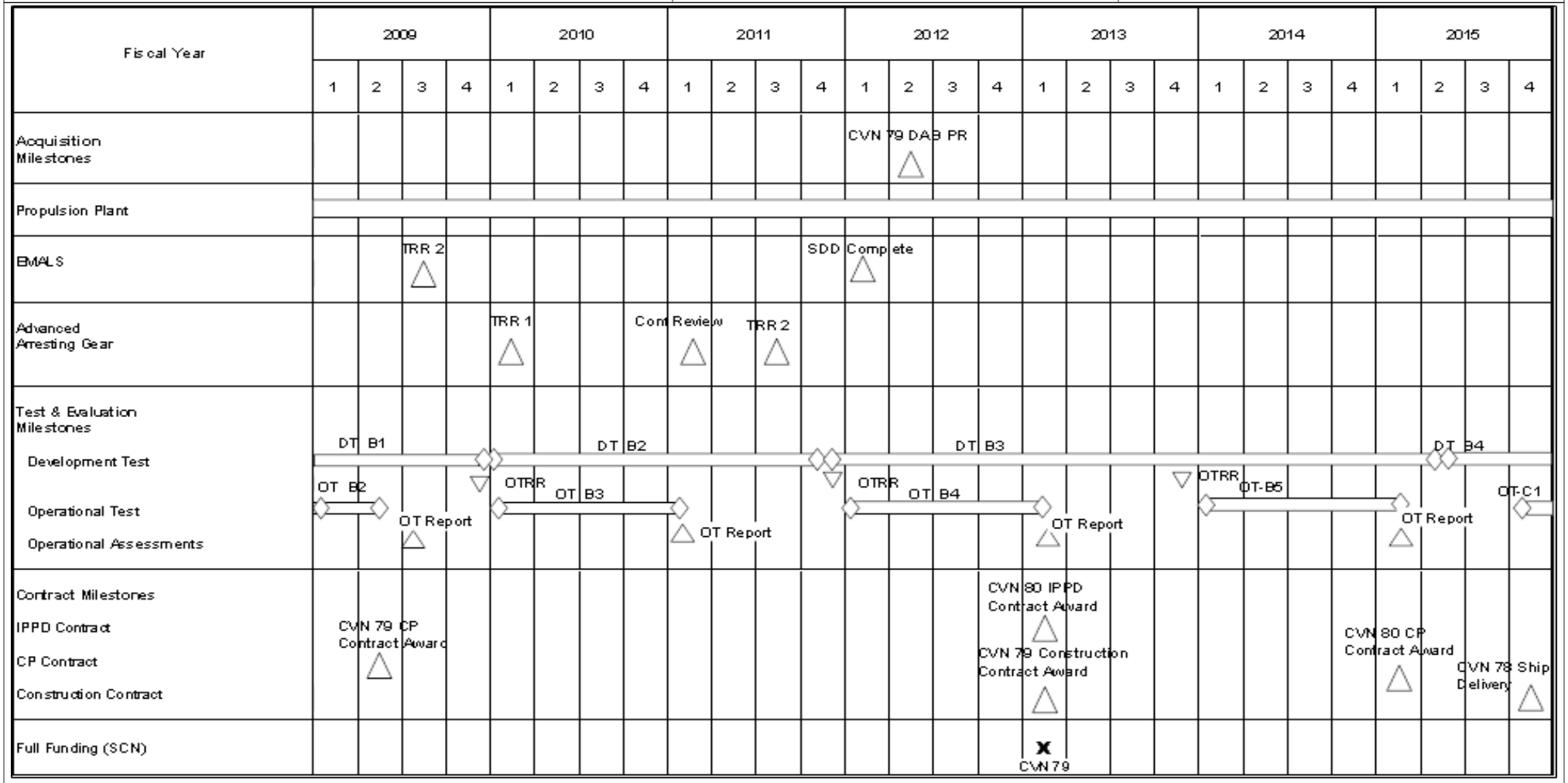

Exhibit R-4A, RDT&E Schedule Details: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603512N: *Carrier Systems Development*	**PROJECT** 2208: *CVN 21*

Schedule Details

	Start		End	
Event	**Quarter**	**Year**	**Quarter**	**Year**
CVN 79 DAB PR	2	2012	2	2012
Propulsion Plant	1	2009	4	2015
EMALS TRR 2 (DT/OA)	3	2009	3	2009
EMALS SDD Complete	1	2012	1	2012
Advanced Arresting Gear (AAG) TRR 1 (IT)	1	2010	1	2010
AAG Config Review	1	2011	1	2011
AAG TRR 2 (IT)	3	2011	3	2011
Developmental Tests DT-B1	1	2009	4	2009
Developmental Tests DT-B2	1	2010	4	2011
Developmental Tests DT-B3	4	2011	2	2015
Developmental Tests DT-B4	2	2015	4	2015
Operational Tests Readiness Review 1	4	2009	4	2009
Operational Tests Readiness Review 2	4	2011	4	2011
Operational Tests Readiness Review 3	4	2013	4	2013
Operational Tests OT-B2	1	2009	2	2009
Operational Tests OT-B3	1	2010	1	2011
Operational Tests OT-B4	1	2012	1	2013
Operational Tests OT-B5	1	2014	1	2015

Exhibit R-4A, RDT&E Schedule Details: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603512N: *Carrier Systems Development*	**PROJECT** 2208: *CVN 21*

	Start		End	
Event	**Quarter**	**Year**	**Quarter**	**Year**
Operational Tests OT-C1	4	2015	4	2015
Operational Tests Report 1	3	2009	3	2009
Operational Tests Report 2	1	2011	1	2011
Operational Tests Report 3	1	2013	1	2013
Operational Tests Report 4	1	2015	1	2015
CVN 79 CP Contract Award	2	2009	2	2009
CVN 80 IPPD Contract Award	1	2013	1	2013
CVN 79 Construction Contract Award	1	2013	1	2013
CVN 80 CP Contract Award	1	2015	1	2015
CVN 78 Ship Delivery	4	2015	4	2015
CVN 79 SCN Full Funding	1	2013	4	2015

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603512N: *Carrier Systems Development*	PROJECT 3216: *Tactical Support Center-Integration*	

COST ($ in Millions)	FY 2009 Actual	FY 2010 Estimate	FY 2011 Base Estimate	FY 2011 OCO Estimate	FY 2011 Total Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
3216: *Tactical Support Center-Integration*	0.000	5.133	8.583	0.000	8.583	2.349	5.067	4.002	5.199	Continuing	Continuing
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0		

A. Mission Description and Budget Item Justification

The CV-TSC program provides increased situational awareness to the CSG in support of force protection, primarily in the area of ASW. Through the integration of off-board sensors and signal, data and display processors, the AN/SQQ-34 is utilized in detecting, classifying, and localizing threats. An integrated element of the Carrier Combat System, the AN/SQQ-34 supports the tactical deployment of embarked ASW and SUW assets (S-3B until retirement, SH-60F helicopter). This project provides the design, development and engineering foundation to refresh legacy AN/SQQ-34 systems on all Carriers and shore sites in support of fleet introduction and shipboard integration of the MH-60R Multi Mission Helicopter. Upgrades to legacy systems will enable exchange of sensor, tactical and imagery data with the MH-60R initially and eventually with P-8 and BAMS aircraft.

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
MH-60R Integration Development for CV-TSC	0.000	5.133	8.583	0.000	8.583
FY 2010 Plans: Design and develop the AN/SQQ-34(V)2 upgrade to support the MH-60R Multi Mission Helicopter. MH-60R Integration Increment 1 establishes initial link with helo through Ku-Band Common Data Link (CDL). *FY 2011 Base Plans:* Continue development of the AN/SQQ-34(V)2 Increment 1 upgrade to support the MH-60R Multi Mission Helicopter. Begin design and development of Increment 2 upgrade to support multiple helos and link connectivity management.					
Accomplishments/Planned Programs Subtotals	0.000	5.133	8.583	0.000	8.583

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603512N: *Carrier Systems Development*	PROJECT 3216: *Tactical Support Center-Integration*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total	FY 2012	FY 2013	FY 2014	FY 2015	Cost To Complete	Total Cost
• OPN/2176: *Undersea Support Equipment (CV-TSC/CDL portion)*	6.356	20.088	19.866	0.000	19.866	20.305	8.774	0.591	0.599	Continuing	Continuing

D. Acquisition Strategy

The CV-TSC will be upgraded to support full deployments of KU-Band equipped MH-60R aircraft. The CV-TSC development activity is a government field activity, Naval Undersea Warfare Center, Division Keyport. Hardware procurements and back fit of the CV-TSC will use the AN/SQQ-34C as a baseline with additional hardware necessary for MH-60R support. Hardware shall be procured via a Request For Proposal (RFP) with industry. To the maximum extent possible, CV-TSC will use enterprise hardware initiatives being developed by the Navy in support of DDG-1000 and Aegis Modernization.

E. Performance Metrics

- Successfully complete Preliminary Design Review (PDR) and Critical Design Review (CDR) for MH-60R system upgrade.
- Utilize COTS-based Common Processor/Common Display Systems (CPS/CDS) to minimize Total Ownership Costs.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603512N: *Carrier Systems Development*	PROJECT 3216: *Tactical Support Center-Integration*

Product Development ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Non-Recurring Engineering	WR	NAVSEA Keyport WA	0.000	3.479	Jan 2010	1.372	Oct 2010	0.000		1.372	Continuing	Continuing	Continuing
System Eng / S/W Development	WR	NAVSEA Keyport WA	0.000	1.654	Jan 2010	4.838	Oct 2010	0.000		4.838	Continuing	Continuing	Continuing
Integration	WR	NAVSEA Keyport WA	0.000	0.000		1.873	Oct 2010	0.000		1.873	Continuing	Continuing	Continuing
		Subtotal	0.000	5.133		8.083		0.000		8.083			

Remarks

Test and Evaluation ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Test and Certification	WR	NAVSEA/Keyport WA	0.000	0.000		0.500	Oct 2010	0.000		0.500	Continuing	Continuing	Continuing
		Subtotal	0.000	0.000		0.500		0.000		0.500			

Remarks

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603512N: *Carrier Systems Development*	PROJECT 3216: *Tactical Support Center-Integration*	

	Total Prior Years Cost	FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	5.133		8.583		0.000		8.583			

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603512N: *Carrier Systems Development*	PROJECT 3216: *Tactical Support Center-Integration*	

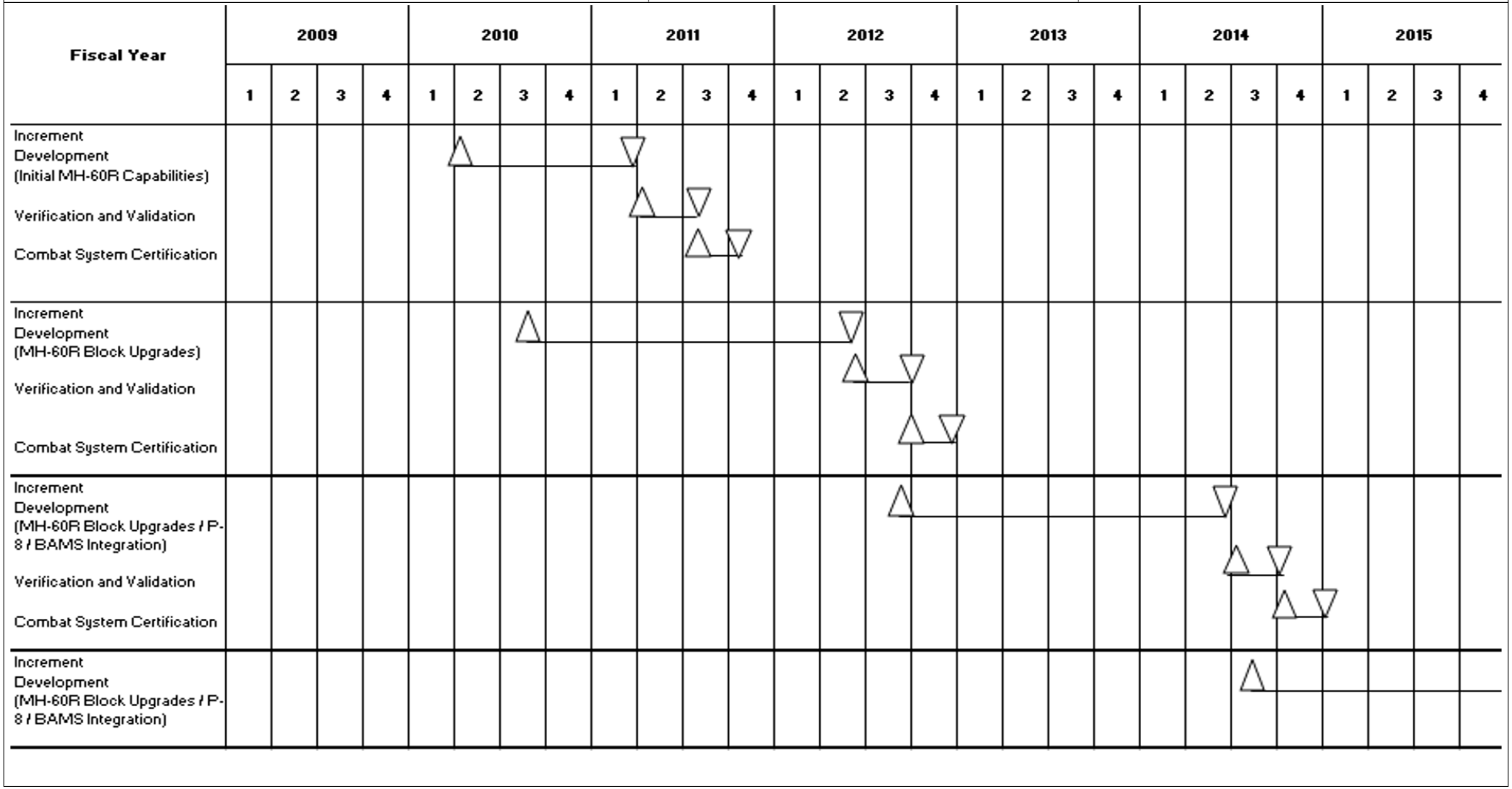

Exhibit R-4A, RDT&E Schedule Details: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603512N: *Carrier Systems Development*	**PROJECT** 3216: *Tactical Support Center-Integration*

Schedule Details

	Start		End	
Event	**Quarter**	**Year**	**Quarter**	**Year**
Initial MH-60R Capabilities Development	2	2010	1	2011
Initial MH-60R Verification and Validation	2	2011	3	2011
Initial MH-60R Combat System Certification	3	2011	4	2011
MH-60R Block Upgrades Development	3	2010	2	2012
MH-60R Verification and Validation	2	2012	3	2012
MH-60R Combat System Certification	3	2012	4	2012
MH-60R Block Upgrades (P-8/BAMS Integration)(Increment 1)	3	2012	2	2014
Verification and Validation	3	2014	4	2014
Combat System Certification	4	2014	1	2015
MH-60R Block Upgrades (P-8/BAMS Integration) (Increment 2)	3	2014	4	2015

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603512N: *Carrier Systems Development*	PROJECT 3217: *KU-Band Common Data Link*	

COST ($ in Millions)	FY 2009 Actual	FY 2010 Estimate	FY 2011 Base Estimate	FY 2011 OCO Estimate	FY 2011 Total Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
3217: *KU-Band Common Data Link*	0.000	14.502	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	14.502
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0		

A. Mission Description and Budget Item Justification

Develops a multi-mission, shipboard, high data rate Ku-Band data link between the embarked air assets and the Carrier combat system, enabling exchange of sensor, tactical and imagery data initially with the MH-60R Multi Mission Helicopter. It also provides capability for on-the-deck mission synchronization with MH-60R. Eventually, the KU-band data link will support other Ku-Band equipped aircraft, including the P-8 and BAMS. This effort will provide the Carrier with the capability to support multiple simultaneous aircraft on different missions, also completing the Kill Chain by linking sensor platform to sensor controllers and the ASW/SUW warfare commanders. This development effort will support the initial deployments of the Ku-Band equipped MH-60R Air wing for new construction Carriers, RCOH Carriers, and NIMITZ class back fits.

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
Common Data Link Development *FY 2010 Plans:* Development of Ku-Band data link between the embarked air assets and the Carrier combat system.	0.000	14.502	0.000	0.000	0.000
Accomplishments/Planned Programs Subtotals	0.000	14.502	0.000	0.000	0.000

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603512N: *Carrier Systems Development*	PROJECT 3217: *KU-Band Common Data Link*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total	FY 2012	FY 2013	FY 2014	FY 2015	Cost To Complete	Total Cost
• OPN/2176: *Undersea Support Equipment (CV-TSC/CDL Portion)*	6.356	20.088	19.866	0.000	19.866	20.305	8.774	0.591	0.599	Continuing	Continuing

D. Acquisition Strategy

The KU-Band Common Data Link will be upgraded on the Carrier to support full deployments of KU-Band equipped MH-60R aircraft. The required development for this effort will be completed in FY10. Procurements and back fit of the Ku-Band capability will be fielded starting in FY11. PEO C4I shall develop the additional capabilities by implementing an Engineering Change Proposal (ECP) to the AN/USQ-167 Communications Data Link System (CDL-S). ECP implementation shall be procured via a Request For Proposal (RFP) with industry. This would ensure the most efficient and cost effective implementation for Navy.

E. Performance Metrics

- Increase capability from one (1) 360 degree aircraft link to four (4) simultaneous 360 degree aircraft links, while reducing overall manning.

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603512N: *Carrier Systems Development*	PROJECT 4004: *EMALS*	

COST ($ in Millions)	FY 2009 Actual	FY 2010 Estimate	FY 2011 Base Estimate	FY 2011 OCO Estimate	FY 2011 Total Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
4004: *EMALS*	87.284	94.143	50.341	0.000	50.341	22.999	4.670	3.274	2.775	Continuing	Continuing
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0		

A. Mission Description and Budget Item Justification

This project provides for the development of an advanced technology aircraft launch system in support of the CVN 78 design and construction schedule. It also provides for the life cycle support of the system. The Electromagnetic Aircraft Launch System (EMALS) will replace the current steam catapult on CVN 78 and follow-on ships of the CVN 78

Class. EMALS provides better control of applied forces, both peak and transient dynamic, improved reliability and maintainability, increased operational availability, and reduced operator and maintainer workload.

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
EMALS	86.985	94.143	50.341	0.000	50.341
EMALS *FY 2009 Accomplishments:* (1) EMALS System Development and Demonstration (SDD) Phase - Continue shipboard representative system development effort. Complete the manufacture and installation of a shipboard representative system into the System Facility Demonstration (SFD) site. Commission the SFD site. Initiate System Integration and Environment Testing and Highly Accelerated Life Testing (HALT). Continue High Cycle Testing (HCT). Provide management, system engineering, test and ship integration support.					

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603512N: *Carrier Systems Development*	**PROJECT** 4004: *EMALS*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
FY 2010 Plans: (1) EMALS SDD Phase - Continue SDD Phase. Continue shipboard representative system development effort. Complete HALT and Environmental Testing. Perform System Functional Demonstration, Deadload Testing, and Aircraft Compatibility Testing. Provide management, system engineering, test, and ship integration support. (2) EMALS Engineering and Life Cycle Support (E&LCS) - Award the E&LCS Contract during second quarter. Provide technical services, program management and logistics management in support of EMALS CVN 79 shipset efforts. *FY 2011 Base Plans:* (1) EMALS SDD Phase - Continue shipboard representative system development effort. Continue testing and perform risk mitigation. Provide management, system engineering, test, and ship integration support. (2) EMALS E&LCS - Continue E&LCS Contract. Provide technical services, program management and logistics management in support of EMALS CVN 78 shipset efforts.					
Defense Acquisition Workforce Fund *FY 2009 Accomplishments:* Funded Defense Acquisition Workforce Fund	0.299	0.000	0.000	0.000	0.000
Accomplishments/Planned Programs Subtotals	87.284	94.143	50.341	0.000	50.341

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603512N: *Carrier Systems Development*	PROJECT 4004: *EMALS*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total	FY 2012	FY 2013	FY 2014	FY 2015	Cost To Complete	Total Cost
• BLI 200100: *Carrier Replacement Program*	3,915.642	1,219.927	2,639.569	0.000	2,639.569	494.823	2,418.293	3,386.556	2,284.498	Continuing	Continuing

D. Acquisition Strategy

The CVN 78 will be the first ship of the CVN 78 Class of aircraft carriers designed to replace USS ENTERPRISE and the ships of the NIMITZ Class. The CVN 78 will feature a new nuclear propulsion and electrical generation/distribution system, new electromagnetic aircraft launching system, advanced arresting gear system, all electric auxiliaries, warfare system improvements, survivability enhancements, improved weapons handling, and improved aircraft servicing. These design features will result in lower manpower and total ownership costs as compared to the NIMITZ Class. Additionally, the following war fighting benefits will be realized: increased sortie generation rate, improved ship
self defense capability, increased launch and recovery capability/flexibility, increased operational availability, and increased flexibility to support future upgrades.

E. Performance Metrics

Successfully complete High Cycle Test (HCT) Phase II Full Load Testing. Successfully complete Highly Accelerated Life Test (HALT) Phase I and Phase II (extended). Successfully complete Commissioning Testing at the SDD test facility. Successfully complete SFD testing. Successfully complete EQT testing.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603512N: *Carrier Systems Development*	PROJECT 4004: *EMALS*

Product Development ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Aircraft Launch, Recovery & Support	C/CPAF	Northrop Grumman VA	83.352	0.000		0.000		0.000		0.000	0.000	83.352	Continuing
Aircraft Launch, Recovery & Support	C/CPAF	General Atomics (PDRR) CA	82.719	0.000		0.000		0.000		0.000	0.000	82.719	Continuing
Aircraft Launch, Recovery & Support	C/CPAF	General Atomics (SDD) CA	258.533	67.776	Dec 2009	29.858	Oct 2010	0.000		29.858	32.018	388.185	404.670
Aircraft Launch, Recovery & Support	WR	NAWC Lakehurst NJ	41.504	3.200	Nov 2009	0.000		0.000		0.000	0.000	44.704	Continuing
Aircraft Launch, Recovery & Support	C/CPAF	NGSB-NN VA	2.536	0.000		0.000		0.000		0.000	0.000	2.536	Continuing
Aircraft Launch, Recovery & Support	Various/ Various	Miscellaneous Various	3.301	0.020	Dec 2009	0.000		0.000		0.000	0.000	3.321	Continuing
Aircraft Launch, Recovery & Support	C/CPAF	General Atomics (SDD) - Award Fee CA	5.719	7.430	Dec 2009	4.750	Oct 2010	0.000		4.750	0.000	17.899	17.899
		Subtotal	477.664	78.426		34.608		0.000		34.608	32.018	622.716	422.569

Remarks

A 36.9 million prior approval reprogramming was approved in April 2008 with FY07 dollars and is included in Total Prior Year Cost.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603512N: *Carrier Systems Development*	PROJECT 4004: *EMALS*	

Test and Evaluation ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Aircraft Launch, Recovery & Support	WR	NAWC Lakehurst NJ	42.845	15.717	Dec 2009	15.733	Dec 2010	0.000		15.733	1.700	75.995	Continuing
		Subtotal	42.845	15.717		15.733		0.000		15.733	1.700	75.995	

Remarks

Management Services ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
DAWF	Various/ Various	Not Specified Not Specified	0.299	0.000		0.000		0.000		0.000	0.000	0.299	Continuing
		Subtotal	0.299	0.000		0.000		0.000		0.000	0.000	0.299	

Remarks

	Total Prior Years Cost	FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	520.808	94.143		50.341		0.000		50.341	33.718	699.010	422.569

Remarks

Exhibit R-4, **RDT&E Schedule Profile:** PB 2011 Navy		**DATE:** February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603512N: *Carrier Systems Development*	**PROJECT** 4004: *EMALS*

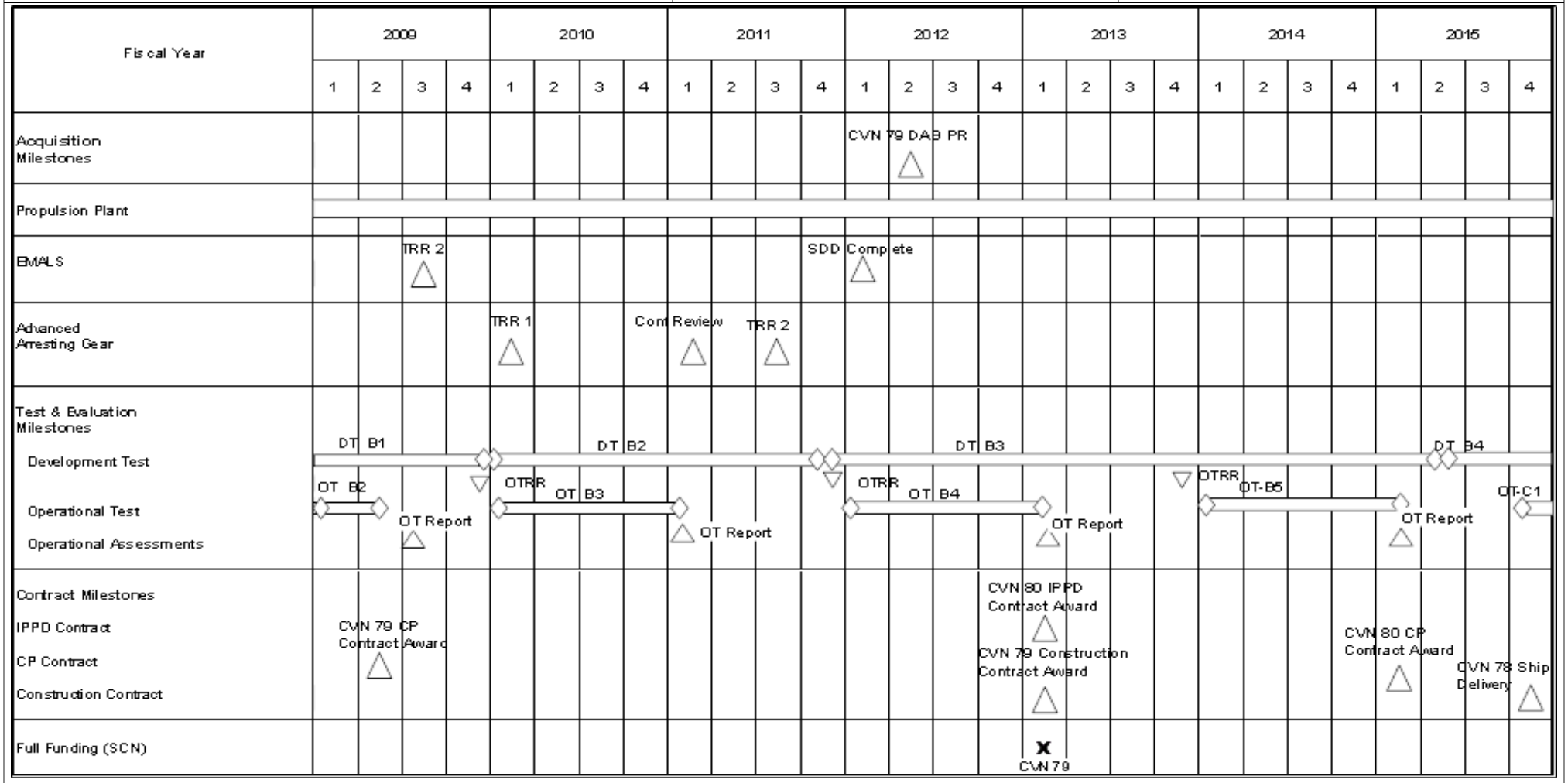

Exhibit R-4A, RDT&E Schedule Details: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603512N: *Carrier Systems Development*	**PROJECT** 4004: *EMALS*

Schedule Details

	Start		End	
Event	**Quarter**	**Year**	**Quarter**	**Year**
CVN 79 DAB PR	2	2012	2	2012
Propulsion Plant	1	2009	4	2015
EMALS TRR 2 (DT/OA)	3	2009	3	2009
EMALS SDD Complete	1	2012	1	2012
Advanced Arresting Gear (AAG) TRR 1 (IT)	1	2010	1	2010
AAG Config Review	1	2011	1	2011
AAG TRR 2 (IT)	3	2011	3	2011
Developmental Tests DT-B1	1	2009	4	2009
Developmental Tests DT-B2	1	2010	4	2011
Developmental Tests DT-B3	4	2011	2	2015
Developmental Tests DT-B4	2	2015	4	2015
Operational Tests Readiness Review 1	4	2009	4	2009
Operational Tests Readiness Review 2	4	2011	4	2011
Operational Tests Readiness Review 3	4	2013	4	2013
Operational Tests OT-B2	1	2009	2	2009
Operational Tests OT-B3	1	2010	1	2011
Operational Tests OT-B4	1	2012	1	2013
Operational Tests OT-B5	1	2014	1	2015

Exhibit R-4A, RDT&E Schedule Details: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603512N: *Carrier Systems Development*	**PROJECT** 4004: *EMALS*

	Start		End	
Event	**Quarter**	**Year**	**Quarter**	**Year**
Operational Tests OT-C1	4	2015	4	2015
Operational Tests Report 1	3	2009	3	2009
Operational Tests Report 2	1	2011	1	2011
Operational Tests Report 3	1	2013	1	2013
Operational Tests Report 4	1	2015	1	2015
CVN 79 CP Contract Award	2	2009	2	2009
CVN 80 IPPD Contract Award	1	2013	1	2013
CVN 79 Construction Contract Award	1	2013	1	2013
CVN 80 CP Contract Award	1	2015	1	2015
CVN 78 Ship Delivery	4	2015	4	2015
CVN 79 SCN Full Funding	1	2013	4	2015

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603512N: *Carrier Systems Development*	PROJECT 4005: *Smart Carrier*	

COST ($ in Millions)	FY 2009 Actual	FY 2010 Estimate	FY 2011 Base Estimate	FY 2011 OCO Estimate	FY 2011 Total Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
4005: *Smart Carrier*	1.585	1.794	1.628	0.000	1.628	1.771	1.792	1.838	1.879	Continuing	Continuing
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0		

A. Mission Description and Budget Item Justification

The Smart Carrier Demonstration and Validation program exploits available technologies to deliver an affordable, robust, operator-friendly automation control environment for Navy Aircraft Carrier shipboard equipment. The program provides the system architecture, requirements/specification development, technology selection, software development
(including software baseline), as well as land-based and shipboard testing of new technologies to improve shipboard operations and to reduce workload, manpower requirements, and Total Ownership Costs. Initial technologies include Aviation Fuels (JP-5) Automation, the Advanced Damage Control System (ADCS), Automated Material Handling Systems, Damage Control Inventory Management and Stowage System (DCIMSS), List Control, Firemain Control, Integrated Condition Assessment System, Interior Communications/Systems Monitoring Alarm Upgrades, and the Digital Video Surveillance System. Demonstration technologies include Advanced Damage Control System (ADCS) software improvements,
Electronic Valve Operator automation, Superior Sound Technology, Vibration Monitoring/Rotating Machinery Diagnostic Tools, Flat Plane Speakers, Smart Circuit Breakers, Distilling Unit Automation, Reboiler Automation, In-line Aviation Fuels Sampling, Advanced Oil Purification System, Oil Monitoring Sensors, and Voice Interactive Display. Wireless systems, smart sensors, knowledge-based systems, automated casualty control, automated technology for workload reduction, linked smart devices, common software tools for interoperability, and self-healing network are technologies being considered for future applications.

Multi Mission Helicopter. Upgrades to legacy systems will enable exchange of sensor, tactical and imagery data with the MH-60R initially and eventually with P-8 and Broad Area

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
Smart Carrier	1.577	1.794	1.628	0.000	1.628

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603512N: *Carrier Systems Development*	PROJECT 4005: *Smart Carrier*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
FY 2009 Accomplishments: Smart Carrier - Fiscal Year 2009 efforts will continue ADCS software improvements for installation in USS NIMITZ (CVN68) and continue Aviation Fuels Electric Valve Operator automation, as well as continue the development and testing of Superior Sound Technologies for shipboard announcing systems. Other initiatives include continuation of the Input Output Controller (IOC) replacement project; Identify, develop and test a shipboard qualified Uninterruptible Power System (UPS) to replace existing obsolete 15KVA UPS SYSTEMS meeting Mil Spec requirements; and conduct a conceptual study to improve the operational capacity of CVN68 Class 363-ton air conditioning plant. Develop a shipboard AC Plant model. Additional FY 2009 efforts will also initiate software development of vibration monitoring/rotating machinery diagnostic tools and software development for expanded condition-based maintenance for rotating machinery. *FY 2010 Plans:* Fiscal Year 2010 efforts include re-boiler automation, liquid load management, advanced fire and smoke sensors, and Integrated Condition Assessment System software improvements, all via modifications and improvements to the existing Smart Carrier hardware and software suite. Also, conduct research and development of a Smart Automated Oil Pollution Abatement (AOPA) System on board Smart Carrier CVN68 Class ships. *FY 2011 Base Plans:* Fiscal Year 2011 plans include continuation of re-boiler automation, liquid load management, advanced fire and smoke sensors, and Integrated Condition Assessment System software improvements, all via modifications and improvements to the existing Smart Carrier hardware and software suite. Continue research and development of a Smart Automated Oil Pollution Abatement (AOPA) System on board Smart Carrier CVN68 Class ships.					

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603512N: *Carrier Systems Development*	PROJECT 4005: *Smart Carrier*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
Defense Acquisition Workforce Fund	0.008	0.000	0.000	0.000	0.000
FY 2009 Accomplishments: Funded Defense Acquisition Workforce Fund					
Accomplishments/Planned Programs Subtotals	1.585	1.794	1.628	0.000	1.628

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total	FY 2012	FY 2013	FY 2014	FY 2015	Cost To Complete	Total Cost
• OPN/98100: *Items Under $5M Smart Carrier (LT 140)*	15.220	15.566	16.325	0.000	16.325	0.000	0.000	0.000	0.000	0.000	47.111

D. Acquisition Strategy

Investigate, demonstrate, and implement available technologies to deliver a robust, operator-friendly automation control environment for Navy Aircraft Carrier shipboard equipment to reduce workload, manpower requirements, and Total Ownership Costs (TOC).

E. Performance Metrics

Successfully complete Ship Control System Governor Software Development, AC Plant Model Capacity Optimization, UPS Replacements, ADCS Software Improvements (AFSSS/FCCS) Software Development Test, Electronic Valve Operator Automation, Superior Sound Technology (5MC) Development/Integration, Vibration Monitoring/Rotating Machinery Diagnostic Tools SW Development, Vibration Monitoring/Rotating Machinery Diagnostic Tools SW Development Test, Expanded Condition-Based Maintenance-Rotating Machinery, Reboiler Automation SW/HW Development, Liquid Load Management SW Development/Test, Advanced Fire and Smoke Sender System Development, Integrated Condition Assessment System Software Development.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603512N: *Carrier Systems Development*	PROJECT 4005: *Smart Carrier*	

Product Development ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Ship Integration	WR	NAVSEA Phil	0.840	0.125	Nov 2009	0.147	Nov 2010	0.000		0.147	0.000	1.112	Continuing
		Subtotal	0.840	0.125		0.147		0.000		0.147	0.000	1.112	

Remarks

Support ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Software Development	WR	NAVSEA Phil	5.587	0.644	Nov 2009	0.595	Nov 2010	0.000		0.595	0.000	6.826	Continuing
Program Management Support	WR	NAVSEA Phil	1.750	0.260	Nov 2009	0.250	Nov 2010	0.000		0.250	0.000	2.260	Continuing
Training Development	WR	NAVSEA Phil	0.470	0.095	Nov 2009	0.080	Nov 2010	0.000		0.080	0.000	0.645	Continuing
Integrated Logistics Support	WR	NAVSEA Phil	0.880	0.200	Nov 2009	0.120	Nov 2010	0.000		0.120	0.000	1.200	Continuing
		Subtotal	8.687	1.199		1.045		0.000		1.045	0.000	10.931	

Remarks

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603512N: *Carrier Systems Development*	PROJECT 4005: *Smart Carrier*	

Test and Evaluation ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation	WR	NAVSEA Phil	2.886	0.470	Nov 2009	0.436	Nov 2010	0.000		0.436	Continuing	Continuing	Continuing
		Subtotal	2.886	0.470		0.436		0.000		0.436			

Remarks

Management Services ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
DAWF	Various/ Various	Various Various	0.008	0.000		0.000		0.000		0.000	0.000	0.008	Continuing
		Subtotal	0.008	0.000		0.000		0.000		0.000	0.000	0.008	

Remarks

	Total Prior Years Cost	FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	12.421	1.794		1.628		0.000		1.628			

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603512N: *Carrier Systems Development*	**PROJECT** 4005: *Smart Carrier*

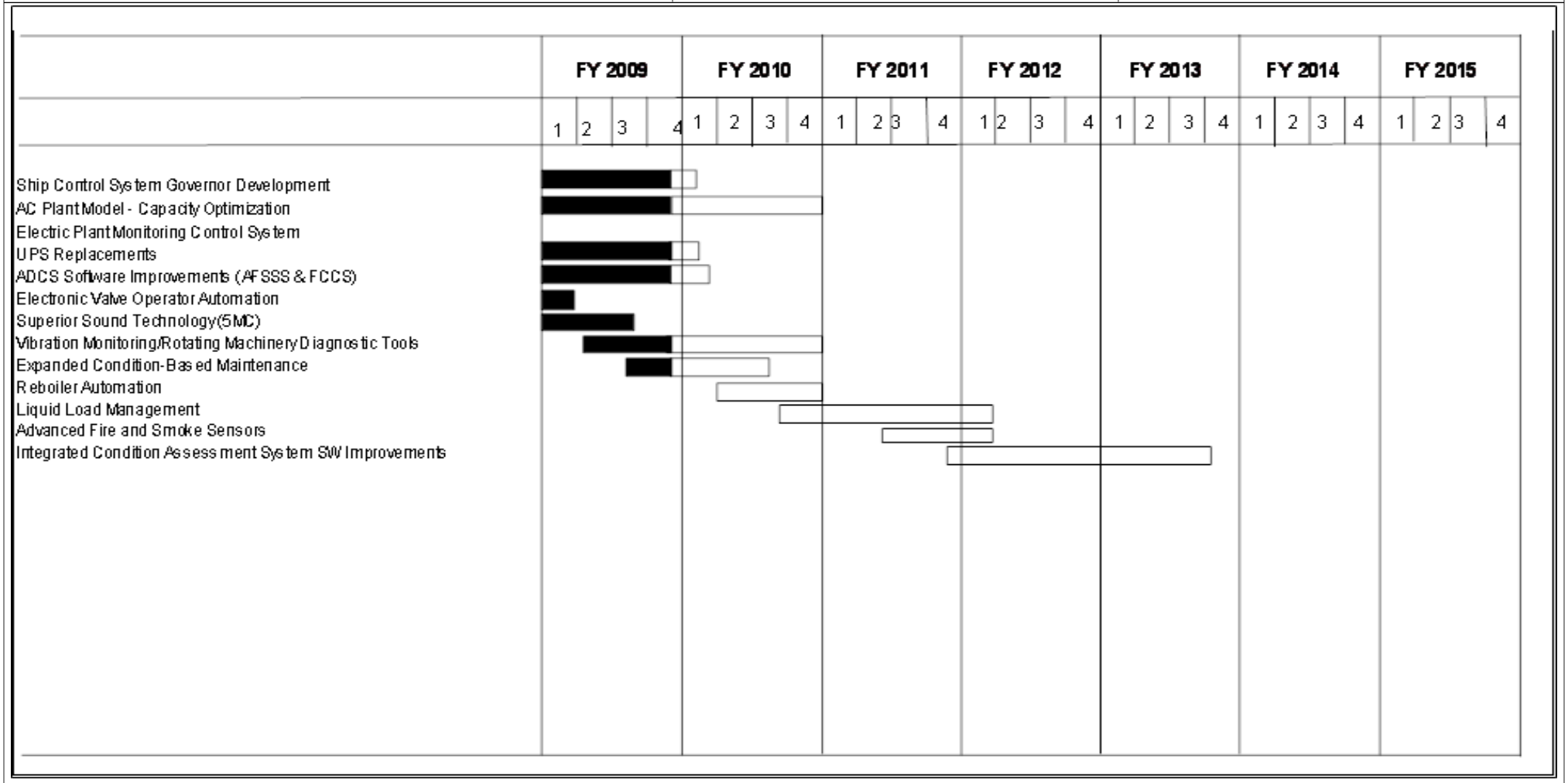

Exhibit R-4A, RDT&E Schedule Details: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603512N: *Carrier Systems Development*	**PROJECT** 4005: *Smart Carrier*

Schedule Details

	Start		End	
Event	**Quarter**	**Year**	**Quarter**	**Year**
Ship Control System Governor Software Development	1	2009	1	2010
AC Plant Model - Capacity Optimization	1	2009	4	2010
UPS Replacements	1	2009	1	2010
ADCS Software Improvements (AFSSS/FCCS) Software Development Test	1	2009	1	2010
Electronic Valve Operator Automation	1	2009	1	2009
Superior Sound Technology (5MC) Development/Integration	1	2009	3	2009
Vibration Monitoring/Rotating Machinery Diagnostic Tools SW Development	2	2009	2	2010
Vibration Monitoring/Rotating Machinery Diagnostic Tools SW Dev Test	3	2010	4	2010
Expanded Condition-Based Maintenance - Rotating Machinery	3	2009	3	2010
Reboiler Automation SW/HW Development	2	2010	4	2010
Liquid Load Management SW Development/Test	3	2010	1	2012
Advanced Fire and Smoke Sendor System Development	2	2011	1	2012
Integrated Condition Assessment System Software Development	4	2011	3	2013

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603512N: *Carrier Systems Development*	PROJECT 9999: *Congressional Adds*	

COST ($ in Millions)	FY 2009 Actual	FY 2010 Estimate	FY 2011 Base Estimate	FY 2011 OCO Estimate	FY 2011 Total Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
9999: *Congressional Adds*	27.525	2.948	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	39.731
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0		

A. Mission Description and Budget Item Justification

Congressional Adds

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010
Congressional Add: Composite Mast for CVNs *FY 2010 Plans:* Develop and validate a full scale composite aircraft carrier topside structure, providing a lightweight fragmentation/structural/fire integrated technology solution that can meet/exceed current performance requirements while reducing costs.	0.000	2.948
Congressional Add: IMPROVED CORROSION PROTECTION FOR ELECTROMAGNETIC *FY 2009 Accomplishments:* Funding will be used to continue ongoing corrosion testing at Ocean City Research Testing facility in New Jersey. Various coupons and coating have been exposed up to 7 months now and will continue to be evaluated up to 3 years of exposure under simulated flight deck trough conditions. The funding will also be used to initiate a phase 2 study into the development of a corrosion inhibitor addition to the armature cooling to extend the armature s life. Phase one identified several candidates which look promising. The remainder of the funds will be utilized to interrogate and document the material	1.995	0.000

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603512N: *Carrier Systems Development*	PROJECT 9999: *Congressional Adds*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010
properties of the alloys selected for use on EMALS. Fatigue and fracture data will be compiled under the unique conditions of the EMALS trough for in-service support of the EMALS system.		
Congressional Add: National Sensor Fusion Support for Puget Sound Por *FY 2009 Accomplishments:* Funds will be used to incorporate National Sensors data into a fusion engine in order to provide a complete and accurate Common Tactical Picture (CTP) of the surface and subsurface threat environment to the at-sea Warfare Commanders. The National Sensor Fusion Configuration Item (NSFCI), as an integral part of the AN/UYQ-100, has demonstrated the capability to collect and integrate a wide variety of disparate geospatial and sensor data, to fuse the available data sources into real time vessel tracks and to provide military commanders with the CTP they need to support critical battlespace decisions. The NSF for PSPS is being developed as an application within the Service Oriented Architecture (SOA) of the Undersea Warfare - Decision Support System (USW-DSS) (AN/UYQ-100).	1.596	0.000
Congressional Add: EMALS *FY 2009 Accomplishments:* Funding will be used to support additional scope of work resulting from complex ship integration, a re-planned Test and Evaluation Program to reduce risks for CVN 78, incorporation of the Production Assessment Review findings and the escalated costs of steel, copper and other materials. Additionally, the funding supported resolution of technical problems associated with Factory Acceptance Testing of the Power Conversion Subsystem, the Prime Power Interface Subsystem and Motor-Generator #4. The associated impacts caused test start delays for High Cycle Test Phase II and Highly Accelerated Life Testing.	23.934	0.000
Congressional Adds Subtotals	27.525	2.948

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603512N: *Carrier Systems Development*	**PROJECT** 9999: *Congressional Adds*

C. Other Program Funding Summary ($ in Millions)

N/A

D. Acquisition Strategy

N/A

E. Performance Metrics

Congressional Adds

Exhibit R-2, RDT&E Budget Item Justification: PB 2011 Navy										DATE: February 2010	
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*				R-1 ITEM NOMENCLATURE PE 0603513N: *Shipboard Sys Component Dev*							
COST ($ in Millions)	**FY 2009 Actual**	**FY 2010 Estimate**	**FY 2011 Base Estimate**	**FY 2011 OCO Estimate**	**FY 2011 Total Estimate**	**FY 2012 Estimate**	**FY 2013 Estimate**	**FY 2014 Estimate**	**FY 2015 Estimate**	**Cost To Complete**	**Total Cost**
Total Program Element	35.748	30.224	0.051	0.000	0.051	0.699	0.728	0.747	0.762	Continuing	Continuing
2469: *Open System Architecture (OSA)*	0.861	1.684	0.051	0.000	0.051	0.699	0.728	0.747	0.762	Continuing	Continuing
2470: *ITD-Integrated Topside Design*	0.011	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	63.465
2471: *Integrated Power Systems (IPS)*	3.064	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	369.829
9999: *Congressional Adds*	31.812	28.540	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	145.486

A. Mission Description and Budget Item Justification

Funds the development of shipboard system components and technologies for the future surface combatant family of ships and focuses on the following efforts: (1) development of DDG 1000 specific and future surface combatant survivability and damage control/firefighting systems and features that reduce vulnerability against weapons, (2) implements modular standard open systems architecture at the total ship/system level and supports reduced manning efforts through automation, (3) develops technologies to achieve a total integrated topside design focused on DDG 1000 and other future surface ships, and (4) supports the Integrated Power System effort that provides total ship electric power,
including electric propulsion, power conversion and distribution, combat system and mission load interfaces to the electric power system.

Project 9999 - Congressional Adds: Advanced Fluid Controls for Shipboard Applications, Advanced Repair Technology for the Expeditionary Navy, Advanced Steam Turbine, Integrated Power System Converter, Smart Valve, DDG-51 Hybrid Drive System, DDG-51 Permanent Magnet Hybrid Electronic Propulsion, Mobile Valve and Flex Hose Maintenance (MVFM), Power Dense Integrated Power System for CG(X), Extreme Torque (XTM) Propulsion Motor, Data Acquisition Reporting and Trending System (DARTS), Infrared LED Free Space Optics Communications Advancement, Smart Machinery Spaces, Landing Craft Composite Lift Fan, Advance Fuel Filtration System, High Shock 100 Amp Current Limiting Circuit Breaker, Integrated Condition Assessment and Reliability Engineering, Integrated Power System Dense Harmonic Filter Design, IP Over Power Line Carrier Network Integration with ICAS, Propulsion Manufacturing Technology Development, and Shipboard Wireless Maintenance Assistant.

Exhibit R-2, RDT&E Budget Item Justification: PB 2011 Navy	DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603513N: *Shipboard Sys Component Dev*

B. Program Change Summary ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
Previous President's Budget	26.824	1.691	0.000	0.000	0.000
Current President's Budget	35.748	30.224	0.051	0.000	0.051
Total Adjustments	8.924	28.533	0.051	0.000	0.051
• Congressional General Reductions		-0.127			
• Congressional Directed Reductions		0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds		28.660			
• Congressional Directed Transfers		0.000			
• Reprogrammings	8.975	0.000			
• SBIR/STTR Transfer	-0.051	0.000			
• Program Adjustments	0.000	0.000	0.051	0.000	0.051

Congressional Add Details ($ in Millions, and Includes General Reductions)	FY 2009	FY 2010
Project: 9999: *Congressional Adds*		
Congressional Add: *Advanced Fuel Filtration System*	0.000	1.195
Congressional Add: *Advanced Steam Turbine*	0.000	3.983
Congressional Add: *High Shock 100 Amp Current Limiting Circuit Breaker*	0.000	0.598
Congressional Add: *Integrated Condition Assessment and Reliability Engineering*	0.000	0.797
Congressional Add: *Integrated Power System Dense Harmonic Filter Design*	0.000	1.593
Congressional Add: *IP Over Power Line Carrier Network Integration with ICAS*	0.000	1.593
Congressional Add: *Propulsion Manufacturing Technology Development*	0.000	3.744
Congressional Add: *Shipboard Wireless Maintenance Assistant*	0.000	1.195
Congressional Add: *Smart Machinery Spaces System*	2.393	0.000
Congressional Add: *ADV FLUID CONTROLS FOR SHIPBOARD APPLICATIONS*	2.493	2.988
Congressional Add: *ADVANCED REPAIR TECHNOLOGY FOR THE EXPEDITIONARY N*	0.798	0.000

Exhibit R-2, RDT&E Budget Item Justification: PB 2011 Navy	DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603513N: *Shipboard Sys Component Dev*

Congressional Add Details ($ in Millions, and Includes General Reductions)	FY 2009	FY 2010
Congressional Add: *ADV STEAM TURBINE*	1.596	0.000
Congressional Add: *INTEGRATED POWER SYSTEM CONVERTER*	1.995	1.593
Congressional Add: *SMART VALVE*	0.798	0.000
Congressional Add: *DG-51 Hybrid Drive System*	6.581	8.066
Congressional Add: *Mobile Valve and Flex Hose Maintenance (MVFM)*	0.997	0.000
Congressional Add: *Power Dense Integrated Power System fo C(X)*	2.992	0.000
Congressional Add: *Extreme Torque (XTM) Propulsion Motor*	0.798	0.000
Congressional Add: *Data Acquisition Reporting and Trending System (DA*	2.393	0.000
Congressional Add: *Infrared LED Free Space Optics Communications Adva*	0.399	0.000
Congressional Add: *Landing Craft Composite Lift Fan*	0.000	1.195
Congressional Add: *DDG-51 Permanent Magnet Hybrid Electronic Propulsi*	7.579	0.000
Congressional Add Subtotals for Project: 9999	31.812	28.540
Congressional Add Totals for all Projects	31.812	28.540

Change Summary Explanation

FY11 from previous President's Budget is shown as zero because no FY11-15 data was presented in President's Budget 2010.

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603513N: *Shipboard Sys Component Dev*	PROJECT 2469: *Open System Architecture (OSA)*	

COST ($ in Millions)	FY 2009 Actual	FY 2010 Estimate	FY 2011 Base Estimate	FY 2011 OCO Estimate	FY 2011 Total Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
2469: *Open System Architecture (OSA)*	0.861	1.684	0.051	0.000	0.051	0.699	0.728	0.747	0.762	Continuing	Continuing
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0		

A. Mission Description and Budget Item Justification

Architectures, Interfaces & Modular Systems (AIMS): This funding supports implementation of Modular Standard Open Systems Architecture (MOSA) at the total system/ship level. These modular interfaces facilitate mission and market adaptability, technology refresh and insertion, and competition. This funding supports the market
surveillance and technology and other projections, cost and logistics analyses, process development, industry partnering, demonstrations and assessments necessary to translate into total ship acquisition.

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
Total Open Shipboard Applications and Concepts	0.000	0.719	0.051	0.000	0.051
Implementation: Transition with industry common Architectures, Interfaces, and Modular Systems (AIMS) for shipboard zones. A. Total Open Shipboard Applications and Concepts: *FY 2010 Plans:* Assess feasibility of open system/modular application to total ship levels, develop interface plan. *FY 2011 Base Plans:* Continue Total Ship interface standards development and implementation.					
Open Sensors Zone	0.276	0.541	0.000	0.000	0.000

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603513N: *Shipboard Sys Component Dev*	PROJECT 2469: *Open System Architecture (OSA)*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
Implementation: Transition with industry common Architectures, Interfaces, and Modular Systems (AIMS) for shipboard zones. A. Open Sensors Zone. *FY 2009 Accomplishments:* Continued Architecture Development. *FY 2010 Plans:* Interface Development.					
Open Machinery Zone Implementation: Transition with industry common Architectures, Interfaces, and Modular Systems (AIMS) for shipboard zones. A. Open Machinery Zone. *FY 2009 Accomplishments:* Architecture Concept. *FY 2010 Plans:* Develop architectures.	0.388	0.215	0.000	0.000	0.000
Open Weapons/Power Projection Zone Implementation: Transition with industry common Architectures, Interfaces, and Modular Systems (AIMS) for shipboard zones. A. Open Weapons/Power Projection Zone *FY 2009 Accomplishments:* Interface Implementation *FY 2010 Plans:* Interface Implementation.	0.197	0.209	0.000	0.000	0.000

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603513N: *Shipboard Sys Component Dev*	PROJECT 2469: *Open System Architecture (OSA)*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
Accomplishments/Planned Programs Subtotals	0.861	1.684	0.051	0.000	0.051

C. Other Program Funding Summary ($ in Millions)

N/A

D. Acquisition Strategy

Not Applicable

E. Performance Metrics

Quarterly Program Reviews

Exhibit R-4, RDT&E Schedule Profile: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603513N: *Shipboard Sys Component Dev*	**PROJECT** 2469: *Open System Architecture (OSA)*

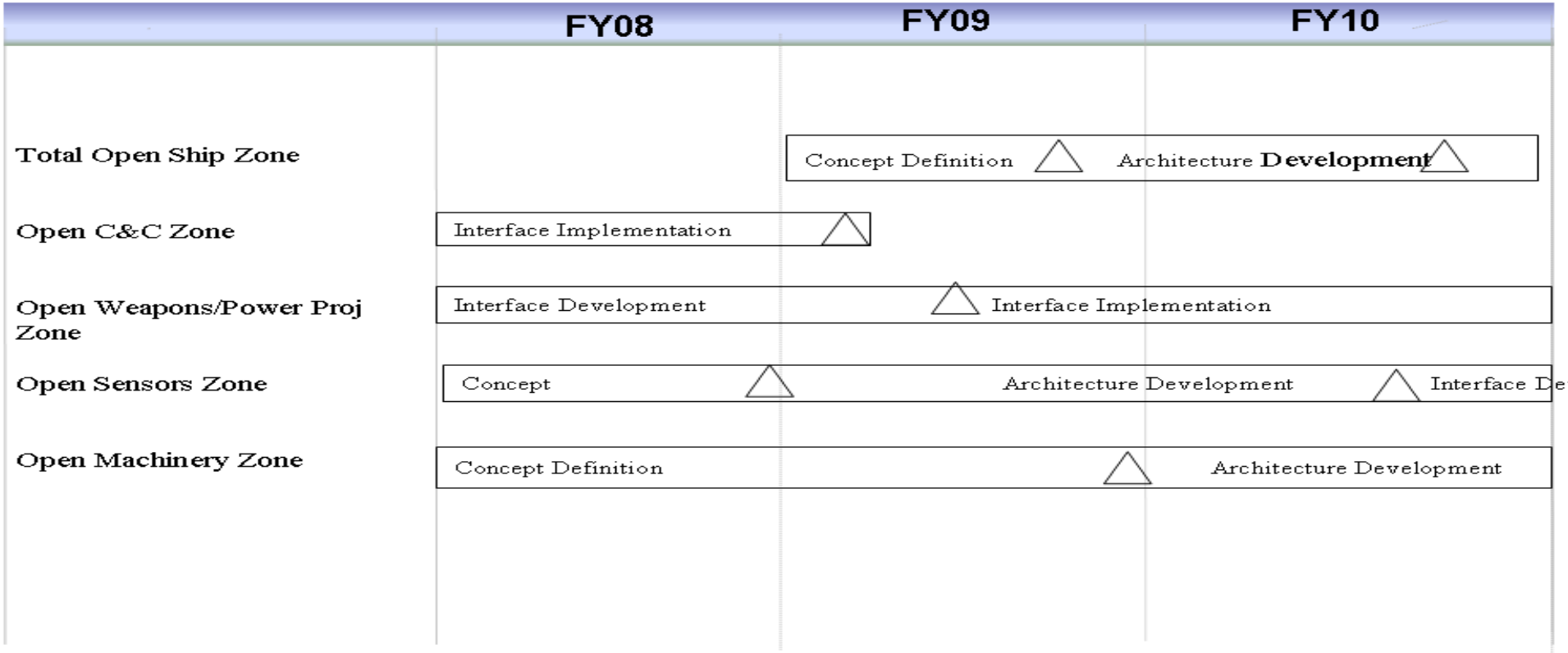

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603513N: *Shipboard Sys Component Dev*	PROJECT 2470: *ITD-Integrated Topside Design*	

COST ($ in Millions)	FY 2009 Actual	FY 2010 Estimate	FY 2011 Base Estimate	FY 2011 OCO Estimate	FY 2011 Total Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
2470: *ITD-Integrated Topside Design*	0.011	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	63.465
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0		

A. Mission Description and Budget Item Justification

This project develops the necessary technologies to achieve a total integrated topside design focused on DDG 1000 and other future surface combatant ships as well as supporting upgrades to existing ships in the Fleet. Technology focus areas include the development, enhancement, validation and verification of modeling and simulation (M&S)
tools to support topside signature control, electronic warfare effectiveness, and electromagnetic engineering. This project also develops technical data to support the use of large-scale marine composites on surface combatants to facilitate topside signature control. Topside signature control and electronic warfare effectiveness M&S tools
supported by this project enable Navy transformation efforts related to sea strike by facilitating the cost effective design, design approval, and Live Fire Test and Evaluation of low signature surface ships. The validated, integrated, physics-based, electromagnetic radiation (VIPER) M&S tool suite currently being developed under this
project will provide the Navy with a state-of-the-art electromagnetic engineering (EME) capability that is applicable to both new construction and existing ships in the Fleet. By providing the design community with tools able to accurately predict the optimum arrangement of topside sensors to minimize electromagnetic interference (EMI), this
project enables Navy transformation efforts by facilitating FORCEnet, the connection of sensors, networks, weapons, decision aids and warriors from seabed to space. Development of marine composite technical data supports Navy transformation efforts by enabling the cost effective design of stealthy surface ship topsides that have improved
corrosion control which, in turn enables optimized manning. This program is directed toward improved affordability, performance, reduced life cycle cost, reliability and maintainability, signature reduction, standardization, and weight and manning reductions for the existing and future Fleet.

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
ITD-Integrated Topside Design	0.011	0.000	0.000	0.000	0.000

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603513N: *Shipboard Sys Component Dev*	PROJECT 2470: *ITD-Integrated Topside Design*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
FY 2009 Accomplishments: Conducted assessment of Topside modeling and simulation tools.					
Accomplishments/Planned Programs Subtotals	0.011	0.000	0.000	0.000	0.000

C. Other Program Funding Summary ($ in Millions)

N/A

D. Acquisition Strategy

N/A

E. Performance Metrics

Quarterly Program Reviews

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603513N: *Shipboard Sys Component Dev*	PROJECT 2471: *Integrated Power Systems (IPS)*	

COST ($ in Millions)	FY 2009 Actual	FY 2010 Estimate	FY 2011 Base Estimate	FY 2011 OCO Estimate	FY 2011 Total Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
2471: *Integrated Power Systems (IPS)*	3.064	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	369.829
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0		

A. Mission Description and Budget Item Justification

Beginning in FY10 funding for PE 0603513N/2471 (Integrated Power Systems (IPS)) has been realigned to PE 0603573N/2471.
This project supports the Integrated Power Systems (IPS) program. IPS provides total ship electric power, including electric propulsion, power conversion and distribution, combat system and mission load interfaces to the electric power system. IPS supports multiple ship class applications for future surface ships.

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
Integrated Power Systems (IPS)-Acquisition Workforce Acquisition Workforce *FY 2009 Accomplishments:* N/A	0.019	0.000	0.000	0.000	0.000
IPS-System Development System Development: Completed prototype of detailed design and manufacture of high-speed generator. Commence preliminary and detailed design of power conversion equipment for advance architecture. *FY 2009 Accomplishments:* N/A	1.110	0.000	0.000	0.000	0.000
IPS-System Test	1.860	0.000	0.000	0.000	0.000

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603513N: *Shipboard Sys Component Dev*	PROJECT 2471: *Integrated Power Systems (IPS)*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
System Test: Completed Land Based Test Site modifications for High Speed Generator (HSG). Conduct testing of HSG at the land based test site at NSWCCD, Philadelphia PA *FY 2009 Accomplishments:* N/A					
IPS-Platform Specific Platform Specific: Developed IPS configurations in support of all future surface ship programs. Develop/modify IPS ship configuration documentation including concepts of operations, system level descriptions/requirements, and module performance specifications as necessary to support power system requirements for CG(X) and other future ships. *FY 2009 Accomplishments:* N/A	0.075	0.000	0.000	0.000	0.000
Accomplishments/Planned Programs Subtotals	3.064	0.000	0.000	0.000	0.000

C. Other Program Funding Summary ($ in Millions)

N/A

D. Acquisition Strategy

IPS is a candidate system for DDG 1000 and all other future surface ships.

E. Performance Metrics

Quarterly Reviews.

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603513N: *Shipboard Sys Component Dev*	PROJECT 9999: *Congressional Adds*	

COST ($ in Millions)	FY 2009 Actual	FY 2010 Estimate	FY 2011 Base Estimate	FY 2011 OCO Estimate	FY 2011 Total Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
9999: *Congressional Adds*	31.812	28.540	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	145.486
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0		

A. Mission Description and Budget Item Justification

Congressional Adds: Advanced Fluid Controls for Shipboard Applications, Advanced Repair Technology for the Expeditionary Navy, Advanced Steam Turbine, Integrated Power System Converter, Smart Valve, DDG-51 Hybrid Drive System, DDG-51 Permanent Magnet Hybrid Electronic Propulsion, Mobile Valve and Flex Hose Maintenance (MVFM), Power Dense Integrated Power System for CG(X), Extreme Torque (XTM) Propulsion Motor, Data Acquisition Reporting and Trending System (DARTS), Infrared LED Free Space Optics Communications Advancement, Smart Machinery Spaces, Landing Craft Composite Lift Fan, Advance Fuel Filtration System, High Shock 100 Amp Current Limiting Circuit Breaker, Integrated Condition Assessment and Reliability Engineering, Integrated Power System Dense Harmonic Filter Design, IP Over Power Line Carrier Network Integration with ICAS, Propulsion Manufacturing Technology Development, and Shipboard Wireless Maintenance Assistant.

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010
Congressional Add: Advanced Fuel Filtration System *FY 2010 Plans:* Apply FY 2010 congressional add funding in support of Advanced Fuel Filtration System efforts as directed by congress. The requested funding will be used for the development of the Advanced Fuel Filtration (AFF) system. AFF is one-third the cost of the legacy centrifugal purifierm, and will save $25 million per year for the Navy from maintenance and operation cost after it is fully implemented to the DDG-51 and CG-47 class ships.	0.000	1.195
Congressional Add: Advanced Steam Turbine	0.000	3.983

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603513N: *Shipboard Sys Component Dev*	PROJECT 9999: *Congressional Adds*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010
FY 2010 Plans: Funds will be used to continue engineering, technical services, manufacturing and testing indicated for the Advanced Steam Turbine (AST) Project. Currently there is only one qualified submarine Turbine Generator (TG) provider. Qualification of a second submarine TG vendor will create competition and lower overall submarine program costs.		
Congressional Add: High Shock 100 Amp Current Limiting Circuit Breaker *FY 2010 Plans:* Apply FY 2010 congressional add funding in support of High Shock 100 Amp Current Limiting Circuit Breaker efforts as directed by congress. Funding will be used to develop a new 100 amp breaker that will complete a family of current limiting AQB circuit breakers used in electrical distribution systems onboard Navy combatant vessels. The new breaker will save size and weight, will eliminate the need for current limiting fuses, and will enhance both the survivability of the electrical system and the survivability of the ship's mission. The Navy presently uses current limiting electronic trip AQB circuit breakers in its electrical distribution systems at the 250 amp, 400 amp and 800 amp frame sizes. Missing from this family is a 100 amp frame size breaker. The new 100 amp AQB current limiting breaker will eliminate the need to use current limiting fuses and fuse bases. This will save about 30% space and weight. Circuit breakers can be re-closed after clearing a fault condition in the electrical system instead of the present situation wherein fuse units must be physically replaced. This enhances the survivability of the electrical system, which therefore enhances the survivability of the ship's mission. There are also logistic support savings.	0.000	0.598
Congressional Add: Integrated Condition Assessment and Reliability Engineering *FY 2010 Plans:* Apply FY 2010 congressional add funding in support of Integrated Condition Assessment and Reliability Engineering with ICAS efforts as directed by congress. The Integrated Condition	0.000	0.797

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603513N: *Shipboard Sys Component Dev*	PROJECT 9999: *Congressional Adds*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010
Assessment & Reliability Engineering (ICARE) project delivers a predictive capability for the Navy to forecast maintenance problems for critical shipboard equipment and enable advance maintenance and logistics decision making. The project is an important use of taxpayer funds as it would modernize the Navy's Condition Assessment System; enable the Navy to realize significant cost savings by helping equipment maintainers and decision makers more accurately predict equipment problems and prioritize/schedule corrective actions before a major fault occurs. It also addresses #20 on CNO's SURFACE WARFARE ENTERPRISE TOP 31 PROGRAM ISSUES FOR POM-FY10, "Integrated condition assessment system & distance support initiatives." The Navy has been unable to identify funds to integrate maintenance metrics data with equipment sensor monitoring and reporting. Lack of FY10 funds will likely delay the condition-based assessment upgrade for shipboard use which, in turn, could generate larger financial and schedule impacts. ICARE integrates maintenance and equipment metrics with sensor data fundamental to achieving this modernization priority.		
Congressional Add: Integrated Power System Dense Harmonic Filter Design *FY 2010 Plans:* Apply FY 2010 congressional add funding in support of Integrated Power System Dense Harmonic Filter Design with ICAS efforts as directed by congress. Funding would be used to validate models of the existing DDG-1000 baseline harmonic filters through testing at the Florida State University's Center for Advanced Power Systems Facility and to develop models for a hybrid filter design for DDG-1000 to be produced in western Pennsylvania. This is a valuable use of taxpayer funding because it would enhance performance of the hybrid filters for shipboard power systems and create jobs in western Pennsylvania. Converteam, Inc. - Pittsburgh, PA 15238	0.000	1.593
Congressional Add: IP Over Power Line Carrier Network Integration with ICAS	0.000	1.593

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603513N: *Shipboard Sys Component Dev*	**PROJECT** 9999: *Congressional Adds*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010
FY 2010 Plans: Apply FY 2010 congressional add funding in support of IP Over Power Line Carrier Network Integration with ICAS efforts as directed by congress. Naval Sea Systems Command has been installing sensing and wireless capabilities for data collection and integration with ICAS. Demonstrations to date have proven successful. However, the costs and time associated with installations has been a limiting factor to the overall success. One of the keys to success is minimizing the cost of installations in order to achieve the associated ROI, while at the same time maintaining the open architecture, enabling the integration of multiple sensing systems. Additional installations, testing and validation are required as new sensor systems are developed and delivered for shipboard evaluation. In order to assist in the transitioning of the technologies it is imperative that we have a highly mobile and flexible system capable of easily adapting to the emerging technologies. Utilizing Internet Protocol over Power Line Carrier technology, the concept of Affordable Flexible Controls Network (AFCN) has been developed utilizing FY08 funding. To date Engineering Design Models (EDM) have been developed and testing and validation is in progress. Additional testing will be conducted 4th quarter FY09 at a Land Based Engineering Test Site. The integrated products such as AFCN will provide for the necessary network infrastructure for the rapid movement of data and video to ICAS without the requirement to pull CAT 5 or 6 cables or deploy other unsecure networking architecture. This will result in a more flexible, scalable and mobile network and significantly reduced deployment and monitoring costs. Additional testing of the AFCN within the environment that includes technologies such as 802.11N, Zigbee and Bluetooth is required to assist in a smooth transition. Installations at Land Based Test Sites and aboard test ships, such as ex-Paul Foster will provide the proper environment to test the integration of the multiple technologies in an open environment.		
Congressional Add: Propulsion Manufacturing Technology Development *FY 2010 Plans:* Apply FY 2010 congressional add funding in support of Propulsion Manufacturing Technology Development efforts as directed by congress. The purpose of this add is to prove the benefits of NiB	0.000	3.744

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603513N: *Shipboard Sys Component Dev*	PROJECT 9999: *Congressional Adds*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010
coating in large scale naval propulsion equipment applications and provides significant opportunities for improved operations and fuel efficiency.		
Congressional Add: Shipboard Wireless Maintenance Assistant *FY 2010 Plans:* Apply FY 2010 congressional add funding in support of Shipboard Wireless Maintenance Assistance efforts as directed by congress. This rugged, handheld wireless device will provide information to maintenance personnel as part of the Navy's Smart Ship Program.	0.000	1.195
Congressional Add: Smart Machinery Spaces System *FY 2009 Accomplishments:* Funded the development of a comprehensive, automated Condition-Based Maintenance (CBM) solution that incorporates Configuration Management (CM), CBM and Automated Logistics functions.	2.393	0.000
Congressional Add: ADV FLUID CONTROLS FOR SHIPBOARD APPLICATIONS *FY 2009 Accomplishments:* Funds were applied to develop and verify an automated fluid system applicable to the VLS Deluge System. This system will have reduced weight, higher reliabilty and will require less manning than the current system. Marotta provided two (2) in-line composite valves, two (2) controllers, and two (2) back-up power supplies, for Navy system testing. The testing efforts yielded a completely qualified system design. System components for 3 additional sizes will also be qualified. System components will be qualified to MIL-S-901 shock, MIL-Std-167 vibration, API607 Burn Test (main valve) and Electric Magnetic Interface (EMI) testing (electronic controller with back-up power module). A test facility will be designed at NSWCCD-SSES for funtional testing and demonstration of the advance fluid system.	2.493	2.988

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603513N: *Shipboard Sys Component Dev*	PROJECT 9999: *Congressional Adds*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010
FY 2010 Plans: Continue development and verification of an automated fluid system applicable to the VLS Deluge System. This system will have reduced weight, higher reliabilty and will require less manning than the current system. Marotta will provide two (2) in-line composite valves, two (2) controllers, and two (2) back-up power supplies, for Navy system testing. The testing efforts will yield a completely qualified system design. System components for 3 additional sizes will also be qualified. System components will be qualified to MIL-S-901 shock, MIL-Std-167 vibration, API607 Burn Test (main valve) and EMI testing (electronic controller with back-up power module). A test facility will be designed at NSWCCD-SSES for funtional testing and demonstration of the advance fluid system.		
Congressional Add: ADVANCED REPAIR TECHNOLOGY FOR THE EXPEDITIONARY N *FY 2009 Accomplishments:* The Advanced Repair Technology for Expeditionary Navy focused on providing innovations in repair technology to the Expeditionary Navy aboard ships at sea and at forward repair sites.	0.798	0.000
Congressional Add: ADV STEAM TURBINE *FY 2009 Accomplishments:* Funds were applied to provide engineering, technical services, manufacturing and testing indicated for the Advanced Steam Turbine (AST) Project. Currently there is only one qualified submarine Turbine Generator (TG) provider. Qualification of a second submarine TG vendor will create competition and lower overall submarine program costs.	1.596	0.000
Congressional Add: INTEGRATED POWER SYSTEM CONVERTER	1.995	1.593

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603513N: *Shipboard Sys Component Dev*	PROJECT 9999: *Congressional Adds*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010
FY 2009 Accomplishments: Integrated Power System Converter developed integrated power system propulsion motor drive power electronics technologies for future surface combatants that allows for rapid response to electrical system load demands. *FY 2010 Plans:* Continue the development of the integrated power system propulsion motor drive power electronics technologies for future surface combatants that allows for rapid response to electrical system load demands.		
Congressional Add: SMART VALVE *FY 2009 Accomplishments:* Funded the development of prototype smart valves (four 4" valves and two 6" valves) and tested their functionality in a fluid system loop. The valves were then tested in a land based, scaled fluid system.	0.798	0.000
Congressional Add: DG-51 Hybrid Drive System *FY 2009 Accomplishments:* Funds for the DDG-51 Hybrid Drive System are used to develop, build and test proof of concept equipment for a DDG-51 Hybrid Electric Drive System. Development of this technology significantly reduces fuel consumption and increased DDG-51 Class mission effectiveness through longer time on station. *FY 2010 Plans:* Continue FY 2009 development efforts in support of the DDG-51 Hybrid Drive System.	6.581	8.066
Congressional Add: Mobile Valve and Flex Hose Maintenance (MVFM)	0.997	0.000

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603513N: *Shipboard Sys Component Dev*	**PROJECT** 9999: *Congressional Adds*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010
FY 2009 Accomplishments: Funds were applied to improve the current process of inspecting valves and flex hoses on-board ship from a cumbersome and manpower intensive effort to one that provides ships force and repair activities with one source for Valve and Flex Hose configurations. Fully implemented and operational, the MVFM will save approximately 8-10% of typical ship availability. Without MVFM, Shipboard planning and maintenance and Quality of Life for the sailor is severely reduced due to time constraints and lack of available personnel to accomplish planning and maintenance.		
Congressional Add: Power Dense Integrated Power System fo C(X) *FY 2009 Accomplishments:* Funding continued the development of a power dense Integrated Power System (IPS) suitable for surface combatant main power generation, distribution and conversion. These funds were used to perform a system level analysis of future electrical power needs and design and manufacture of prototype demonstration hardware.	2.992	0.000
Congressional Add: Extreme Torque (XTM) Propulsion Motor *FY 2009 Accomplishments:* Funding continued the design and development of Full Scale Extreme Torque Density (XTM) Propulsion Motor technology for future Naval vessels. More power dense, efficient, and reduced noise singature propulsion systems may be necessary to meet evolving requirements for future combatants.	0.798	0.000
Congressional Add: Data Acquisition Reporting and Trending System (DA	2.393	0.000

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603513N: *Shipboard Sys Component Dev*	PROJECT 9999: *Congressional Adds*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010
FY 2009 Accomplishments: The Data Acquisition Reporting and Trending System (DARTS) is an acquisition application which provides logsheet capabilities. This add has enhanced and integrated parts of DARTS functionality into both legacy and new Condition Based Maintenance (CBM) applications, where applicable.		
Congressional Add: Infrared LED Free Space Optics Communications Adva *FY 2009 Accomplishments:* Funding applied to securely communicate using infrared light, enabling simultaneous data, video and voice communication in environments, where otherwise communication would be impossible or undesirable. Navy, through appropriate work scope definition and coordination with NAVSEA technical authority and operational users, has developed effective Infrared LED Free Space Optics in support of Navy secure communications concepts.	0.399	0.000
Congressional Add: Landing Craft Composite Lift Fan *FY 2010 Plans:* Apply FY 2010 congressional add funding in support of Land Craft Composite Lift Fan efforts as directed by congress. Funding will be used to install, demonstrate and test the composite lift fan prototype on a Navy landing craft (LCAC) and incorporate lessons learned into a final composite lift fan design.	0.000	1.195
Congressional Add: DDG-51 Permanent Magnet Hybrid Electronic Propulsi *FY 2009 Accomplishments:* DDG-51 Permanent Magnet Hybrid Electronic Propulsion project developed and domonstrated an advanced propulsion motor drive for DDG-51 by utilizing a hybrid power electronics approach.	7.579	0.000

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603513N: *Shipboard Sys Component Dev*	PROJECT 9999: *Congressional Adds*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010
Congressional Adds Subtotals	31.812	28.540

C. Other Program Funding Summary ($ in Millions)

N/A

D. Acquisition Strategy

Congressional Adds

E. Performance Metrics

Congressional Adds

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Exhibit R-2, RDT&E Budget Item Justification: PB 2011 Navy										DATE: February 2010	
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*				R-1 ITEM NOMENCLATURE PE 0603542N: *Radiological Control*							
COST ($ in Millions)	**FY 2009 Actual**	**FY 2010 Estimate**	**FY 2011 Base Estimate**	**FY 2011 OCO Estimate**	**FY 2011 Total Estimate**	**FY 2012 Estimate**	**FY 2013 Estimate**	**FY 2014 Estimate**	**FY 2015 Estimate**	**Cost To Complete**	**Total Cost**
Total Program Element	1.069	1.366	1.358	0.000	1.358	1.439	0.926	0.947	0.966	Continuing	Continuing
1830: *RADIAC Development*	1.069	1.366	1.358	0.000	1.358	1.439	0.926	0.947	0.966	Continuing	Continuing

A. Mission Description and Budget Item Justification

Mission: The Radiation Detection, Indication and Computation (RADIAC) Program is responsible for providing radiation monitoring instruments that detect and measure radiation in accordance with the provisions of Title 10 of the Code of Federal Regulations (10CFR). These instruments are used on all vessels afloat and at every shore installation in order to ensure the safety of personnel and the environment. RADIACs are also required after an act of terrorism or war involving radiological or nuclear materials in order to enable continuity of warfighting ability.

Justification: Many RADIAC instruments and dosimetry systems are decades old and approaching the end of their useful lives. In some cases the equipment and replacement parts are no longer manufactured, making the equipment logistically unsupportable. In other cases increasing failure rates due to age make replacements an economic efficiency improvement.
In all cases a technology refresh will make both economic sense and provide increased operational capabilities. Naval Nuclear Propulsion Program (NNPP): Instruments are developed to support the safe operation and maintenance of nuclear powered vessels and at nuclear maintenance facilities. Non-NNPP: Instruments are developed to support other than NNPP end users, such as Explosive Ordnance Disposal, Weapons, Medical, Industrial Radiography and Training. Visit, Board, Search & Seizure (VBSS): The Navy has been tasked to intercept and board vessels at sea to search for nuclear or radiological materials that could be used for terrorist attacks. These instruments would have different characteristics than those used for NNPP and non-NNPP purposes and prototypes must be developed and/or tested and evaluated. The AN/PDR-65 Ship Board Monitoring System is obsolete and will be replaced. The IM-239/WDQ Air Particle Detector (APD) and the HD-732, HD-1150 and HD-1151 Air Particle Samplers (APS) are obsolete and will be replaced.

Exhibit R-2, RDT&E Budget Item Justification: PB 2011 Navy	DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603542N: *Radiological Control*

B. Program Change Summary ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
Previous President's Budget	1.090	1.372	0.000	0.000	0.000
Current President's Budget	1.069	1.366	1.358	0.000	1.358
Total Adjustments	-0.021	-0.006	1.358	0.000	1.358
• Congressional General Reductions		-0.006			
• Congressional Directed Reductions		0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds		0.000			
• Congressional Directed Transfers		0.000			
• Reprogrammings	0.000	0.000			
• SBIR/STTR Transfer	-0.021	0.000			
• Program Adjustments	0.000	0.000	1.358	0.000	1.358

Change Summary Explanation

Technical: Not applicable.

Schedule: Not applicable.

FY11 from previous President's Budget is shown as zero because no FY11-15 data was presented in President's Budget 2010.

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603542N: *Radiological Control*	PROJECT 1830: *RADIAC Development*	

COST ($ in Millions)	FY 2009 Actual	FY 2010 Estimate	FY 2011 Base Estimate	FY 2011 OCO Estimate	FY 2011 Total Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
1830: *RADIAC Development*	1.069	1.366	1.358	0.000	1.358	1.439	0.926	0.947	0.966	Continuing	Continuing
Quantity of RDT&E Articles	13	14	33	0	33	0	0	0	0		

A. Mission Description and Budget Item Justification

Mission: The Radiation Detection, Indication and Computation (RADIAC) Program is responsible for providing radiation monitoring instruments that detect and measure radiation in accordance with the provisions of Title 10 of the Code of Federal Regulations (10CFR). These instruments are used on all vessels afloat and at every shore installation in order to ensure the safety of personnel and the environment. RADIACs are also required after an act of terrorism or war that involves nuclear material in order to enable continuing warfighting ability.

Justification: Many RADIAC instruments and dosimetry systems are decades old and approaching the end of their useful lives. In some cases the equipment and replacement parts are no longer manufactured, making the equipment logistically unsupportable. In other cases increasing failure rates due to age make replacements an economic efficiency
improvement. In all cases a technology refresh will make both economic sense and provide increased operational capabilities. Naval Nuclear Propulsion Program (NNPP): Instruments are developed to support the safe operation and maintenance of nuclear powered vessels and at nuclear maintenance facilities. Non-NNPP: Instruments are developed
to support other than NNPP end users, such as Explosive Ordnance Disposal, Weapons, Medical, Industrial Radiography and Training. Expanded Maritime Intercept Operations (EMIO): The Navy has been tasked to intercept and board vessels at sea to search for nuclear or radiological materials that could be used for terrorist attacks. These
instruments would have different characteristics than those used for NNPP and non-NNPP purposes and prototypes must be developed and/or tested and evaluated. The AN/PDR-65 Ship Board Monitoring System is obsolete and will be replaced. The IM-239/WDQ Air Particle Detector (APD) and the HD-732, HD-1150 and HD-1151 Air Particle Samplers (APS)
are obsolete and will be replaced.

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
Naval Academy Midshipman Summer Internship	0.015	0.015	0.015	0.000	0.015

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603542N: *Radiological Control*	PROJECT 1830: *RADIAC Development*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
Every summer a Midshipman is selected to conduct laboratory studies in support of the Naval Dosimetry System to research various responses and issues with thermoluminescent dosimetry. Funds pay for materials. *FY 2009 Accomplishments:* Accomplished study assigned by Naval Academy instructor. *FY 2010 Plans:* Accomplish study assigned by Naval Academy instructor. *FY 2011 Base Plans:* Accomplish study assigned by Naval Academy instructor.					
Next Generation Air Particle Detector The IM-239/WDQ Air Particle Detector (APD) is a 400-pound piece of installed equipment on nuclear powered ships that monitors emissions into the air from the ships' nuclear power plants. There are eight on each Nimitiz class carrier and six on each submarine of all classes. The current version is approximately 30 years old and despite component upgrades it has reached the end of its useful life due to parts and technological obsolesence. Naval Reactors requires a new version for the nuclear fleet. The RADIAC Program is working with the pre-eminent facility in this field in the U.S., the DoE Remote Sensing Laboratory at Nellis AFB, NV, to develop the new version. *FY 2009 Accomplishments:* Resolved final technical issues, developed final specifications and produced first three prototypes. *FY 2010 Plans:* Complete final three prototypes and issue them to Nuclear Propulsion Test Units for T&E.	0.750	0.750	0.700	0.000	0.700

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603542N: *Radiological Control*	PROJECT 1830: *RADIAC Development*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
FY 2011 Base Plans: Based on T&E results, issue final specifications and solicit vendors to build prototypes and provide cost estimates for full production. Artifact quantities is an estimate that will be dependent upon the number of offerors, and/or the number of prototypes they propose to build.					
Naval Nuclear Propulsion Program (NNPP) Survey Meter A survey meter for NNPP must meet military specifications for shipboard use, to include high tolerances for exposure to characteristics such as shock, temperature, humidity and sea water. COTS survey meters, which in most cases might be adequate in the mentioned environmental regards for shore-based requirements, cannot meet military requirements. COTS equipment is evaluated for compliance with technical specifications, and for potential hardening for shipboard use. *FY 2009 Accomplishments:* Procured COTS equipment, began environmental and technical performance testing. *FY 2011 Base Plans:* Solicit vendor prototypes for T&E.	0.304	0.000	0.026	0.000	0.026
Pressurized Ion Chamber The Radiological Affairs Support Office (RASO) has requested a feasability study into the performance of a pressurized ion chamber in a pulsed X-ray field. Articles are commercial equipment for evaluation. *FY 2010 Plans:* Procure articles for evaluation. T&E and issue report to RASO on findings.	0.000	0.090	0.000	0.000	0.000
Electronic Pocket Dosimeter (EPD) Mesh Network	0.000	0.461	0.000	0.000	0.000

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603542N: *Radiological Control*	PROJECT 1830: *RADIAC Development*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
Naval Reactors has requested the study of adding capabilities to the newly fielded Electronic Pocket Dosimeter (EPD). Besides its basic functionality for recording dose exposure, this instrument also has the ability to remotely monitor and report the radiation exposure of on-scene emergency responders. This feature has not been implemented in the Navy EPDs that were recently procured and fielded, but the USAF already makes extensive use of the same EPD, along with the extra hardware and software required for the purpose of keeping track of responders in emergencies in terms both of their accumulated exposure and precise location. A second application of the EPD telemetry capability is for radiological work. This would include workers wearing EPDs during high radiation level work, and EPDs being posted at locations where radiation level measurements are required in high radiation background areas. Posting of EPDs in such a situation would preclude having a technician enter the danger area with a survey meter to measure the radiation level. An example would be monitoring the radiation level of the pipe through which primary plant resin is being discharged from the ship. *FY 2010 Plans:* Procure items for evaluation. Issue report and make recommendation.					
Optically Stimulated Luminesence (OSL) The need for dosimetry is a very significant consequence of working with or around ionizing radiation. The expensive infrastructure and investments by the Navy in its dosimetry program is evidence of the importance of a robust dosimetry system to the health and safety of the Navy's military and civilian personnel. As new and improved technologies appear, it is important to evaluate them for their potential to improve performance while reducing total operating costs. OSL is a relatively new technology where the benefits appear to be significant but have yet to be fully evaluated. This project's objective is to make modest investments with the labor of a Navy Health Physicist to explore, in	0.000	0.050	0.000	0.000	0.000

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603542N: *Radiological Control*	PROJECT 1830: *RADIAC Development*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
colloboration with a U.S. Army colleague interested in the same technology for Army use, the potential of the military application for OSL dosimetry. *FY 2010 Plans:* Conduct colloborative preliminary testing. Issue a report recommending further T&E, or other alternatives.					
Speciality Survey Meters and Detectors Develop replacements for obsolete equipment and develop new capabilities for specialized applications. These include: 1) a Radiological Affairs Support Program survey meter; 2) a neutron detector to replace the obsolete Self Indicating Pocket Dosimeter; 3) a uRem survey meter; 4) a shipboard gamma detector that could be part of a Chemical, Biological and Radiological sensor network; and 5) a teletector. Articles are prototypes for T&E. *FY 2011 Base Plans:* Develop replacements for obsolete equipment and develop new capabilities for specialized applications.	0.000	0.000	0.535	0.000	0.535
Visit, Board, Search & Seizure (VBSS) The VBSS mission of the Navy includes the requirement to be able to board ships and be able to detect and identify potential radiological or nuclear Weapons of Mass Destruction (WMD). Such a sensitive mission requires leading edge technology and capabilities to ensure success. The recently fielded AN/PDX-1 RADIAC Set contains several instruments that serve different purposes, perhaps the most significant item being the detector. Current technology dictates that the sensitivity of the detector is directly proportional to the size of the detector element; i.e., the larger the detector, the more sensitive and capable it is. However, in VBSS there must be a tradeoff between size/weight and capability, since it is difficult and hazardous for boarding parties to carry a backpack-sized detector, along with their	0.000	0.000	0.082	0.000	0.082

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603542N: *Radiological Control*	PROJECT 1830: *RADIAC Development*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
weapons and other gear, up a rope ladder to board a vessel on the high seas. This will be a continuing and growing effort to find smaller, lighter instruments with enhanced sensitivity, reach-back capability, and other enhancements to provide the Navy the best and most cost effective equipment possible for this critical mission. *FY 2011 Base Plans:* Procure equipment for T&E.					
Accomplishments/Planned Programs Subtotals	1.069	1.366	1.358	0.000	1.358

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total	FY 2012	FY 2013	FY 2014	FY 2015	Cost To Complete	Total Cost
• OPN 2920: *RADIAC*	9.176	5.971	6.104	0.000	6.104	8.005	8.181	8.732	8.996	Continuing	Continuing

D. Acquisition Strategy

Development efforts are focused on evaluation, modification (as required to meet operational requirements) and adaptation of commercial-off-the-shelf (COTS) technology in order to minimize total ownership costs. To the maximum extent possible new contracts are targeted for fixed price efforts to control development cost.

E. Performance Metrics

Program Reviews

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603542N: *Radiological Control*	PROJECT 1830: *RADIAC Development*

Product Development ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Primary Hardware Development	C/FP	Various Not Specified	11.390	0.000		0.000		0.000		0.000	0.000	11.390	11.390
		Subtotal	11.390	0.000		0.000		0.000		0.000	0.000	11.390	11.390

Remarks

Support ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Development Support	WR	NSWC Carderock West Bethesda, MD	3.297	0.285	Nov 2009	0.366	Nov 2010	0.000		0.366	Continuing	Continuing	Continuing
Development Support	SS/CPIF	Univ. of Washington Seattle, WA	1.157	0.000		0.000		0.000		0.000	0.000	1.157	1.157
		Subtotal	4.454	0.285		0.366		0.000		0.366			

Remarks

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603542N: *Radiological Control*	PROJECT 1830: *RADIAC Development*

Test and Evaluation ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Operational Test & Evaluation	WR	Various Not Specified	0.833	0.117	Feb 2010	0.000		0.000		0.000	0.000	0.950	0.950
		Subtotal	0.833	0.117		0.000		0.000		0.000	0.000	0.950	0.950

Remarks

Management Services ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Contractor Engineering Support	C/FP	Orbis, Inc., Charleston, SC	2.029	0.210	Nov 2009	0.238	Nov 2010	0.000		0.238	Continuing	Continuing	Continuing
Labor (Researach Personnel)	MIPR	DoE, RSL, Nellis AFB, NV	3.033	0.750	Nov 2009	0.750	Nov 2010	0.000		0.750	Continuing	Continuing	Continuing
Travel	WR	NAVSEA Washington, D.C.	0.365	0.004	Nov 2009	0.004	Nov 2010	0.000		0.004	Continuing	Continuing	Continuing
		Subtotal	5.427	0.964		0.992		0.000		0.992			

Remarks

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603542N: *Radiological Control*	PROJECT 1830: *RADIAC Development*	

	Total Prior Years Cost	FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	22.104	1.366		1.358		0.000		1.358			

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603542N: *Radiological Control*	PROJECT 1830: *RADIAC Development*

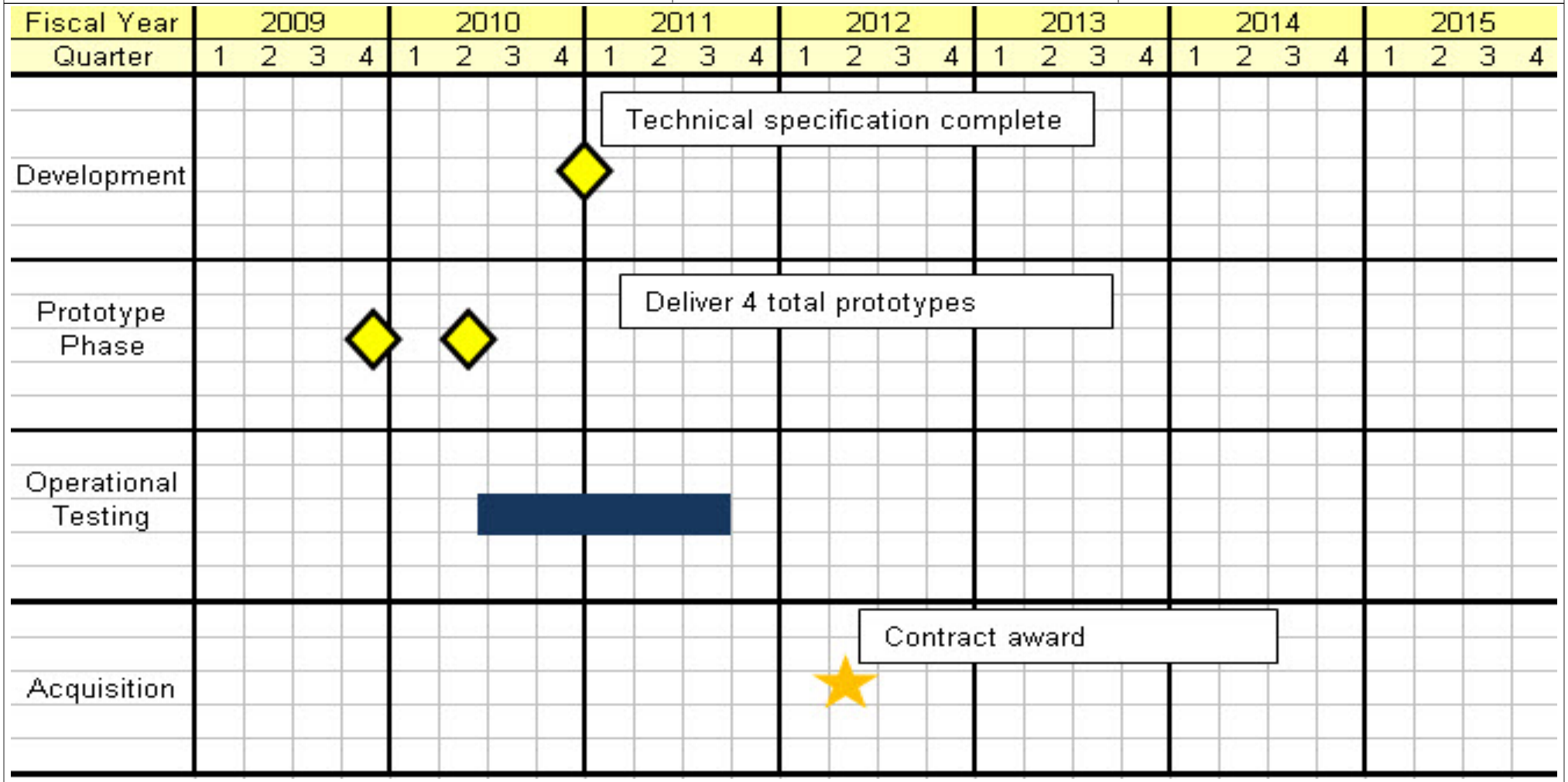

Exhibit R-4A, RDT&E Schedule Details: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603542N: *Radiological Control*	**PROJECT** 1830: *RADIAC Development*

Schedule Details

	Start		End	
Event	**Quarter**	**Year**	**Quarter**	**Year**
Development	4	2010	4	2010
Prototypes	4	2009	2	2010
Operational Testing	3	2010	3	2011
Acquisition (Contract Award)	2	2010	2	2010

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Exhibit R-2, RDT&E Budget Item Justification: PB 2011 Navy										DATE: February 2010	
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*				R-1 ITEM NOMENCLATURE PE 0603553N: *Surface ASW*							
COST ($ in Millions)	**FY 2009 Actual**	**FY 2010 Estimate**	**FY 2011 Base Estimate**	**FY 2011 OCO Estimate**	**FY 2011 Total Estimate**	**FY 2012 Estimate**	**FY 2013 Estimate**	**FY 2014 Estimate**	**FY 2015 Estimate**	**Cost To Complete**	**Total Cost**
Total Program Element	47.506	23.497	21.673	0.000	21.673	34.542	2.378	2.848	2.843	Continuing	Continuing
1704: *Undersea Warfare*	28.757	21.904	21.673	0.000	21.673	34.542	2.378	2.848	2.843	Continuing	Continuing
9999: *Congressional Adds*	18.749	1.593	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	52.759

A. Mission Description and Budget Item Justification

The Anti-Submarine Warfare (ASW) Advanced Development project provides advanced development demonstration and validation of technology for potential surface sonar and combat system applications. Program Element (PE) 0603553N has been designated to support emerging multi-static technologies, and the CNO's ASW Initiative. Efforts focus on resolution of technical issues associated with providing capability against the FY09 and beyond threat, with emphasis on shallow water/ littoral areas, deep water Undersea Warfare (USW), and demonstration and validation of USW concepts and technology. Key technology areas include active sonar transmissions; advanced signal and data processing; active sonar classification; towed and hull arrays; transducer technology; and periscope detection techniques. Starting in FY07, the CNO's ASW Initiative (formerly known as Task Force ASW) included the development of new and innovative technologies. Efforts associated with these technologies include design, development, integration, and testing of future undersea superiority systems. These systems include distributed sensor systems; Vertical Line Array; static active buoy fields; submarine countermeasures; compact rapid-effect weapons; longer-range radio systems; multi-static sonar; and multi-sensor data fusion, including multi-platform data fusion and net-centric USW concepts.

Project Unit 9999 is comprised of Congressional Adds for Small Business Technology Insertion (FY09), Automated Readiness Measurement Systems (FY09) and Low Frequency Active Towed Sonar Organic ASW Capability (FY10).

Exhibit R-2, RDT&E Budget Item Justification: PB 2011 Navy	DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603553N: *Surface ASW*

B. Program Change Summary ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
Previous President's Budget	48.189	21.995	0.000	0.000	0.000
Current President's Budget	47.506	23.497	21.673	0.000	21.673
Total Adjustments	-0.683	1.502	21.673	0.000	21.673
• Congressional General Reductions		-0.098			
• Congressional Directed Reductions		0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds		1.600			
• Congressional Directed Transfers		0.000			
• Reprogrammings	-0.032	0.000			
• SBIR/STTR Transfer	-0.652	0.000			
• Program Adjustments	0.000	0.000	21.673	0.000	21.673
• Rate/Misc Adjustments	0.001	0.000	0.000	0.000	0.000

Congressional Add Details ($ in Millions, and Includes General Reductions)	FY 2009	FY 2010
Project: 9999: *Congressional Adds*		
Congressional Add: *Low Frequency Active Towed Sonar Organic ASW Capability*	0.000	1.593
Congressional Add: *Automated Readiness Measurement System*	2.792	0.000
Congressional Add: *SMALL BUSINESS INSERTION*	15.957	0.000
Congressional Add Subtotals for Project: 9999	18.749	1.593
Congressional Add Totals for all Projects	18.749	1.593

Change Summary Explanation

Technical: Not applicable.

Schedule: Not applicable.

FY11 from previous President's Budget is shown as zero because no FY11-15 data was presented in President's Budget 2010.

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603553N: *Surface ASW*	PROJECT 1704: *Undersea Warfare*	

COST ($ in Millions)	FY 2009 Actual	FY 2010 Estimate	FY 2011 Base Estimate	FY 2011 OCO Estimate	FY 2011 Total Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
1704: *Undersea Warfare*	28.757	21.904	21.673	0.000	21.673	34.542	2.378	2.848	2.843	Continuing	Continuing
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0		

A. Mission Description and Budget Item Justification

The CNO's ASW initiative is a focused effort to identify the most promising ASW technologies through a process of discovery, assessment, experimentation, and analysis. The CNO's ASW initiative will coordinate the development of technologies which move beyond incremental or marginal improvements in ASW effectiveness. The CNO's vision of "fundamentally changing the way ASW is currently conducted to render the enemy submarine irrelevant against U.S. and coalition forces", necessitates a change in the calculus of how the US Navy conducts ASW. Central to the CNO's ASW initiatives achieving the CNO's vision are several innovative approaches which include using the art-of-the-technologically-possible; minimizing force-on-force; reducing the ASW end-to-end time line; supporting rapid maneuver; developing off-board and distributed ASW detection systems; and finding innovative weapons solutions. To achieve these key approaches, it is essential to develop new ASW technologies and conduct at-sea experiments to prove/disprove technology concepts and collect corroborating data. The most promising technology concepts from government laboratories, university research centers, and industry are developed to the point where these technologies can be tested in at-sea experiments, with the objective of transitioning those which demonstrate exceptional capability to programs of record.

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
CNO ASW Initiative	28.614	21.904	21.673	0.000	21.673
FY 2009 Accomplishments: Active Clutter Reduction algorithms were demonstrated in real-time during SHAREM 159 and SHAREM 160. Five algorithms were selected for transition into the AN/SQQ-89A(V)15 ACB-11 baseline. A development contract for Continuous Active Sonar was awarded, an at-sea demonstration was conducted and efforts to determine the feasibility of developing a variable depth sonar were initiated.					

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603553N: *Surface ASW*	PROJECT 1704: *Undersea Warfare*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
FY 2010 Plans: Continue development of continuous active sonar and variable depth sonar for surface combat systems and continued studies of new acoustic, non-acoustic, and off-board sensors and independent critical review and analysis of alternatives of selected and potential CNO ASW initiative technologies. *FY 2011 Base Plans:* Continue development of continuous active sonar and variable depth sonar for surface combat systems and continued studies of new acoustic, non-acoustic, and off-board sensors and independent critical review and analysis of alternatives of selected and potential CNO ASW initiative technologies.					
DAWDF Defense Acquisition Workforce Development Fund. *FY 2009 Accomplishments:* N/A	0.143	0.000	0.000	0.000	0.000
Accomplishments/Planned Programs Subtotals	28.757	21.904	21.673	0.000	21.673

C. Other Program Funding Summary ($ in Millions)

N/A

D. Acquisition Strategy

Competitively awarded contracts from Broad Agency Announcement (BAA) solicitations.

E. Performance Metrics

Not applicable.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603553N: *Surface ASW*	PROJECT 1704: *Undersea Warfare*

Product Development ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Multi-Static Sonar Development	WR	NUWC Newport, RI	1.524	0.000		0.000		0.000		0.000	0.000	1.524	Continuing
Multi-Static Sonar Development	C/CPFF	AAC NY	0.067	0.000		0.000		0.000		0.000	0.000	0.067	Continuing
Multi-Static Sonar Development	WR	NAWC Patuxent River, MD	0.230	0.000		0.000		0.000		0.000	0.000	0.230	Continuing
Multi-Static Sonar Development	C/CPFF	Adaptive Methods VA	1.003	0.000		0.000		0.000		0.000	0.000	1.003	Continuing
Multi-Static Sonar Development	C/CPFF	JHU/APL MD	0.017	0.000		0.000		0.000		0.000	0.000	0.017	Continuing
Multi-Static Sonar Development	WR	SPAWAR San Diego, CA	0.541	0.000		0.000		0.000		0.000	0.000	0.541	Continuing
		Subtotal	3.382	0.000		0.000		0.000		0.000	0.000	3.382	

Remarks

Test and Evaluation ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation	WR	NUWC Newport, RI	3.472	0.000		0.000		0.000		0.000	0.000	3.472	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603553N: *Surface ASW*	PROJECT 1704: *Undersea Warfare*

Test and Evaluation ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation	WR	NAWC Patuxent River, MD	0.343	0.000		0.000		0.000		0.000	0.000	0.343	Continuing
Developmental Test & Evaluation	C/CPFF	BBN VA	0.250	0.000		0.000		0.000		0.000	0.000	0.250	Continuing
Developmental Test & Evaluation	C/CPFF	AAC NY	1.067	0.000		0.000		0.000		0.000	0.000	1.067	Continuing
Developmental Test & Evaluation	WR	NUWC Keyport, WA	0.259	0.000		0.000		0.000		0.000	0.000	0.259	Continuing
Developmental Test & Evaluation	WR	NSWC Dahlgren, VA	0.265	0.000		0.000		0.000		0.000	0.000	0.265	Continuing
Developmental Test & Evaluation	C/CPFF	UT/ARL TX	1.844	0.000		0.000		0.000		0.000	0.000	1.844	Continuing
Developmental Test & Evaluation	MIPR	U.S. ARMY MITRE, MA	0.060	0.000		0.000		0.000		0.000	0.000	0.060	Continuing
Developmental Test & Evaluation	WR	NRL DC	0.537	0.000		0.000		0.000		0.000	0.000	0.537	Continuing
Developmental Test & Evaluation	WR	NSWC Carderock, MD	0.672	0.000		0.000		0.000		0.000	0.000	0.672	Continuing
Developmental Test & Evaluation	WR	NSMA VA	0.907	0.000		0.000		0.000		0.000	0.000	0.907	Continuing
Technology Development	C/CPFF	JHU/APL MD	15.878	7.409	Dec 2009	6.653	Dec 2010	0.000		6.653	Continuing	Continuing	Continuing
Technology Development	WR	NUWC Newport, RI	16.957	5.936	Oct 2009	5.784	Dec 2010	0.000		5.784	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603553N: *Surface ASW*	PROJECT 1704: *Undersea Warfare*	

Test and Evaluation ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
At-Sea Test/Experiment	WR	ONR 3 Phoenix, VA	5.500	0.000		0.000		0.000		0.000	0.000	5.500	Continuing
Enhanced Data Collection (SSEMP)	C/CPFF	JHU/APL MD	4.462	0.000		0.000		0.000		0.000	Continuing	Continuing	Continuing
Enhanced Data Collection (SSEMP)	C/CPFF	UT/ARL TX	2.000	0.000		0.000		0.000		0.000	Continuing	Continuing	Continuing
Technology Development	C/CPFF	Northrop Grumman Corp. VA	4.684	0.000		0.000		0.000		0.000	0.000	4.684	Continuing
Technology Development	C/CPFF	Adaptive Methods VA	2.785	0.000		0.000		0.000		0.000	Continuing	Continuing	Continuing
Technology Development	C/CPFF	AAC NY	1.067	0.000		0.000		0.000		0.000	0.000	1.067	Continuing
Technology Development	C/CPFF	Alion Sciences VA	3.500	2.000	Jan 2010	2.200	Dec 2010	0.000		2.200	Continuing	Continuing	Continuing
Technology Development	C/CPFF	Lockheed Martin ISS	0.610	2.000	Dec 2009	2.862	Dec 2010	0.000		2.862	0.000	5.472	Continuing
Technology Development	C/CPFF	UT/ARL TX	2.209	2.699	Dec 2009	2.214	Dec 2010	0.000		2.214	0.000	7.122	Continuing
Technology Development	WR	NUWC Keyport, WA	0.260	0.260	Oct 2009	0.260	Oct 2010	0.000		0.260	0.000	0.780	Continuing
Technology Development	WR	NSWC Carderock, MD	0.706	0.400	Oct 2009	0.500	Oct 2010	0.000		0.500	0.000	1.606	Continuing
Technology Development	MIPR	U.S. ARMY MITRE, MA	0.000	0.200	Jan 2010	0.200	Nov 2010	0.000		0.200	0.000	0.400	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603553N: *Surface ASW*	PROJECT 1704: *Undersea Warfare*

Test and Evaluation ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Technology Development	C/CPFF	EG&G VA	1.050	0.000		0.000		0.000		0.000	0.000	1.050	Continuing
Technology Development	C/CPFF	L-3 Communications VA	3.000	0.000		0.000		0.000		0.000	0.000	3.000	Continuing
Technology Development	C/CPFF	VAR VAR*	3.409	0.000		0.000		0.000		0.000	0.000	3.409	Continuing
		Subtotal	77.753	20.904		20.673		0.000		20.673			

Remarks

*Consists of multiple performing activities with funding for each not greater than $1 million per year.

Management Services ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Support	C/CPAF	BAE Systems MD	1.661	0.950	Jan 2010	0.950	Nov 2010	0.000		0.950	0.000	3.561	Continuing
Program Management Support	C/CPFF	Stanley and Associates VA	0.350	0.000		0.000		0.000		0.000	0.000	0.350	Continuing
Travel	WR	NAVSEA PEO IWS 5	0.150	0.050	Oct 2009	0.050	Oct 2010	0.000		0.050	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603553N: *Surface ASW*	PROJECT 1704: *Undersea Warfare*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	FY 2010 Cost	FY 2010 Award Date	FY 2011 Base Cost	FY 2011 Base Award Date	FY 2011 OCO Cost	FY 2011 OCO Award Date	FY 2011 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
		DC											
DAWDF	Various/ Various	Not Specified Not Specified	0.143	0.000		0.000		0.000		0.000	0.000	0.143	Continuing
		Subtotal	2.304	1.000		1.000		0.000		1.000			

Remarks

	Total Prior Years Cost	FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	83.439	21.904		21.673		0.000		21.673			

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603553N: *Surface ASW*	PROJECT 1704: *Undersea Warfare*

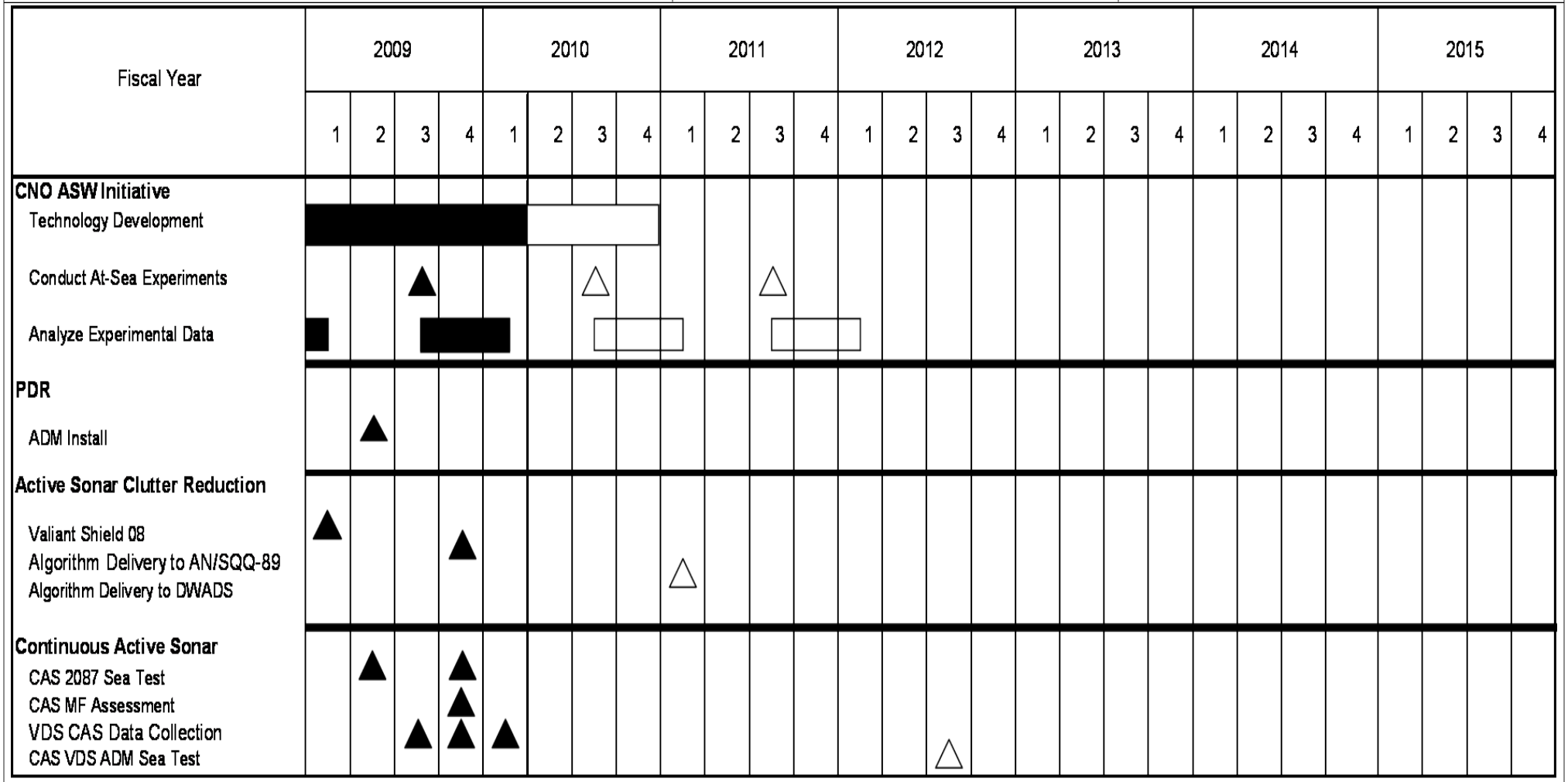

Exhibit R-4A, RDT&E Schedule Details: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603553N: *Surface ASW*	**PROJECT** 1704: *Undersea Warfare*

Schedule Details

	Start		End	
Event	**Quarter**	**Year**	**Quarter**	**Year**
Technology Development	1	2009	4	2010
Conduct At-Sea Experiment (test promising technologies)	3	2009	3	2011
Analyze Experimental Data	1	2009	1	2012
ADM Install on CVN-73	2	2009	2	2009
Valiant Shield 08	1	2009	1	2009
Algorithm Delivery to AN/SQQ-89A(V)15	4	2009	4	2009
Algorithm Delivery to DWADS	1	2011	1	2011
CAS 2087 Sea Test	2	2009	4	2009
CAS MF Assessment	4	2009	4	2009
VDS CAS Data Collection	3	2009	1	2010
VDS CAS ADM Sea Test	3	2012	3	2012

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603553N: *Surface ASW*	PROJECT 9999: *Congressional Adds*	

COST ($ in Millions)	FY 2009 Actual	FY 2010 Estimate	FY 2011 Base Estimate	FY 2011 OCO Estimate	FY 2011 Total Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
9999: *Congressional Adds*	18.749	1.593	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	52.759
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0		

A. Mission Description and Budget Item Justification

Congressional Adds.

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010
Congressional Add: Low Frequency Active Towed Sonar Organic ASW Capability *FY 2010 Plans:* FY10 Congressional Add - Project 10C108: Low Frequency Active Sonar Orgranic Anti-Submarine Warfare (ASW) capability improvement development.	0.000	1.593
Congressional Add: Automated Readiness Measurement System *FY 2009 Accomplishments:* 9809A - Automated Readiness Measurement System will develop a readiness assessment tool which will be fully integrated into the Undersea Warfare Decision Support System (USW-DSS) Build 3 and subsequent builds with a scalable, extensible, open Commercial Off-The-Shelf (COTS) architecture compliant with Common Surface Combatant Open Architecture (OA). ARMS will provide an objective assessment of readiness in multiple mission areas. The initial application will assess ASW mission areas and is being developed as a segment of USW-DSS. ARMS will provide a core application for the objective assessment of mission readiness, capable of dynamically configuring to ship class specific environments and systems. The ARMS tactical decision tool will provide the Commander with the	2.792	0.000

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603553N: *Surface ASW*	PROJECT 9999: *Congressional Adds*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010
ability to evaluate alternative force deployment and assignments, considering own force material and operational readiness, in a dynamic tactical environment. ARMS total ownership costs will be minimized by developing a functional architecture that is compliant with OA initiatives, scalable and extensible, and maximizes reuse of functionality across multiple ship classes.		
Congressional Add: SMALL BUSINESS INSERTION *FY 2009 Accomplishments:* 9B69A - Small Business Technology Insertion will implement the cost-effective advantages gained through the Acoustic Rapid Commercial Off-The-Shelf Insertion/Advanced Processor Build Program (ARCI/APB) within the submarine community concept in other acquisition programs. Cost effective gains include modularity, rapid technology insertion, software re-use, improved manufacturing processes, and cost reductions. Navy Open Architecture (OA) doctrine calls for a standard-based, middleware solution to be used for data communication. Funds will be used to encourage the use of virtualization that will allow disparate systems to co-exist on a single computer, thus allowing shipboard computer rooms/processing centers to be smaller in size, consume less power, and provide more processing capability in a more efficient and effective way.	15.957	0.000
Congressional Adds Subtotals	18.749	1.593

C. Other Program Funding Summary ($ in Millions)

N/A

D. Acquisition Strategy

N/A

E. Performance Metrics

Congressional Adds.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2011 Navy										DATE: February 2010	
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*				R-1 ITEM NOMENCLATURE PE 0603561N: *Adv Submarine System Dev*							
COST ($ in Millions)	**FY 2009 Actual**	**FY 2010 Estimate**	**FY 2011 Base Estimate**	**FY 2011 OCO Estimate**	**FY 2011 Total Estimate**	**FY 2012 Estimate**	**FY 2013 Estimate**	**FY 2014 Estimate**	**FY 2015 Estimate**	**Cost To Complete**	**Total Cost**
Total Program Element	153.783	549.392	608.566	0.000	608.566	841.214	911.568	1,127.274	681.979	Continuing	Continuing
0223: *Sub Combat System Improvement (ADV)*	45.764	51.038	51.040	0.000	51.040	48.082	46.211	46.194	47.296	Continuing	Continuing
2033: *Adv Submarine System Development*	61.044	72.301	42.515	0.000	42.515	37.230	34.525	36.632	37.384	Continuing	Continuing
3197: *Undersea Superiority*	35.631	32.176	21.983	0.000	21.983	0.000	0.000	0.000	0.000	0.000	89.790
3220: *SBSD Advanced Submarine System Development*	0.000	385.910	493.028	0.000	493.028	755.902	830.832	1,044.448	597.299	Continuing	Continuing
9999: *Congressional Adds*	11.344	7.967	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	73.206

A. Mission Description and Budget Item Justification

This program element supports innovative research and development in submarine hull and combat systems technologies and the subsequent evaluation, demonstration, and validation for submarine platforms. It will increase the submarine technology base and provide subsystem design options not currently feasible. The program element also supports programs
transitioning from Science and Technology (S&T), Defense Advanced Research Projects Agency (DARPA), Industry Research and Development, and Small Business Innovative Research (SBIR) projects.

Project Unit 0223:
The Advanced Submarine Combat Systems Development non-acquisition (NON-ACAT) program supports Navy Submarine Acoustic Superiority and Technology Insertion Initiatives through the application of advanced development and testing of sonar and tactical control systems improvements. This Project transitions technologies developed by Navy Technology bases, the private sector, Office of Naval Research (ONR), Future Naval Capabilities, and DARPA. The Project addresses technology challenges to improve tactical control in littoral and open ocean environments for a variety of operational missions including peacetime engagement, surveillance, battle space preparation, deterrence, regional sea denial, precision strike, task group support, and ground warfare support. Prototype hardware / software systems are developed to demonstrate technologically promising system concepts in laboratory and at-sea submarine environments. Specifically, the focus of the technology efforts will be Advanced Processing Build-Acoustic (APB-A), Advanced Processing Build-Tactical (APB-T), Advanced Processing Build - Imaging (APB-I), tactical control, and Advanced Sonar Arrays. APBs develop and demonstrate improvements to current and future sonar/combat control systems. The Advanced Sonar

Exhibit R-2, RDT&E Budget Item Justification: PB 2011 Navy	DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603561N: *Adv Submarine System Dev*

Arrays program develops and tests new sensors and demonstrates large array configuration. This Project is funded under demonstration and validation, as it develops and integrates hardware for experimental tests related to specific platform applications.

Project Unit 2033:
The Advanced Submarine Systems Development (ASSD) Program is a non-acquisition program that develops, matures, and transitions Hull, Mechanical, and Electrical (HM&E) technologies from Science & Technology (S&T) to operational platforms, develops and demonstrates submarine design and naval architecture products destined for backfit, forward fit, and/or future submarines, and operates unique Research and Development experimentation, modeling, and simulation facilities to enhance submarine stealth, maneuverability, capability, and affordability. The program is structured to support near term technology insertion to achieve VIRGINIA Class cost reductions and influence future submarine concepts and core technologies. In support of Sea Power 21, Sea Trial experimentation supports the naval enterprises in identifying and prototyping capabilities and technologies that support the warfighter. Focus is on the Undersea Enterprise (USE), the Naval Network/ FORCENET (NNFE), Naval Expeditionary Combat Enterprise (NECE), Surface Warfare Enterprise (SWE), and Special Operations Force Enterprise (SOFE). In addition to enterprise support, experimentation may identify, develop, integrate, and test Intelligence, Surveillance, and Reconnaissance (ISR) technologies and develop littoral precision strike capabilities supporting the Overseas Contingency Operations (OCO). Experimentation and demonstration is conducted in a joint warfighting context with other services, (i.e. the U.S. Marines, U.S. Army, and the U.S. Air Force), to enable early assessment of warfighting capabilities, and to contribute to better technology selection decisions for potential incremental development. This program also supports Information Exchange Programs and joint Project Arrangements (PA) with the United Kingdom, Canada, and Australia.

Project Unit 3197:
The Undersea Superiority Project supports offboard Anti-Submarine Warfare (ASW) technologies selected by the Chief of Naval Operations (CNO) ASW Cross Functional Team for technologies that hold the potential for deployment and/or use by submarine platforms. Efforts associated with these technologies include design, development, integration and testing of future Undersea Superiority systems.

Project Unit 3220:
The objective of the Sea Based Strategic Deterrent (SBSD) Advanced Submarine System Development project is to design and prepare for construction of the replacement of the OHIO Class SSBN.

Exhibit R-2, RDT&E Budget Item Justification: PB 2011 Navy	DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603561N: *Adv Submarine System Dev*

B. Program Change Summary ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
Previous President's Budget	150.686	551.836	0.000	0.000	0.000
Current President's Budget	153.783	549.392	608.566	0.000	608.566
Total Adjustments	3.097	-2.444	608.566	0.000	608.566
• Congressional General Reductions		-2.289			
• Congressional Directed Reductions		-8.000			
• Congressional Rescissions	0.000	-0.155			
• Congressional Adds		8.000			
• Congressional Directed Transfers		0.000			
• Reprogrammings	6.601	0.000			
• SBIR/STTR Transfer	-3.504	0.000			
• Program Adjustments	0.000	0.000	608.566	0.000	608.566

Congressional Add Details ($ in Millions, and Includes General Reductions)	FY 2009	FY 2010
Project: 9999: *Congressional Adds*		
Congressional Add: *Fiber Optic Conformal Acoustic Velocity Sensor (FO*	1.995	0.000
Congressional Add: *Organic Submarine ISRT Demonstration (IRST OSAID)*	0.000	2.390
Congressional Add: *SSBN(X) Systems Development*	0.000	1.992
Congressional Add: *Underwater Explosion Modeling for Non-Pressure Hull Fairing*	0.000	1.992
Congressional Add: *Large Displacement UUV At Sea Launch and Recovery*	1.690	0.000
Congressional Add: *LOW COST - LASER MODULE ASSEMBLY FOR THE NAVY'S AC*	1.596	0.000
Congressional Add: *UNDERSEA MISSILE LAUNCH STUDY (ULMS)*	3.190	0.000
Congressional Add: *Acoustic Research Detachment Large Scale Vehicles*	0.479	0.000
Congressional Add: *Submarine Fatline Vector Sensor Towed Array*	0.798	1.593
Congressional Add: *Submarine Littoral Defense System*	1.596	0.000
	11.344	7.967

Exhibit R-2, RDT&E Budget Item Justification: PB 2011 Navy	DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603561N: *Adv Submarine System Dev*

Congressional Add Details ($ in Millions, and Includes General Reductions)	FY 2009	FY 2010
Congressional Add Subtotals for Project: 9999		
Congressional Add Totals for all Projects	11.344	7.967

Change Summary Explanation

The Program adjustment shown in FY10 reflects the removal of funds for the Overseas Contingency Operations (OCO) support.

FY11 from previous President's Budget is shown as zero because no FY11-15 data was presented in President's Budget 2010.

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603561N: *Adv Submarine System Dev*	PROJECT 0223: *Sub Combat System Improvement (ADV)*	

COST ($ in Millions)	FY 2009 Actual	FY 2010 Estimate	FY 2011 Base Estimate	FY 2011 OCO Estimate	FY 2011 Total Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
0223: *Sub Combat System Improvement (ADV)*	45.764	51.038	51.040	0.000	51.040	48.082	46.211	46.194	47.296	Continuing	Continuing
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0		

A. Mission Description and Budget Item Justification

Project Unit 0223: The Advanced Submarine Combat Systems Development Non-ACAT program supports Navy Submarine Acoustic Superiority and Technology Insertion Initiatives by the application of advanced development and testing of sonar and tactical control systems improvements. This Project transitions technologies developed by Navy technology bases, the private sector, ONR, Future Naval Capabilities, and DARPA. The Project addresses technology challenges to improve tactical control in littoral and open ocean environments for a variety of operational missions including peacetime engagement, surveillance, battle space preparation, deterrence, regional sea denial, precision strike, task group support, and ground warfare support. Prototype hardware / software systems are developed to demonstrate technologically promising system concepts in laboratory and at-sea submarine environments. Specifically, the focus of the technology efforts will be APB-A, APB-T, APB-I, tactical control, and Advanced Sonar Arrays. APBs develop and demonstrate improvements to current and future sonar/combat control systems. The Advanced Sonar Arrays program develops and tests new sensors and demonstrates large array configuration. This Project is funded under demonstration and validation, as it develops and integrates hardware for experimental tests related to specific platform applications.

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
Advanced Sonar System Processing	26.197	26.438	26.540	0.000	26.540
FY 2009 Accomplishments: APB(A)-07 transitioned to PMS401 for fleet introduction. FY09 APB(A) continued improvements in high frequency active systems, automated vulnerability detectors, and improved tracking and localization, specifically using passive-narrow band sonar for target acoustic state estimation. Primary improvements were delivered for the Wide Aperture Array (WAA), Low Cost Conformal Array (LCCA), and 688 Class sphere array signal processing.					

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603561N: *Adv Submarine System Dev*	PROJECT 0223: *Sub Combat System Improvement (ADV)*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
FY 2010 Plans: FY10 will focus on improved signal processing to stitch close aboard acoustic coverage to provide 360 degree situational awareness. Work will continue on ranging tools, search space reduction tools, and active systems. Improved Signal processing for the new fat-line towed array will be developed. Efforts will continue to focus on more seamless integration of acoustic and non-acoustic sensor information for tracking and command information. *FY 2011 Base Plans:* FY11 will focus on improved signal processing to stitch close aboard acoustic coverage to provide 360 degree situational awareness. Work will continue on ranging tools, search space reduction tools, and active systems. Improved Signal processing for the new fat-line towed array will be developed. Efforts will continue to focus on more seamless integration of acoustic and non-acoustic sensor information for tracking and command information.					
Advanced Tactical Control *FY 2009 Accomplishments:* APB(T)-07 transitioned to PMS425 for fleet introduction. FY09 APB(T) continued improvements in Command Information Management, acoustic and non-acoustic contact association, and the initial steps required to automate combat systems operations, in support of display simplification and work flow streamlining. *FY 2010 Plans:* FY10 efforts will continue on improving the tactical commander's ability to manage close in and high density scenarios through advanced target motion analysis, contact management, tactical scene rendering, uncertainty management, and close encounter decision management. Efforts will continue to focus on more seamless integration of acoustic and non acoustic sensor information for tracking and command information. Efforts will begin to focus on improving imaging system's signal processing	11.000	16.000	16.000	0.000	16.000

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
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B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
to automate repetitive tasks and develop automated detection, tracking and ranging capabilities. Initial efforts will focus on baselining system performance. *FY 2011 Base Plans:* FY11 efforts will continue on improving the tactical commander's ability to manage close in and high density scenarios through advanced target motion analysis, contact management, tactical scene rendering, uncertainty management, and close encounter decision management. Efforts will continue to focus on more seamless integration of acoustic and non acoustic sensor information for tracking and command information. Efforts will begin to focus on improving imaging system's signal processing to automate repetitive tasks and develop automated detection, tracking and ranging capabilities. Initial efforts will focus on baselining system performance.					
Advanced Sensors *FY 2009 Accomplishments:* In FY09, conducted Conformal Acousitc Velocity Sonar (CAVES) Large Vertical Array (LVA) sea test and analysis on 688 platform; developed and tested Rapid Commercial Off the Shelf (COTS) Insertion Next Generation (RCI NextGen) for CAVES LVA sea test; began development of (Light Weight) LW LCCA Advanced Development Model (ADM); continued working with PEO IWS5B to develop surface ship Acoustic Communications (ACOMMS) and resolve encrypted ACOMMS submarine solution. Selected between Twin Line Thin Line (TLTL) and Vector Sensor Towed Array (VSTA) for Advanced Towed Array Technology (ATAT). Additionally, began scoping work and studies on a future submarine sensor design. *FY 2010 Plans:* FY10 will support PMS450 with CAVES LVA installation and at-sea test on VIRGINIA platform; finish development of LW LCCA ADM; finish development of encrypted ACOMMS submarine solution; finish LW LCCA development and fabricate ADM; finish development of encrypted ACOMMS submarine solution; and complete Lake Pend Oreille tow tests of TLTL and VSTA arrays.	8.340	8.600	8.500	0.000	8.500

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
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B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
FY 2011 Base Plans: FY11 will support PMS450 with CAVES LVA installation and at-sea test on VIRGINIA platform; finish development of LW LCCA ADM; finish development of encrypted ACOMMS submarine solution; finish LW LCCA development and fabricate ADM; finish development of encrypted ACOMMS submarine solution; and complete Lake Pend Oreille tow tests of TLTL and VSTA arrays.					
DAWDF *FY 2009 Accomplishments:* Defense Acquisition Workforce Development Fund.	0.227	0.000	0.000	0.000	0.000
Accomplishments/Planned Programs Subtotals	45.764	51.038	51.040	0.000	51.040

C. Other Program Funding Summary ($ in Millions)

N/A

D. Acquisition Strategy

Use competitively awarded contracts from Broad Agency Announcement (BAA) solicitations.

E. Performance Metrics

- Advanced Processing Build (APB): Deliver at-sea tested submarine capability improvements to PEO Submarines as prescribed by the Fleet every two years. Conduct Milestone Reviews with the Milestone Decision Authority and PEO Submarines prior to delivery.
- Conduct Conformal Acoustic Velocity Sonar (CAVES) sea test 3Q10. CAVES provides significant advantages over existing technology; 2/3 of acquisition and installation costs, 10% of life cycle costs, and less impact on hull structure. CAVES/Wide Aperture Array replacement of Light Weight WAA provides a cost savings of $8M - $13M/ship.
- Conduct Low Cost Conformal Array (LCCA) Advanced Development Model (ADM) sea test 1Q10.
- Deliver Twin Line Thin Line (TLTL) Short Aperture (3X) Array, Vector Sensor Towed Array (VSTA) Short Aperture (3X) Array, TLTL & VSTA (3X) Lake Pend Oreille Test Reports.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy			DATE: February 2010
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Product Development ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Product Development	WR	NUWC/Newport RI	50.591	7.058	Oct 2009	10.328	Oct 2010	0.000		10.328	Continuing	Continuing	Continuing
Product Development	WR	NRL DC	0.446	0.000		0.000		0.000		0.000	0.000	0.446	0.446
Product Development	WR	NSWC/Carderock MD	15.937	4.540	Oct 2009	3.700	Oct 2010	0.000		3.700	Continuing	Continuing	Continuing
Product Development	WR	NSWC/Dahlgren VA	0.490	0.050	Oct 2009	0.050	Oct 2010	0.000		0.050	Continuing	Continuing	Continuing
Product Development	WR	ONI DC	0.045	0.850	Jan 2010	0.000		0.000		0.000	Continuing	Continuing	Continuing
Product Development	C/CPAF	NSMA VA	5.870	1.524	Nov 2009	1.500	Nov 2010	0.000		1.500	Continuing	Continuing	Continuing
Product Development	WR	ONR VA	1.925	0.800	Dec 2009	0.800	Dec 2010	0.000		0.800	Continuing	Continuing	Continuing
Product Development	WR	SSC/San Diego CA	1.403	0.050	Oct 2009	0.050	Oct 2010	0.000		0.050	Continuing	Continuing	Continuing
Product Development	WR	COMSUBLANT VA	0.420	0.125	Oct 2009	0.125	Oct 2010	0.000		0.125	Continuing	Continuing	Continuing
Product Development	WR	COMSUBPAC HI	0.455	0.125	Oct 2009	0.125	Oct 2010	0.000		0.125	Continuing	Continuing	Continuing
Product Development	MIPR	U.S. Army/MITRE NJ	2.800	1.795	Jan 2010	0.000		0.000		0.000	0.000	4.595	4.595
Product Development	MIPR	U.S. AFB/MIT Lincoln Labs MA	7.484	2.000	Jan 2010	2.000	Nov 2010	0.000		2.000	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy		DATE: February 2010
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Product Development ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Product Development	C/CPFF	PSU/ARL PA	2.378	1.340	Dec 2009	0.250	Dec 2010	0.000		0.250	Continuing	Continuing	Continuing
Product Development	C/CPFF	UT/ARL TX	15.130	3.230	Dec 2009	5.500	Dec 2010	0.000		5.500	Continuing	Continuing	Continuing
Product Development	C/CPFF	JHU/APL MD	38.228	9.305	Dec 2009	7.100	Dec 2010	0.000		7.100	Continuing	Continuing	Continuing
Product Development	C/CPFF	Lockheed Martin VA	22.956	5.800	Dec 2009	5.687	Dec 2010	0.000		5.687	Continuing	Continuing	Continuing
Product Development	C/CPFF	Progeny VA	3.257	0.350	Dec 2009	0.350	Dec 2010	0.000		0.350	Continuing	Continuing	Continuing
Product Development	C/CPFF	METRON VA	3.358	0.800	Dec 2009	0.800	Dec 2010	0.000		0.800	Continuing	Continuing	Continuing
Product Development	C/CPFF	Alion Sciences VA	1.867	1.400	Jan 2010	1.400	Dec 2010	0.000		1.400	Continuing	Continuing	Continuing
Product Development	C/CPFF	SEDNA VA	3.464	0.750	Jan 2010	0.500	Dec 2010	0.000		0.500	Continuing	Continuing	Continuing
Product Development	C/CPFF	DSR/GD VA	11.186	1.461	Jan 2010	2.500	Dec 2010	0.000		2.500	Continuing	Continuing	Continuing
Product Development	C/CPFF	Northrop Grumman VA	0.400	0.000		0.000		0.000		0.000	0.000	0.400	0.400
Product Development	WR	SPAWAR CA	0.400	0.000		0.000		0.000		0.000	0.000	0.400	0.400
Product Development	C/CPFF	SAIC VA	1.050	1.500	Jan 2010	1.500	Dec 2010	0.000		1.500	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy		DATE: February 2010
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Product Development ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Product Development	C/CPFF	Adaptive Methods VA	0.400	0.300	Dec 2009	0.300	Dec 2010	0.000		0.300	Continuing	Continuing	Continuing
Product Development	C/CPFF	AAC NY	0.375	0.000		0.000		0.000		0.000	0.000	0.375	0.375
Product Development	C/CPFF	GA Tech Research Institute GA	2.416	0.300	Dec 2009	0.300	Dec 2010	0.000		0.300	Continuing	Continuing	Continuing
Product Development	C/CPFF	Multisensor Science VA	0.150	0.200	Jan 2010	0.200	Dec 2010	0.000		0.200	Continuing	Continuing	Continuing
Product Development	MIPR	U.S. Army Research Lab MD	1.000	0.300	Dec 2009	0.400	Dec 2010	0.000		0.400	Continuing	Continuing	Continuing
Product Development	C/CPFF	Chesapeake Science MD	1.899	0.900	Jan 2010	0.900	Dec 2010	0.000		0.900	Continuing	Continuing	Continuing
Product Development	C/CPFF	Lockheed Martin NY	4.614	1.900	Dec 2009	3.000	Dec 2010	0.000		3.000	Continuing	Continuing	Continuing
Product Development	C/CPFF	In Depth Engineering VA	1.440	0.610	Jan 2010	0.000		0.000		0.000	0.000	2.050	2.050
		Subtotal	203.834	49.363		49.365		0.000		49.365			

Remarks

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy		DATE: February 2010
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Management Services ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Support	C/CPAF	Stanley and Associates VA	1.000	0.000		0.000		0.000		0.000	0.000	1.000	1.000
Program Management Support	C/CPAF	BAE Systems MD	5.749	1.600	Jan 2010	1.600	Dec 2010	0.000		1.600	Continuing	Continuing	Continuing
Program Management Support	C/CPFF	EG&G VA	0.950	0.000		0.000		0.000		0.000	0.000	0.950	0.950
Travel	WR	NAVSEA PEO IWS5 DC	0.300	0.075	Oct 2009	0.075	Oct 2010	0.000		0.075	Continuing	Continuing	Continuing
Acquisition Workforce	Various/ TBD	Not Specified Not Specified	0.227	0.000		0.000		0.000		0.000	0.000	0.227	0.227
		Subtotal	8.226	1.675		1.675		0.000		1.675			

Remarks

	Total Prior Years Cost	FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	212.060	51.038		51.040		0.000		51.040			

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603561N: *Adv Submarine System Dev*	PROJECT 0223: *Sub Combat System Improvement (ADV)*

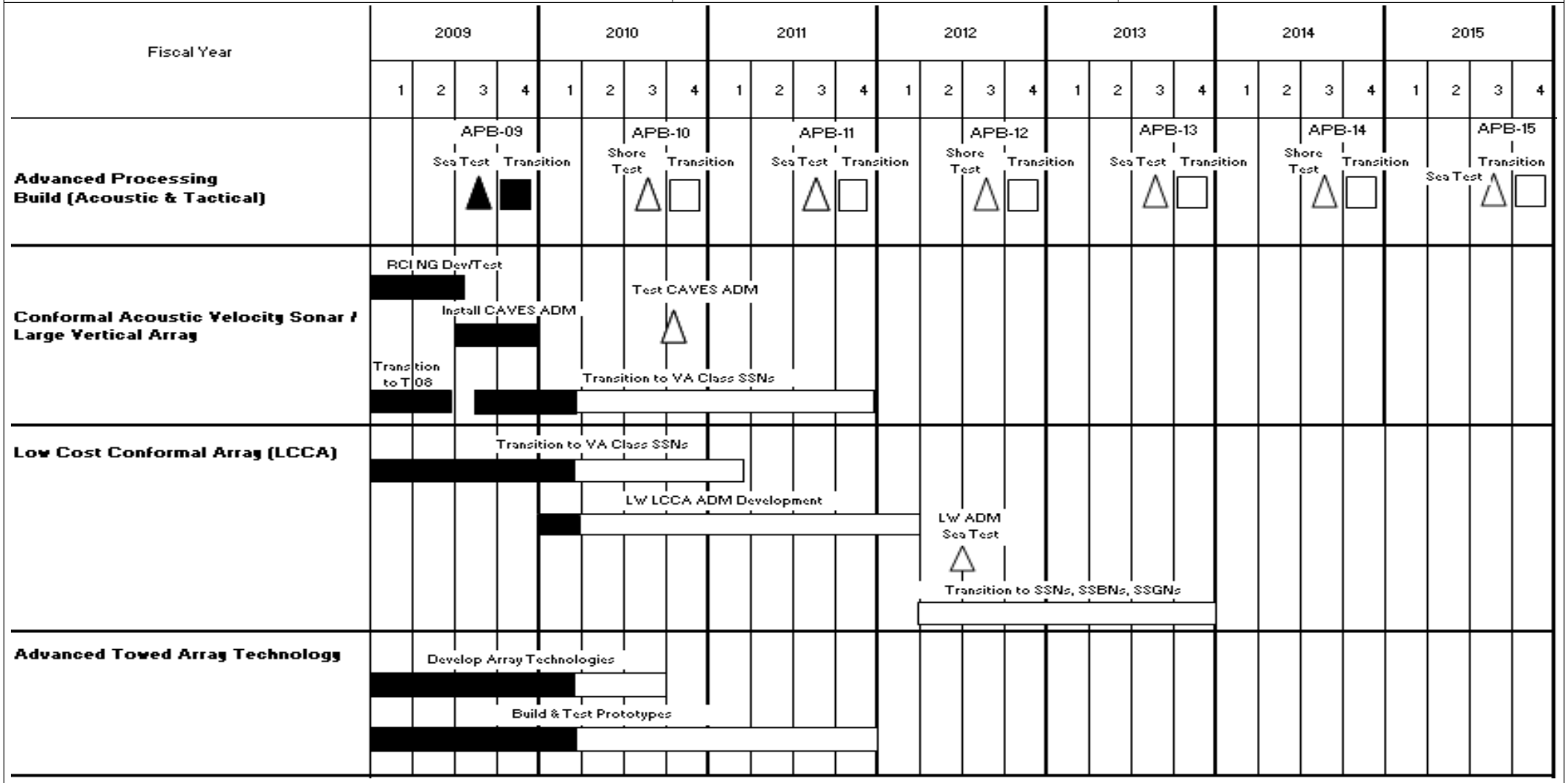

Exhibit R-4A, RDT&E Schedule Details: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603561N: *Adv Submarine System Dev*	**PROJECT** 0223: *Sub Combat System Improvement (ADV)*

Schedule Details

	Start		End	
Event	**Quarter**	**Year**	**Quarter**	**Year**
APB-09 Sea Test	3	2009	3	2009
Transition APB-09 to ARCI/BYG-1	4	2009	4	2009
APB-10 Shore Test	3	2010	3	2010
Transition APB-10 to ARCI/BYG-1	4	2010	4	2010
APB-11 Sea Test	3	2011	3	2011
Transition APB-11 to ARCI/BYG-1	4	2011	4	2011
APB-12 Shore Test	3	2012	3	2012
Transition APB-12 to ARCI/BYG-1	4	2012	4	2012
APB-13 Sea Test	3	2013	3	2013
Transition APB-13 to ARCI/BYG-1	4	2013	4	2013
APB-14 Shore Test	3	2014	3	2014
Transition APB-14 to ARCI/BYG-1	4	2014	4	2014
APB-15 Sea Test	3	2015	3	2015
Transition APB-15 to ARCI/BYG-1	4	2015	4	2015
Develop and Test RCI Next Gen	1	2009	3	2009
Install ADM Array	3	2009	4	2009
Test ADM array	4	2010	4	2010
Transition to T108	1	2009	2	2009

Exhibit R-4A, RDT&E Schedule Details: PB 2011 Navy		DATE: February 2010
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	Start		End	
Event	Quarter	Year	Quarter	Year
Transition to VA Class SSNs (CAVES/LVA)	3	2009	4	2011
Transition to VA Class SSNs (LCCA)	1	2009	4	2011
Lightweight LCCA ADM Development	1	2010	1	2012
Lightweight ADM Sea Test	2	2012	3	2012
Transition to SSNs, SSBNs, SSGNs	2	2012	4	2013
Develop TLTL/VSTA Array Technologies	1	2009	3	2010
Build & Test Prototype TLTL/VSTA Arrays	1	2009	4	2011

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy			DATE: February 2010
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COST ($ in Millions)	FY 2009 Actual	FY 2010 Estimate	FY 2011 Base Estimate	FY 2011 OCO Estimate	FY 2011 Total Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
2033: *Adv Submarine System Development*	61.044	72.301	42.515	0.000	42.515	37.230	34.525	36.632	37.384	Continuing	Continuing
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0		

A. Mission Description and Budget Item Justification

The Advanced Submarine Systems Development (ASSD) Program is a non-acquisition program that develops, matures, and transitions HM&E technologies from S&T to operational platforms, develops and demonstrates submarine design and naval architecture products destined for backfit, forward fit, and/or future submarines, and operates unique R&D experimentation, modeling, and simulation facilities to enhance submarine stealth, maneuverability, capability and affordability. The program is structured to support near term technology insertion to achieve VIRGINIA Class cost reduction and influence future submarine concepts and core technologies. In support of Sea Power 21, Sea Trial experimentation supports the naval enterprises in identifying and prototyping capabilities and technologies that support the warfighter. Focus is on the USE, the NNFE, NECE, SWE, and SOFE. In addition to enterprise support, experimentation may identify, develop, integrate, and test Intelligence, Surveillance, and Reconnaissance (ISR) technologies and develop littoral precision strike capabilities. Experimentation and demonstration is conducted in a joint warfighting context with other services, (i.e. the U.S. Marines, U.S. Army, and the U.S. Air Force), to enable early assessment of warfighting capabilities, and to contribute to better technology selection decisions for potential incremental development. This program also supports Information Exchange Programs and joint Project Arrangements with the United Kingdom, Canada, and Australia.

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
Payloads and Sensors/Subtotal Cost	22.248	27.241	8.285	0.000	8.285
Develop promising advanced technologies and/or concepts capable of revolutionizing submarine design, reducing cost, improving payload flexibility, increasing capability, reducing weight and space requirements, exploring alternative payload launch mechanisms, increasing reliability with concomitant decreases in required maintenance, and improving material strength. Develop payload demonstrations targeted at improving flexible ocean interface, ISR requirements, and payload and launch retrieval methods from undersea platforms. Conduct Navy and joint SEA TRIALS that take the demonstrations to					

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B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
the Fleet in order to assess the operational value of the technologies and systems under consideration. The SEA TRIALS/experiments support examination and assessment of potential new Fleet capabilities based on the Sea Power 21 Pillars of SEA SHIELD, SEA BASING, SEA STRIKE, and FORCENET. *FY 2009 Accomplishments:* FY09 Accomplishments include: For Small Missile Encapsulation (SME) redesigned and rebuilt test assets and completed the static underwater encapsulation tests at Aberdeen Test Center (ATC). Assessed, refurbished, and tested the equipment necessary for testing the capsule at periscope depth speeds at San Clemente Island (SCI) (Translation Testing). For Water Piercing Missile Launcher (WPML) conducted additional fly-out test from a moving submerged translator at higher cross current. Matured development and tested a new launcher design with its own method of gas generation to aid water piercing. Developed, tested, and transitioned ISR technologies to support Irregular Warfare (NIWO). Supported SSGN participation in exercise TALISMAN SABER 2009. *FY 2010 Plans:* FY10 Planned Accomplishments include: For SME conduct translation testing, complete analysis and provide report. Definitize WPML unique launcher design with gas generation and continue system engineering and safety tasks related to submarine integration. Develop, test, and transition ISR technologies to support irregular warfare. Provide SEA STALKER Unmanned Underwater Vehicle (UUV) capability to subsurface platform (SSGN) by developing and testing the integration between the UUV and launching system. Conduct planning and technology risk reduction for TRIDENT WARRIOR 2010. *FY 2011 Base Plans:* FY11 Planned Accomplishments include: Document results of WPML project. Commence advanced Towed Array Handler Development. Develop, test, and transition ISR technologies to support irregular warfare. Conduct SSGN exercise demonstrating an integrated Joint ISR architecture, persistent ISR, and advanced networking capability to the Joint Force and localized commanders in real time. This					

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B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
experiment will include SSGN integration with autonomous vehicles to support Theater Commander's requirements.					
Acquisition Workforce DAWDF *FY 2009 Accomplishments:* N/A	0.293	0.000	0.000	0.000	0.000
Stealth/Subtotal Cost Develop technologies and tools to increase the safety of submarines by recognizing and mitigating sources of noise, ensuring that submarines can penetrate contested waters by reduced acoustic observables, and remaining undetected in the littorals. Develop technologies and Tactics, Techniques, and Procedures (TTPs) that will be integrated with existing naval assets to develop new or enhance existing warfighting concepts. Operate the Large Scale Vehicle (LSV 2) and the Intermediate Scale Measurement System (ISMS) to conduct large model experiments for submarines focusing on stealth, maneuvering and control, affordability, and operational effectiveness. *FY 2009 Accomplishments:* FY09 Accomplishments include: Continued LSV operations and maintained LSV and ISMS test ranges. Developed and coordinated integrated program plan with ONR and PMS450 to execute research and development related to flow-noise, future sonar concepts and structural acoustics. Performed concept design and fabrication of scale model Integrated Bow Conformal (IBC) structure utilizing newly developed castable polyurethane materials. Completed hydrostatic pressure testing of conformal array test articles using newly developed materials. Completed qualification testing on new conformal array material. Completed literature search to provide basis for development of multipurpose hull treatment materials for future platforms. Obtained relative full-scale data to support	16.292	19.617	25.100	0.000	25.100

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B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
validation of modeling and analysis approaches related to Alternating Current (AC) Electromagnetic Signatures. Conducted full scale baseline signature measurement trials. *FY 2010 Plans:* FY10 Planned Accomplishments include: Conduct LSV operations and maintain LSV and ISMS test ranges. Obtain relative full scale data to support validation of modeling techniques related to AC Signature propagation. Execute research and development related to flow-noise, future sonar concepts, and structural acoustics for ONR, PMS450, and future submarine programs. Complete manufacturing studies on new castable polyurethane materials to support future conformal array applications. Develop Tactical, Technical Procedures (TTP) for and testing. Continue conducting full scale baseline signature measurement trials. *FY 2011 Base Plans:* FY11 Planned Accomplishments include: Conduct LSV operations and maintain LSV and ISMS test ranges. Support PMS 450 Future Sail Hydrodynamic development and assessment. Support OHIO Class SSBN replacement design development. Maintaining the ISMS range to conduct PMS 401 Towed Array calibration and testing, PMS 450 Payload Bay/Large Aperture Bow Array testing for target strength and structural acoustics and ONR Large UUV testing. Performing a refresh of major ISMS systems. Continue conducting full scale baseline signature measurement trials.					
Total Ownership/Affordability/Subtotal Cost Demonstrate technologies with potential to reduce total life cycle costs of the system by providing reduced construction costs, commonality of interfaces, longer life of parts, and/or lower maintenance requirements. *FY 2009 Accomplishments:* FY09 Accomplishments include: Completed qualification testing on 10,000 and 20,000 in-lb 3-position rotary Electric Actuation System (EAS) ADMs. Planned and scheduled the at-sea bow	5.237	11.100	4.930	0.000	4.930

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B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
plane electric actuator Operation Alteration (OPALT). Initiated Temporary Alteration (TEMPALT) planning to demonstrate rotary EAS on an operational submarine. Continued Electric Actuation of Universal Modular Mast (UUM) design, Interface Control Drawings (ICDs), and initiated OPALT planning. Completed CO2 scrubber sorbent material performance testing. Completed design and construction of a 1/10 th capacity CO2 scrubber test unit for lab evaluation. Completed design of sorbent test cubes for shipboard testing. Updated Business Case Analysis (BCA) for the new CO2 removal system. Conducted pop up and Intermediate Scale Measurement System tests to assess damping configuration. Completed report trial of two SSN-688 class platforms with modified Main Ballast Tank (MBT) damping configurations to support reduction in maintenance requirements. Completed summary report on Modular Integrated Deck Structure (MIDS) testing and associated analysis. Completed functional requirements for Control Surfaces. Initiated functional requirements for external applications, and completed BCA, ICDs, arrangement studies and concept designs for replacing external hydraulic actuators with electric systems. *FY 2010 Plans:* FY10 Planned Accomplishments include: Fabricate design, perform T&E and complete OPALT Technical Data Package (TDP) for bow plane electric control surface actuation demonstrator. Complete OPALT TDP for an at-sea demonstration of rotary and UMM EAS. Complete functional requirements for external electric actuation systems. Complete functional requirements for External Electric Actuation Systems. Evaluate external EAS concept design and complete preliminary design of a high risk application. Complete VA Class BCA for the new CO2 scrubber prototype system. Build and lab test CO2 scrubber sorbent test cubes. Complete TEMPALT TDP and install test cubes for shipboard testing. Initiate design of full capacity CO2 scrubber breadboard system. Complete MBT Damping trial report on SSN-688I platform with modified configuration. Conduct assessment of life cycle maintenance cost reduction opportunities of in-service submarines to reduce current and future submarine maintenance cost.					

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603561N: *Adv Submarine System Dev*	PROJECT 2033: *Adv Submarine System Development*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
FY 2011 Base Plans: FY 11 Planned Accomplishments include: Install OPALT to demonstrate bow plane electric actuation. Install TEMPALT to demonstrate a rotary EAS at sea. Build CO2 Scrubber prototype, manufacture sorbent material and perform material testing.					
Advanced Propulsion/Ship Concept Developments/Subtotal Cost	16.974	14.343	4.200	0.000	4.200
Overcome selected technological barriers expected to have significant impact on submarine hull, mechanical, and electrical (HM&E) systems to enable design options for a submarine with VIRGINIA Class capability in three technical areas: Shaftless Propulsion, External Weapon Stow and Launch, and Radical Ship HM&E Infrastructure Reduction. Develop submarine alternative propulsion and stern configurations with potential to significantly reduce submarine acquisition cost. Demonstrate critical performance parameters via Appropriate Scale Demonstrators in realistic environmental conditions. Evaluate integration of technologies and approaches for cost reduction in future nuclear submarines. Develop understanding of ship concept studies and submarine cost drivers and model analysis. Develop and demonstrate technologies for a future SSBN in areas of hull and platform technologies, propulsors, ship control, electric actuation, sensors, and self defense. This work will apply to future submarine designs and the long-lead concept work on the next undersea strategic deterrent platform. Conduct concept studies and mission utility studies for variant submarine designs, including VIRGINIA derivatives. *FY 2009 Accomplishments:* FY09 Accomplishments include: Conducted Tango Bravo (TB) demonstrations and acoustic modeling to reduce risk of proceeding to TB Shaftless Propulsion phase 3. Completed External Weapons final report. Continued concept studies to support Sea Based Strategic Deterrent (SBSD) Analysis of Alternatives (AoA), requirements development and R&D planning.					

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603561N: *Adv Submarine System Dev*	PROJECT 2033: *Adv Submarine System Development*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
Completed detail design of the TB X-Planes electric actuator and ship control system modifications. Completed performance requirements, OPALT planning and procure long lead material for bow plane control surface electric actuator demonstration on SSN 774. *FY 2010 Plans:* FY10 Planned Accomplishments: Continue partnership with DARPA on TB project. Continue demonstration and performance testing of TB Shaftless Propulsion prototype. Perform motor structural acoustic design and testing. *FY 2011 Base Plans:* FY11 Planned Accomplishments include: Complete TB Shaftless Propulsion project.					
Accomplishments/Planned Programs Subtotals	61.044	72.301	42.515	0.000	42.515

C. Other Program Funding Summary ($ in Millions)

N/A

D. Acquisition Strategy

F2033: Sole source Concept Formulation Study contracts with General Dynamics Electric Boat (EB) and Northrop Grumman Shipbuilding (NGSB).

E. Performance Metrics

Complete prototype design effort of a representative first generation WPML launcher to include down selected gas generator feature to aid the water piercing effort as a low cost high performance alternative to other missile launch systems.
-To enable transition of a minimum of three technology challenge solutions supporting emergent war fighter needs.
-Sustain critical one of a kind national R&D hydro acoustic infrastructure enabling the design and assessment of VIRGINIA Class Block IV cost reduction and the OHIO Replacement Program design for affordability.
-Refine the design a prototypical Advanced CO2 system based upon at-sea testing of new solid sorbent material to remove the entire amine system from future submarines.

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603561N: *Adv Submarine System Dev*	**PROJECT** 2033: *Adv Submarine System Development*

-Install and test three at-sea demonstrations for electric actuation of critical ship control and ship system operation components in support of the OHIO Replacement Program and follow-on VIRGINIA Class Block Upgrades.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603561N: *Adv Submarine System Dev*	PROJECT 2033: *Adv Submarine System Development*	

Product Development ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Product Development	SS/CPFF	NGSB Newport News, VA	2.082	1.000	Dec 2009	0.904	Oct 2010	0.000		0.904	Continuing	Continuing	Continuing
Product Development	WR	NSWC Dahlgren, VA	1.321	3.920	Nov 2009	0.000		0.000		0.000	Continuing	Continuing	Continuing
Product Development	SS/CPFF	Kollmorgen N. Hampton, MA	1.000	0.100	Mar 2010	0.000		0.000		0.000	Continuing	Continuing	Continuing
Product Development	SS/CPFF	Oceaneering Chesapeake, VA	0.000	1.900	Jan 2010	0.000		0.000		0.000	0.000	1.900	1.900
Product Development	SS/CPFF	Boeing St. Louis, MO	0.000	0.925	Mar 2010	0.000		0.000		0.000	0.000	0.925	0.925
Product Development	SS/CPFF	EB Groton, CT	10.327	19.390	Oct 2009	17.848	Oct 2010	0.000		17.848	Continuing	Continuing	Continuing
Product Development	SS/CPFF	Raytheon Portsmouth, RI	14.517	1.517	Feb 2010	0.000		0.000		0.000	Continuing	Continuing	Continuing
Product Development	WR	NSWC Bethesda, MD	42.765	18.094	Oct 2009	9.833	Oct 2010	0.000		9.833	Continuing	Continuing	Continuing
Product Development	SS/CPFF	ARL/PSU State College, PA	2.887	1.500	Dec 2009	0.970	Dec 2010	0.000		0.970	Continuing	Continuing	Continuing
Product Development	SS/CPFF	UT/ARL Austin, TX	6.050	0.000		0.000		0.000		0.000	0.000	6.050	6.050
Product Development	SS/CPFF	JHU/APL Laurel, MD	15.054	0.540	Apr 2010	0.000		0.000		0.000	Continuing	Continuing	Continuing
Product Development	C/Various	Various Various	21.582	7.907	Jan 2010	3.230	Oct 2010	0.000		3.230	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603561N: *Adv Submarine System Dev*	PROJECT 2033: *Adv Submarine System Development*

Product Development ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Product Development	WR	NUWC Newport, RI	43.636	2.398	Oct 2009	1.300	Oct 2010	0.000		1.300	Continuing	Continuing	Continuing
Product Development	WR	ONR Arlington, VA	8.066	0.000		0.000		0.000		0.000	0.000	8.066	8.066
Product Development	SS/CPFF	Lockheed Martin Bethesda, MD	8.934	0.000		0.000		0.000		0.000	0.000	8.934	8.934
Product Development	WR	SPAWAR San Diego, CA	5.850	0.000		0.000		0.000		0.000	Continuing	Continuing	Continuing
		Subtotal	184.071	59.191		34.085		0.000		34.085			

Remarks

Various/VAR is used to group multiple activities with small funding levels and when multiple award dates are planned.

Support ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Contractor Engineering Support	SS/CPFF	Various Various	6.062	1.450	Oct 2009	0.895	Oct 2010	0.000		0.895	Continuing	Continuing	Continuing
Government Engineering Support	WR	Various Various	2.829	1.189	Oct 2009	0.510	Oct 2010	0.000		0.510	Continuing	Continuing	Continuing
Travel	WR	NAVSEA HQ Not Specified	0.319	0.090	Oct 2009	0.080	Oct 2010	0.000		0.080	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603561N: *Adv Submarine System Dev*	PROJECT 2033: *Adv Submarine System Development*

Support ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Acquisition Workforce	C/TBD	Not Specified Not Specified	0.293	0.000		0.000		0.000		0.000	0.000	0.293	0.293
		Subtotal	9.503	2.729		1.485		0.000		1.485			

Remarks

Various/VAR is used to group multiple activities with small funding levels and when multiple award dates are planned.

Test and Evaluation ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation	SS/CPFF	EB Groton, CT	2.371	2.256	Oct 2009	1.376	Oct 2010	0.000		1.376	Continuing	Continuing	Continuing
Developmental Test & Evaluation	SS/CPFF	Raytheon Portsmouth, VA	8.104	1.000	Feb 2010	0.000		0.000		0.000	Continuing	Continuing	Continuing
Developmental Test & Evaluation	WR	NAVAIR Patuxent, MD	2.593	0.000		0.000		0.000		0.000	Continuing	Continuing	Continuing
Developmental Test & Evaluation	C/Various	Various Various	2.664	2.572	Nov 2009	2.297	Oct 2010	0.000		2.297	Continuing	Continuing	Continuing
Developmental Test & Evaluation	WR	NUWC Newport, RI	1.402	0.970	Oct 2009	0.760	Oct 2010	0.000		0.760	Continuing	Continuing	Continuing
Developmental Test & Evaluation	WR	NSWC Carderock, MD	5.167	2.500	Oct 2009	2.512	Oct 2010	0.000		2.512	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603561N: *Adv Submarine System Dev*	PROJECT 2033: *Adv Submarine System Development*

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	FY 2010 Cost	FY 2010 Award Date	FY 2011 Base Cost	FY 2011 Base Award Date	FY 2011 OCO Cost	FY 2011 OCO Award Date	FY 2011 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation	SS/CPFF	NGSB Newport News, VA	0.000	0.783	Oct 2009	0.000		0.000		0.000	Continuing	Continuing	Continuing
Developmental Test & Evaluation	SS/CPFF	JHU/ARL Laurel, MD	0.005	0.300	Apr 2010	0.000		0.000		0.000	Continuing	Continuing	Continuing
Developmental Test & Evaluation	SS/CPFF	ARL/PSU State College, PA	0.720	0.000	Dec 2009	0.000		0.000		0.000	Continuing	Continuing	Continuing
Developmental Test & Evaluation	WR	NSWC Dahlgren, VA	1.320	0.000	Nov 2009	0.000		0.000		0.000	Continuing	Continuing	Continuing
		Subtotal	24.346	10.381		6.945		0.000		6.945			

Remarks

Various/VAR is used to group multiple activities with small funding levels and when multiple award dates are planned.

	Total Prior Years Cost	FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	217.920	72.301		42.515		0.000		42.515			

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603561N: *Adv Submarine System Dev*	**PROJECT** 2033: *Adv Submarine System Development*

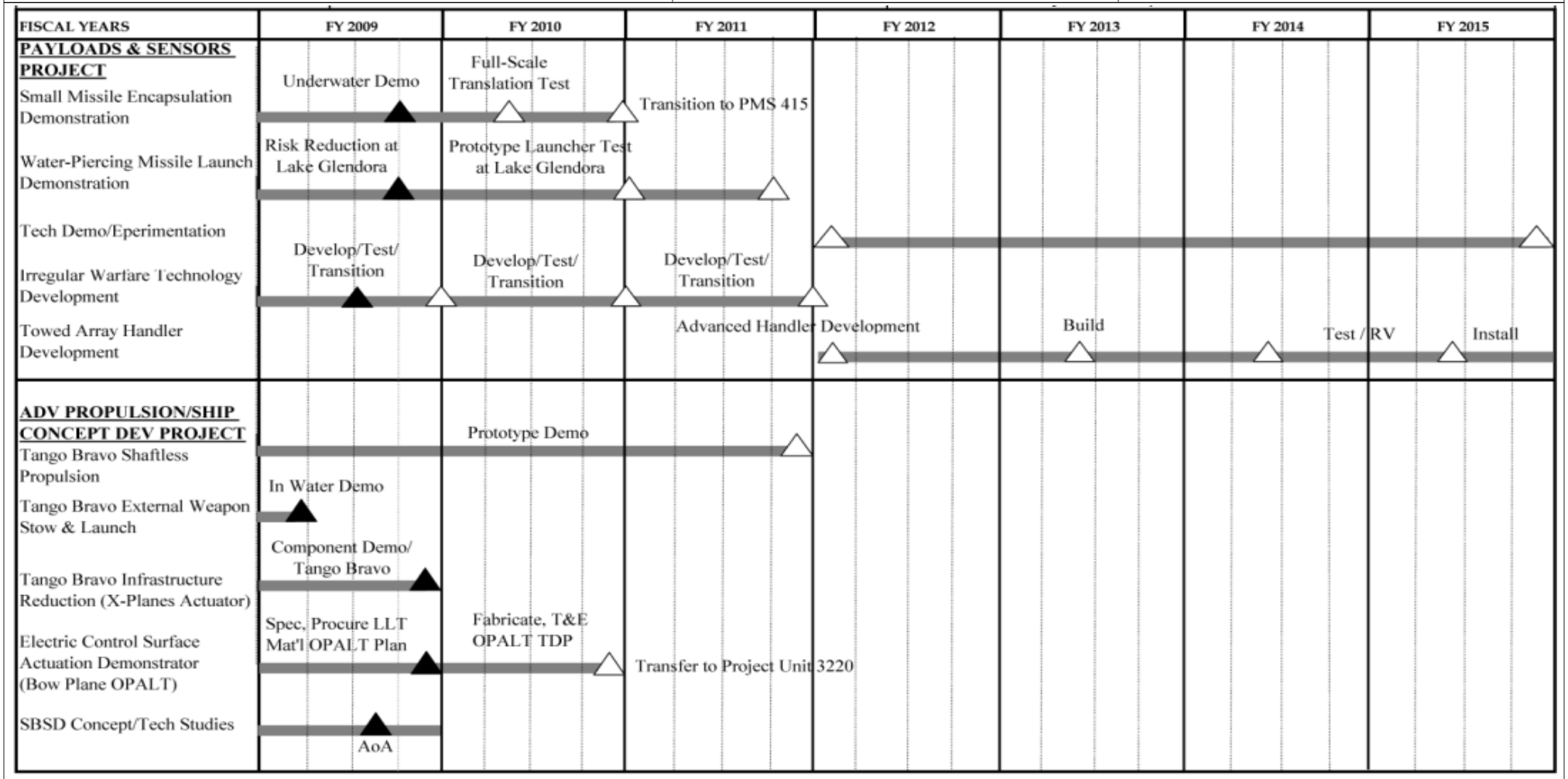

Exhibit R-4, RDT&E Schedule Profile: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603561N: *Adv Submarine System Dev*	**PROJECT** 2033: *Adv Submarine System Development*

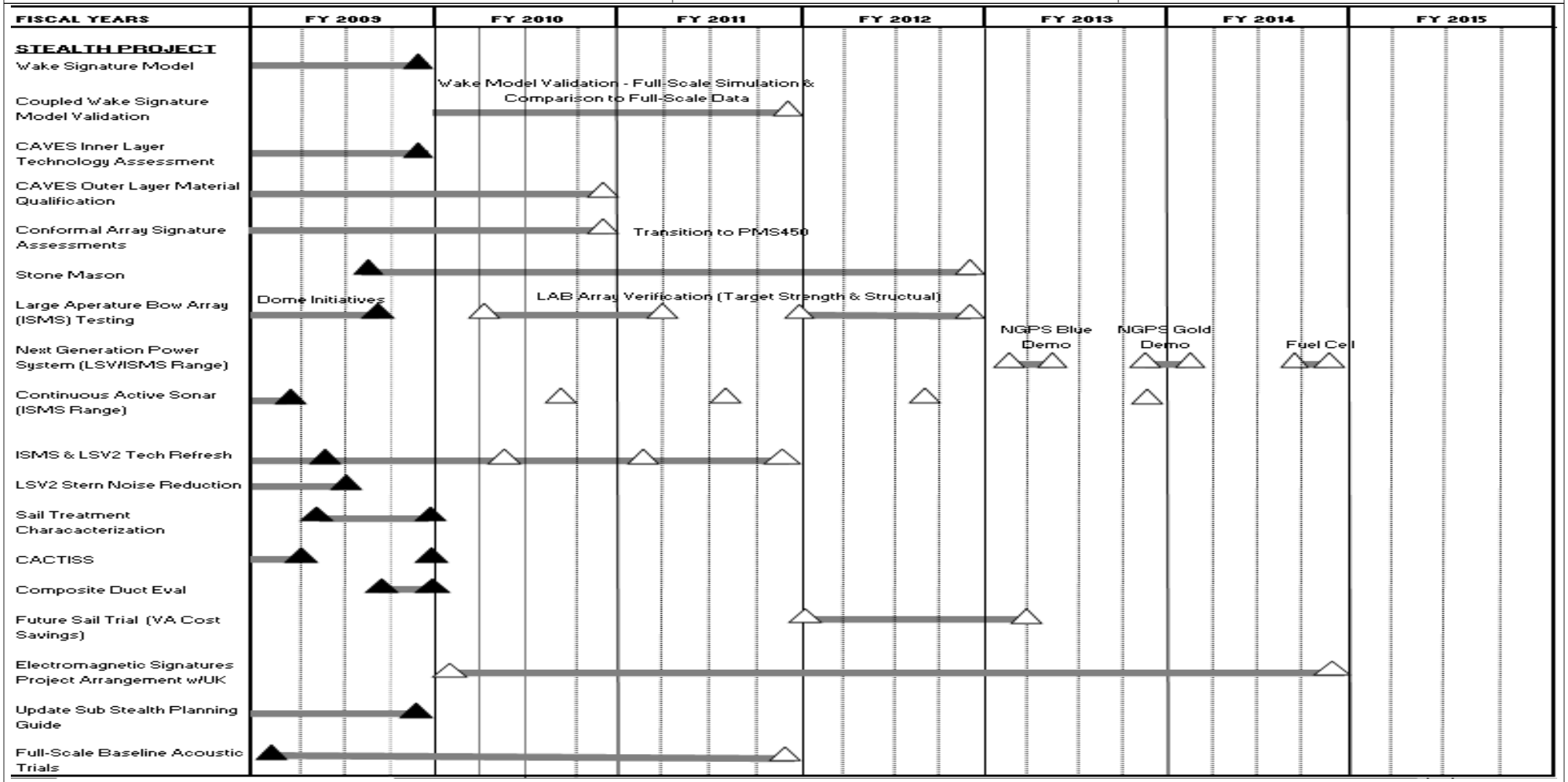

Exhibit R-4, RDT&E Schedule Profile: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603561N: *Adv Submarine System Dev*	PROJECT 2033: *Adv Submarine System Development*

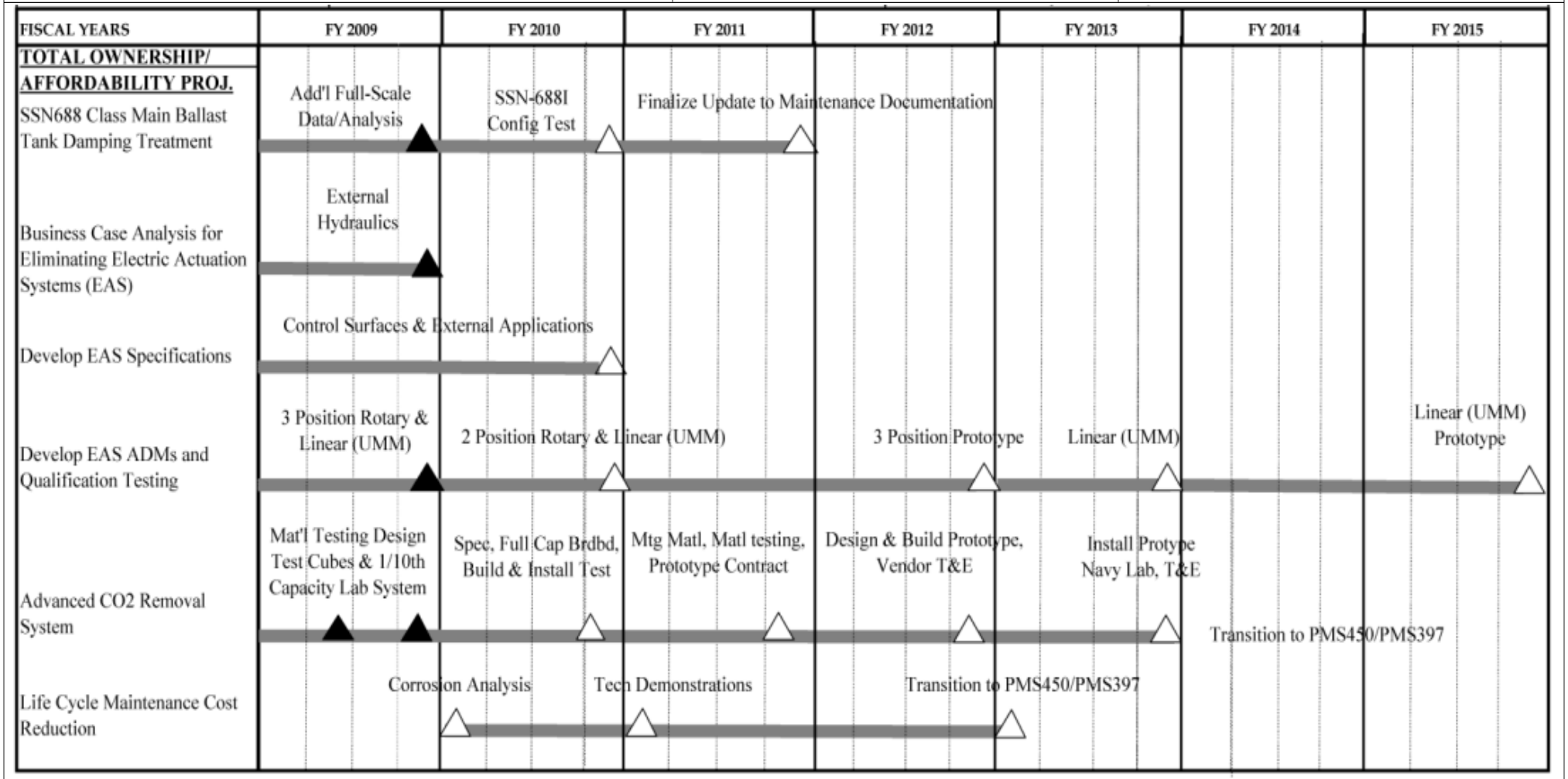

Exhibit R-4A, RDT&E Schedule Details: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603561N: *Adv Submarine System Dev*	**PROJECT** 2033: *Adv Submarine System Development*

Schedule Details

	Start		End	
Event	**Quarter**	**Year**	**Quarter**	**Year**
Small Missile Encapsulation Demo (Underwater Demo)	4	2009	4	2009
Small Missile Encapsulation Full-Scale Translation Testing	2	2010	2	2010
Water Piercing Missile Launch Prep & Demo	1	2009	3	2011
Technology Demonstration (Experimentation)	1	2012	4	2015
Irregular Warfare Technology Development	1	2009	4	2011
Towed Array Handling	1	2012	4	2015
Tango Bravo Shaftless Propulsion	1	2009	4	2011
Tango Bravo External Weapon Stow & Launch	1	2009	1	2009
Tango Bravo Infrastructure Reduction	1	2009	4	2009
Electric Control Surface Actuation Demo	1	2009	4	2009
SBSD Concept/Tech Studies	1	2009	4	2009
Wake Signature Model	1	2009	4	2009
Coupled Wake Signature Model Validation	1	2010	4	2011
CAVES Inner Layer Technology Assessment	1	2009	4	2009
CAVES Outer-Layer Material Qualification	1	2009	4	2010
Conformal Array Signature Assessment	1	2009	4	2010
Stone Mason	3	2009	4	2012
Large Aperture Bow Array Testing	1	2009	4	2012

Exhibit R-4A, RDT&E Schedule Details: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603561N: *Adv Submarine System Dev*	**PROJECT** 2033: *Adv Submarine System Development*

	Start		End	
Event	**Quarter**	**Year**	**Quarter**	**Year**
Next Generation Power System Assessment	1	2013	3	2014
Continuous Active Sonar Assessment	1	2009	4	2013
LSV2 & ISMS Technology refresh	2	2009	4	2011
LSV2 Stern Noise Reduction	1	2009	2	2009
Sail Treatment Characterization	2	2009	4	2009
CACTISS	1	2009	4	2009
Composite Duct Eval, LSV2 (VA Cost Savings)	3	2009	4	2009
Future Sail Trial	1	2012	1	2013
Electromagnetic Signatures Project Arrangement (PA) w/UK	1	2010	4	2014
Update Submarine Stealth Planning Guide (SPG)	1	2009	4	2009
Full-Scale Baseline Acoustic Trails	1	2009	4	2011
SSN-688 Class Main Ballast Tank Damping Treatment	1	2009	4	2011
Business Case Analysis for EAS	1	2009	4	2009
Develop EAS Specifications	1	2009	2	2010
Develop EAS ADM's and Qualification Testing	1	2009	4	2015
Advanced CO2 Removal System	1	2009	4	2013
Life Cycle Maintenance Cost Reduction	1	2010	1	2013

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603561N: *Adv Submarine System Dev*	PROJECT 3197: *Undersea Superiority*	

COST ($ in Millions)	FY 2009 Actual	FY 2010 Estimate	FY 2011 Base Estimate	FY 2011 OCO Estimate	FY 2011 Total Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
3197: *Undersea Superiority*	35.631	32.176	21.983	0.000	21.983	0.000	0.000	0.000	0.000	0.000	89.790
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0		

A. Mission Description and Budget Item Justification

Project Unit 3197: This Project supports Navy Undersea Superiority through the application of advanced development and testing of organic and offboard sonar and tactical control systems. This Project transitions technologies developed by Navy technology bases, the private sector, ONR, Future Naval Capabilities, and DARPA. This non-acquisition Project addresses technology challenges to improve Anti Submarine Warfare (ASW) in littoral and open ocean environments for a variety of operational missions by relevant tactical ASW capabilities. Prototype hardware / software systems are developed to demonstrate technologically promising system concepts in laboratory and at-sea submarine environments. Technologies are selected by the CNO ASW Initiative which was established to support the CNO vision to "fundamentally change the way ASW is currently conducted to render the enemy submarine irrelevant against US and coalition forces". It matures promising undersea warfare technologies via an incremental development methodology, establishes military utility through sea testing and self assessment, and supports transition to production as merited by results.

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
Undersea Superiority	35.453	32.176	21.983	0.000	21.983
FY 2009 Accomplishments: FY09 awarded development contracts for Deep Water Active Detection System (DWADS) and Reliable Acoustic Path (RAP) Line Array system, and conducted at-sea experiments of both. Continued support to Deployable Autonomous Distributed System (DADS) and completed Shallow Water Acoustic Performance study. *FY 2010 Plans:* FY10 will continue development of DWADS to include integration, prototyping, land based and at-sea testing of ADMs and conduct of Military Utility Assessments (MUAs). Development of Distributed					

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
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B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
Netted Sensors Control and Communications capabilities will be included in DWADS and RAP efforts. Continue studies, analysis and assessments of potential transformational ASW technologies. Initiate planning for development of new technologies resulting from aforementioned studies. *FY 2011 Base Plans:* FY11 will continue development of DWADS to include integration, prototyping, land based and at-sea testing of ADMs and conduct of Military Utility Assessments (MUAs). Development of Distributed Netted Sensors Control and Communications capabilities will be included in DWADS and RAP efforts. Continue studies, analysis and assessments of potential transformational ASW technologies. Initiate planning for development of new technologies resulting from aforementioned studies.					
DAWDF *FY 2009 Accomplishments:* Defense Acquisition Workforce Development Fund.	0.178	0.000	0.000	0.000	0.000
Accomplishments/Planned Programs Subtotals	35.631	32.176	21.983	0.000	21.983

C. Other Program Funding Summary ($ in Millions)

N/A

D. Acquisition Strategy

Use competitively awarded contracts from BAA solicitations.

E. Performance Metrics

- Reliable Acoustic Path Vertical Line Array (RAP VLA) provides detection of quiet diesel submarines at ranges 3 to 7 times water depth. Continue RAP VLA development and conduct a Deep Digital Array sea test and an Engineering Integration test in FY10.
- Deep Water Active Detection System (DWADS) - participate in Distributed Netted System (DNS) 10-1 Prototype testing in Convergence Zone and Valiant Shield 10 with Integrated Units in FY10.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603561N: *Adv Submarine System Dev*	PROJECT 3197: *Undersea Superiority*	

Product Development ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Product Development	WR	ONR VA	0.000	0.000		1.064	Nov 2010	0.000		1.064	0.000	1.064	1.064
Product Development	WR	NUWC/Newport RI	1.220	0.000	Oct 2009	0.800	Oct 2010	0.000		0.800	0.000	2.020	2.020
Product Development	WR	Marine Acoustics Inc. NC	0.188	0.175	Jan 2010	1.000	Dec 2010	0.000		1.000	0.000	1.363	1.363
Product Development	MIPR	U.S. AFB/MIT Lincoln Labs MA	0.000	1.200	Nov 2009	0.600	Nov 2010	0.000		0.600	0.000	1.800	1.800
Product Development	C/CPFF	JHU/APL MD	2.050	5.462	Dec 2009	3.500	Dec 2010	0.000		3.500	0.000	11.012	11.012
Product Development	C/CPFF	Lockheed Martin VA	2.531	7.444	Dec 2009	5.500	Dec 2010	0.000		5.500	0.000	15.475	15.475
Product Development	C/CPFF	SAIC VA	0.000	0.000		0.200	Dec 2010	0.000		0.200	0.000	0.200	0.200
Product Development	C/CPFF	Lockheed Martin CA	11.886	12.611	Dec 2009	0.000		0.000		0.000	0.000	24.497	24.497
Product Development	C/CPFF	In Depth Engineering VA	0.900	0.000		0.000		0.000		0.000	0.000	0.900	0.900
Product Development	C/CPFF	Scientific Solutions Inc NH	0.500	0.000		0.000		0.000		0.000	0.000	0.500	0.500
Product Development	WR	Naval Research Lab	0.885	0.000		0.000		0.000		0.000	0.000	0.885	0.885

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603561N: *Adv Submarine System Dev*	PROJECT 3197: *Undersea Superiority*

Product Development ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
		DC											
		Subtotal	20.160	26.892		12.664		0.000		12.664	0.000	59.716	59.716

Remarks

Test and Evaluation ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Test and Evaluation	WR	SPAWAR, San Diego CA	1.600	0.000		0.250	Oct 2010	0.000		0.250	0.000	1.850	1.850
Test and Evaluation	WR	NUWC/Newport RI	2.922	2.735	Oct 2009	1.800	Oct 2010	0.000		1.800	0.000	7.457	7.457
Test and Evaluation	C/CPFF	JHU/APL MD	5.080	0.500	Dec 2009	1.200	Dec 2010	0.000		1.200	0.000	6.780	6.780
Test and Evaluation	C/CPFF	UT/ARL TX	1.650	0.750	Dec 2009	4.000	Dec 2010	0.000		4.000	0.000	6.400	6.400
Test and Evaluation	MIPR	U.S. AFB/MIT Lincoln Labs MA	0.000	0.150	Dec 2009	0.100	Dec 2010	0.000		0.100	0.000	0.250	0.250
Test and Evaluation	WR	Various Various	3.724	0.689	Jan 2010	1.509	Dec 2010	0.000		1.509	0.000	5.922	5.922

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603561N: *Adv Submarine System Dev*	PROJECT 3197: *Undersea Superiority*

Test and Evaluation ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
		Subtotal	14.976	4.824		8.859		0.000		8.859	0.000	28.659	28.659

Remarks

Management Services ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Support	C/CPAF	BAE SYSTEMS MD	0.400	0.400	Dec 2009	0.400	Dec 2010	0.000		0.400	0.000	1.200	1.200
Travel	WR	NAVSEA PEO IWS5 DC	0.010	0.060	Oct 2009	0.060	Oct 2010	0.000		0.060	0.000	0.130	0.130
DAWDF	C/TBD	TBD TBD	0.178	0.000		0.000		0.000		0.000	0.000	0.178	0.178
		Subtotal	0.588	0.460		0.460		0.000		0.460	0.000	1.508	1.508

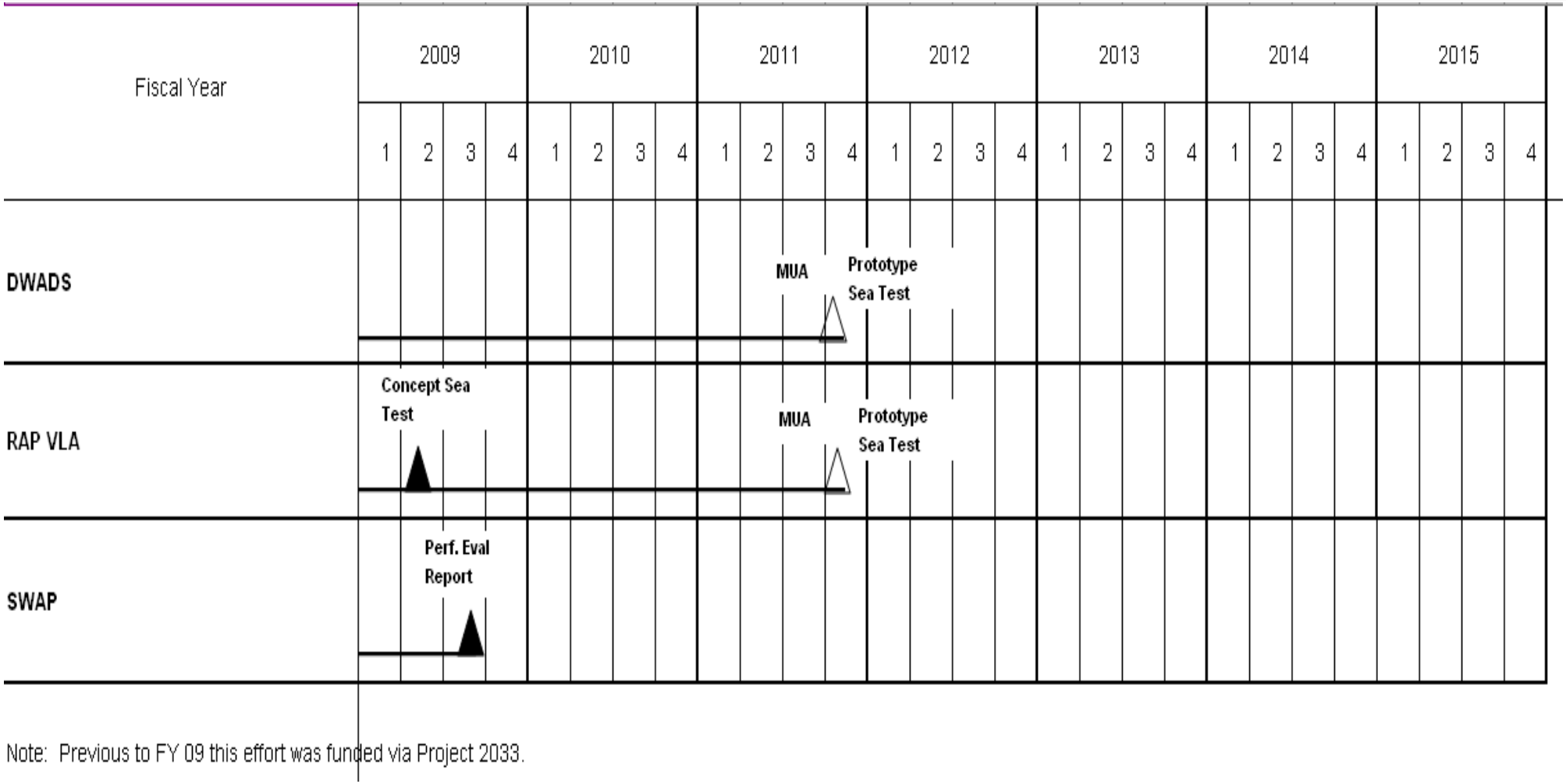
Remarks

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603561N: *Adv Submarine System Dev*	PROJECT 3197: *Undersea Superiority*	

	Total Prior Years Cost	FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	35.724	32.176		21.983		0.000		21.983	0.000	89.883	89.883

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603561N: *Adv Submarine System Dev*	PROJECT 3197: *Undersea Superiority*



Note: Previous to FY 09 this effort was funded via Project 2033.

Exhibit R-4A, RDT&E Schedule Details: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603561N: *Adv Submarine System Dev*	**PROJECT** 3197: *Undersea Superiority*

Schedule Details

	Start		End	
Event	**Quarter**	**Year**	**Quarter**	**Year**
DWADS Military Utility Assessment (MUA)	3	2011	3	2011
DWADS Fully Functional Prototype Sea Test	4	2011	4	2011
RAP VLA Proof of Concept Sea Test	2	2009	2	2009
RAP VLA Military Utility Assessment (MUA)	3	2011	3	2011
RAP VLA Fully Functional Prototype Sea Test	4	2011	4	2011
SWAP Performance Evaluation Report	3	2009	3	2009

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603561N: *Adv Submarine System Dev*	PROJECT 3220: *SBSD Advanced Submarine System Development*	

COST ($ in Millions)	FY 2009 Actual	FY 2010 Estimate	FY 2011 Base Estimate	FY 2011 OCO Estimate	FY 2011 Total Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
3220: *SBSD Advanced Submarine System Development*	0.000	385.910	493.028	0.000	493.028	755.902	830.832	1,044.448	597.299	Continuing	Continuing
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0		

A. Mission Description and Budget Item Justification

The SBSD Advanced Submarine System Development program funding requests supports the necessary design, systems engineering, prototyping, and vendor qualification activities needed to execute the schedule for Common Missile Compartment (CMC) design, and whole ship design and component development technologies for the next generation ballistic
missile submarine. The U.S. RDT&E program supports cooperation with the UK to maintain its strategic deterrent, continuing over 46 years of cooperation under the Polaris Sales Agreement.

The following key activities are imperative for a successful ship acquisition to replace the OHIO Class SSBNs:
1. Design and development of a missile compartment, the launch system and the strategic support systems to meet US strategic requirements in accordance with the President's direction (NOV 06) to support the replacement of the United Kingdom (UK) strategic deterrent, the VANGUARD Class SSBN. UK Secretary of State John Hutton's letter dated
February 2009, confirmed continued UK support for the CMC Program. US Secretary of Defense Gates response dated May 09, confirmed joint US/UK CMC design efforts.

2. AOA analysis was completed May 09 along with final out brief to OSD. The final AOA Report completed in September 2009. OSD's PA&E AOA Sufficiency Review Letter was signed December 2009.

3. Concept and System Definition for remaining portions of the ship in order to maintain US synchronization with the missile compartment design efforts to provide a balanced and integrated US submarine design within US schedule requirements.

4. Development of advanced submarine platform technologies to provide capabilities needed to enhance platform operational effectiveness and minimize life cycle cost over its service life.

B. Accomplishments/Planned Program ($ in Millions)

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603561N: *Adv Submarine System Dev*	PROJECT 3220: *SBSD Advanced Submarine System Development*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
SBSD Advanced Submarine System Development	0.000	385.910	493.028	0.000	493.028

SBSD Concept and System Definition and Prototyping
The SBSD program supports design, systems engineering, prototyping, and vendor qualification activities needed to develop the CMC design and the OHIO Replacement whole ship design and component development. SBSD design work is necessary for decisions on missile tube hull insert casting manufacturing in FY 2010 and missile compartment construction strategy in FY 2011. The design timelines are templated on the successful approach proven on VIRGINIA, adjusted for the additional complexity of a missile compartment and strategic weapons systems. The SBSD program will leverage off the demonstrated results from the VIRGINIA class program, resulting in a mature CMC design prior to construction to minimizes risk of design rework, schedule overruns and potential cost growth.

Additional efforts are directed to technologies requiring significant development times and those technologies with early design impacts. These include propulsor development, ship control (e.g., control surfaces), and ship signatures. These technologies are critical to understanding stealth capabilities for a ship class that will be in service until 2080.

Activities planned for FY10 and FY11 include the design of a missile compartment to satisfy both the U.S. and UK Navy's requirements, efforts to mature advanced technologies and development of a new launcher system providing adaptability and flexibility throughout the ship's life. Ship development efforts include important pre-construction activities such as studies of ship requirements, investigation of technology options, improvement and validation of performance prediction tools, and improvement of design tools. Platform technology development will address technologies that must be mature to support start of ship design such as the propulsor, electric actuation, maneuvering/ship control and signatures.

FY 2010 Plans:
FY10 Planned Accomplishments:

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603561N: *Adv Submarine System Dev*	PROJECT 3220: *SBSD Advanced Submarine System Development*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
- Development of CMC related sections of the ship specification - Development of drawings for qualification missile quad pack design - Development of CMC system diagrams - Procurement and manufacturing of critical casting and manufacturing prototypes validating planned missile compartment production techniques - Concept and design work on a missile tube test facility, test stand, and refurbishment of a test vehicle needed to support underwater launch system prototype and qualifications - Initial systems engineering - Definition of required CMC testing during the build cycle - Development of propulsor technologies - Development of ship control technologies (e.g., control surfaces) - Definition and development of ship signatures parameters and technologies *FY 2011 Base Plans:* FY 11 Planned Accomplishments include continuation of FY10 efforts and the following new efforts: - Complete Launcher Test Stand Design - Complete Surface Launch Test Vehicle Design - Complete Prototype Launcher Design - Complete Launch Test Facility Design - Systems Engineering and Integration Requirements Development - Missile Tube design - Common Missile Compartment design - Updated Integrated Master schedule - CMC Build strategy down select - Missile tube / Strategic Weapon System Support vendor qualifications - Product Model Development - Development of Signature Management Tools and Techniques for Propulsor Structural Acoustics - Development of Design Guidance and Interface Control Requirements					

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603561N: *Adv Submarine System Dev*	PROJECT 3220: *SBSD Advanced Submarine System Development*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
- Systems Engineering of Propulsor/Shaft/Stern/Engine Room - Hardware Manufacturing for Large Scale Vehicle Models - Planning and Preparations for Large Scale Vehicle Model Trials - Hydrodynamic Studies for Propulsor Inflow - Design Tool Development - Flow Noise Design Feature Component Test and Analysis - Planning and Preparations for Pressure Hull Confirmation Models - Planning and Preparations for Shock Design and Qualification Process - Implementation of a Component Development Management Process at the Shipbuilder					
Accomplishments/Planned Programs Subtotals	0.000	385.910	493.028	0.000	493.028

C. Other Program Funding Summary ($ in Millions)

N/A

D. Acquisition Strategy

The OHIO Class replacement will use a variety of acquisition strategies. The missile compartment must be designed and developed earlier than other parts of the ship in order to support the expressed intent of the President to support the UK in development of its own Successor SSBN program. It also preserves the potential for a common US-UK missile compartment, which would maximize the benefit of the ongoing US-UK partnership in strategic deterrence. Concept and System Definition efforts will be performed primarily by the US submarine shipyards. R&D efforts will be performed by Navy laboratories, shipyards, private industry, and University Affiliated Research Centers.

E. Performance Metrics

Successful completion of Launcher Test Stand Design, Launcher Test Vehicle Design, Prototype Launcher Design, Launch Test Facility Design, and updated Integrated Master Schedule, and CMC build strategy down select. Development of Signature Management Tools, Techniques for Propulsor Structural Acoustics, and Design Guidance and Interface Control Requirements.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603561N: *Adv Submarine System Dev*	PROJECT 3220: *SBSD Advanced Submarine System Development*	

Product Development ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Product Development	SS/CPFF	Ship Design Contractor Not Specified	0.000	30.000	Jan 2010	47.600	Jan 2011	0.000		47.600	Continuing	Continuing	Continuing
Product Development	WR	NSWC Carderock, MD	0.000	25.000	Jan 2010	73.539	Oct 2010	0.000		73.539	Continuing	Continuing	Continuing
Product Development	SS/CPFF	ARL Penn State University State College, PA	0.000	2.000	Feb 2010	1.572	Nov 2010	0.000		1.572	Continuing	Continuing	Continuing
Product Development	SS/CPFF	EB Groton, CT	0.000	32.500	Jan 2010	7.439	Oct 2010	0.000		7.439	Continuing	Continuing	Continuing
Product Development	SS/CPFF	NGSB Newport News, VA	0.000	26.700	Jan 2010	1.829	Oct 2010	0.000		1.829	Continuing	Continuing	Continuing
Product Development	SS/CPFF	NGMS Sunnyvale, CA	0.000	55.000	Feb 2010	40.402	Nov 2010	0.000		40.402	Continuing	Continuing	Continuing
Product Development	WR	NUWC Newport, RI	0.000	4.000	Jan 2010	18.275	Oct 2010	0.000		18.275	Continuing	Continuing	Continuing
Product Development	SS/CPFF	Missile Comp Design Contractor-EB Groton, CT	0.000	128.393	Jan 2010	148.895	Jan 2011	0.000		148.895	Continuing	Continuing	Continuing
Product Development	SS/CPFF	JHU/APL Laurel, MD	0.000	4.500	Mar 2010	2.918	Dec 2010	0.000		2.918	Continuing	Continuing	Continuing
Product Development	SS/CPIF	Missile Launch System Contractor	0.000	35.000	Apr 2010	0.000		0.000		0.000	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603561N: *Adv Submarine System Dev*	PROJECT 3220: *SBSD Advanced Submarine System Development*

Product Development ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
		Not Specified											
Product Development	SS/CPFF	Draper Labs Cambridge, MA	0.000	5.000	Mar 2010	4.669	Dec 2010	0.000		4.669	Continuing	Continuing	Continuing
Product Development	SS/CPFF	LMFS MD	0.000	15.000	Mar 2010	5.597	Dec 2010	0.000		5.597	Continuing	Continuing	Continuing
Product Development	Various/ Various	Various VAR	0.000	2.517	Jan 2010	0.654	Oct 2010	0.000		0.654	Continuing	Continuing	Continuing
Product Development	Various/ Various	Propulsor Technology VAR	0.000	0.000		1.572	Dec 2010	0.000		1.572	Continuing	Continuing	Continuing
Product Development	PO	NOTU FL	0.000	0.000		52.506	Oct 2010	0.000		52.506	Continuing	Continuing	Continuing
Product Development	SS/CPFF	LMMSC CA	0.000	0.000		28.862	Oct 2010	0.000		28.862	Continuing	Continuing	Continuing
Product Development	SS/CPFF	GDAIS VA	0.000	0.000		13.039	Oct 2010	0.000		13.039	Continuing	Continuing	Continuing
Product Development	SS/CPFF	IEC VA	0.000	0.000		2.801	Oct 2010	0.000		2.801	Continuing	Continuing	Continuing
Product Development	WR	NSWC VA	0.000	0.000		3.729	Oct 2010	0.000		3.729	Continuing	Continuing	Continuing
Product Development	SS/CPFF	BAE MD	0.000	0.000		6.546	Oct 2010	0.000		6.546	Continuing	Continuing	Continuing
Product Development	Various/ Various	SSP VAR	0.000	0.000		2.321		0.000		2.321	Continuing	Continuing	Continuing
		Subtotal	0.000	365.610		464.765		0.000		464.765			

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603561N: *Adv Submarine System Dev*	PROJECT 3220: *SBSD Advanced Submarine System Development*

Product Development ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract

Remarks

Note: Various is used for multiple activities with different award dates

Test and Evaluation ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Contractor Test and Evaluation Support	C/Various	Various Not Specified	0.000	1.000	Apr 2010	1.100	Apr 2011	0.000		1.100	Continuing	Continuing	Continuing
Government Test and Evaluation Support	WR	Various Not Specified	0.000	1.000	Jan 2010	1.810	Oct 2010	0.000		1.810	Continuing	Continuing	Continuing
Travel	WR	NAVSEA HQ Not Specified	0.000	0.100	Jan 2010	0.150	Jan 2010	0.000		0.150	Continuing	Continuing	Continuing
		Subtotal	0.000	2.100		3.060		0.000		3.060			

Remarks

Note: Various is used for multiple activities with different award dates

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603561N: *Adv Submarine System Dev*	PROJECT 3220: *SBSD Advanced Submarine System Development*

Management Services ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Contractor Management Support	C/Various	Various Not Specified	0.000	8.000	Jan 2010	14.115	Oct 2010	0.000		14.115	Continuing	Continuing	Continuing
Government Management Support	WR	Various Not Specified	0.000	10.000	Jan 2010	10.838	Oct 2010	0.000		10.838	Continuing	Continuing	Continuing
Travel	WR	NAVSEA HQ Not Specified	0.000	0.200	Jan 2010	0.250	Jan 2011	0.000		0.250	Continuing	Continuing	Continuing
		Subtotal	0.000	18.200		25.203		0.000		25.203			

Remarks

Note: Various is used for multiple activities with different award dates

	Total Prior Years Cost	FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	385.910		493.028		0.000		493.028			

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603561N: *Adv Submarine System Dev*	PROJECT 3220: *SBSD Advanced Submarine System Development*

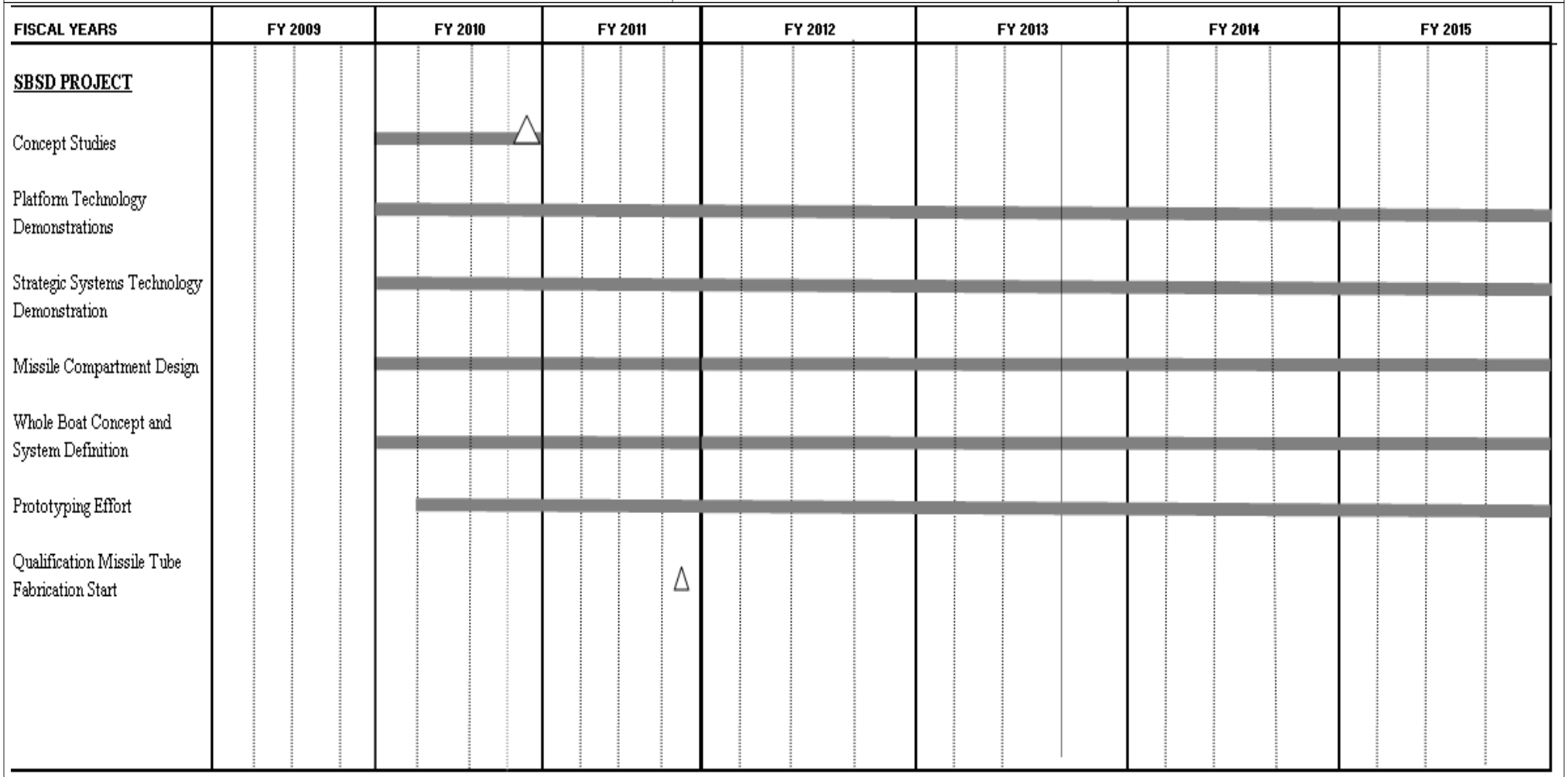


Exhibit R-4A, RDT&E Schedule Details: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603561N: *Adv Submarine System Dev*	**PROJECT** 3220: *SBSD Advanced Submarine System Development*

Schedule Details

	Start		End	
Event	**Quarter**	**Year**	**Quarter**	**Year**
Concept Studies	1	2010	4	2010
Platform Technology Demonstrations	1	2010	4	2015
Strategic Systems Technology Demonstrations	1	2010	4	2015
Missile Compartment Design	1	2010	4	2015
Whole Boat Concept and System Definition	1	2010	4	2015
Prototyping Effort	2	2010	4	2015
Qualification Missile Tube Fabrication Start	4	2011	4	2011

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603561N: *Adv Submarine System Dev*	PROJECT 9999: *Congressional Adds*	

COST ($ in Millions)	FY 2009 Actual	FY 2010 Estimate	FY 2011 Base Estimate	FY 2011 OCO Estimate	FY 2011 Total Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
9999: *Congressional Adds*	11.344	7.967	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	73.206
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0		

A. Mission Description and Budget Item Justification

Congressional Add Projects.

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010
Congressional Add: Fiber Optic Conformal Acoustic Velocity Sensor (FO *FY 2009 Accomplishments:* Funds will be used to accelerate development of Fiber Optic Conformal Acoustic Velocity Sensor (FOCAVES) technology for the next generation SSN (Virginia Block IV) and the follow-on Strategic Based Sea Deterrent (next generation Ballistic Missile Submarine).	1.995	0.000
Congressional Add: Organic Submarine ISRT Demonstration (IRST OSAID) *FY 2010 Plans:* (PMS-425) Working with NAVSEA/NUWC, the purpose of this program is to design, build, and test an encapsulated UAV, about the size of a sonobuoy, which egresses from the submarine from the downward facing Trash Disposal Unit common on all submarines. This funding will allow for a full scale submerged capsule.	0.000	2.390
Congressional Add: SSBN(X) Systems Development	0.000	1.992

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603561N: *Adv Submarine System Dev*	PROJECT 9999: *Congressional Adds*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010
FY 2010 Plans: The FY10 Congressional plus-up for SSBN(X) Systems Development will execute concept studies to narrow the design space, execute technology trade-off studies, and execute research and development for selected submarine technologies. This plus-up will be executed by the submarine design industrial base for the timely development of technology options and will reduce the risk of their successful insertion into the OHIO Replacement design.		
Congressional Add: Underwater Explosion Modeling for Non-Pressure Hull Fairing *FY 2010 Plans:* The FY10 Congressional plus-up for Underwater Explosion Modeling for Non-Pressure Hull Fairing will allow execution of underwater shock (UNDEX) modeling & simulation of composite non-pressure hull (NPH) structures, to enhance UNDEX survivability of lightweight/low cost composite fairing structures for application to US Navy Ohio Class Replacement.	0.000	1.992
Congressional Add: Large Displacement UUV At Sea Launch and Recovery *FY 2009 Accomplishments:* Funding will be used to define, document and provide interfaces, modular support equipment, and launch & recovery documentation for rapid affordable integration of Large Displacement UUVs and undersea payloads into SSGN Large Tubes. Land based facilities and in-water tests will be executed to demonstrate modular integration techniques and procedures. Payload interfaces and modular integration approach will maximize compatibility for potential use on other submarine classes.	1.690	0.000
Congressional Add: LOW COST - LASER MODULE ASSEMBLY FOR THE NAVY'S AC	1.596	0.000

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603561N: *Adv Submarine System Dev*	PROJECT 9999: *Congressional Adds*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010
FY 2009 Accomplishments: Funds will be used to develop and evaluate promising laser interrogation technologies for a common towed array fiber optic receiver that is lower cost, more insensitive to vibration, and more reliable than in current underwater fiber optic acoustic sensor systems. Service needs lower cost, more insensitive to vibration, and more reliable laser solutions for fiber optic towed array receivers.		
Congressional Add: UNDERSEA MISSILE LAUNCH STUDY (ULMS) *FY 2009 Accomplishments:* This funding will used to conduct concept studies for a follow-on platform to the OHIO Class submarine and to perform analyses and trade studies to identify necessary R&D to begin in FY09 and beyond.	3.190	0.000
Congressional Add: Acoustic Research Detachment Large Scale Vehicles *FY 2009 Accomplishments:* This funding facilitates the installation of a new fiber optic cable to provide for remote data collection and recording, remote vehicle command and control, and reduced deployment costs.	0.479	0.000
Congressional Add: Submarine Fatline Vector Sensor Towed Array *FY 2009 Accomplishments:* Funds will be used to support the Navy's Sea Power 21 ASW mission objectives via the development and demonstration of a VSTA which will provide improved gain and better Target Motion Analysis (TMA). Improvements will include steering in the direction of interfering sources, and instantaneously resolving right-left ambiguity of a single line array without the need for ship maneuvering.	0.798	1.593

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603561N: *Adv Submarine System Dev*	**PROJECT** 9999: *Congressional Adds*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010
FY 2010 Plans: Funds will be used to continue development and demonstration of a VSTA and improve upon gain and Target Motion Analysis.		
Congressional Add: Submarine Littoral Defense System *FY 2009 Accomplishments:* This funding will be used to conduct as much of the test objectives as possible in the following priority: Translation Testing, End-to-End System Demonstration, and Surface Target testing using AIM-9X Block II will Lock-On After Launch (LOAL) functionality.	1.596	0.000
Congressional Adds Subtotals	11.344	7.967

C. Other Program Funding Summary ($ in Millions)

N/A

D. Acquisition Strategy

N/A

E. Performance Metrics

Congressional Add Projects.

Exhibit R-2, RDT&E Budget Item Justification: PB 2011 Navy										DATE: February 2010	
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*				R-1 ITEM NOMENCLATURE PE 0603562N: *Submarine Tactical Warfare Sys*							
COST ($ in Millions)	**FY 2009 Actual**	**FY 2010 Estimate**	**FY 2011 Base Estimate**	**FY 2011 OCO Estimate**	**FY 2011 Total Estimate**	**FY 2012 Estimate**	**FY 2013 Estimate**	**FY 2014 Estimate**	**FY 2015 Estimate**	**Cost To Complete**	**Total Cost**
Total Program Element	13.749	12.520	5.590	0.000	5.590	5.697	5.799	5.931	6.052	Continuing	Continuing
0770: *Adv Sub Supp Equip Prog*	4.349	4.356	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	44.907
1739: *Submarine Arctic W/F Development*	5.809	5.774	5.590	0.000	5.590	5.697	5.799	5.931	6.052	Continuing	Continuing
9999: *Congressional Adds*	3.591	2.390	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	11.000

A. Mission Description and Budget Item Justification

The Submarine Tactical Warfare Systems program element is comprised of the Advanced Submarine Support Equipment Program (ASSEP) and the Submarine Special Operations Support Program. The objective is to improve submarine operational effectiveness through the development and implementation of advanced Research and Development (R&D). In order to provide improved operational effectiveness, R&D efforts are focused on Advanced Imaging Developments and Advanced Electronic Warfare Support (ES) Developments. A continuing need exists to improve these capabilities in view of the advancements in potential imaging counter detection, the need to support specialized missions and the increasingly dense and sophisticated electronic environment caused by the proliferation of complex radar, communications, and navigation equipment of potential adversaries. Ongoing developments in 360 degree imaging systems and radar range finding (PATRIOT) technologies are supporting these needs. The Submarine Arctic Warfare Development program responds to the increased threat of Naval activity in the littoral and the continuing threat of submarine and surface ship activity in regions of the world through the development of advanced submarine R&D technology to provide improved operational capability in shallow water regions. Particular emphasis is placed in the areas of sonar operability and maintainability, littoral operations, mine warfare, tactical surveillance, weapon utility and other submarine support missions. Efforts include assessment of combat system effectiveness, development of Arctic specific improvements for existing sonars and weapons, development of class specific Arctic operational guidelines and the testing of ice-capable submarine support structures. This program also provides the framework for various R&D programs to conduct test and evaluation in shallow water and Arctic regions.

Exhibit R-2, RDT&E Budget Item Justification: PB 2011 Navy	DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603562N: *Submarine Tactical Warfare Sys*

B. Program Change Summary ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
Previous President's Budget	13.767	10.172	0.000	0.000	0.000
Current President's Budget	13.749	12.520	5.590	0.000	5.590
Total Adjustments	-0.018	2.348	5.590	0.000	5.590
• Congressional General Reductions		-0.052			
• Congressional Directed Reductions		0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds		2.400			
• Congressional Directed Transfers		0.000			
• Reprogrammings	-0.007	0.000			
• SBIR/STTR Transfer	-0.011	0.000			
• Program Adjustments	0.000	0.000	5.590	0.000	5.590

Congressional Add Details ($ in Millions, and Includes General Reductions)	FY 2009	FY 2010
Project: 9999: *Congressional Adds*		
Congressional Add: *High Torque, Low Speed, Direct Drive Electric Motor Technology*	0.000	1.593
Congressional Add: *HIGH AWARNESS LITORAL OBSERVING (HALO) SENSOR*	1.197	0.000
Congressional Add: *Common Architecture Imaging System (CAIS) Program*	0.798	0.000
Congressional Add: *Submarine Panoramic Awarness System Program*	1.596	0.797
Congressional Add Subtotals for Project: 9999	3.591	2.390
Congressional Add Totals for all Projects	3.591	2.390

Change Summary Explanation

Schedule: Not applicable.

FY11 from previous President's Budget is shown as zero because no FY11-15 data was presented in President's Budget 2010.

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603562N: *Submarine Tactical Warfare Sys*	PROJECT 0770: *Adv Sub Supp Equip Prog*	

COST ($ in Millions)	FY 2009 Actual	FY 2010 Estimate	FY 2011 Base Estimate	FY 2011 OCO Estimate	FY 2011 Total Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
0770: *Adv Sub Supp Equip Prog*	4.349	4.356	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	44.907
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0		

A. Mission Description and Budget Item Justification

A continuing need exists to improve Imaging and Electronic Warfare Support (ES) capabilities in view of the advancements in potential imaging counter detection, the need to support specialized missions and the increasingly dense electromagnetic environment caused by the proliferation of complex radar, communications, and navigation equipment of potential adversaries. Improvements are necessary for submarine ES and imaging to be operationally effective in the following mission areas: Joint Littoral Warfare, Joint Surveillance, Space and Electronic Warfare, Intelligence Collection, Maritime Protection and Joint Strike. The program is divided into two project categories: Advanced Imaging Project Development and Advanced Electronic Warfare Support Project Development. Both of these categories will allow for the evaluation of the vulnerability of submarine masts, periscopes and sensors to visual, radar, and infrared detection and evaluation of state of the art technology to implement periscope/mast engineering improvements to reduce counter detection threats, the pursuit of technologies (such as PATRIOT LPI radar range finding and 360 degree imaging systems) to develop submarine-unique improvements to mast, periscope, and ES electromagnetic and electro-optic sensors based on emerging technologies available from DOD Exploratory Development Programs, industry Independent Research and Development, academia and other sources. Feasibility Demonstration Models (FDMs) are developed, evaluated, and validated in the lab and through at-sea testing.

The Advanced Imaging Project Development projects include the development of: 360 Degree Imaging - Far Term Advanced System, 360 Degree Imaging - Near Term System, 360 Degree Submarine Panoramic Infra-Red (SPIR) Imaging System, 360 Degree Affordable Modular Panoramic Periscope (AMPP), Low Cost Expendable Sensor (LCES), Advanced Head Window Water Shedding, Electro-Optic Diploops, and a Low Cost, Multi-Spectral, Grade A Head Window. The Advanced Electronic Warfare Support (ES) Development projects include the development of: PATRIOT Phase B - Low Probability of Intercept (LPI) Radar, LPI Direction Finding (DF), Distant ES Support and Remote Log-In, Specific Emitter Identification (SEI) Improvements, ES Vulnerability Tool, Integrated ES and ECS Radio Frequency Distribution Unit (RFDU), Multi-function Modular Mast (MMM) Payloads, Mast Signature Reduction, and PATRIOT Non-Scanning LPI Radar.

All programs funded in this project are non-acquisition category programs. Program plans and priorities are established by N87. The test articles identified consist of critical components that will be fully developed during engineering development into Engineering Development Models (EDMs). ASSEP Programs will eventually be broken down into initial and developmental research, for both Imaging and Electronic Warfare.

ASSEP Program will become a Military Intelligence Program and under a new Program Element 0303562N beginning Fiscal Year 2011.

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603562N: *Submarine Tactical Warfare Sys*	**PROJECT** 0770: *Adv Sub Supp Equip Prog*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
Advanced Imaging Project Development	2.117	2.584	0.000	0.000	0.000
FY 2009 Accomplishments: 360 Degree Imaging (JPL) - Far Term Advanced System; 360 Degree Imaging (ONR T18)- Near Term System; 360 Degree Submarine Panoramic Mid-Wave Infra-Red (MWIR) Imaging System; 360 Degree Affordable Modular Panoramic Periscope (AMPP); Low Cost Expendable Sensor (LCES); Advanced Head Window Water Shedding; Electro-Optic Diploops; Low Cost, Multi-Spectral Grade A Head Window					
FY 2010 Plans: 360 Degree Imaging (JPL) - Far Term Advanced System; 360 Degree Imaging (ONR T18)- Near Term System; 360 Degree Submarine Panoramic Mid-Wave Infra-Red (MWIR) Imaging System; 360 Degree Affordable Modular Panoramic Periscope (AMPP); Low Cost Expendable Sensor (LCES); Advanced Head Window Water Shedding; Electro-Optic Diploops; Low Cost, Multi-Spectral Grade A Head Window					
Advanced Electronic Warfare Support (ES) Project Development	2.211	1.772	0.000	0.000	0.000
FY 2009 Accomplishments: PATRIOT Phase B - Low Probability of Intercept (LPI) Radar Capability Insertions (CI) - LPI Direction Finding (DF) - Distant ES Support and Remote Log-In					

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603562N: *Submarine Tactical Warfare Sys*	PROJECT 0770: *Adv Sub Supp Equip Prog*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
- Specific Emitter Identification (SEI) Improvements - ES Vulnerability Tool - Integrated ES and ECS Radio Frequency Distribution Unit (RFDU) Multi-function Modular Mast (MMM) Payloads Mast Signature Reduction PATRIOT Non-Scanning LPI Radar *FY 2010 Plans:* PATRIOT Phase B - Low Probability of Intercept (LPI) Radar Capability Insertions (CI) - LPI Direction Finding (DF) - Distant ES Support and Remote Log-In - Specific Emitter Identification (SEI) Improvements - ES Vulnerability Tool - Integrated ES and ECS Radio Frequency Distribution Unit (RFDU) Multi-function Modular Mast (MMM) Payloads Mast Signature Reduction PATRIOT Non-Scanning LPI Radar					
DAWDF *FY 2009 Accomplishments:* Defense Acquisition Workforce Development Fund	0.021	0.000	0.000	0.000	0.000
Accomplishments/Planned Programs Subtotals	4.349	4.356	0.000	0.000	0.000

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603562N: *Submarine Tactical Warfare Sys*	PROJECT 0770: *Adv Sub Supp Equip Prog*

C. Other Program Funding Summary ($ in Millions)

N/A

D. Acquisition Strategy

This project optimizes technology insertion using a build-test-build approach to support ES and imaging operational needs. Operational needs have been based on the tactical requirements identified in CNO letters, Serial N77/3U629212, dated 04 Sep 03, Serial N77/3U629205, dated 01 Apr 03, and Serial N77/1U651534, dated 30 Oct 01, COMSUBLANT/COMSUBPAC Command Capability Issues (CCIs), Virginia Class SSN Operational Requirements Document objectives, a review, assessment and prioritization of Sensor and Processor efforts and SSN force level projections for SSN688/688I, SSN21, and SSN 774 classes through FY11. Project efforts develop submarine unique improvements to mast, periscope, and ES electromagnetic and electro-optic sensors based on emerging technologies that are available from DOD Exploratory Development Programs, industry Independent Research and Development, and other sources. FDMs will be developed to provide a realistic method of evaluating the improvements, including deployment on submarines for testing.

E. Performance Metrics

The RDD program goal is to respond to urgent operational needs within 30 days and provide for rapid development and fielding of prototype solutions within 270 days.

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603562N: *Submarine Tactical Warfare Sys*	PROJECT 1739: *Submarine Arctic W/F Development*	

COST ($ in Millions)	FY 2009 Actual	FY 2010 Estimate	FY 2011 Base Estimate	FY 2011 OCO Estimate	FY 2011 Total Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
1739: *Submarine Arctic W/F Development*	5.809	5.774	5.590	0.000	5.590	5.697	5.799	5.931	6.052	Continuing	Continuing
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0		

A. Mission Description and Budget Item Justification

The Submarine Arctic Warfare Development project responds to the increased threat of submarine and surface ship activity in Arctic regions of the world through the development of advanced submarine concepts. It places particular emphasis on submarine operability and mission support in unique cold, ice-covered environments. Efforts include assessment of combat system effectiveness, weapons testing, use of high frequency sonars in Arctic regions, testing of ice-capable submarine structures, and development of class specific Arctic operational guidelines. This project also provides the framework for various R&D programs to conduct test and evaluation in shallow water and Arctic regions.

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
Conduct ICEX and Arctic Transit Mission, ICEX Workup and Training, Ice Camp	5.781	5.774	5.590	0.000	5.590
FY 2009 Accomplishments: Conducted Ice Exercise (ICEX) mission, Arctic transit mission, ICEX workup, ICEX training, and Ice Camp. Provided planning and logistics, and supported Ice Camp Operations and Scientific Ice Expedition (SCICEX) accommodations. Supported Arctic deployments, including inter-fleet transfers, as required by the Submarine Force Commanders.					
FY 2010 Plans: Provide planning and logistics, and support Ice Camp Operations and SCICEX accommodations. Support Arctic deployments, including inter-fleet transfers, as required by the Submarine Force Commanders. Investigate, research, develop and deploy new systems for Arctic submarine support. Support testing and tactical development required to improve submarine Arctic operability and					

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603562N: *Submarine Tactical Warfare Sys*	PROJECT 1739: *Submarine Arctic W/F Development*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
warfighting. Coordinate and provide technical and logistical support for the Ice Camp in the Arctic Ocean. *FY 2011 Base Plans:* Conduct ICEX mission, Arctic transit mission, ICEX workup, ICEX training, and Ice Camp. Provide planning and logistics, and support Ice Camp Operations and SCICEX accommodations. Support Arctic deployments, including inter-fleet transfers, as required by the Submarine Force Commanders. Investigate, research, develop and deploy new systems for Arctic submarine support. Support testing and tactical development required to improve submarine Arctic operability and warfighting. Coordinate and provide technical and logistical support for the Ice Camp in the Arctic Ocean.					
DAWDF Defense Aquisition Workforce Development Fund. *FY 2009 Accomplishments:* N/A	0.028	0.000	0.000	0.000	0.000
Accomplishments/Planned Programs Subtotals	5.809	5.774	5.590	0.000	5.590

C. Other Program Funding Summary ($ in Millions)

N/A

D. Acquisition Strategy

Use sole source and competitively awarded contracts through the Fleet Industrial Supply Center (FISC) regional contracting office for equipment and technical services. NAVSEA university omnibus contract will be used for procurement of logistics support for Ice Camps.

E. Performance Metrics

- Complete Ice Exercise workup in preparation for the Ice Exercise (at-sea) Mission.
- Participate in Scientific Ice Experiment accommodation planning for Arctic Ice Camp.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603562N: *Submarine Tactical Warfare Sys*	PROJECT 1739: *Submarine Arctic W/F Development*

Test and Evaluation ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation	WR	SUBDEVRON FIVE Seattle, WA	14.276	4.434	Oct 2009	4.250	Oct 2010	0.000		4.250	Continuing	Continuing	Continuing
Developmental Test & Evaluation	C/CPFF	University of Washington/APL Seattle, WA	4.428	1.200	Jan 2010	1.200	Nov 2010	0.000		1.200	Continuing	Continuing	Continuing
Developmental Test & Evaluation	WR	NAVSEA Newport, RI	0.235	0.000		0.000		0.000		0.000	0.000	0.235	0.235
		Subtotal	18.939	5.634		5.450		0.000		5.450			

Remarks

Management Services ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Support	C/CPFF	EG&G VA	0.311	0.000		0.000		0.000		0.000	0.000	0.311	0.311
Program Management Support	C/CPFF	BAE SYSTEMS MD	0.504	0.140	Jan 2010	0.140	Nov 2010	0.000		0.140	Continuing	Continuing	Continuing
Travel	WR	NAVSEA PEO IWS 5 Washington, DC	0.040	0.000		0.000		0.000		0.000	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603562N: *Submarine Tactical Warfare Sys*	PROJECT 1739: *Submarine Arctic W/F Development*

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	FY 2010 Cost	FY 2010 Award Date	FY 2011 Base Cost	FY 2011 Base Award Date	FY 2011 OCO Cost	FY 2011 OCO Award Date	FY 2011 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
DAWDF	C/TBD	Not Specified Not Specified	0.028	0.000		0.000		0.000		0.000	0.000	0.028	0.028
		Subtotal	0.883	0.140		0.140		0.000		0.140			

Remarks

	Total Prior Years Cost	FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	19.822	5.774		5.590		0.000		5.590			

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603562N: *Submarine Tactical Warfare Sys*	**PROJECT** 1739: *Submarine Arctic W/F Development*

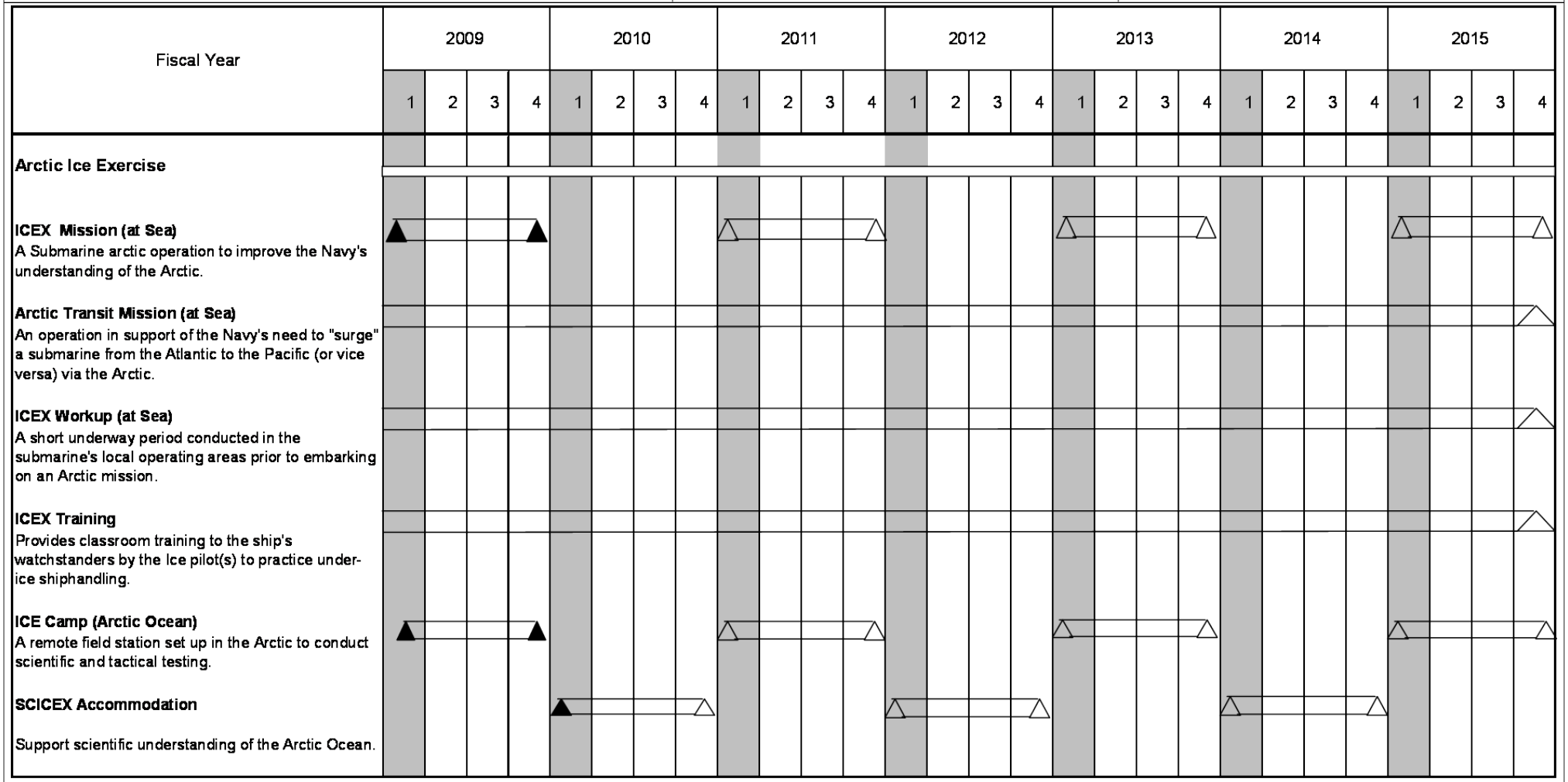


Exhibit R-4A, RDT&E Schedule Details: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603562N: *Submarine Tactical Warfare Sys*	**PROJECT** 1739: *Submarine Arctic W/F Development*

Schedule Details

	Start		End	
Event	**Quarter**	**Year**	**Quarter**	**Year**
ICEX Mission (at Sea)	1	2009	4	2015
Arctic Transit Mission (at Sea)	1	2009	4	2015
ICEX Workup (at Sea)	1	2009	4	2015
ICEX Training	1	2009	4	2015
ICE Camp (Arctic Ocean)	1	2009	4	2015
SCICEX Accommodation	1	2010	4	2014

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603562N: *Submarine Tactical Warfare Sys*	PROJECT 9999: *Congressional Adds*	

COST ($ in Millions)	FY 2009 Actual	FY 2010 Estimate	FY 2011 Base Estimate	FY 2011 OCO Estimate	FY 2011 Total Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
9999: *Congressional Adds*	3.591	2.390	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	11.000
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0		

A. Mission Description and Budget Item Justification

A continuing need exists to improve submarine capabilities to improve safety of ship, survivability, and operational effectiveness in the increasingly dense littoral environment encountered by submarines prosecuting special missions in the Global War on Terrorism (GWOT). Improvements are necessary for operational effectiveness in the following mission areas: Joint Littoral Warfare, Joint Surveillance, Space and Electronic Warfare, Intelligence Collection, Maritime Protection and Joint Strike. The ASSEP program is currently investigating means to improve effectiveness in these areas and is pursuing the development of a 360 degree imaging system. In order to maximize the availability of this type of system to the fleet as well as providing an increased number of available, enhanced capability systems for consideration and future competitive procurement, additional investigation into the development of an initial capability Engineering Development Model (EDM) as well as the investigation into alternate enhanced capability technologies for long term solutions is required. In addition to this requirement, there is a need to extend the Intelligence, Surveillance, Reconnaissance, and Targeting (ISRT) reach of the submarine conducting these missions to points over the horizon. In order to achieve this end the ASSEP program is investigating potential means of providing a stealthy launch of Unmanned Aerial Systems (UAS) to conduct these needed ISRT tasks.

All programs funded in this project are non-acquisition category programs. Program plans and priorities are established by N87. The test articles identified consist of critical components that will be fully developed during engineering development into EDMs.

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010
Congressional Add: High Torque, Low Speed, Direct Drive Electric Motor Technology *FY 2010 Plans:* Procure hardware and perform Navy test and evaluation of the electric motor technology for submarine applications.	0.000	1.593
	1.197	0.000

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603562N: *Submarine Tactical Warfare Sys*	**PROJECT** 9999: *Congressional Adds*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010
Congressional Add: HIGH AWARNESS LITORAL OBSERVING (HALO) SENSOR *FY 2009 Accomplishments:* N/A		
Congressional Add: Common Architecture Imaging System (CAIS) Program *FY 2009 Accomplishments:* N/A	0.798	0.000
Congressional Add: Submarine Panoramic Awarness System Program *FY 2009 Accomplishments:* N/A *FY 2010 Plans:* N/A	1.596	0.797
Congressional Adds Subtotals	3.591	2.390

C. Other Program Funding Summary ($ in Millions)

N/A

D. Acquisition Strategy

This project optimizes technology insertion using a build-test-build approach to support ES and imaging operational needs. Operational needs have been based on the tactical requirements identified in CNO letters, Serial N77/3U629212, dated 04 Sep 03, Serial N77/3U629205, dated 01 Apr 03, and Serial N77/1U651534, dated 30 Oct 01, COMSUBLANT/COMSUBPAC Command Capability Issues (CCIs), Virginia Class SSN Operational Requirements Document objectives, a review, assessment and prioritization of Sensor and Processor efforts and SSN force level projections for SSN688/688I, SSN21, and SSN 774 classes through FY15. Project efforts develop submarine unique improvements to mast, periscope, and ES electromagnetic and electro-optic sensors based on emerging technologies that are available

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603562N: *Submarine Tactical Warfare Sys*	PROJECT 9999: *Congressional Adds*

from DOD Exploratory Development Programs, industry Independent Research and Development, and other sources. Feasibility Demonstration Models (FDMs) will be developed to provide a realistic method of evaluating the improvements, including deployment on submarines for testing.

E. Performance Metrics

Congressional Adds

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Exhibit R-2, RDT&E Budget Item Justification: PB 2011 Navy										DATE: February 2010	
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*				R-1 ITEM NOMENCLATURE PE 0603563N: *Ship Concept Advanced Design*							
COST ($ in Millions)	**FY 2009 Actual**	**FY 2010 Estimate**	**FY 2011 Base Estimate**	**FY 2011 OCO Estimate**	**FY 2011 Total Estimate**	**FY 2012 Estimate**	**FY 2013 Estimate**	**FY 2014 Estimate**	**FY 2015 Estimate**	**Cost To Complete**	**Total Cost**
Total Program Element	36.240	22.387	17.883	0.000	17.883	17.254	17.009	16.515	17.563	Continuing	Continuing
2196: *Design, Tools, Plans and Concepts*	3.361	0.678	0.621	0.000	0.621	0.642	0.660	0.680	0.620	Continuing	Continuing
3161: *NAVSEA Tech Authority*	28.092	21.709	17.262	0.000	17.262	16.612	16.349	15.835	16.943	Continuing	Continuing
9999: *Congressional Adds*	4.787	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	32.682

A. Mission Description and Budget Item Justification

Explore alternative surface ship force structures, advanced surface ship and unmanned surface vehicles concepts, and the potential technologies for these force structures and advanced concepts in support of pre-acquisition mission needs analysis, mission area analysis, and planning. The objective is a more affordable, mission capable surface ship force including ships with reduced manning, increased producibility, reduced operating and support costs, and greater utilization of the latest technology. The program directly supports the Navy Shipbuilding Plan with state-of-the-art design tools and methods for surface ship force structure alternative studies, ship & unmanned vehicle concept studies, and the actual conduct of surface ship force structure alternative studies and advanced design concept studies for the ships that may become part of the shipbuliding plan.

Project 2196 - This project funds concept development engineering, mission effectiveness analysis, and other analyses for formulation of future surface ship force structure along with development of the tools to accomplish these efforts. Advanced ship concept studies, ship and ship systems technology assessments, and the development and upgrade of
ship concept design and engineering tools, methods, and criteria.

Project 3161 - This project funds a prioritized portfolio of time-sensitive initiatives supporting NAVSEA Technical Authority through integrated efforts in Cross Platform Systems Development (CPSD), furthering Sea Enterprise through the development of support elements for Technical Warrant Holders and meeting relevant needs of the warfare community. The areas of exploration for CPSD include surface ship concept advanced development, submarine concepts, next generation unmanned surface vehicle, high speed ships/craft, tool integration and technical data exchange, embedded interoperability engineering, and mission capability system engineering. The research products developed by this project directly influence future acquisition programs by providing a range of technically acceptable alternatives and evaluation of emerging technologies.

Project 9999: Congressional Adds

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B. Program Change Summary ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
Previous President's Budget	30.970	22.541	0.000	0.000	0.000
Current President's Budget	36.240	22.387	17.883	0.000	17.883
Total Adjustments	5.270	-0.154	17.883	0.000	17.883
• Congressional General Reductions		-0.094			
• Congressional Directed Reductions		0.000			
• Congressional Rescissions	0.000	-0.060			
• Congressional Adds		0.000			
• Congressional Directed Transfers		0.000			
• Reprogrammings	-1.593	0.000			
• SBIR/STTR Transfer	-0.317	0.000			
• Program Adjustments	0.000	0.000	17.883	0.000	17.883
• Congressional Recision Adjustments	-0.020	0.000	0.000	0.000	0.000
• Congressional Add Adjustments	7.200	0.000	0.000	0.000	0.000

Congressional Add Details ($ in Millions, and Includes General Reductions)	FY 2009	FY 2010
Project: 9999: *Congressional Adds*		
Congressional Add: *LOW SIGNATURE MODULAR WEAPON PLATFORM*	3.191	0.000
Congressional Add: *Analytics for Shipboard Monitoring Systems*	1.596	0.000
Congressional Add Subtotals for Project: 9999	4.787	0.000
Congressional Add Totals for all Projects	4.787	0.000

Change Summary Explanation

FY09 - Reflects the realignment of Low Signature Modular Weapon Platform congressional add.

FY11 from previous President's Budget is shown as zero because no FY11-15 data was presented in President's Budget 2010.

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COST ($ in Millions)	FY 2009 Actual	FY 2010 Estimate	FY 2011 Base Estimate	FY 2011 OCO Estimate	FY 2011 Total Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
2196: *Design, Tools, Plans and Concepts*	3.361	0.678	0.621	0.000	0.621	0.642	0.660	0.680	0.620	Continuing	Continuing
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0		

A. Mission Description and Budget Item Justification

This project develops and explores alternative surface ship force structures, advanced surface ship and unmanned surface vehicles concepts, and the potential technologies for these force structures, along with advanced concepts in support of pre-acquisition mission needs analysis, mission area analysis, and planning. The objective is a more affordable, mission capable surface ship force including ships with reduced manning, increased producibility, reduced operating and support costs, and greater utilization of the latest technology. The program directly supports the Navy Shipbuilding Plan with state-of-the-art design tools and methods for surface ship force structure alternative studies, ship & unmanned vehicle concept studies, surface ship mission effectiveness studies, and advanced design concept studies for the ships that may become part of the shipbuilding plan.

(U) This project provides the foundation for an affordable and mission capable surface ship force. It also supports the next step in the development of a transformed naval force by accomplishing the pre-milestone A (especially pre-concept decision) efforts for all potential surface ships and craft. These efforts are the required first step in the integration of total ship systems, including combat systems, weapons systems and Hull, Mechanical and Electrical (HM&E) systems. Inadequate early planning and ship concept formulation can result in down-stream design, construction and operational problems. A more subtle and severely negative impact of neglecting this early effort is that the "best" concepts and technologies may never even be considered and our greatest potential ship design advances never realized. Designs and technologies must meet the threat. This project supports this requirement.

(U) This project funds concept development engineering, mission effectiveness analysis, and other analyses for formulation of future surface ship force structure along with development of the tools to accomplish these efforts. Advanced ship concept studies, ship and ship systems technology assessments, and the development and upgrade of ship concept design and engineering tools, methods, and criteria are also funded in this project.

(U) This project accomplishes the following: (1) Develops alternative surface ship force structure concepts including the ships and unmanned vehicles; (2) Evaluates the mission capability effectiveness and costs for these alternative surface fleet architectures; (3) Performs fleet warfighting/mission effectiveness assessment studies; (4) Identifies future surface ship requirements and characteristics necessary to meet future threats and support mission needs; (5) Investigates new affordable ship concepts and evaluates technologies necessary to support these concepts; (6) Provides design methods and automated design tools to develop and evaluate ship concepts; and (7) Supports development of Initial Capabilities Documents (ICD) and analogous early requirements documents for future ships. These efforts are done

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to support mission analysis, mission needs development and technology assessment in support of future fleet concepts and potential ship acquisition programs. These efforts are fundamental to the Navy's formulation of the future fleet.

(U) Supports concept exploration and mission needs assessment for potential future ship acquisition programs, however, these are not direct efforts for specific, authorized shipbuilding programs. This project is the only R&D effort (Government or commercial) that supports and maintains this country's naval ship design and engineering capabilities in the area of very early stage (Concept Design) design tools, criteria, and methods.

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
Ship Concepts and Mission Need Analysis	1.579	0.483	0.534	0.000	0.534
(U) Develop ship concepts and perform analysis for potential ships and Force Architecture 5-10 years out in shipbuilding plan. *FY 2009 Accomplishments:* Accomplished concept designs for Navy Expeditionary Combat Command/Expeditionary Security Force (NECC/ESF) Gap Analysis; Concept designs for future surface combatants; Competition for New Risk Area Projects. *FY 2010 Plans:* Concept designs for Surface Combatant Anti Submarine Warfare (ASW), Anti Surface Warfare (ASuW) and Maritime Presence Gap Analyses; Competition for New Risk Area Projects. *FY 2011 Base Plans:* Concept designs for small and medium surface combatants with a broad mix of gun, missile, and other emerging weapon topics (high energy, etc.)					
Total Ship Technology Assessment	0.595	0.101	0.087	0.000	0.087
(U) Analyze the benefits and impacts of new ship, Hull, Mechanical & Electrical (HM&E) concepts, technologies and warfare systems.					

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B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
FY 2009 Accomplishments: Supported LSD Replacement Design Team with technical assessment, selection, and monitoring using Technology Knowledge Management Systems (TKMS); Analyze TKMS needs of Tanker Auxiliary Oiler (TAO) Replacement; Competition for New Risk Area Projects. *FY 2010 Plans:* Expand Total Ship Technology Assessment (TSTA) to ongoing surface combatant concept and Auxiliary Tug Fleet Salvage Ship (ATFSS) Design Team with technical assessment, selection and monitoring using TKMS. *FY 2011 Base Plans:* Expand TSTA methodology to ASW, ASUW products developed under FY10 Concepts and Mission Needs Analysis.					
Ship Concept Design and Engineering Tools, Methods, and Criteria (U) Improve capability for rapid and accurate ship performance/cost/risk assessments and tradeoff studies. *FY 2009 Accomplishments:* Validated the Advanced Ship Synthesis Evaluation Tool (ASSET) Expanded Capability; Leading Edge Advanced Prototyping System (LEAPS) Distribution System Modeling (II; LEAPS Apps for Small Craft. *FY 2010 Plans:* Testing of ASSET for ongoing and emerging ship concepts; including new hullforms and technologies, emerging combat system concepts.	0.765	0.044	0.000	0.000	0.000
Mission Systems Interface Development and Demonstration	0.415	0.050	0.000	0.000	0.000

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B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
(U) Requirements development to counter asymmetric, peer and littoral enemies with tailored, modularized mission systems. *FY 2009 Accomplishments:* Expeditionary Strike Force modular mission package defined; Small combatant in-theater rearming concept development; Continued concept development of small combatant unmanned vehicle ASW sensor system; Ship ballistic missile defense system level integration analysis. *FY 2010 Plans:* Open-ocean ASW technology insertion analysis.					
DAWDF Defense Acquisition Workforce Development Fund. *FY 2009 Accomplishments:* N/A	0.007	0.000	0.000	0.000	0.000
Accomplishments/Planned Programs Subtotals	3.361	0.678	0.621	0.000	0.621

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total	FY 2012	FY 2013	FY 2014	FY 2015	Cost To Complete	Total Cost
• RDTEN/0204202N: *DDG-1000*	0.000	524.269	549.241	0.000	549.241	337.564	124.079	177.579	171.945	0.000	1,884.677
• RDTEN/0603512N: *Carrier Systems Development*	178.095	175.823	93.830	0.000	93.830	65.502	52.306	50.878	52.513	0.000	668.947
• RDTEN/0603513N: *Shipboard Systems Component Development*	35.748	30.224	0.051	0.000	0.051	0.699	0.728	0.747	0.762	0.000	68.959
	22.813	38.197	1.796	0.000	1.796	0.285	0.360	0.402	0.409	0.000	64.262

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C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total	FY 2012	FY 2013	FY 2014	FY 2015	Cost To Complete	Total Cost
• RDTEN/0603564N: *Ship Preliminary Design/Feasibility*											
• RDTEN/0604300N: *SC21 Total Ship Systems Engineering*	506.798	7.966	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	514.764
• RDTEN/0604567N: *Ship Contract Design/Live Fire T&E*	84.640	91.587	153.686	0.000	153.686	153.107	172.749	110.312	103.862	0.000	869.943
• RDTEN/0603582N: *Combat System Integration*	62.472	22.444	24.344	0.000	24.344	26.181	25.516	25.267	23.942	0.000	210.166

D. Acquisition Strategy

This is a non acquisition program that develops, evaluates, and validates early stages of total ship concepts and technologies in support of SCN planning and potential future ship acquisition programs. This program also supports development, demonstration, evaluation, and validation of engineering tools, methods, and criteria for those concept designs and assessments.

E. Performance Metrics

None

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COST ($ in Millions)	FY 2009 Actual	FY 2010 Estimate	FY 2011 Base Estimate	FY 2011 OCO Estimate	FY 2011 Total Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
3161: *NAVSEA Tech Authority*	28.092	21.709	17.262	0.000	17.262	16.612	16.349	15.835	16.943	Continuing	Continuing
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0		

A. Mission Description and Budget Item Justification

This project has been established to support NAVSEA Technical Authority through coordinated, collaborative, cross-platform systems development resulting in advanced capabilities across business lines through development adaptation and extension of processes, procedures, and tools necessary to develop and explore alternative surface ship and submarine force structures; advanced submarine, surface ship & unmanned surface vehicle concepts; interoperability; and development of systems level engineering criteria and options to support these force structures and advanced concepts as part of pre-acquisition mission needs analysis, mission area analysis, SCN, and R&D planning. The objective is the coordination of ongoing early-stage concept design and development efforts for cross-platform applicability to result in a more affordable, mission-capable, and interoperable surface ship and submarine forces including ships and submarines with reduced manning, increased producibility, reduced operating and support costs, and greater utilization of the latest technology.

NAVSEA Tech Authority efforts under Project 3161, known as the Cross Platform Systems Development (CPSD) Program enhance ongoing efforts within Project 2196 and transition directly to early-stage ship design for Ship and Submarine Preliminary Design and Feasibility Studies and other Program Executive Office (PEO) ship and submarine
design programs. While these efforts support concept exploration and mission needs assessment for potential future ship and submarine acquisition programs, they are not direct efforts for specific, authorized shipbuilding programs. This project is the only R&D effort (Government or commercial) that provides a coordinated, collaborative approach to the development of cross-platform naval ship, submarine, and weapon system design and engineering capabilities in the areas of design tools, criteria, and methods. This project also provides innovative solutions for current Fleet issues involving Technical Authority, such as current interoperability issues with new systems or platforms.

Naval Ship System Engineering Tech Authority recapitalization and product development consolidates platform advanced concept development and design tool development in CPSD 1.0 (Platform Concept Advanced Development) and CPSD 2.0 (Platform Design and Certification Tools/Engineering and Tech Data Exchange Development); and aligned standards and requirements development for modularity and system / component commonality within CPSD 3.0 (Ship Systems Engineering/Modular Ship Systems Development). Program product areas support: platform-centric force architecture and concept development and tools (CPSD 1.0, CPSD 2.0), engineering products and system development (CPSD 3.0, CPSD 5.0), and system interoperability and mission capability for delivering ships and submarines (CPSDs 6.0, 8.0, 9.0). CPSD develops and transitions products to Technical Warrant Holder (TWH) community and develop prioritized plans and activities for future products from emerging cross platform technical requirements and associated capabilities.

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B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
Platform Concept Advanced Development	2.363	1.887	2.190	0.000	2.190

(U) Directly supports the Navy's ability to understand risk and associated cost of surface and submarine warfare assets; Pre-Milestone A ship, craft, and unmanned surface vehicle (USV) design and analysis. (CPSD 1.0) Note: Formerly titled Ship Concept Advance Development in PB10.

FY 2009 Accomplishments:
Accomplished Auxiliary Ship Concept Designs; Future Expeditionary Warfare Concept Designs; Modular Architectures Integration; Competition for New Risk Area Projects including modularity and advanced signatures; Autonomous Health Monitoring and recovery prototype.

FY 2010 Plans:
Future Expeditionary Warfare Concept Study and capability assessment; Develop future surface combatant concept options incorporating emerging combat system, propulsor/propulsion, powering, and modular architectures; Develop future auxiliary concepts including replenishment and fleet support; Integrate future submarine concepts and force architecture options; Develop green/brown water support and presence concepts; Examine common cross platform architectures, interfaces, and modular approaches to leverage common mission capability and achieve producibility efficiencies; Develop High Speed Open Ocean concepts leveraging results of ongoing technology development; Competition for New Work Area Projects.

FY 2011 Base Plans:
Expand Capability assessment begun in FY10 to other warfare areas; Continue operational assessment of Long Range Endurance prototype and Autonomous Health Monitoring and Recovery prototype; Continue development of USV interoperability concepts and architectures including technical architectures for USV operations aboard manned and unmanned surface combatants; Continue platform design processes and Standards in development support of next generation

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B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
submarine concept exploration; Continue development of cross-platform, common modular payload and interface concepts.					
Platform Design and Certification Tools/Engineering and Tech Data Exchange	2.606	2.052	3.657	0.000	3.657
(U) Develop and validate tools to certify the safety and mission capability of platform concepts and subsequently ships and submarines; establish integrated NAVSEA tool suite to support execution of NAVSEA Tech Authority. (CPSD 2.0) Note: Formerly titled Ship Design & Cert Tools & Tech Data Exchange in PB10 *FY 2009 Accomplishments:* Extended and integrated analytical tools supporting high performance naval ship technologies; Demo tech data exchange between Live Fire Test & Evaluation Modeling & Simulation (LFT&E M&S) environment and shipbuilder CAD environments; Extended M&S integrated environmental to additional engineering disciplines; Competed for New Risk Area projects. *FY 2010 Plans:* Continue integration of analytical tools supporting high performance naval ship technologies; Continue assessment of data exchange standards between LFT&E M&S and shipbuilder CAD environments; begin certification process; Continue expansion of M&S integrated environment to additional engineering disciplines; Coordinate data development and data exchange requirements to minimize data regeneration and modification efforts between disciplines and support reuse through design and acquisition process. *FY 2011 Base Plans:* Continue Technical Warrant Holder Concept Validation Support; continue Concept Design Tool Development - implementation and validation; Continue integration of analytical tools supporting high performance naval ship technologies; Continue assessment of data exchange standards between LFT&E M&S and shipbuilder CAD environments; Begin certification process; Continue expansion					

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B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
of M&S integrated environment to additional engineering disciplines. Coordinate data development and data exchange requirements to minimize data regeneration and modification efforts between disciplines and support reuse through design and acquisition process.					
Ship Systems Engineering /Modular Ship Systems Development	2.505	1.975	3.062	0.000	3.062
(U) Ship system development with a focus on technology transition, modularity, ship system technology integration, and design standards for new ship classes for pre-Alternative of Analysis (AoA) studies and ongoing POR ship and submarine development. (CPSD 3.0) Note: Formerly titled Advanced Ship Systems Development in PB10 *FY 2009 Accomplishments:* Validated Future Fleet Engineering Systems and Service Life Studies; Continued development and validation of Full Ship Finite Element Modeling Baseline and expand resolution for damage control assessment; Continued platform ballasting and deballasting design tool studies; Validated ship system commercial design rolls for advanced material handling and machining. *FY 2010 Plans:* Expand Full Ship Finite Element Modeling Baseline and expand resolution into survivability, vulnerability and recoverability analyses; Incorporate integrated topside design tool set and methodologies; Expand Cost Analysis modeling and simulation via improved cost estimating relationships that include concepts of equipment density and fabrication complexity; Articulate developing combat system architectures in terms of ship system impacts and cost; Include emerging power and propulsion system architectures into Modeling Baseline. *FY 2011 Base Plans:* Continue Cost Analysis modeling and simulation via improved cost estimating relationships that include concepts of fabrication complexity; continue survivability, recoverability and vulnerability analyses; Continue developing hydrodynamic safe operating envelope analysis methods and design					

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B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
processes; articulate development of combat system architectures in terms of ship system impacts and cost; Include emerging power, propulsion and auxiliary system architectures and technologies into Modeling Baselines; incorporate integrated power and combat system architectures; Develop open and modular system technical architectures for various platforms development transition of open architecture standards and tools to NAVSEA community.					
Next Generation USV (U) Development and demonstration of Unmanned Surface Vehicle (USVs) with focus on autonomous behavior, modularity, new ship classes for pre Alternative of Analysis (AoA) studies. (CPSD 4.0) *FY 2009 Accomplishments:* Accomplished the Long Range Endurance prototype; Autonomous Health Monitoring and Recovery prototype; Competition for New Risk Area Projects. *FY 2010 Plans:* Conduct operational assessment of Long Range Endurance prototype and Autonomous Health Monitoring and Recovery prototype; Continue development of USV interoperability R-1 Line Item No 43 CLASSIFICATION: EXHIBIT R-2a concepts and architectures; development of open architecture & modular system and technical architectures for USV operations aboard manned and unmanned surface combatants; Competition for New Risk Area Projects.	1.613	1.316	0.000	0.000	0.000
High Speed Ships and Craft Engineering (U) Investigate concepts for future high speed ships and craft that promise improved mission effectiveness in mobility, survivability, and warfare mission areas. (CPSD 5.0) *FY 2009 Accomplishments:* Accomplished the Drag Reduction Transition to fleet demonstrator; AWJ-21 design tool validation and Naval Vessel Register (NVR) integration; Competition for New Risk Area Projects.	3.031	2.388	1.770	0.000	1.770

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B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
FY 2010 Plans: Weapon Effects Testing of Aluminum Structures (MOA - FIN-GER USA) tri lateral testing of Ship 2 of Helsinki Class Fast Missile Craft; High Speed Ships tools, guidelines, validation data sets and training: High speed human systems (trials, testing, numeric modeling, guidelines for early stage design); Light Weight Structures cooperative research with NATO partners; Light Weight Structures Shock (Helsinki Class) Shock Trial. *FY 2011 Base Plans:* Reliability Based Structural Design of Aluminum Ships - Helsinki Class Life Time Loads and Fatigue analyses; Composite propulsor construction and testing; Trials, testing, numeric modeling, guidelines supporting for early stage design of High Speed Ships and Craft.					
Alternative Power Systems Engineering (U) Investigate concepts for ships and craft with alternative power/propulsion systems evaluating effectiveness in mobility, survivability, and warfare mission areas. (CPSD 6.0) *FY 2009 Accomplishments:* Completed the Fuel Cell At Sea Demonstration prototype construction; Rim Driven Ducted Propulsor prototype construction; Competition for New Risk Area Projects. *FY 2010 Plans:* Alternate propulsion tools, guidelines, validation data sets and training: Extreme wave modeling cooperative research project with NATO partners; Hydrodynamics force and moment modeling supporting dynamic stability simulation; Next Generation Integrated Propulsion systems architecting, survivability and propulsor.	2.857	2.236	1.627	0.000	1.627

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B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
FY 2011 Base Plans: Commercial Pod Foreign Comparitive Testing numeric simulations, purpose built podded propulsion design to vulnerability; next generation Integrated prop systems engineering; Shaft and strut hydro numeric modeling of lateral plane force and moment effects on ship stability.					
Future Submarine Design (U) Develop ship concept studies and evaluate technologies to define the Next Generation Submarine, common SSN-SSBN Hull and Payload Modularity. (CPSD 7.0) Note: Titled CPSD 8 in PB10 *FY 2009 Accomplishments:* Completed Navy After Next Tech Validations; Technical Warrant Holder Concept Validation Support; SUBCODE Concept Design Tool Dev - phase 4; Submarine Design Processes and Standards Development. *FY 2010 Plans:* Navy After Next Tech Validations; Technical Warrant Holder Concept Validation Support; SUBCODE Concept Design Tool Dev - integration and testing phase; Submarine Design Processes and Standards Development; next generation submarine concept exploration; modular payload and interface concept development.	3.777	2.924	0.000	0.000	0.000
Embedded Interoperability (I/O) Engineering (U) Establishes and executes a dedicated process for evaluating the interoperability performance of warfare systems early in the acquisition cycle, prior to certification. Embedded I/O ensures that fewer mission critical system failures degrade the ultimately fielded warfighting capability. Focus on emerging Open Architecture warfare systems. (CPSD 8.0) Note: Titled CPSD 9 in PB10	3.980	3.060	2.407	0.000	2.407

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603563N: *Ship Concept Advanced Design*	PROJECT 3161: *NAVSEA Tech Authority*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
FY 2009 Accomplishments: Completed the Develop Tactics, Techniques and Procedures (TTP) for CVN 77 and DDG Modernization based on FY 08 work; Pre-certification for the interoperability test and assessment of LCS 1 & 2 and CG Modernization, DDG 1000 and CVN 21 (CVN 78). Completed the Development of the TTP for LCS 1 & 2 based on FY 09 work. *FY 2010 Plans:* Complete development of TTP for CVN 77 and DDG Modernization; continue pre-certification for the interoperability test and assessment of LCS, CG Modernization, DDG 1000 and CVN 21 (CVN 78); Complete interoperability efforts LPD 17 (class); Complete TTP for LCS 1 & 2. *FY 2011 Base Plans:* Continue interoperability test and assessment of CG Modernization, DDG 1000 and CVN 21 (CVN 78); Complete interoperability efforts LPD 17 (class).					
Mission Capability Systems Engineering (U) Develop force level systems engineering criteria and guidance at the Systems of Systems (SoS) and Family of Systems (FoS) level. (CPSD 9.0) Note: Titled CPSD 10 in PB10 *FY 2009 Accomplishments:* Provided technical standards, definitions and requirements for National Security Systems, specifically Navy Single Integrated Air Picture (SIAP), Naval Integrated Fire Control Counter Air (NIFC-CA), and Information Assurance (IA); Provided independent technical review of radar and RF systems under development, Standard Missile (SM-6) and the Amphibious Improvement Program (AIP); Completed development of air launcher torpedo battle system for improved weapon performance.	4.186	2.979	2.549	0.000	2.549

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603563N: *Ship Concept Advanced Design*	PROJECT 3161: *NAVSEA Tech Authority*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
FY 2010 Plans: Continue to provide technical standards, definitions and requirements for National Security Systems (NSS), integrated architecture views for warfare systems of systems, independent technical analysis of warfare systems design and development options and the development of technical artifacts and associated products required by applicable source references by using specially selected Technical Authority Warrant Holders. *FY 2011 Base Plans:* Continue to provide technical standards, definitions and requirements for National Security Systems (NSS), integrated architecture views for warfare systems of systems, independent technical analysis of warfare systems design and development options and the development of technical artifacts and associated products required by applicable source references by using specially selected Technical Authority Warrant Holders; Expand independent technical analysis of warfare systems design and development options to additional Technical Authority Warrant Holders.					
Ship Engineering & Analysis Technology Center	1.029	0.892	0.000	0.000	0.000
(U) Provides Government activities, shipbuilders, academia and contractors the following: (CPSD 10.0) Note: Titled CPSD 7 in PB10 *FY 2009 Accomplishments:* Completed the High performance computing systems; Commercial and research software libraries; Classified and unclassified connectivity; High end data visualization and collaboration tools/Centralized data repository; Provided the framework of continued world class computing upon which specific task funding will build. (project 2196 in FY06) *FY 2010 Plans:* Expand high performance computing system efforts; leveraging commercial and research software and connectivity; Develop security, visualization and collaborative processes to leverage common					

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603563N: *Ship Concept Advanced Design*	PROJECT 3161: *NAVSEA Tech Authority*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
centralized data storage; Conduct hydrodynamic analyses of emerging ship and craft concepts in various mission performance and geographic regimes; Conduct airwake analysis of emerging high-speed ship concepts including impact of modular mission and payload architectures and configurations.					
DAWDF Defense Acquisition Workforce Development Fund. *FY 2009 Accomplishments:* N/A	0.145	0.000	0.000	0.000	0.000
Accomplishments/Planned Programs Subtotals	28.092	21.709	17.262	0.000	17.262

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total	FY 2012	FY 2013	FY 2014	FY 2015	Cost To Complete	Total Cost
• RDTEN/0204202N: *DDG-1000*	0.000	524.269	549.241	0.000	549.241	337.564	124.079	177.579	171.945	0.000	1,884.677
• RDTEN/0603512N: *Carrier Systems Development*	178.095	175.823	93.830	0.000	93.830	65.502	52.306	50.878	52.513	0.000	668.947
• RDTEN/0603513N: *Shipboard Systems Component Development*	35.748	30.224	0.051	0.000	0.051	0.699	0.728	0.747	0.762	0.000	68.959
• RDTEN/0603564N: *Ship Preliminary Design/Feasibility Studies*	22.813	38.197	1.796	0.000	1.796	0.285	0.360	0.402	0.409	0.000	64.262
• RDTEN/0604300N: *SC21 Total Ship Systems Engineering*	506.798	7.966	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	514.764
• RDTEN/0604567N: *Ship Contract Design/Live Fire T&E*	84.640	91.587	153.686	0.000	153.686	153.107	172.749	110.312	103.862	0.000	869.943
	62.472	22.444	24.344	0.000	24.344	26.181	25.516	25.267	23.942	0.000	210.166

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603563N: *Ship Concept Advanced Design*	PROJECT 3161: *NAVSEA Tech Authority*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total	FY 2012	FY 2013	FY 2014	FY 2015	Cost To Complete	Total Cost
• RDTEN/0603582N: *Combat System Integration*											

D. Acquisition Strategy

This is a non acquisition program that develops, evaluates, and validates early stages of total ship concepts and technologies in support of SCN planning and potential future ship and submarine acquisition programs. This program also supports development, demonstration, evaluation, and validation of engineering tools, methods, and criteria for those concept designs and assessments. This program supports the NAVSEA Technical Warrant Holders by providing validated engineering tools, methods, and criteria for ship, submarine and weapon system concept designs and assessments while fostering collaboration and coordination of efforts resulting in more effective use of funding.

E. Performance Metrics

None

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603563N: *Ship Concept Advanced Design*	PROJECT 3161: *NAVSEA Tech Authority*

Product Development ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Systems Engineering	Various/ Various	Various Contractors Various	9.527	2.190	Apr 2010	2.036	Apr 2011	0.000		2.036	Continuing	Continuing	Continuing
Systems Engineering	WR	NSWC, NUWC, CDSA Various	23.180	8.097	Jan 2010	6.350	Jan 2011	0.000		6.350	Continuing	Continuing	Continuing
Engineering Development	WR	NSWC, NUWC Various	22.234	8.290	Mar 2010	6.361	Mar 2011	0.000		6.361	Continuing	Continuing	Continuing
Demonstration & Evaluation	WR	NSWC Various	10.007	2.922	Feb 2010	2.305	Feb 2011	0.000		2.305	Continuing	Continuing	Continuing
Demonstration & Evaluation	WR	SPAWAR Various	1.710	0.110	Mar 2010	0.110	Mar 2011	0.000		0.110	Continuing	Continuing	Continuing
		Subtotal	66.658	21.609		17.162		0.000		17.162			

Remarks

Management Services ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Travel	Allot	NAVSEA HQ Washington, DC	0.300	0.100	Sep 2010	0.100	Sep 2011	0.000		0.100	Continuing	Continuing	Continuing
DAWDF		Not Specified	0.145	0.000		0.000		0.000		0.000	0.000	0.145	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603563N: *Ship Concept Advanced Design*	PROJECT 3161: *NAVSEA Tech Authority*

Management Services ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
	Various/ Various	Not Specified											
		Subtotal	0.445	0.100		0.100		0.000		0.100			

Remarks

	Total Prior Years Cost	FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	67.103	21.709		17.262		0.000		17.262			

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603563N: *Ship Concept Advanced Design*	PROJECT 3161: *NAVSEA Tech Authority*

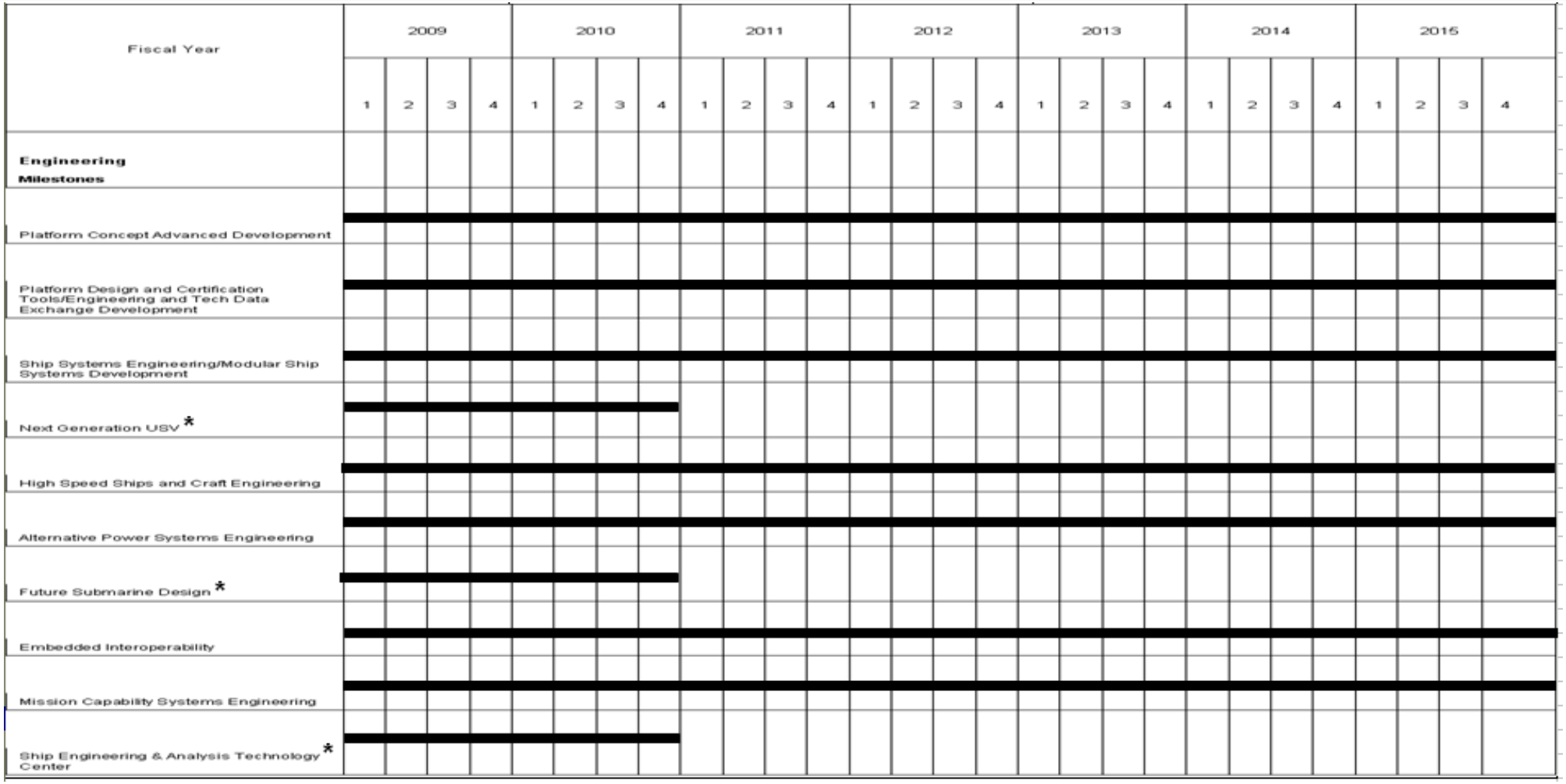

Exhibit R-4A, RDT&E Schedule Details: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603563N: *Ship Concept Advanced Design*	**PROJECT** 3161: *NAVSEA Tech Authority*

Schedule Details

	Start		End	
Event	**Quarter**	**Year**	**Quarter**	**Year**
Platform Concept Advanced Development	1	2009	4	2015
Platform Design and Certification Tools/Engineering and Tech Data Exchange Development	1	2009	4	2015
Ship Systems Engineering/Modular Ship Systems Development	1	2009	4	2015
Next Generation USV	1	2009	4	2010
High Speed Ships and Craft Engineering	1	2009	4	2015
Alternative Power Systems Engineering	1	2009	4	2015
Future Submarine Design	1	2009	4	2010
Embedded Interoperability Engineering	1	2009	4	2015
Mission Capability Systems Engineering	1	2009	4	2015
Ship Engineering & Analysis Technology Center	1	2009	4	2010

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603563N: *Ship Concept Advanced Design*	PROJECT 9999: *Congressional Adds*	

COST ($ in Millions)	FY 2009 Actual	FY 2010 Estimate	FY 2011 Base Estimate	FY 2011 OCO Estimate	FY 2011 Total Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
9999: *Congressional Adds*	4.787	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	32.682
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0		

A. Mission Description and Budget Item Justification

Congressional Adds.

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010
Congressional Add: LOW SIGNATURE MODULAR WEAPON PLATFORM *FY 2009 Accomplishments:* (U) This effort will support the seal delivery vehicle (SDV) as technology demonstrators to explore enhanced seakeeping performance, payload modularity, integrated command and control, advanced construction techniques, reliability and maintainability. This task will conduct a craft survey and report of the Sealion I vessel and extend the length of Sealion I to mirror Sealion II.	3.191	0.000
Congressional Add: Analytics for Shipboard Monitoring Systems *FY 2009 Accomplishments:* (U) Analytics for Shipboard Monitoring Systems (ASMS) is an open architecture model that will enhance legacy and new ship capabilities while saving acquisition dollars and yield workload reduction. Moving from stove piped and proprietary systems to open systems will streamline current processes, reduce supporting infrastructure and will support rapid deployment of emerging diagnostic technologies to optimize Fleet readiness and maintenance funds allocation.	1.596	0.000
Congressional Adds Subtotals	4.787	0.000

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603563N: *Ship Concept Advanced Design*	PROJECT 9999: *Congressional Adds*

C. Other Program Funding Summary ($ in Millions)

N/A

D. Acquisition Strategy

N/A

E. Performance Metrics

Congressional Adds.

Exhibit R-2, RDT&E Budget Item Justification: PB 2011 Navy										DATE: February 2010	
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*				R-1 ITEM NOMENCLATURE PE 0603564N: *Ship Prel Design & Feasibility Studies*							
COST ($ in Millions)	**FY 2009 Actual**	**FY 2010 Estimate**	**FY 2011 Base Estimate**	**FY 2011 OCO Estimate**	**FY 2011 Total Estimate**	**FY 2012 Estimate**	**FY 2013 Estimate**	**FY 2014 Estimate**	**FY 2015 Estimate**	**Cost To Complete**	**Total Cost**
Total Program Element	22.884	38.197	1.796	0.000	1.796	0.285	0.360	0.402	0.409	Continuing	Continuing
0408: *Ship Development (ADV)*	4.391	1.478	0.437	0.000	0.437	0.285	0.360	0.402	0.409	Continuing	Continuing
3195: *JCC(X)*	8.281	25.045	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	35.280
3226: *Green Water Craft*	0.000	1.476	1.359	0.000	1.359	0.000	0.000	0.000	0.000	0.000	2.835
9999: *Congressional Adds*	10.212	10.198	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	32.261

A. Mission Description and Budget Item Justification

0408 - SURFTECH - Ship Development project supports the evaluation of advanced and alternative technologies through the Surface Ship Technology (SURFTECH) process for suitability for meeting total ship concepts capability needs.

- OCEAN CLASS AGOR - Ship Preliminary Design and Feasiblility Studies to support procurement of two AGOR ocean Class vessels in FY11 and FY12.

3195 - JCC(X) was planned as a mobile, self-sustaining platform with robust C4ISR capability for a Joint Force Commander and staff and provides in-theater command and control should a land-based headquarters be unavailable, constrained or threatened.

3226 - Green Water Craft which will provide maritime security and stability operations and increased maritime domain awareness in compliance with Global Maritime Security objectives and in direct support of Global Fleet Stations (GFS). Funding will provide for craft feasibility and sizing study and subsystem Mockups in support of initial craft production.

Congressional Adds:
Support for Naval Ship Hydrodynamic Test Facility, Bow Lifting Body Ship Research and Low Signature Defensive Weapon System for Surface Combatant Craft.

Exhibit R-2, RDT&E Budget Item Justification: PB 2011 Navy	DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603564N: *Ship Prel Design & Feasibility Studies*

B. Program Change Summary ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
Previous President's Budget	24.781	28.135	0.000	0.000	0.000
Current President's Budget	22.884	38.197	1.796	0.000	1.796
Total Adjustments	-1.897	10.062	1.796	0.000	1.796
• Congressional General Reductions		-0.158			
• Congressional Directed Reductions		0.000			
• Congressional Rescissions	0.000	-0.020			
• Congressional Adds		10.240			
• Congressional Directed Transfers		0.000			
• Reprogrammings	-1.500	0.000			
• SBIR/STTR Transfer	-0.396	0.000			
• Program Adjustments	0.000	0.000	1.796	0.000	1.796
• Rate/Misc Adjustments	-0.001	0.000	0.000	0.000	0.000

Congressional Add Details ($ in Millions, and Includes General Reductions)	FY 2009	FY 2010
Project: 9999: *Congressional Adds*		
Congressional Add: *Low Signature Defensive Weapon System for Surface Combatant Craft*	0.000	3.824
Congressional Add: *SUPPORT FOR NAVAL SHIP HYDRODYNAMICS TEST FACILITI*	3.989	3.187
Congressional Add: *Bow Lifting Body Ship Research*	6.223	3.187
Congressional Add Subtotals for Project: 9999	10.212	10.198
Congressional Add Totals for all Projects	10.212	10.198

Change Summary Explanation

FY11 from previous President's Budget is shown as zero because no FY11-15 data was presented in President's Budget 2010.

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603564N: *Ship Prel Design & Feasibility Studies*	PROJECT 0408: *Ship Development (ADV)*	

COST ($ in Millions)	FY 2009 Actual	FY 2010 Estimate	FY 2011 Base Estimate	FY 2011 OCO Estimate	FY 2011 Total Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
0408: *Ship Development (ADV)*	4.391	1.478	0.437	0.000	0.437	0.285	0.360	0.402	0.409	Continuing	Continuing
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0		

A. Mission Description and Budget Item Justification

This project unit supports two efforts.

SURFTECH - The evaluation of advanced and alternative technologies through the Surface Ship Technology (SURFTECH) process for examining suitability for meeting total ship concepts capability needs. The objective of this project is to provide decision makers with feasible, affordable alternatives to be selected for further development. In support of surface ship advanced technology development and transformation, the surface ship community has instituted a technology evaluation process to coordinate, identify, prioritize, and integrate technology insertion and development efforts and assist RDT&E community efforts to initiate appropriate technology development. The current acquisition guidelines require the development of critical technologies after Milestone A. If significant gap analysis, planning, and early development efforts are not conducted in parallel with Concept Development the Navy will not be able to provide broad, cross-platform direction to surface navy development efforts in an effective manner and will not effectively leverage limited resources to quicken the pace of both development and transition of critical mission technologies for timely acquisition.

AGOR OCEAN - Funding supports the acquisition of general purpose research vessels which will conduct science, educational and engineering operations in all oceans, and will be operated by the University Oceanographic Laboratory System (UNOLS).

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
Ocean Class AGOR	3.823	0.967	0.000	0.000	0.000
FY 2009 Accomplishments: Funding supports necessary preliminary efforts in order to award detail design and procurement contract.					

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603564N: *Ship Prel Design & Feasibility Studies*	PROJECT 0408: *Ship Development (ADV)*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
FY 2010 Plans: Continued support for necessary preliminary efforts in order to award detail design and procurement contract.					
SURFTECH *FY 2009 Accomplishments:* As new ship concepts with desired mission capabilities are developed, SURFTECH will continuously identify, prioritize, and integrate technology insertion and development efforts and assist the RDT&E community efforts to initiate appropriate technology development. SURFTECH will provide continuous analysis of and feedback to ongoing technology development efforts to ensure project relevance and timely transition to meet acquisition schedules, which will be documented in the Technology Plan. *FY 2010 Plans:* Continued identification, prioritization, and integration of technology insertion and development efforts and assist the RDT&E community efforts to initiate appropriate technology development. SURFTECH will provide continuous analysis of and feedback to ongoing technology development efforts to ensure project relevance and timely transition to meet acquisition schedules, which will be documented in the Technology Plan. *FY 2011 Base Plans:* Continued identification, prioritization, and integration of technology insertion and development efforts and assist the RDT&E community efforts to initiate appropriate technology development. SURFTECH will provide continuous analysis of and feedback to ongoing technology development efforts to ensure project relevance and timely transition to meet acquisition schedules, which will be documented in the Technology Plan.	0.545	0.511	0.437	0.000	0.437
Defense Acquisition Wokforce Development Fund (DAWDF)	0.023	0.000	0.000	0.000	0.000

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603564N: *Ship Prel Design & Feasibility Studies*	PROJECT 0408: *Ship Development (ADV)*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
FY 2009 Accomplishments: Defense Acquisition Wokforce Development Fund					
Accomplishments/Planned Programs Subtotals	4.391	1.478	0.437	0.000	0.437

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total	FY 2012	FY 2013	FY 2014	FY 2015	Cost To Complete	Total Cost
• SCN/5087: *Oceanographic Ships*	0.000	0.000	89.093	0.000	89.093	0.000	0.000	0.000	0.000	0.000	89.093

D. Acquisition Strategy

N/A

E. Performance Metrics

NONE

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603564N: *Ship Prel Design & Feasibility Studies*	PROJECT 3195: *JCC(X)*	

COST ($ in Millions)	FY 2009 Actual	FY 2010 Estimate	FY 2011 Base Estimate	FY 2011 OCO Estimate	FY 2011 Total Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
3195: *JCC(X)*	8.281	25.045	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	35.280
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0		

A. Mission Description and Budget Item Justification

JCC(X) was planned to be a mobile, self-sustaining platform with robust C4ISR capability for a Joint Force Maritime Component Commander (JFMCC) or Joint Force Commander and staff and provides in-theater command and control should a land-based headquarters be unavailable, constrained or threatened. The JCC(X) program has been deferred. C2 capability will remain resident in CVNs and large-deck amphips. Assessments of the LCC 19 & 20 will be conducted to determine life extensions.

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
JCC (X) Budgeted funds provides the afloat/ashore command and control (C2) preliminary design and feasibility study efforts. *FY 2009 Accomplishments:* N/A *FY 2010 Plans:* N/A	8.232	25.045	0.000	0.000	0.000
DAWDF Defense Acquisition Workforce Development Fund *FY 2009 Accomplishments:* N/A	0.049	0.000	0.000	0.000	0.000

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603564N: *Ship Prel Design & Feasibility Studies*	**PROJECT** 3195: *JCC(X)*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
Accomplishments/Planned Programs Subtotals	8.281	25.045	0.000	0.000	0.000

C. Other Program Funding Summary ($ in Millions)

N/A

D. Acquisition Strategy

N/A

E. Performance Metrics

N/A

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603564N: *Ship Prel Design & Feasibility Studies*	PROJECT 3226: *Green Water Craft*	

COST ($ in Millions)	FY 2009 Actual	FY 2010 Estimate	FY 2011 Base Estimate	FY 2011 OCO Estimate	FY 2011 Total Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
3226: *Green Water Craft*	0.000	1.476	1.359	0.000	1.359	0.000	0.000	0.000	0.000	0.000	2.835
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0		

A. Mission Description and Budget Item Justification

Green Water Craft which will provide maritime security and stability operations and increased maritime domain awareness in compliance with Global Maritime Security objectives and in direct support of Global Fleet Stations (GFS). Funding will provide for craft feasibility and sizing study and subsystem Mockups in support of initial craft production.

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
Green Water Craft	0.000	1.476	1.359	0.000	1.359
In support of initial craft production, Government and contractor engineering support will conduct craft feasibility and sizing studies to be used to develop Command and Control System and Pilot House Static Mockups. *FY 2010 Plans:* N/A *FY 2011 Base Plans:* N/A					
Accomplishments/Planned Programs Subtotals	0.000	1.476	1.359	0.000	1.359

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603564N: *Ship Prel Design & Feasibility Studies*	**PROJECT** 3226: *Green Water Craft*

C. Other Program Funding Summary ($ in Millions)

N/A

D. Acquisition Strategy

N/A

E. Performance Metrics

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603564N: *Ship Prel Design & Feasibility Studies*	PROJECT 3226: *Green Water Craft*

Product Development ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Craft Sizing Study	Various/FP	TBD TBD	0.000	0.300	Feb 2010	0.000		0.000		0.000	0.000	0.300	Continuing
Command and Control Mockup Design and Prototype Development	Various/FP	TBD TBD	0.000	0.850	Feb 2010	0.589	Nov 2010	0.000		0.589	0.000	1.439	Continuing
Pilot House Static Mockup	Various/FP	TBD TBD	0.000	0.000		0.438	Nov 2010	0.000		0.438	0.000	0.438	Continuing
		Subtotal	0.000	1.150		1.027		0.000		1.027	0.000	2.177	

Remarks

Management Services ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Contractor Engineering Support (Green Water)	Various/ Various	CSC Not Specified	0.000	0.070	Feb 2010	0.070	Nov 2010	0.000		0.070	0.000	0.140	Continuing
Government Engineering Support (Green Water)	WR	NSWCCD CCD Not Specified	0.000	0.222	Feb 2010	0.222	Nov 2010	0.000		0.222	0.000	0.444	Continuing
Travel (Green Water)	Reqn	NAVSEA Not Specified	0.000	0.034	Feb 2010	0.040	Dec 2010	0.000		0.040	0.000	0.074	Continuing
		Subtotal	0.000	0.326		0.332		0.000		0.332	0.000	0.658	

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603564N: *Ship Prel Design & Feasibility Studies*	PROJECT 3226: *Green Water Craft*

Management Services ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Remarks													

	Total Prior Years Cost	FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	1.476		1.359		0.000		1.359	0.000	2.835	

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603564N: *Ship Prel Design & Feasibility Studies*	PROJECT 3226: *Green Water Craft*

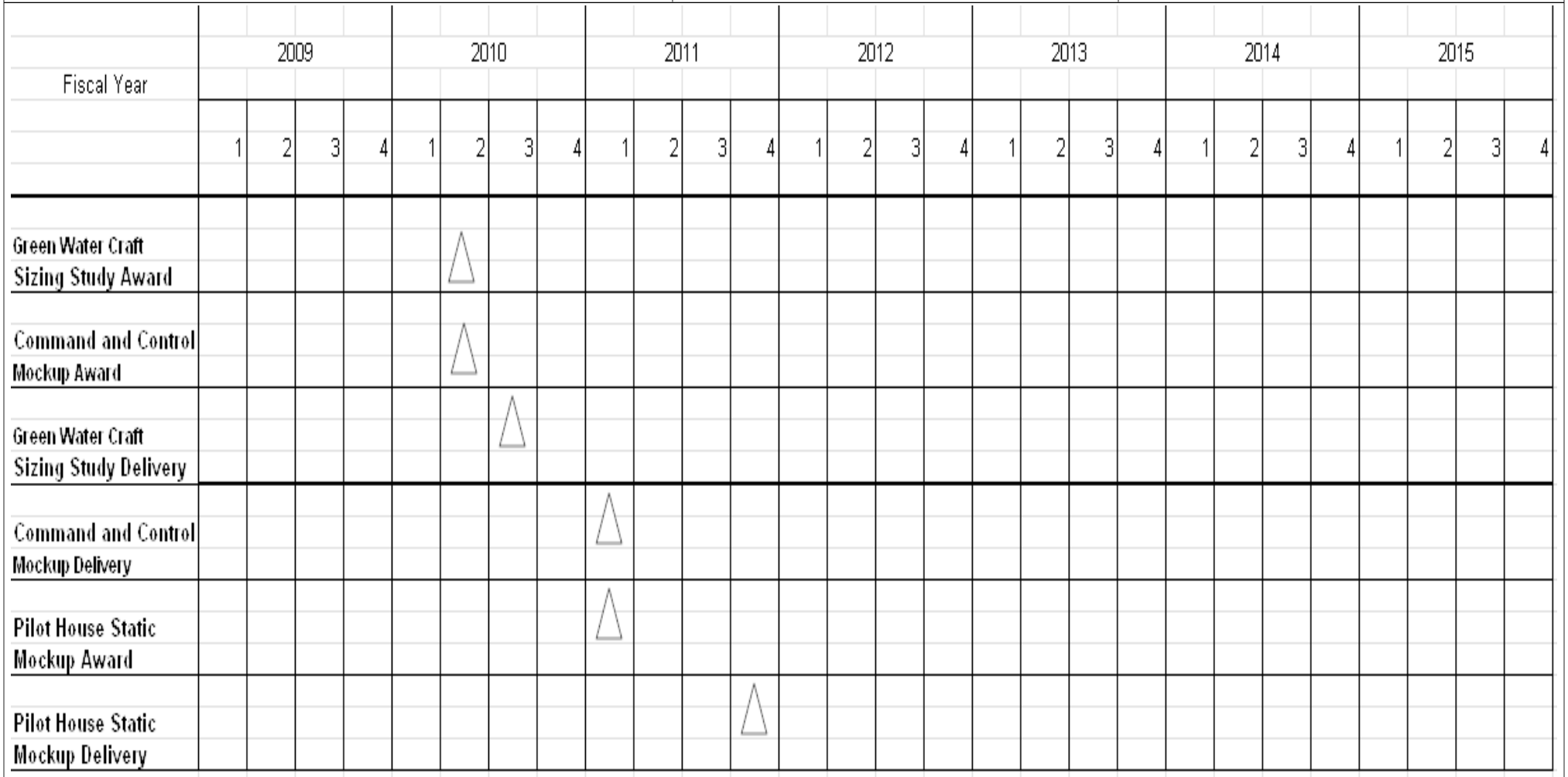

Exhibit R-4A, RDT&E Schedule Details: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603564N: *Ship Prel Design & Feasibility Studies*	**PROJECT** 3226: *Green Water Craft*

Schedule Details

	Start		End	
Event	**Quarter**	**Year**	**Quarter**	**Year**
Green Water Craft Sizing Study Award	2	2010	2	2010
Command and Control Mockup Award	2	2010	2	2010
Green Water Craft Sizing Study Report	3	2010	3	2010
Command and Control Mockup Delivery	1	2011	1	2011
Pilot House Static Mockup Award	1	2011	1	2011
Pilot House Static Mockup Delivery	4	2011	4	2011

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603564N: *Ship Prel Design & Feasibility Studies*	PROJECT 9999: *Congressional Adds*	

COST ($ in Millions)	FY 2009 Actual	FY 2010 Estimate	FY 2011 Base Estimate	FY 2011 OCO Estimate	FY 2011 Total Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
9999: *Congressional Adds*	10.212	10.198	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	32.261
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0		

A. Mission Description and Budget Item Justification

Congressional Adds.

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010
Congressional Add: Low Signature Defensive Weapon System for Surface Combatant Craft *FY 2010 Plans:* Low Signature Defensive Weapon System for Surface Combatant Craft	0.000	3.824
Congressional Add: SUPPORT FOR NAVAL SHIP HYDRODYNAMICS TEST FACILITI *FY 2009 Accomplishments:* (U) NSWCCD has implemented a five year, five phase fixed price contract to replace the wavemaking system in the Manuevering and Seakeeping (MASK) Basin with modern systems capable of supporting current and future Navy needs. This 3rd year effort will fund the 3rd phase of the contract to continue developing components for the wavemaker. *FY 2010 Plans:* This 4th year effort will fund the 4th phase of the contract to continue developing components for the wavemaker.	3.989	3.187
	6.223	3.187

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603564N: *Ship Prel Design & Feasibility Studies*	**PROJECT** 9999: *Congressional Adds*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010
Congressional Add: Bow Lifting Body Ship Research *FY 2009 Accomplishments:* Bow Lifting Body Ship Research project will develop and transition lifting body technologies to support future acquisition programs that consider single hull configurations. *FY 2010 Plans:* Continue developing and transitioning lifting body technologies to support future acquisition programs that consider single hull configurations.		
Congressional Adds Subtotals	10.212	10.198

C. Other Program Funding Summary ($ in Millions)

N/A

D. Acquisition Strategy

N/A

E. Performance Metrics

Congressional Adds.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2011 Navy										DATE: February 2010	
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*				R-1 ITEM NOMENCLATURE PE 0603573N: *Advanced Surface Machinery Sys*							
COST ($ in Millions)	**FY 2009 Actual**	**FY 2010 Estimate**	**FY 2011 Base Estimate**	**FY 2011 OCO Estimate**	**FY 2011 Total Estimate**	**FY 2012 Estimate**	**FY 2013 Estimate**	**FY 2014 Estimate**	**FY 2015 Estimate**	**Cost To Complete**	**Total Cost**
Total Program Element	3.192	20.553	5.459	0.000	5.459	5.408	5.493	5.614	5.726	Continuing	Continuing
2471: *Integrated Power Systems (IPS)*	0.000	5.576	5.459	0.000	5.459	5.408	5.493	5.614	5.726	Continuing	Continuing
9999: *Congressional Adds*	3.192	14.977	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	32.740

A. Mission Description and Budget Item Justification

The Electric Ship Office (ESO) is responsible for developing and executing the Next Generation Integrated Power System (NGIPS) technology development and transition plan. The ESO's initial efforts are to coordinate the ongoing electric power efforts of the PEOs and Office of Naval Research, establishing the technical basis and strategic direction for Naval power system architectures, developing decision making tools, and establishing technical standards.

This PE funds the development of specific and future electric ship technologies for DDG 1000 and Future Surface Combatant (FSC) family of ships, with focus on the Integrated Power System (IPS), which provides total ship electric power, including electric propulsion, power conversion and distribution, and combat system and mission load interfaces to the electric power system.

The IPS budget, project 2471, is in PE 0603513N for FY2009.

Exhibit R-2, RDT&E Budget Item Justification: PB 2011 Navy	DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603573N: *Advanced Surface Machinery Sys*

B. Program Change Summary ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
Previous President's Budget	9.175	5.599	0.000	0.000	0.000
Current President's Budget	3.192	20.553	5.459	0.000	5.459
Total Adjustments	-5.983	14.954	5.459	0.000	5.459
• Congressional General Reductions		-0.086			
• Congressional Directed Reductions		0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds		15.040			
• Congressional Directed Transfers		0.000			
• Reprogrammings	0.000	0.000			
• SBIR/STTR Transfer	0.000	0.000			
• Program Adjustments	0.000	0.000	5.459	0.000	5.459
• Congressional Recision Adjustments	0.017	0.000	0.000	0.000	0.000
• Congressional Add Adjustments	-6.000	0.000	0.000	0.000	0.000

Congressional Add Details ($ in Millions, and Includes General Reductions)	FY 2009	FY 2010
Project: 9999: *Congressional Adds*		
Congressional Add: *Fan Coil of the Future*	0.000	2.709
Congressional Add: *High Density Power Conversion and Distribution Equipment*	0.000	1.195
Congressional Add: *Surf Combatant Hybrid Propulsion/Power Generation*	0.000	6.373
Congressional Add: *Microdrive for Future HVAC Systems*	0.000	1.912
Congressional Add: *Next Gen Shipboard Int Pwr Fuel Efficiency Enhancer*	0.000	1.593
Congressional Add: *Integrated Advanced Ship Control (IASC)*	1.197	1.195
Congressional Add: *Ship Affordability Through Advanced Aluminum Struc*	1.995	0.000
Congressional Add Subtotals for Project: 9999	3.192	14.977
Congressional Add Totals for all Projects	3.192	14.977

Exhibit R-2, RDT&E Budget Item Justification: PB 2011 Navy	DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603573N: *Advanced Surface Machinery Sys*

Change Summary Explanation

Program Adjustments: FY09 adjustments due to moving funding for the Congressional Add for Smart Machinery Spaces system to RDTEN PE 0603513N, Shipboard System Component Development, and moving funding for two Congressional Adds for Low Signature Modual Weapon Platform and Analytics for Shipboard Monitoring Systems to RDTEN 0603563N, Ship Concept Advance Design. FY10 adjustments are a result of FY10 Congressional Adds.

FY11 from previous President's Budget is shown as zero because no FY11-15 data was presented in President's Budget 2010.

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603573N: *Advanced Surface Machinery Sys*	PROJECT 2471: *Integrated Power Systems (IPS)*	

COST ($ in Millions)	FY 2009 Actual	FY 2010 Estimate	FY 2011 Base Estimate	FY 2011 OCO Estimate	FY 2011 Total Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
2471: *Integrated Power Systems (IPS)*	0.000	5.576	5.459	0.000	5.459	5.408	5.493	5.614	5.726	Continuing	Continuing
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0		

A. Mission Description and Budget Item Justification

This project supports the Integrated Power Systems (IPS) program. IPS provides total ship electric power, including electric propulsion, and power conversion and distribution. The DDG 1000 will be an electric drive ship with integrated power architecture. IPS reduces acquisition and operating costs of naval ships and increases military effectiveness. IPS leverages investments in technologies that will be useable by both military and commercial sectors.

IPS has the potential to revolutionize the design, construction, and operation of U.S. naval ships by using electricity as the primary energy transfer medium aboard ship. The flexibility of electric power transmission allows power generating modules with various power ratings to be connected to propulsion loads and ship service in any arrangement that supports the ship's mission at lowest overall cost. Systems engineering in IPS is focused on increasing the commonality of components used across ship types and in developing modules which will be integral to standardization, zonal system architectures, and generic shipbuilding strategies. The purpose of increased commonality is to reduce the total cost of ship ownership by using common modules composed of standard components and/or standard interfaces.

IPS addresses ship platform program goals through: reduced ship acquisition cost through integration of propulsion and ship's service prime movers; lower ship operational costs resulting from more flexible operating characteristics and more efficient components; reduced ship construction costs by allowing more extensive modular construction of power generation, distribution, and loads; improved ship survivability and reduced vulnerability through increased arrangement flexibility and improved electrical system survivability; reduced manning through improved power management systems and reduced on-board maintenance requirements; improved ship signature characteristics; improved design adaptability to meet future requirements of multiple ship types or missions; integrating power management and protection by fully utilizing the power electronics in the system to perform fault protection as well as power conversion and load management functions; simplified technology insertion which allows new technologies to be installed within IPS much less expensively than presently possible; and, reduced machinery system acquisition costs through utilization of commercially shared technologies and components.

The IPS budget, project 2471, is in PE 0603513 for FY2009.

B. Accomplishments/Planned Program ($ in Millions)

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603573N: *Advanced Surface Machinery Sys*	PROJECT 2471: *Integrated Power Systems (IPS)*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
IPS System Development	0.000	2.500	2.175	0.000	2.175
FY 2010 Plans: System Development: Continue to conduct detailed design and prototype fabrication of power conversion equipment for advanced architecture. Continue to improve baseline power system performance by performing analysis, modeling and simulation, life cycle cost analysis, producibility studies, module development, ship integration, architecture design, ship electric architectures and high power weapons systems requirements, and related efforts. Continue to evaluate emerging technologies for ship applications to determine future feasibility and development requirements. Emerging technologies include fuel cells, high-energy weapons, high power radars, and advanced power electronics.					
FY 2011 Base Plans: System Development: Continue to conduct detailed design and prototype fabrication of power conversion equipment for advanced architecture. Continue to improve baseline power system performance by performing analysis, modeling and simulation, life cycle cost analysis, producibility studies, module development, ship integration, architecture design, ship electric architectures and high power weapons systems requirements, and related efforts. Continue to evaluate emerging technologies for ship applications to determine future feasibility and development requirements. Emerging technologies include fuel cells, high-energy weapons, high power radars, and advanced power electronics.					
IPS System Test	0.000	2.926	3.134	0.000	3.134
FY 2010 Plans: System Test: Continue to conduct land based testing of power conversion equipment at NSWCCD, Philadelphia PA to mitigate potential risks associated with a fielded IPS system and reduce ship's signature, improve survivability and efficiency by fabricating components, inserting into the IPS test site or an appropriate test platform. Continue to conduct demonstrations to maintain and develop					

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603573N: *Advanced Surface Machinery Sys*	PROJECT 2471: *Integrated Power Systems (IPS)*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
the critical engineering capability and capacity to insert future high power weapon systems (radars, lasers and electromagnetic launch weapons) into DDG-1000 and future ship classes including FSC. Continue to conduct demonstrations to show improved performance and potential to reduce combat system costs. *FY 2011 Base Plans:* System Test: Continue to conduct land based testing of power conversion equipment at NSWCCD, Philadelphia PA to mitigate potential risks associated with a fielded IPS system and reduce ship's signature, improve survivability and efficiency by fabricating components, inserting into the IPS test site or an appropriate test platform. Continue to conduct demonstrations to maintain and develop the critical engineering capability and capacity to insert future high power weapon systems (radars, lasers and electromagnetic launch weapons) into DDG-1000 and future ship classes including FSC. Continue to conduct demonstrations to show improved performance and potential to reduce combat system costs.					
Platform Specific *FY 2010 Plans:* Platform Specific: Continue to develop IPS configurations in support of all future surface ship programs. Continue to develop / modify IPS ship configuration documentation including concepts of operations, System Level description / Requirements, and module performance specifications as necessary to support power system requirements for the DDG-51, FSC and other future ships. Continue to improve ship power system smart product model to support cost / performance tradeoffs of alternative IPS ship configurations and evaluation of emerging electric power system and component technologies. *FY 2011 Base Plans:* Platform Specific: Continue to develop IPS configurations in support of all future surface ship programs. Continue to develop / modify IPS ship configuration documentation including concepts	0.000	0.150	0.150	0.000	0.150

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603573N: *Advanced Surface Machinery Sys*	PROJECT 2471: *Integrated Power Systems (IPS)*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
of operations, System Level description / Requirements, and module performance specifications as necessary to support power system requirements for the DDG-51, FSC and other future ships. Continue to improve ship power system smart product model to support cost / performance tradeoffs of alternative IPS ship configurations and evaluation of emerging electric power system and component technologies.					
Accomplishments/Planned Programs Subtotals	0.000	5.576	5.459	0.000	5.459

C. Other Program Funding Summary ($ in Millions)

N/A

D. Acquisition Strategy

IPS is a candidate system for DDG 1000, Future Surface Combatant (FSC), and all other future surface ships.

E. Performance Metrics

The Integrated Power System (IPS) project within the Electric Ships Office (ESO) will: mitigate 20% of Next Generation IPS (NGIPS) Technology Development Roadmap activities/risks; Address 20% of the relevant specs and standards written addressing components and subsystems on the NGIPS roadmap; Execute 100% of the signed Technology Transition Agreements with ONR; Complete 100% of the advanced developments currently planned for the Energy Storage Module and Propulsion Generation Module.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603573N: *Advanced Surface Machinery Sys*	PROJECT 2471: *Integrated Power Systems (IPS)*

Product Development ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Primary HW Development	C/CPFF	Alion Science Corp Fairfax VA	4.925	1.000	Oct 2009	1.254	Oct 2010	0.000		1.254	0.000	7.179	Continuing
Primary HW Development	C/CPFF	Curtiss-Wright EMD Pittsburgh, PA	10.000	0.750	Oct 2009	0.000		0.000		0.000	0.000	10.750	Continuing
Primary HW Development	C/CPFF	Adv Pwr Elec TBD	0.000	0.250	Mar 2010	1.000	Oct 2010	0.000		1.000	0.000	1.250	Continuing
Primary HW Development	WR	NSWCCD-SSES Phila, PA	26.741	1.000	Oct 2009	1.000	Oct 2010	0.000		1.000	0.000	28.741	Continuing
		Subtotal	41.666	3.000		3.254		0.000		3.254	0.000	47.920	

Remarks

Test and Evaluation ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation	WR	NSWCCD-SSES Phila, PA	20.005	2.576	Oct 2009	2.205	Oct 2010	0.000		2.205	0.000	24.786	Continuing
		Subtotal	20.005	2.576		2.205		0.000		2.205	0.000	24.786	

Remarks

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603573N: *Advanced Surface Machinery Sys*	PROJECT 2471: *Integrated Power Systems (IPS)*	

	Total Prior Years Cost	FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	61.671	5.576		5.459		0.000		5.459	0.000	72.706	

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603573N: *Advanced Surface Machinery Sys*	**PROJECT** 2471: *Integrated Power Systems (IPS)*

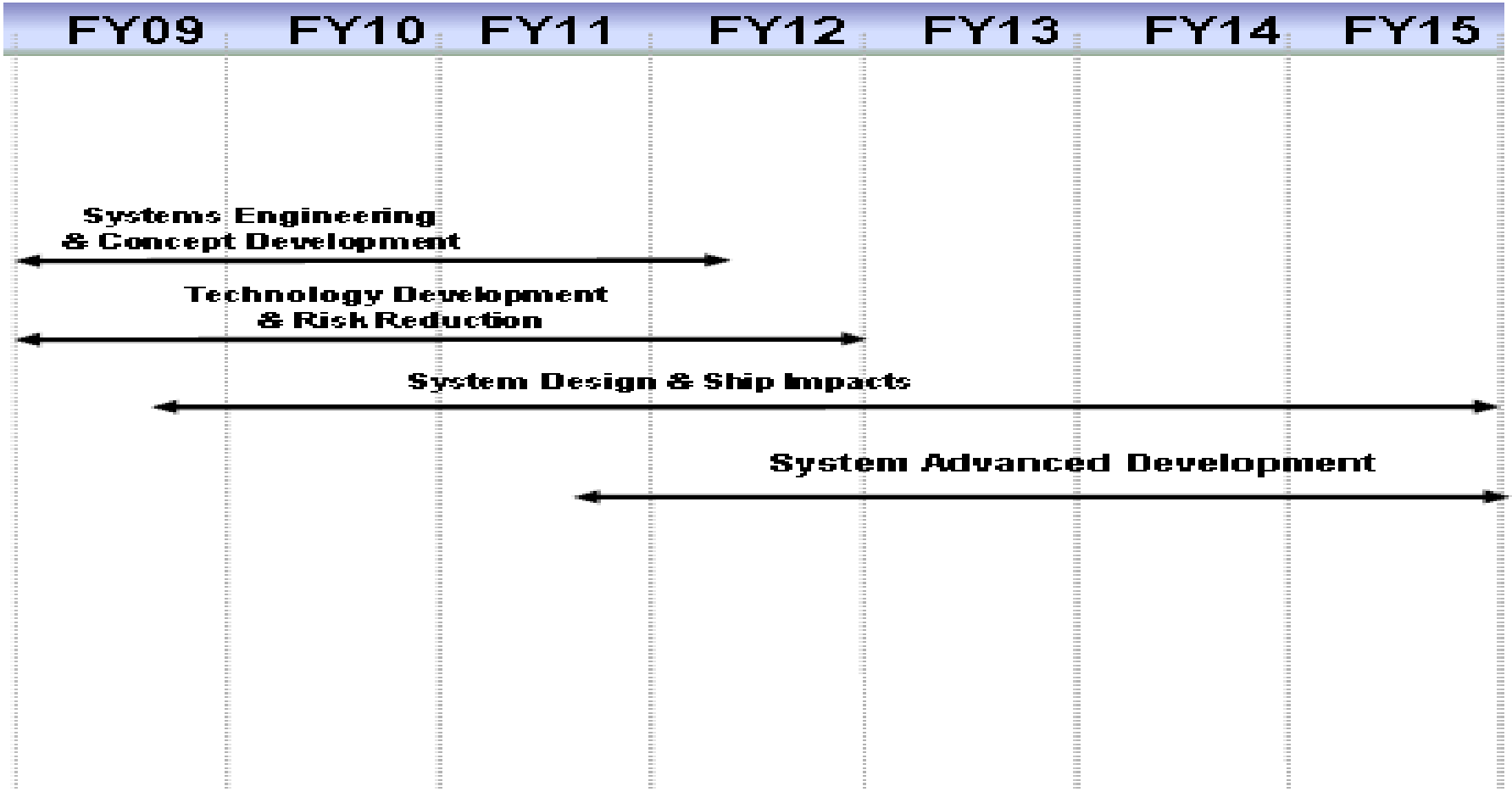

Exhibit R-4A, RDT&E Schedule Details: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603573N: *Advanced Surface Machinery Sys*	**PROJECT** 2471: *Integrated Power Systems (IPS)*

Schedule Details

	Start		End	
Event	**Quarter**	**Year**	**Quarter**	**Year**
System Engineering & Concept Development	1	2009	2	2012
Technology Development & Risk Reduction	1	2009	4	2012
System Design & Ship Impact	3	2009	4	2015
System Advanced Development	3	2011	4	2015

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603573N: *Advanced Surface Machinery Sys*	PROJECT 9999: *Congressional Adds*	

COST ($ in Millions)	FY 2009 Actual	FY 2010 Estimate	FY 2011 Base Estimate	FY 2011 OCO Estimate	FY 2011 Total Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
9999: *Congressional Adds*	3.192	14.977	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	32.740
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0		

A. Mission Description and Budget Item Justification

Congressional Adds

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010
Congressional Add: Fan Coil of the Future *FY 2010 Plans:* This project will create the Fan Coil Assemblies that will give the Navy 25-50% more cooling capacity, while also reducing weight by 25-50%, and lowering noise.	0.000	2.709
Congressional Add: High Density Power Conversion and Distribution Equipment *FY 2010 Plans:* High density power conversion and distribution equipment: Develop high density power conversion and distribution equipment to support the increased demand for electrical energy from new equipment and weapons systems. Conduct efforts associated with the increasing voltage and current requirements which require advances in switchboard design, current interruptions devices, and distribution systems. Conduct proof of concept and prototype development for new systems with the capacity to handle the increased electrical loading of naval surface ships.	0.000	1.195
Congressional Add: Surf Combatant Hybrid Propulsion/Power Generation	0.000	6.373

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603573N: *Advanced Surface Machinery Sys*	PROJECT 9999: *Congressional Adds*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010
FY 2010 Plans: Surface Combatant Hybrid Propulsion/Power Generation: design, build and test a prototype Hybrid Electric Drive (HED) for surface combatants.		
Congressional Add: Microdrive for Future HVAC Systems *FY 2010 Plans:* This project will develop small, light, and cooler drive systems that can react smoothly to temperature variations. The new system will also be quieter, allowing these systems to be put in sections of the ship that are low noise spaces.	0.000	1.912
Congressional Add: Next Gen Shipboard Int Pwr Fuel Efficiency Enhancer *FY 2010 Plans:* Next Generation Shipboard Integrated Power Fuel Efficiency Enhancer: Continue development of advanced propulsion technologies to enhance fuel economy, lower acquisition costs, and reduce weight on United States Navy ships. Continue the development of Integrated Power System and Hybrid Electric Drive technologies for surface ship and submarine propulsion	0.000	1.593
Congressional Add: Integrated Advanced Ship Control (IASC) *FY 2009 Accomplishments:* Accomplished the initial technical enhancement which includes the standardization of hardware and software interfaces, evolving to a fully-open architecture configuration that will apply to all US Navy ships. The primary focus will be to standardize interconnecting interfaces. Software development that supports commonality across the US Navy fleet will be integrated into the system, in accordance with the common Navy data library of components, for graphical user interface (GUI) requirements. To	1.197	1.195

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603573N: *Advanced Surface Machinery Sys*	PROJECT 9999: *Congressional Adds*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010
support system development, initial prototype and operational testing was accomplished in a land-based environment. *FY 2010 Plans:* Continue the technical enhancement which includes the standardization of hardware and software interfaces, evolving to a fully-open architecture configuration that will apply to all US Navy ships. The primary focus will be to standardize interconnecting interfaces. Software development that supports commonality across the US Navy fleet will be integrated into the system, in accordance with the common Navy data library of components, for graphical user interface (GUI) requirements. To support system development, initial prototype and operational testing was accomplished in a land-based environment.		
Congressional Add: Ship Affordability Through Advanced Aluminum Struc *FY 2009 Accomplishments:* Accomplished design optimization and developed tools to be used to identify specific needs and material solutions in defined thrust areas where validation is necessary to overcome technical barriers to the use of aluminum. These needs may include optimization of existing aluminum alloys and/or development of new aluminum alloys for enhanced corrosion resistance, development of manufacturing technologies to reduce cost and part count, and development of advanced joining technologies such as friction stir welding.	1.995	0.000
Congressional Adds Subtotals	3.192	14.977

C. Other Program Funding Summary ($ in Millions)

N/A

D. Acquisition Strategy

N/A

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603573N: *Advanced Surface Machinery Sys*	**PROJECT** 9999: *Congressional Adds*

E. Performance Metrics

Congressional Adds

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Exhibit R-2, RDT&E Budget Item Justification: PB 2011 Navy										DATE: February 2010	
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*				R-1 ITEM NOMENCLATURE PE 0603581N: *Littoral Combat Ship (LCS)*							
COST ($ in Millions)	**FY 2009 Actual**	**FY 2010 Estimate**	**FY 2011 Base Estimate**	**FY 2011 OCO Estimate**	**FY 2011 Total Estimate**	**FY 2012 Estimate**	**FY 2013 Estimate**	**FY 2014 Estimate**	**FY 2015 Estimate**	**Cost To Complete**	**Total Cost**
Total Program Element	372.036	422.746	226.288	0.000	226.288	183.419	110.261	82.202	87.285	Continuing	Continuing
3096: *Littoral Combat Ship*	103.288	121.407	75.675	0.000	75.675	71.585	31.302	25.233	26.712	Continuing	Continuing
3129: *LCS Mission Package Development*	168.082	162.458	109.048	0.000	109.048	111.834	78.959	56.969	60.573	Continuing	Continuing
4018: *Littoral Combat Ship Construction*	90.393	75.147	41.565	0.000	41.565	0.000	0.000	0.000	0.000	0.000	1,279.015
9999: *Congressional Adds*	10.273	63.734	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	100.139

A. Mission Description and Budget Item Justification

A. MISSION DESCRIPTION:

This Program Element (PE) provides funds for detailed design, development, construction, integration and testing of the Littoral Combat Ship (LCS). LCS will be a fast, agile, and networked surface combatant with capabilities optimized to defeat asymmetric threats, and assure naval and joint force access into contested littoral regions. It will use open-systems-architecture design, modular weapons, and sensor systems, and a variety of manned and unmanned vehicles to expand the battle space and project offensive power into the littoral. LCS will operate with focused-mission packages that deploy manned and unmanned vehicles to execute a variety of missions, including littoral anti-submarine warfare (ASW), anti-surface warfare (SUW) and mine countermeasures (MCM). LCS will also possess inherent capabilities, regardless of mission package installed, including intelligence, surveillance, reconnaissance (ISR), homeland defense, Maritime Interdiction/Interception Operations (MIO), anti-terrorism/force protection (AT/FP), air self-defense, joint littoral mobility, and Special Operating Forces (SOF) and logistic support for movement of personnel and supplies. This relatively small, high-speed surface combatant will complement the U.S. Navy's AEGIS Fleet and DDG 1000 by operating in environments where it is less desirable to employ larger, multi-mission ships. LCS will have the capability to deploy independently to overseas littoral regions, remain on station for extended periods of time either with a battle group or through a forward-basing arrangement and will be capable of underway replenishment. LCS will operate with Carrier Strike Groups, Surface Action Groups, in groups of other similar ships, or independently for diplomatic and presence missions. Additionally, LCS will have the capability to operate cooperatively with the U.S. Coast Guard and Allies.

Exhibit R-2, RDT&E Budget Item Justification: PB 2011 Navy	DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603581N: *Littoral Combat Ship (LCS)*

B. Program Change Summary ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
Previous President's Budget	367.840	360.518	0.000	0.000	0.000
Current President's Budget	372.036	422.746	226.288	0.000	226.288
Total Adjustments	4.196	62.228	226.288	0.000	226.288
• Congressional General Reductions		-1.762			
• Congressional Directed Reductions		0.000			
• Congressional Rescissions	0.000	-0.010			
• Congressional Adds		64.000			
• Congressional Directed Transfers		0.000			
• Reprogrammings	9.999	0.000			
• SBIR/STTR Transfer	-5.803	0.000			
• Program Adjustments	0.000	0.000	226.288	0.000	226.288

Congressional Add Details ($ in Millions, and Includes General Reductions)	FY 2009	FY 2010
Project: 9999: *Congressional Adds*		
Congressional Add: *Revised Acquisition Strategy*	0.000	59.751
Congressional Add: *MIW Modules Prog - Cong*	0.000	3.983
Congressional Add: *Autonomous Acoustic Array Advanced Tubular Solid O*	1.995	0.000
Congressional Add: *LCS Common MIssion Package Training Environmnet*	4.488	0.000
Congressional Add: *Alternative Use of Mine Warfare Modules*	3.790	0.000
Congressional Add Subtotals for Project: 9999	10.273	63.734
Congressional Add Totals for all Projects	10.273	63.734

Change Summary Explanation

FY09 Program Adjustment reflects a below threshold reprogramming for USS FREEDOM (LCS 1) Early Deployment

FY11 from previous President's Budget is shown as zero because no FY11-15 data was presented in President's Budget 2010.

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603581N: *Littoral Combat Ship (LCS)*	PROJECT 3096: *Littoral Combat Ship*	

COST ($ in Millions)	FY 2009 Actual	FY 2010 Estimate	FY 2011 Base Estimate	FY 2011 OCO Estimate	FY 2011 Total Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
3096: *Littoral Combat Ship*	103.288	121.407	75.675	0.000	75.675	71.585	31.302	25.233	26.712	Continuing	Continuing
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0		

A. Mission Description and Budget Item Justification

The RDT&E portion of the LCS Program is comprised of design and development efforts required to deliver the Flight 0 Class Ships, including integration with modular MCM, ASW, and SUW mission packages, and construction of the first two Flight 0 Class Ships, the USS FREEDOM (LCS 1) delivered September 2008 and the USS INDEPENDENCE (LCS 2) delivered December 2009. It includes the design and development effort required to support the introduction and deployment of a Flight 0+ baseline for the ships awarded in FY09 with the incorporation of lessons learned from the design and construction of USS FREEDOM (LCS 1) and USS INDEPENDENCE (LCS 2), including improved waterjets and a waterjet tunnel extension on the Lockheed Martin (LM) LCS Design. Additionally, it includes design and development efforts required to support the introduction of a new down selected design baseline for a five year block buy in FY10-15. This new baseline will include lessons learned from the LCS 1 through 4 and the introduction of various cost reduction initiatives of a second source for the down selected design in FY12 built to a Technical Data Package (TDP) developed in FY10-12, with selected ship systems provided as GFE.

The LCS Program achieved Milestone A and Program Initiation in May 2004, and underwent a Milestone A update in FY09. Milestone B is planned for third quarter 2010.

The LCS design and development phases include platform design and development, experimentation and ship system design and integration, hull platform testing, development of a Technical Data Package, total ship system engineering and integration, planning and conduct of system testing, including procurement of ordnance.

The R&D portion of LCS funding is also comprised of formal Developmental and Operational Assessment testing of the LCS Ships and Mission Packages. Test and Evaluation will concentrate on verifying integration and interoperability of employed technologies and systems in the LCS Seaframe designs and modular mission packages to achieve the mission capabilities and performance requirements as defined in the LCS Program's Flight 0 and Flight 0+ Capabilities Development Documents (CDD). T&E functions will include the evaluation of Critical Technical Parameters (CTP), Measures of Effectiveness (MOE), Measures of Suitability (MOS), and Key Performance Parameters (KPP) for the core Seaframe and the focused missions. Operational testing will also include the conduct of formal Live Fire Test and Evaluation (LFT&E) efforts including Full Scale Shock Trials (FSST) through FY15.

B. Accomplishments/Planned Program ($ in Millions)

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603581N: *Littoral Combat Ship (LCS)*	PROJECT 3096: *Littoral Combat Ship*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
LCS Class Design Services	20.540	23.000	0.000	0.000	0.000
Provides for Class Design Services efforts and a contract to both industry design teams for continued design refinement of the Flight 0 and 0+ baseline configurations and design development of future LCS Class ships of the down selected design. *FY 2009 Accomplishments:* Maintain configuration management of multiple LCS baselines. Develop, review, approve and implement various Engineering Change Proposals determined necessary to the Flight 0 and Flight 0+ Seaframes resulting from production design drawing refinement, cost reduction initiatives, and improvements to systems and components of each design. Examples include, Engine Room Airborne Noise Abatement, Multiple Fire Alarm System stations, Anti-Terrorism Force Protection improvements, Production and Modeling and Simulation Improvements. These changes will then be incorporated in the drawing packages used by the shipbuilders as the baseline for production. *FY 2010 Plans:* Award Class Design Services contracts for both LCS industry teams. Conduct Industry Systems Engineering design activities supporting the completion and transition to detailed design of the Flight 0+ and FY10 Block Buy baselines, including all required reporting documentation. Translate the Flight 0+ and FY10 Block Buy baseline design drawings and associated documentation, any systems/ component standardization along with information obtained as a result of the Post Delivery Test and Trials into new design baselines, which incorporate production, assembly and fabrication lessons learned from the previous Seaframes as well as operator feedback from the Seaframe and Mission Package Crews obtained during the Testing and Trials Period. Develop, review, and approve changes identified by the industry and/or government team. Maintain configuration management of multiple LCS baselines.					
LCS Program Management	6.318	6.000	1.600	0.000	1.600

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603581N: *Littoral Combat Ship (LCS)*	PROJECT 3096: *Littoral Combat Ship*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
Provides for overall LCS Program operations including technical, production, and logistics oversight, and acquisition, contract, Earned Value (EV), risk, science and technology and financial management. *FY 2009 Accomplishments:* Continued support of Joint Requirements Oversight Council (JROC) reviews and conducted Integrated Product Team (IPT) and Overarching Integrated Product Team (OIPT) events in support of program updates to the Defense Acquisition Executive (DAE). Continued oversight and analyses of contractor Earned Value (EV). Completed Naval Audit Service reviews of USS INDEPENDENCE and USS FREEDOM construction contractors, and continued implementation and monitoring of corrective actions. Completed development of required documentation for proposal solicitation and evaluation for FY09 Flight 0+ Class Ships. Conducted source selection for 2 Flight O+ Seaframes. Initiated development of documentation required for contract completion of USS INDEPENDENCE and USS FREEDOM. Conducted contract administration of transition of new design baseline for Flight 0+ and FY10-FY14 Block Buy ships. Managed initiation of USS INDEPENDENCE and USS FREEDOM formal Developmental and Operational Testing, including integration efforts with Mission Packages. Conducted contract administration of the development of new design baselines, including supporting business cases. Developed Milestone A required documents as directed by DAE. Developed acquisition strategy for FY09 and FY10 ships and developing acquisition strategies for FY11 and future ships. Supported successful Milestone A prime DAE Review. Supported delivery of USS INDEPENDENCE to the Navy. *FY 2010 Plans:* Supported the delivery of USS FREEDOM to the Navy in December 2009. Continue contract administration of transition to new design baselines for Flight 0+ and down selected FY10-14 Block Buy ships. Complete development of all required Milestone B documentation, including new CDD and supporting JROC reviews. Continue to manage execution of USS INDEPENDENCE and USS FREEDOM formal Developmental and Operational Testing, including integration efforts with Mission Packages. Conduct contract administration of the development of new design baselines					

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APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603581N: *Littoral Combat Ship (LCS)*	PROJECT 3096: *Littoral Combat Ship*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
for future ships, including supporting affordability business cases. Finalize new LCS acquisition strategy. Finalize strategy and planning activities for follow on ships contract awards including the introduction of new second source for down selected design. Finalize all Milestone B activities. Manage development of LCS Technical Data Package. *FY 2011 Base Plans:* Continue contract administration for all Flight 0+ ships. Continue all follow-on Milestone B activities to include all required Joint and Service reviews of products. Continue to manage execution of USS INDEPENDENCE and USS FREEDOM formal Developmental and Operational Testing, including integration efforts with the Mission Packages. Continue management of LCS TDP development and preparations for FY12 introduction of second source shipyard.					
LCS System-of-Systems Development, Engineering & Experimentation	35.682	33.777	11.014	0.000	11.014
Provides for LCS Program systems engineering in support of Flight 0, Flight 0+ and new FY10 Block Buy baseline design, development, certification, production (including ship system design and integration) combat system and C4I design, integration, and test, aviation (manned and unmanned) integration, modular MCM, ASW, and SUW mission package integration, logistics product development and various systems engineering activities required to perform risk analyses of new design and production technology concepts. *FY 2009 Accomplishments:* Conducted systems engineering for Flight 0 design and build including multiple engineering, integration, production, and logistics activities. For the USS INDEPENDENCE (LCS 1), continued post-delivery systems engineering support including multiple certifications, tests and trials, and continued technical baseline management through two industrial availabilities and preparations for deployment. For the USS FREEDOM (LCS 2), continued pre-delivery systems engineering support including multiple certifications, tests and trials, and continued technical baseline management through Builder's Trials and preparations for Acceptance Trials and delivery. Managed integration of SUW					

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
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B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
Mission Package components and Independent Verification and Validation (IV&V) for implementation on Flight 0 (USS INDEPENDENCE and USS FREEDOM). Implemented Tactical Common Data Link (TCDL) integrated solution on Flight 0. Completed USS FREEDOM (LCS 2) design aluminum "grillage" and initiated associated material testing. Initiated efforts on SH-60B Datalink integration. Developed facilities support plans for CONUS LCS locations. Conducted systems engineering special studies and analyses in response to numerous emergent design/production issues highlighted in USS INDEPENDENCE and USS FREEDOMtesting. Managed the development, approval and transitioning to production of Flight 0+ technical baselines (Build Specifications), including review, approval and implementation of numerous Engineering Change Proposals (ECPs). Continued development of training equipment to support Train to Qualify.					
FY 2010 Plans: Conduct systems engineering activities for Flight 0, 0+, and FY10 Block Buy baselines including multiple engineering, integration, production, and logistics activities. Support the completion of Acceptance Trials and Delivery for USS FREEDOM. For Flight 0 (USS INDEPENDENCE and USS FREEDOM), continue post-delivery systems engineering support including multiple certifications, tests and trials, and technical baseline management through LCS 1 CMAV and deployment/testing and LCS 2 industrial availabilities and testing. Manage the integration of Mission Package components and Independent Verification and Validation (IV&V) for implementation. Complete USS FREEDOM design associated material testing. Complete efforts on SH-60B Datalink integration. Develop facilities support plans for CONUS LCS locations. Conduct systems engineering special studies and analyses in response to numerous emergent design/production issues highlighted in USS INDEPENDENCE and USS FREEDOM testing and LCS 3 and LCS 4 production. Continue management and transition into production of the Flight 0+ technical baselines (LCS 3 and LCS 4) including review, approval and implementation of numerous Engineering Change Proposals (ECPs). Continue development of training equipment to support Train to Qualify. Manage the development, approval and transition to production of FY10 Block Buy technical baseline (ICDs, SPDs, Build Specifications, Technical Data Package, etc.), including review, approval and implementation of numerous Engineering Change					

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603581N: *Littoral Combat Ship (LCS)*	PROJECT 3096: *Littoral Combat Ship*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
Proposals (ECPs). Complete all required systems engineering Milestone (MS) B documents and facilitate the approval process in support of MS B OIPTs and DAB. Conduct systems engineering efforts as part of the FY10 Block Buy source selection and down select/award. *FY 2011 Base Plans:* Conduct systems engineering activities for Flight 0, 0+, and FY10 Block Buy baselines including multiple engineering, integration, production, and logistics activities. For Flight 0 (USS INDEPENDENCE and USS FREEDOM), continue post-delivery systems engineering support throughout testing and industrial availabilities. Manage the integration of Mission Package components and Independent Verification and Validation (IV&V) for implementation. Conduct systems engineering special studies and analyses as necessary. Continue management and transition into production of the Flight 0+ technical baselines (LCS 3 and LCS 4) including review, approval and implementation of numerous Engineering Change Proposals (ECPs). Continue development of training equipment to support Train to Qualify. Manage the development, approval and transition to production of FY10 Block Buy technical baseline (ICDs, SPDs, Build Specifications, Technical Data Package, etc.), including review, approval and implementation of numerous Engineering Change Proposals (ECPs). Conduct systems engineering efforts as part of the definition of the technical baseline for the FY12 award of the down selected LCS to a second source.					
LCS Total System Training Architecture Provides for an LCS shore-based training capability to satisfy individual, unit, team and force training to meet Train to Qualify CDD requirements. Leverages DDG 1000 Total Ship Training System efforts, as well as trainers previously procured for LCS. *FY 2009 Accomplishments:* Complete upgrade to USS INDEPENDENCE (LCS 1) Trainer to Navy Training vice Vendor Training. Continue development and implementation of the USS FREEDOM (LCS 2) Trainer.	9.100	9.900	10.835	0.000	10.835

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B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
FY 2010 Plans: Update Trainers to ship as-built configurations to meet train to qualify certification requirements. Begin enhancements of other trainers for USS INDEPENDENCE and USS FREEDOM configuration. Develop trainers at Surface Warfare Officer's school for LCS training. Complete the LCS 1 Trainer variant. *FY 2011 Base Plans:* Completion of enhancements to presentations for LCS 1 and LCS 2 configurations. Provides crew training to meet Train to Qualify requirements and provide shore training facility with Navy Continuous Training Environment (NCTE) capability for multiple crews to complete required battlegroup training from shore facility. Develop additional trainers based on the LCS Training Front End Analysis.					
LCS Test & Evaluation Execute formal LCS Test and Evaluation (T&E) program, Developmental Testing and Operational Testing (DT/OT) including Live Fire Test and Evaluation (LFT&E) and procurement of T&E Ordnance. Developmental Test and Evaluation (DT&E) will concentrate on verifying integration and interoperability of employed technologies and systems in the Sea Frame designs and modular mission packages to achieve the mission capabilities and performance requirements as defined in the LCS Program's Capabilities Development Document (CDD). DT&E functions will include the evaluation of Critical Technical Parameters (CTP), Measures of Effectiveness (MOE), Measures of Suitability (MOS), and Key Performance Parameters (KPP) for the core Seaframe and the focused missions. Operational Testing for the LCS will be conducted in multiple phases; multiple phases of Initial Operational Test and Evaluation (IOT&E) on each Seaframe design to support the development of the initial seaframe deliveries and a specific mission package, and Follow-on Operational Test and Evaluation (FOT&E), as required, when new capabilities are developed or refined.	31.180	48.730	52.226	0.000	52.226

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B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
FY 2009 Accomplishments: Initiate the development of test plans for USS INDEPENDENCE and USS FREEDOM that consolidates the specific test and associated testing time. Continue LCS LFT&E Modeling and Simulation and validation testing. Initiate USS INDEPENDENCE (LCS 1) Developmental Testing. DT&E will include the evaluation of Critical Technical Parameters (CTP), Measures of Effectiveness (MOE), Measures of Suitability (MOS), Key Performance Parameters (KPP), and additional attributes for the core Seaframe and the focused mission capabilities. Complete procurement of T&E Ordnance to support LCS Class tests and trials. Perform accelerated testing on USS INDEPENDENCE (LCS 1). *FY 2010 Plans:* Continue LCS LFT&E Modeling and Simulation and validation testing. Continue USS INDEPENDENCE (LCS 1) Developmental Testing and initiate Developmental Testing of USS FREEDOM (LCS 2). Conduct SUW MP Developmental Testing. DT&E will include the evaluation of Critical Technical Parameters (CTP), Measures of Effectiveness (MOE), Measures of Suitability (MOS), Key Performance Parameters (KPP), and additional attributes for the core Seaframe and the focused mission capabilities. Complete procurement of T&E Ordnance to support LCS Class test and trials. Conduct testing on USS INDEPENDENCE and USS FREEDOM for the benefit of the LCS Class (testing and certification will continue into FY11 for both USS INDEPENDENCE and USS FREEDOM). *FY 2011 Base Plans:* Continue LCS LFT&E Modeling and Simulation and validation testing. Complete USS INDEPENDENCE (LCS 1) Development Testing and continue USS FREEDOM (LCS 2) DT. DT&E will include the evaluation of Critical Technical Parameters (CTP), Measures of Effectiveness (MOE), Measures of Suitability (MOS), Key Performance Parameters (KPP), and additional attributes for the core Seaframe and focused mission capabilities. Conduct tests on USS INDEPENDENCE and USS FREEDOM for the benefit of the LCS Class.					
Acquistion Workforce	0.468	0.000	0.000	0.000	0.000

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B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
Acquisition Workforce *FY 2009 Accomplishments:* Acquistion Workforce					
Accomplishments/Planned Programs Subtotals	103.288	121.407	75.675	0.000	75.675

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total	FY 2012	FY 2013	FY 2014	FY 2015	Cost To Complete	Total Cost
• 2127: *Littoral Combat Ship*	1,016.952	1,076.669	1,509.335	0.000	1,509.335	1,808.128	2,333.833	2,416.574	2,747.939	Continuing	Continuing
• 1600: *LCS Modules*	6.332	116.898	82.951	0.000	82.951	121.958	179.857	194.369	306.691	Continuing	Continuing
• 4221: *LCS Module Weapons*	0.000	0.000	9.808	0.000	9.808	5.585	3.235	9.722	7.729	Continuing	Continuing
• 0443: *Aircraft Procurement, Navy*	50.189	77.377	47.484	0.000	47.484	46.242	67.442	89.553	89.485	Continuing	Continuing
• 1B4B: *Ship Maintenance*	11.746	9.115	6.218	0.000	6.218	6.571	6.166	8.478	9.885	Continuing	Continuing
• 1B1B: *Mission and Other Ship Operations*	0.000	0.000	1.190	0.000	1.190	3.285	4.696	6.845	9.499	Continuing	Continuing
• 1B5B: *Ship Depot Operations Support*	25.792	18.873	31.019	0.000	31.019	24.417	33.945	21.341	19.891	Continuing	Continuing
• 1C1C: *Combat Communications*	1.422	1.683	2.108	0.000	2.108	2.723	3.676	3.757	3.823	Continuing	Continuing
• 5100: *Outfitting / Post Delivery*	0.000	0.000	2.787	0.000	2.787	68.794	75.712	104.504	90.958	Continuing	Continuing

D. Acquisition Strategy

The LCS Program takes an evolutionary approach to acquisition that emphasizes competition as the key to achieving affordability. Initially, two industry teams competed against each other with two different LCS designs LCS 1-4, over two flights, Flight 0 and Flight 0+. A down select will be conducted in FY10 to a single design, and a second source introduced in FY12 for continued competition.

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603581N: *Littoral Combat Ship (LCS)*	**PROJECT** 3096: *Littoral Combat Ship*

The incorporation of lessons learned from the design, construction, and testing of the initial two ships, as well as introduction of improved waterjets and a waterjet tunnel extension on the LM LCS design will comprise the Flight 0+ baseline awarded in FY09. A new baseline will be implemented in the FY10-14 Block Buy and maintained in the FY12-14 second source Block Buy, both built to a common Technical Data Package.

The LCS Program achieved Milestone A and Program Initiation in May 2004, and conducted a Defense Acquisition Executive (DAE) review in FY09. Milestone B is planned for third quarter 2010 prior to the award of the FY10 ships.

E. Performance Metrics

The LCS Program achieved Milestone A and Program Initiation in May 2004, and underwent a Milestone A update in FY09. Milestone B is planned for third quarter 2010.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603581N: *Littoral Combat Ship (LCS)*	PROJECT 3096: *Littoral Combat Ship*	

Product Development ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Final Design (Flight 0)	C/CPAF	LM, BIW Various	175.263	0.000		0.000		0.000		0.000	Continuing	Continuing	Continuing
Class Design Services	SS/CPAF	TBD Various	25.340	23.000	Oct 2009	0.000		0.000		0.000	Continuing	Continuing	Continuing
LCS 1 & 2 Shore Trainers	C/CPAF	LM, BIW Various	26.860	9.900	Oct 2009	10.835	Oct 2010	0.000		10.835	Continuing	Continuing	Continuing
SH-60B Datalink	C/CPAF	LM, BIW Various	2.435	0.000		0.000		0.000		0.000	Continuing	Continuing	Continuing
Flight 0 C4I	WR	PEO C4I Various	5.215	0.291	Oct 2009	0.000		0.000		0.000	Continuing	Continuing	Continuing
		Subtotal	235.113	33.191		10.835		0.000		10.835			

Remarks

Support ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Government Engineering Support	WR	NSWC/DD Dahlgren, VA	32.303	7.170	Oct 2009	2.433	Oct 2010	0.000		2.433	Continuing	Continuing	Continuing
Government Engineering Support	WR	NSWC/PC Panama City, FL	22.437	0.340	Oct 2009	0.115	Oct 2010	0.000		0.115	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603581N: *Littoral Combat Ship (LCS)*	PROJECT 3096: *Littoral Combat Ship*

Support ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Government Engineering Support	WR	NUWC Newport, RI	8.355	0.452	Oct 2009	0.154	Oct 2010	0.000		0.154	Continuing	Continuing	Continuing
Government Engineering Support	WR	NAWC AD Pax River, VA	13.264	3.547	Oct 2009	1.204	Oct 2010	0.000		1.204	Continuing	Continuing	Continuing
Government Engineering Support	WR	NSWC/CR Crane, IN	15.907	0.033	Oct 2009	0.011	Oct 2010	0.000		0.011	Continuing	Continuing	Continuing
Government Engineering Support	WR	NSWC/SSES Philadelphia, PA	33.902	9.030	Oct 2009	3.064	Oct 2010	0.000		3.064	Continuing	Continuing	Continuing
Government Engineering Support	Various/ Various	Government Activities Various	22.990	3.911	Oct 2009	1.327	Oct 2010	0.000		1.327	Continuing	Continuing	Continuing
Contractor Engineering Support	C/CPAF	Alion Arlington, VA	28.026	8.820	Oct 2009	2.644	Oct 2010	0.000		2.644	Continuing	Continuing	Continuing
Contractor Engineering Support	C/CPAF	Various Various	17.903	0.183	Oct 2009	0.062	Oct 2010	0.000		0.062	Continuing	Continuing	Continuing
		Subtotal	195.087	33.486		11.014		0.000		11.014			

Remarks

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603581N: *Littoral Combat Ship (LCS)*	PROJECT 3096: *Littoral Combat Ship*

Test and Evaluation ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Test & Evaluation	C/CPAF	Alion Arlington, VA	5.730	2.660	Oct 2008	3.500	Oct 2009	0.000		3.500	0.000	11.890	Continuing
Test & Evaluation	WR	NSWC/PHD Port Hueneme, CA	14.742	4.829	Oct 2008	5.500	Oct 2009	0.000		5.500	0.000	25.071	Continuing
Test & Evaluation	WR	NSWC/SSES Philadelphia, PA	20.021	6.200	Oct 2008	5.900	Oct 2009	0.000		5.900	0.000	32.121	Continuing
Test & Evaluation	WR	NSWC/PC Panama City, FL	1.385	1.846	Oct 2008	2.500	Oct 2009	0.000		2.500	0.000	5.731	Continuing
Test & Evaluation	WR	COMOPTEVFOR Norfolk, VA	3.414	2.000	Oct 2008	2.300	Oct 2009	0.000		2.300	0.000	7.714	Continuing
Test & Evaluation	WR	NSWC/COR Corona, CA	2.606	0.800	Oct 2008	0.800	Oct 2009	0.000		0.800	0.000	4.206	Continuing
Test & Evaluation	WR	Various Various	21.259	12.723	Oct 2008	17.385	Oct 2009	0.000		17.385	0.000	51.367	Continuing
T&E Ordance	WR	IWS 3 Not Specified	5.677	0.000	Oct 2008	0.000	Oct 2009	0.000		0.000	0.000	5.677	Continuing
Test & Evaluation	C/CPAF	LM/GD Various	4.345	16.700	Oct 2008	12.641	Oct 2009	0.000		12.641	0.000	33.686	Continuing
T&E	WR	PEO C4I Charleston, SC	3.296	0.972	Oct 2008	1.700	Oct 2009	0.000		1.700	0.000	5.968	Continuing
		Subtotal	82.475	48.730		52.226		0.000		52.226	0.000	183.431	

Remarks

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603581N: *Littoral Combat Ship (LCS)*	PROJECT 3096: *Littoral Combat Ship*

Management Services ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
CODB	Various/ Various	PEO Ships Washington, DC	3.489	1.140	Oct 2009	0.304	Oct 2010	0.000		0.304	Continuing	Continuing	Continuing
Program Management Support	C/CPAF	Alion Arlington, VA	18.079	2.314	Oct 2009	0.617	Oct 2010	0.000		0.617	Continuing	Continuing	Continuing
Program Management Support	Various/ Various	Various Various	3.942	2.088	Oct 2009	0.557	Oct 2010	0.000		0.557	Continuing	Continuing	Continuing
Program Management Support	C/CPAF	JJMA Arlington, VA	1.480	0.458	Oct 2009	0.122	Oct 2010	0.000		0.122	Continuing	Continuing	Continuing
DAWDF	Various/ Various	Not Specified Not Specified	0.468	0.000		0.000		0.000		0.000	0.000	0.468	Continuing
		Subtotal	27.458	6.000		1.600		0.000		1.600			

Remarks

	Total Prior Years Cost	FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	540.133	121.407		75.675		0.000		75.675			

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603581N: *Littoral Combat Ship (LCS)*	PROJECT 3096: *Littoral Combat Ship*

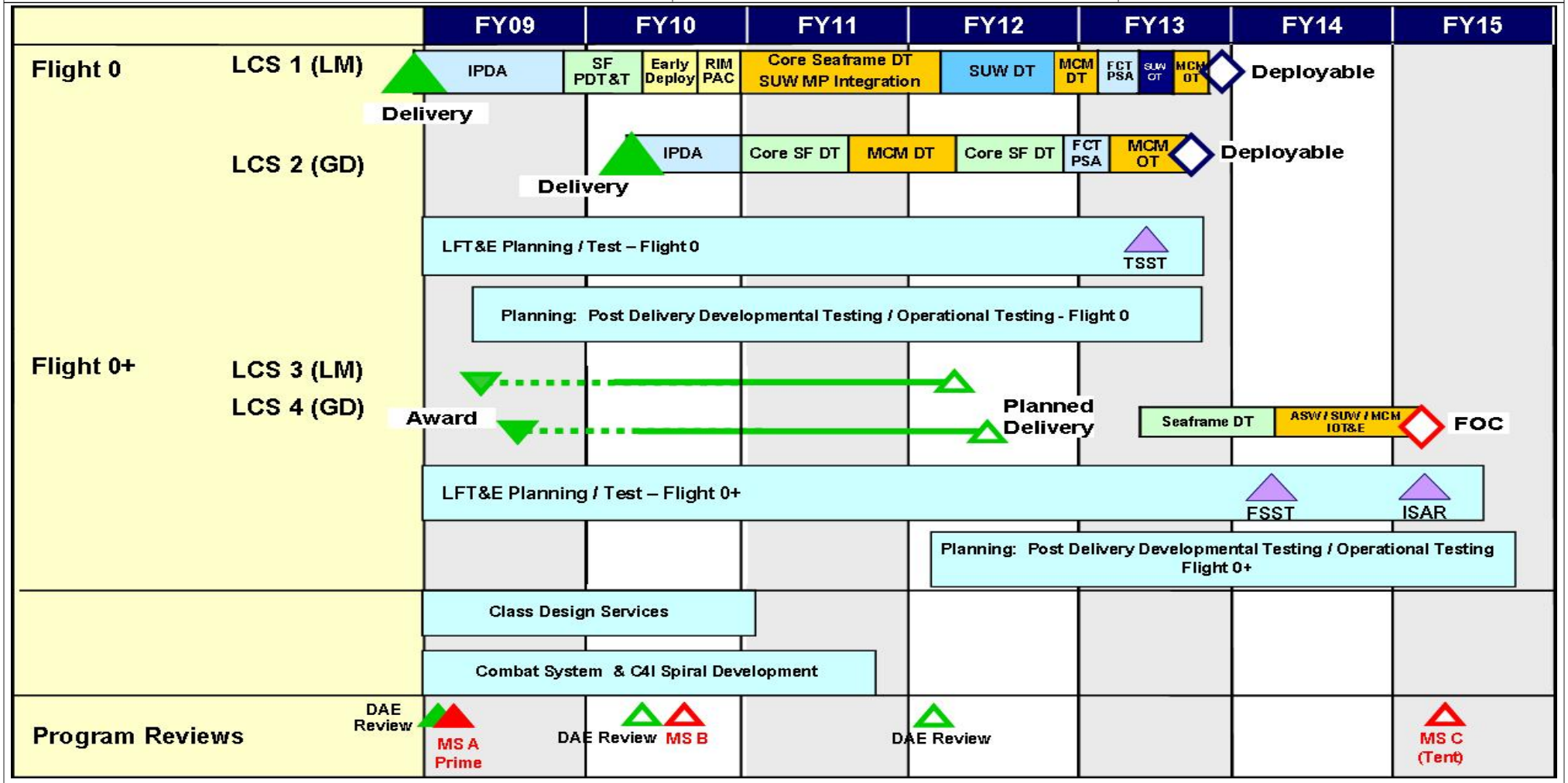

Exhibit R-4A, RDT&E Schedule Details: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603581N: *Littoral Combat Ship (LCS)*	**PROJECT** 3096: *Littoral Combat Ship*

Schedule Details

	Start		End	
Event	**Quarter**	**Year**	**Quarter**	**Year**
Shock Planning/Test (LFT&E) - Flight 0	1	2009	3	2013
Planning; Post Delivery Developmental Testing/Operational Testing Flight 0	2	2009	4	2013
Flight 0 DT / OT	4	2009	4	2013
Shock Planning/Test (LFT&E) - Flight 0+	1	2009	2	2015
Planning: Post Delivery Developmental Testing / Operational Testing Flight 0+	1	2012	3	2015
Flight 0+ DT / OT	2	2013	1	2015
Class Design Services	1	2009	1	2011
Combat System & C4I Spiral Development	1	2009	3	2011
Milestone B	3	2010	3	2010

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603581N: *Littoral Combat Ship (LCS)*	PROJECT 3129: *LCS Mission Package Development*	

COST ($ in Millions)	FY 2009 Actual	FY 2010 Estimate	FY 2011 Base Estimate	FY 2011 OCO Estimate	FY 2011 Total Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
3129: *LCS Mission Package Development*	168.082	162.458	109.048	0.000	109.048	111.834	78.959	56.969	60.573	Continuing	Continuing
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0		

A. Mission Description and Budget Item Justification

Program provides focused war fighting capabilities in littoral mine warfare, countering small boat threats and littoral anti-submarine warfare to provide assured access to enable the US Joint Force operations in the littoral. Mission module development includes architectures, interfaces and development of mission module. Mission systems
development also includes the procurement of the first mission packages to be used on the Flight 0 Littoral Combat Ships (LCS).

Mine Countermeasures (MCM) Mission Modules will provide the Joint Force Commander with the capability to conduct Mine Countermeasure (MCM) operations ranging from first response mine detection and avoidance, to neutralization and sweeping in littoral conditions, enabling Joint Forcible Entry. This will open transit lanes and operating areas for naval forces. MCM operations will reduce the access timeline in contested littorals.

Anti-Submarine Warfare Modules will provide ASW capabilities while operating in a contested littoral environment. Leveraging multiple distributed sensors netted together, LCS will exploit real time undersea data, using maneuver and deception to enhance detection, classification, identification, targeting and destruction of enemy submarines.

Surface Warfare Mission Modules will provide the capability to detect, track and engage small boat threats, giving the joint force commander the ability to maximize striking power, shield high value units, or successfully move through a restricted area.

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
System Engineering	2.489	2.734	2.619	0.000	2.619

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
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B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
FY 2009 Accomplishments: Continuation of Information Assurance (IA), modeling and simulation, Configuration Management (CM), Incremental Development, and safety engineering efforts. *FY 2010 Plans:* Continuation of modeling and simulation, program safety, and CM. *FY 2011 Base Plans:* Continuation of modeling and simulation, program safety, and CM.					
Program Management *FY 2009 Accomplishments:* Continue program-level program management efforts, including Contract Advisory and Assistance Services (CAAS): business and administrative planning, organizing, directing, coordinating, controlling, and approval actions designated to accomplish overall program objectives which are not associated with specific hardware elements and are not included in systems engineering. Maintain and execute logistic plans, processes and programs to assist in the management and support of Mission Modules and Mission Packages. *FY 2010 Plans:* Continue program-level program management efforts, including Contract Advisory and Assistance Services (CAAS): business and administrative planning, organizing, directing, coordinating, controlling, and approval actions designated to accomplish overall program objectives which are not associated with specific hardware elements and are not included in systems engineering. Maintain and execute logistic plans, processes and programs to assist in the management and support of Mission Modules and Mission Packages.	7.704	8.733	4.150	0.000	4.150

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603581N: *Littoral Combat Ship (LCS)*	PROJECT 3129: *LCS Mission Package Development*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
FY 2011 Base Plans: Continue program management efforts: business and administrative planning, organizing, directing, coordinating, controlling, and approval actions designated to accomplish overall program objectives which are not associated with specific hardware elements and are not included in systems engineering.					
System Test and Evaluation *FY 2009 Accomplishments:* Continuation of Mission Package certification efforts for MCM Mission Package (MP), conduct Developmental Testing (DT) of the MCM MP on board USS INDEPENDENCE. *FY 2010 Plans:* Continuation of Mission Package certification efforts for ASW, and SUW. Initiate ASW DT on board USS FREEDOM. MCM and SUW Form, Fit, and Function (FF&F) Test on USS FREEDOM. MCM Launch, Handling, and Recovery (LH&R) test on USS FREEDOM. *FY 2011 Base Plans:* Conduct MCM DT on board USS FREEDOM. Conduct SUW Structural Test Firing (STF) on USS FREEDOM; conduct SUW DT / TECHEVAL and IOT&E on board USS INDEPENDENCE. Complete ASW DT on board USS FREEDOM.	5.864	10.419	34.262	0.000	34.262
Integration, Assemble, Test and Checkout *FY 2009 Accomplishments:* Continue program-level Integration, Assembly, Test & Checkout efforts: technical and functional activities associated with the design, development, and production of mating surfaces, structures, equipment, parts, materials, and software required to assemble hardware/software elements into mission equipment.	1.474	1.064	0.797	0.000	0.797

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
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B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
FY 2010 Plans: Continue program-level Integration, Assembly, Test & Checkout efforts: technical and functional activities associated with the design, development, and production of mating surfaces, structures, equipment, parts, materials, and software required to assemble hardware/software elements into mission equipment. *FY 2011 Base Plans:* Continue program-level Integration, Assembly, Test & Checkout efforts: technical and functional activities associated with the design, development, and production of mating surfaces, structures, equipment, parts, materials, and software required to assemble hardware/software elements into mission equipment.					
Training *FY 2009 Accomplishments:* Complete the incorporation of all MP information into the Navy Training Systems Plan (NTSP). Continue the implementation and management of a proactive training program, continue program-level training efforts: Design, develop, produce, and deliver training services, devices, accessories, aids and equipment. *FY 2010 Plans:* Start the development of the software for the technical trainer in support of the Capabilities Development Document (CDD) requirements for Train-to-Certify and Train-to-Qualify. First years efforts will focus on MCM. *FY 2011 Base Plans:* Continue the development of the technical training software by adding the SUW requirements into the Train-to-Certify and Train-to-Qualify applications.	1.631	13.235	7.623	0.000	7.623

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
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B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
Common Equipment	47.036	31.515	17.968	0.000	17.968
FY 2009 Accomplishments: Mission Package Computing Environment (MPCE) - Mission Package Operating Environment (MPOE) Platform Development - manage software configuration(s), identify and acquire required components, test for compatibility, and deliver post-installation security lock-down scripts. Develop MPOE Integrated Logistics support (ILS) documentation, conduct vendor training. Document the LCS mission package concept of operations, functional & performance requirements, interfaces, and computing environment. Conduct MPCE Integration and Test events on the Seaframes and at USS INDEPENDENCE and USS FREEDOM land-based facilities. Multi-Vehicle Communication System (MVCS) - The Mission Package Off Board Communications will provide the communications systems capabilities that support LCS mission package unmanned vehicle requirements. Conduct installation and checkout (INCO) on LCS Seaframe. MH-60 B/R/S - Initiate the design, development, and prototyping of the Ku-band Common Data Link (CDL) Kit for installation in an SH-60B helicopter to allow the SH-60B to communicate with LCS via its shipboard CDL system. Design and development of a C4ISR Multiplexer / De-Multiplexer Interface Unit. Design and development of Fast Track Imaging(FTI) sets for installation in an MH-60S helicopter. *FY 2010 Plans:* MPCE - Support the conduct of Mission Package developmental testing; correct deficiencies observed during testing. MVCS - Support MVCS Full Capability ship installation; update technical data package after ship installation. Integrate Beyond Line of Sight (BLOS) capability into MVCS. Conduct DT of MVCS increment 1 capability onboard LCS Seaframe. MH 60 B/R/S - Complete the development of the Ku-Band CDL Helo Support Functional segment; install onboard LCS Seaframe and conduct integration testing.					

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603581N: *Littoral Combat Ship (LCS)*	PROJECT 3129: *LCS Mission Package Development*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
FY 2011 Base Plans: MPCE - Support DT and OT events with each Mission Package with the seaframe; identify interface issues and correct deficiencies. MVCS - Support MVCS full operational testing onboard LCS sea frame, correct deficiencies observed during testing.					
Mine Countermeasures (MCM) Mission Package *FY 2009 Accomplishments:* Continue integration of Spiral A Mission Modules. Design, develop, integrate and test mission modules for remainder of systems needed to complete Spiral A baseline. Develop, integrate and test USV and Sweep systems. Develop test procedures and documentation. Integrate the MCM MP with LCS sea frame. *FY 2010 Plans:* Conduct at sea integration (end-to-end) testing. Conduct integration with sea frame. Correct of deficiencies observed during testing. Conduct Certification of MCM MP to include weapons system certification, Human Systems Integration (HSI), IA, and Safety. MCM Form, Fit, and Function (FF&F) Test on USS FREEDOM. MCM Launch, Handling, and Recovery (LH&R) test on USS FREEDOM. *FY 2011 Base Plans:* Conduct MCM DT on board USS FREEDOM. Correct deficiencies observed during testing. Integrate the Surface Mine Countermeasures Unmanned Undersea Vehicle with Low frequency Broadband (SMCM UUV w/LFBB). Continue development, integration and testing of USV and Sweep systems. Validate and verify test procedures and documentation. Incorporate high priority problem trouble reports (PTRs).	22.746	12.532	13.412	0.000	13.412
Anti-Submarine Warfare (ASW) Mission Package	5.897	8.676	0.000	0.000	0.000

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
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B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
FY 2009 Accomplishments: Complete integration of the ASW MP, conduct at-sea testing of ASW MP#1. *FY 2010 Plans:* Complete end-to-end testing of ASW MP#1, integrate the ASW MP with the LCS sea frame and initiate DT events.					
Surface Warfare (SUW) Mission Package *FY 2009 Accomplishments:* Provide required funding to PEO Missiles & Space for Non Line of Site (NLOS) development. Develop the power converter solution for the NLOS Mission Module. Develop and maintain the LCS SUW T&E Road-map and Master Test Plan. Conduct testing of the Gun Mission Module (GMM), the Container Launch Unit (CLU), and the Mission Module. Develop Training and Preliminary Maintenance Plans for the GMM. *FY 2010 Plans:* Purchase NLOS Precision Attack Missile (PAM) Test Missiles. Conduct GMM integration testing with sea frame and combat systems, and End-to-End testing of the GMM. SUW Form, Fit, and Function (FF&F) Test on USS FREEDOM. *FY 2011 Base Plans:* Purchase NLOS Precision Attack Missile (PAM) Test Missiles. Purchase NLOS test targets, integrate NLOS with sea frame, and conduct Non Line of Site Launch System (NLOS-LS) Mission Module radio design. Conduct SUW Structural Test Firing (STF) on USS FREEDOM; conduct SUW DT / TECHEVAL and IOT&E on board USS INDEPENDENCE.	66.364	67.412	26.500	0.000	26.500
Mission Package Portable Control Station (MP-PCS) (Formally Portable Mission Package Computing Environment)	1.600	1.947	1.717	0.000	1.717

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
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B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
FY 2009 Accomplishments: Provide technical expertise in the development and configuration of the MP-PCS. Conduct systems engineering, design, development, and integration tasks to support implementation of a MP-PCS core capability. Track/coordinate the development and installation of the MP-PCS components within the transportable support container. Perform software and hardware integration to support MPCE baseline, revise IA plan and network topology, conduct system groom, perform test and checkout of MPCE and ancillary systems. *FY 2010 Plans:* Provide technical expertise in the development and configuration of the MP-PCS. Conduct systems engineering, design, development, and integration tasks to support implementation of a MP-PCS core capability. Track/coordinate the development and installation of the MP-PCS components within the transportable support container. Perform software and hardware integration to support MPCE baseline, revise IA plan and network topology, conduct system groom, perform test and checkout of MPCE and ancillary systems. *FY 2011 Base Plans:* Provide technical expertise in the development and configuration of the MP-PCS. Conduct systems engineering, design, development, and integration tasks to support implementation of a MP-PCS core capability. Track/coordinate the development and installation of the MP-PCS components within the transportable support container. Perform software and hardware integration to support MPCE baseline, revise IA plan and network topology, conduct system groom, perform test and checkout of MPCE and ancillary systems.					
Pre-Production Engineering	4.230	4.191	0.000	0.000	0.000
FY 2009 Accomplishments: Convert existing MCM MP Technical Data Package (TDP) data to needed format and develop any needed drawings to complete the MP TDP.					

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603581N: *Littoral Combat Ship (LCS)*	PROJECT 3129: *LCS Mission Package Development*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
FY 2010 Plans: Convert existing ASW and SUW MP TDP data to needed format and develop any needed drawings to complete the MP TDP.					
Acquistion Workforce *FY 2009 Accomplishments:* Acquistion Workforce	1.047	0.000	0.000	0.000	0.000
Accomplishments/Planned Programs Subtotals	168.082	162.458	109.048	0.000	109.048

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total	FY 2012	FY 2013	FY 2014	FY 2015	Cost To Complete	Total Cost
• 2127 : *Littoral Combat Ship*	1,016.952	1,076.669	1,509.335	0.000	1,509.335	1,808.128	2,333.833	2,416.574	2,747.939	Continuing	Continuing
• 1600 : *LCS Mission Modules*	6.332	116.898	82.951	0.000	82.951	121.958	179.857	194.369	306.691	Continuing	Continuing
• 4221: *LCS Module Weapons*	0.000	0.000	9.808	0.000	9.808	5.585	3.235	9.722	7.729	Continuing	Continuing
• 0443 : *Aircraft Procurement, Navy*	50.189	77.377	47.484	0.000	47.484	46.242	67.442	89.553	89.485	Continuing	Continuing
• 1B1B: *Mission and Other Ship Operations*	0.000	0.000	1.190	0.000	1.190	3.285	4.696	6.845	9.499	Continuing	Continuing
• 1B4B : *Ship Maintenance*	11.746	9.115	6.218	0.000	6.218	6.571	6.166	8.478	9.885	Continuing	Continuing
• 1B5B : *Ship Depot Operations Support*	25.792	18.873	31.019	0.000	31.019	24.417	33.945	21.341	19.891	Continuing	Continuing
• 1C1C : *Combat Communications*	1.422	1.683	2.108	0.000	2.108	2.723	3.676	3.757	3.823	Continuing	Continuing

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603581N: *Littoral Combat Ship (LCS)*	PROJECT 3129: *LCS Mission Package Development*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total	FY 2012	FY 2013	FY 2014	FY 2015	Cost To Complete	Total Cost
• 5110: *Outfitting / Post Delivery*	0.000	0.000	2.787	0.000	2.787	68.794	75.712	104.504	90.958	Continuing	Continuing

D. Acquisition Strategy

The LCS acquisition strategy encompasses multiple phases: Phases I and II are Concept Refinement and Technology Development, consisting of Preliminary Design, Final Design and Detail Design and Construction for Flight 0 ships. A parallel three phase approach is planned for Flight 0+ ships. - Preliminary System Design, - Final System Design and - Detail Design and Construction.

E. Performance Metrics

Milestone Reviews

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603581N: *Littoral Combat Ship (LCS)*	PROJECT 3129: *LCS Mission Package Development*	

Product Development ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
1.1 System Engineering	WR	Various Various	6.757	2.734	Oct 2009	2.619	Oct 2010	0.000		2.619	0.000	12.110	Continuing
1.3 System Test and Evaluation	WR	Various Various	21.064	10.419	Oct 2009	34.262	Oct 2010	0.000		34.262	0.000	65.745	Continuing
1.4 Integration, Assembly, Test and Check	WR	Various Various	1.474	1.064	Oct 2009	0.797	Oct 2010	0.000		0.797	0.000	3.335	Continuing
1.5 Training	WR	Various Various	3.798	13.235	Oct 2009	7.623	Oct 2010	0.000		7.623	0.000	24.656	Continuing
1.12 Common Equipment Development	WR	Various Various	38.828	22.476	Oct 2009	12.468	Oct 2010	0.000		12.468	0.000	73.772	Continuing
1.13 MCM MP	WR	Various Various	86.056	10.532	Oct 2009	11.412	Oct 2010	0.000		11.412	0.000	108.000	Continuing
1.14 ASW MP	WR	Various Various	126.987	4.976	Oct 2009	0.000		0.000		0.000	0.000	131.963	Continuing
1.15 SUW MP	WR	Various Various	55.264	43.862	Oct 2009	15.000	Oct 2010	0.000		15.000	0.000	114.126	Continuing
1.19 Pre-Production Engineering	WR	Various Various	4.234	4.191	Oct 2009	0.000		0.000		0.000	0.000	8.425	Continuing
1.12 Common Equipment	WR	Various Various	11.019	9.039	Oct 2009	5.500	Oct 2010	0.000		5.500	0.000	25.558	Continuing
1.13 MCM MP Equipment	WR	Various Various	4.600	2.000	Oct 2009	2.000	Oct 2010	0.000		2.000	0.000	8.600	Continuing
1.14 ASW MP Equipment	WR	Various Various	17.810	3.700	Oct 2009	0.000		0.000		0.000	0.000	21.510	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603581N: *Littoral Combat Ship (LCS)*	PROJECT 3129: *LCS Mission Package Development*

Product Development ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
1.15 SUW MP Equipment	WR	Various Various	27.029	23.550	Oct 2009	11.500	Oct 2010	0.000		11.500	0.000	62.079	Continuing
1.16 MP-PCS Equipment	WR	Various Various	1.600	1.947	Oct 2009	1.717	Oct 2010	0.000		1.717	0.000	5.264	Continuing
		Subtotal	406.520	153.725		104.898		0.000		104.898	0.000	665.143	

Remarks

Management Services ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Acquisition Workforce	Various/ Various	Various Various	1.047	0.000		0.000		0.000		0.000	0.000	1.047	Continuing
1.2 Program Management	WR	Various Various	12.805	8.733	Oct 2009	4.150	Oct 2010	0.000		4.150	0.000	25.688	Continuing
		Subtotal	13.852	8.733		4.150		0.000		4.150	0.000	26.735	

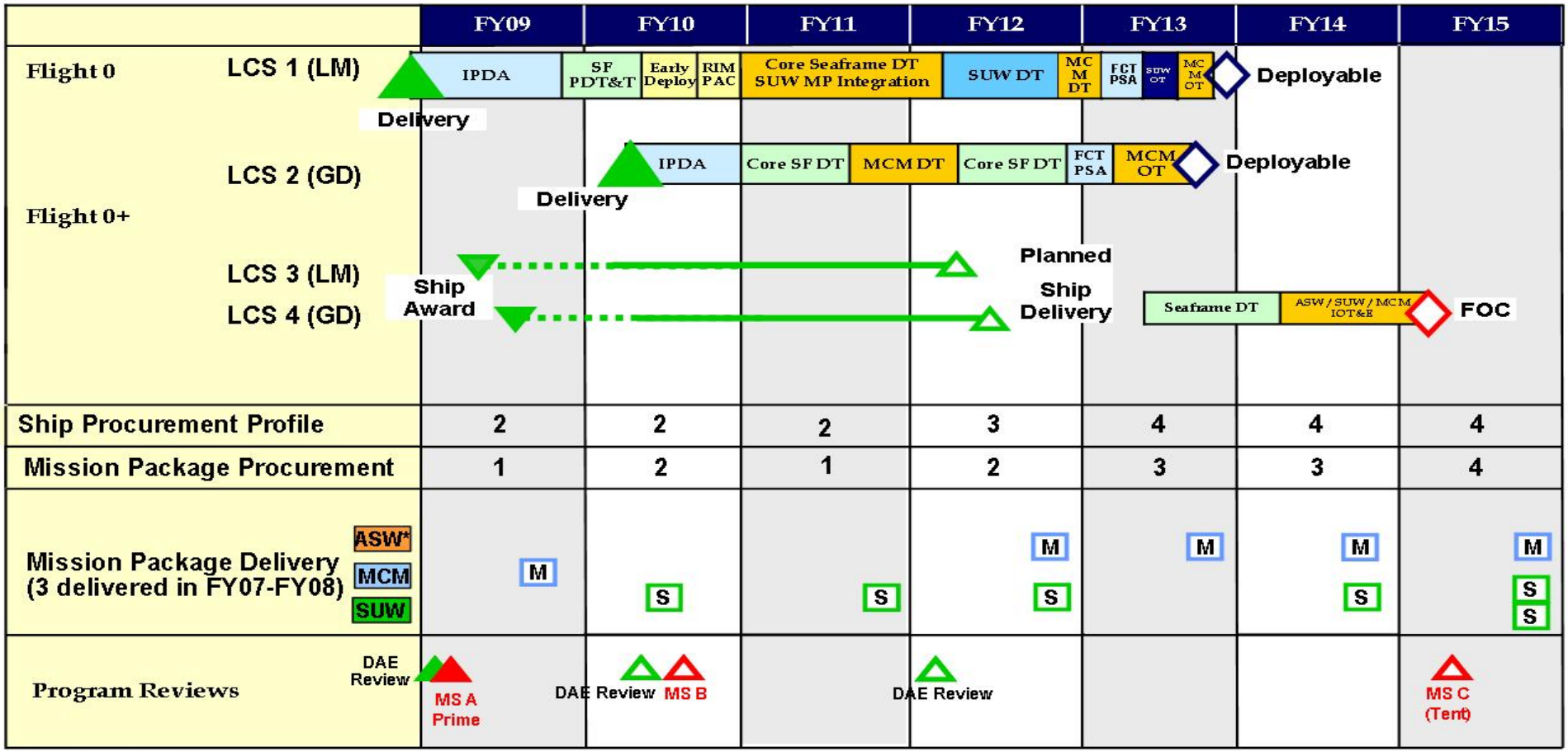
Remarks

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603581N: *Littoral Combat Ship (LCS)*	PROJECT 3129: *LCS Mission Package Development*	

	Total Prior Years Cost	FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	420.372	162.458		109.048		0.000		109.048	0.000	691.878	

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603581N: *Littoral Combat Ship (LCS)*	PROJECT 3129: *LCS Mission Package Development*



*The Navy has determined that a classified capability will be incorporated into future ASW Mission Packages. This capability will address identified ASW MP requirements.

Exhibit R-4A, RDT&E Schedule Details: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603581N: *Littoral Combat Ship (LCS)*	PROJECT 3129: *LCS Mission Package Development*

Schedule Details

	Start		End	
Event	Quarter	Year	Quarter	Year
SUW MP#2 Delivery	2	2010	2	2010
SUW MP Integration	1	2011	1	2012
MCM MP DT (LCS 2)	3	2011	1	2012
SUW MP#3 Delivery	4	2011	4	2011
SUW MP DT	2	2012	3	2012
MCM MP DT (LCS 1)	4	2012	1	2013
MCM MP OT (LCS 2)	2	2013	3	2013
SUW MP OT	3	2013	3	2013
MCM MP OT (LCS 1)	3	2013	4	2013
ASW/SUW/MCM MP IOT&E	2	2014	1	2015

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603581N: *Littoral Combat Ship (LCS)*	PROJECT 4018: *Littoral Combat Ship Construction*	

COST ($ in Millions)	FY 2009 Actual	FY 2010 Estimate	FY 2011 Base Estimate	FY 2011 OCO Estimate	FY 2011 Total Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
4018: *Littoral Combat Ship Construction*	90.393	75.147	41.565	0.000	41.565	0.000	0.000	0.000	0.000	0.000	1,279.015
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0		

A. Mission Description and Budget Item Justification

The Littoral Combat Ship (LCS) will be a fast, agile, and networked surface combatant with capabilities optimized to defeat asymmetric threats, and assure naval and joint force access into contested littoral regions. The threats challenging our naval forces in the littorals include mines, attacks by small surface craft, and quiet diesel submarines armed with a variety of anti-ship weapons. Such threats have great potential to be effectively employed by many less capable countries and non-state actors to prevent access, and use, of littoral areas by U.S. forces.

The LCS Program achieved Milestone A and Program Initiation in May 2004, and conducted a Milestone A update review in 2009. Milestone B is planned for third quarter 2010.

The LCS construction phase includes the construction of two LCS Fight 0 Class Ships, one of each of two designs, and includes Government Furnished Equipment (GFE) for ships systems, Final System Design (FSD), Detail Design, introduction of final interface requirements for integration with mission packages from the Mission Systems and Ship Integration Team (MSSIT), and Outfitting and Post Delivery (OF/PD).

USS FREEDOM (LCS 1)
Basic Construction: 521.0
Change Orders: 0.5
GFE: 12.0
Other: 3.5
Total Cost*: 537.0

USS INDEPENDENCE (LCS 2)
Basic Construction: 589.0
Change Orders: 3.5

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603581N: *Littoral Combat Ship (LCS)*	PROJECT 4018: *Littoral Combat Ship Construction*

GFE: 7.0
Other: 7.5
Total Cost*: 607.0

Non End Cost Item FSD/MSSIT 25.0(LCS1), 54.0(LCS2)
Non End Cost Item OF/PD 94.0(LCS1), 75.0(LCS2)

FSD/MSSIT costs for USS INDEPENDENCE and USS FREEDOM are not true construction costs and are costs associated with design completion.

* Does not include OF/PD and early design costs

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
Construction	63.153	32.000	0.000	0.000	0.000
Provides for the construction, production, test and trials of USS INDEPENDENCE and USS FREEDOM ships, including execution of Change Orders and procurement of Government Furnished Equipment (GFE). *FY 2009 Accomplishments:* Continued detail design and construction of LCS 1 (Lockheed Martin Design) and LCS 2 (General Dynamics - Bath Iron Works Design). Completed procurement of GFE for both USS INDEPENDENCE and USS FREEDOM. Supported and executed the ship pre-delivery test and trials and related certification efforts. *FY 2010 Plans:* Completion of USS FREEDOM.					
Support Costs	0.300	0.000	0.000	0.000	0.000

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603581N: *Littoral Combat Ship (LCS)*	PROJECT 4018: *Littoral Combat Ship Construction*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
FY 2009 Accomplishments: Travel for SUPSHIPS					
Outfitting and Post Delivery Provides for the integration and testing of the seaframe and separately acquired mission packages, implementation of instrumentation packages and validation of structural, seakeeping, hydrodynamic performance, emergent support during the execution of Post Delivery Test & Trials (PDT&T), post-shakedown availability (PSA) to incorporate Engineering Change Proposals that allow for correction of trial card deficiencies, and mission critical upgrades, as required. *FY 2009 Accomplishments:* Initiated operation of installed instrumentation equipment, collection of data and the analysis of critical ship performance parameters. Conducted testing of supporting mission packages, seaframe, and the integrated product. Performed emergent repairs during PDT&T as required. Performed engineering, planning, work package development and procurement of long lead material for the Post-Shakedown Availabilities (PSA) for both USS INDEPENDENCE and USS FREEDOM. Conducted IPDAs for LCS 1 to correct trial card deficiencies and incorporate critical safety and mission critical ECPs that must be completed prior to delivery to the Fleet. Performed engineering, planning and procurement of long lead material for the Industrial Post Delivery Availabilities (IPDA), scheduled immediately after ship delivery. Provided technical support to the INSURV Board. *FY 2010 Plans:* Perform emergent repairs to support IPDA for USS FREEDOM Post Delivery Test and Trials. Conduct Final Contract Trials and provide Technical Support for the INSURV Board. Correct Trial Card discrepancies. Perform advance planning, engineering, work package development and the procurement of material to support two fourteen week industrial Post Shakedown Availability (PSA) to include both USS INDEPENDENCE and USS FREEDOM. Complete instrumentation, data collection	26.719	43.147	41.565	0.000	41.565

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603581N: *Littoral Combat Ship (LCS)*	PROJECT 4018: *Littoral Combat Ship Construction*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
and analysis of critical ship performance. Conduct OF/PD efforts for the Early Deployment of USS INDEPENDENCE. *FY 2011 Base Plans:* Perform Final Contract Trials for USS INDEPENDENCE and USS FREEDOM. Correct Trial Card discrepancies. Initiate Mission Package Developmental Testing (DT) and Initial Operational Test & Evaluation (IOT&E) and continue PSA preparations.					
Acquisiton Work Force *FY 2009 Accomplishments:* Acquisition Workforce	0.221	0.000	0.000	0.000	0.000
Accomplishments/Planned Programs Subtotals	90.393	75.147	41.565	0.000	41.565

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total	FY 2012	FY 2013	FY 2014	FY 2015	Cost To Complete	Total Cost
• 2127: *Littoral Combat Ship*	1,016.952	1,076.669	1,509.335	0.000	1,509.335	1,808.128	2,333.833	2,416.574	2,747.939	Continuing	Continuing
• 1600: *LCS Modules*	6.332	116.898	82.951	0.000	82.951	121.958	179.857	194.369	306.691	Continuing	Continuing
• 4221: *LCS Module Weapons*	0.000	0.000	9.808	0.000	9.808	5.585	3.235	9.722	7.729	Continuing	Continuing
• 0443: *Aircraft Procurement, Navy*	50.189	77.377	47.484	0.000	47.484	46.242	67.442	89.553	89.485	Continuing	Continuing
• 1B1B: *Mission and Other Ship Operations*	0.000	0.000	1.190	0.000	1.190	3.285	4.696	6.845	9.499	Continuing	Continuing
• 1B4B: *Ship Maintenance*	11.746	9.115	6.218	0.000	6.218	6.571	6.166	8.478	9.885	Continuing	Continuing
• 1B5B: *Ship Depot Operations Support*	25.792	18.873	31.019	0.000	31.019	24.417	33.945	21.341	19.891	Continuing	Continuing
• 1C1C: *Combat Communications*	1.422	1.683	2.108	0.000	2.108	2.723	3.676	3.757	3.823	Continuing	Continuing

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603581N: *Littoral Combat Ship (LCS)*	PROJECT 4018: *Littoral Combat Ship Construction*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total	FY 2012	FY 2013	FY 2014	FY 2015	Cost To Complete	Total Cost
• 5110: *Outfitting / Post Delivery*	0.000	0.000	2.787	0.000	2.787	68.794	75.712	104.504	90.958	Continuing	Continuing

D. Acquisition Strategy

The LCS Program takes an evolutionary approach to acquisition that emphasizes competition as a key to achieving affordability. Initially, two industry teams competed against each other with two different LCS designs, LCS 1-4, over two flights, Flight 0 and Flight 0+. A down select will be conducted in FY10 to a single design, and a second source introduced in FY12 for continued competition.

The incorporation of lessons learned from the design, construction, and testing of the initial first two ships, as well as introduction of improved waterjets on both designs and a waterjet tunnel extension on the LM LCS design will comprise the Flight 0+ baseline to be awarded in FY09. The new baseline will be implemented in the FY10-14 Block Buy and maintained in the FY12-14 Second Source Block Buy, both built to a common Technical Data Package.

The LCS Program achieved Milestone A and Program Initiation in May 2004, and conducted a Defense Acquisition Executive (DAE) review in FY09. Milestone B is planned for third quarter 2010 prior to the award of the FY10 ships.

E. Performance Metrics

The LCS Program achieved Milestone A and Program Initiation in May 2004, and underwent a Milestone A update in FY09. Milestone B is planned for the third quarter 2010.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603581N: *Littoral Combat Ship (LCS)*	PROJECT 4018: *Littoral Combat Ship Construction*	

Product Development ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
LCS Ship 1 Construction	C/CPAF	Lockheed Martin Moorestown, NJ	521.000	0.000		0.000		0.000		0.000	0.000	521.000	Continuing
LCS Ship 1 Change Orders	C/CPAF	Lockheed Martin Moorestown, NJ	0.500	0.000		0.000		0.000		0.000	0.000	0.500	Continuing
LCS Ship 1 GFE	C/CPAF	Lockheed Martin Moorestown, NJ	12.000	0.000		0.000		0.000		0.000	0.000	12.000	Continuing
LCS Ship 2 Construction	C/CPAF	General Dynamics Bath, ME	557.000	32.000	Oct 2009	0.000		0.000		0.000	0.000	589.000	Continuing
LCS Ship 2 Change Orders	C/CPAF	General Dynamics Bath, ME	3.500	0.000		0.000		0.000		0.000	0.000	3.500	Continuing
LCS Ship 2 GFE	C/CPAF	General Dynamics Bath, ME	7.000	0.000		0.000		0.000		0.000	0.000	7.000	Continuing
LCS Ship 1 FSD/MSSIT	C/CPAF	Lockheed Martin Moorestown, NJ	25.000	0.000		0.000		0.000		0.000	0.000	25.000	Continuing
LCS Ship 2 FSD/MSSIT	C/CPAF	General Dynamics Bath, ME	54.000	0.000		0.000		0.000		0.000	0.000	54.000	Continuing
Initial Outfitting	Various/ Various	Various Various	21.601	0.000		0.000		0.000		0.000	0.000	21.601	Continuing
Testing and Logistics	WR	Various Various	21.961	1.687	Oct 2009	2.665	Oct 2010	0.000		2.665	Continuing	Continuing	Continuing
Post Delivery ECP	C/CPAF	Lockheed Martin - General Dynamics	24.357	15.000	Oct 2009	24.900	Oct 2010	0.000		24.900	0.000	64.257	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603581N: *Littoral Combat Ship (LCS)*	PROJECT 4018: *Littoral Combat Ship Construction*

Product Development ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
		Various											
PSA/PSA Planning/ INSURV/OPTAR	WR	Various Various	6.271	26.460	Oct 2009	14.000	Oct 2010	0.000		14.000	0.000	46.731	Continuing
		Subtotal	1,254.190	75.147		41.565		0.000		41.565			

Remarks

Final Ship Design/Mission Ship System Integration Team costs for LCS 1 and LCS 2 are not true construction costs, and although funds were obligated against the 4018 construction project contracts, these costs were associated with MSSIT/FSD for design completion.

Support ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Travel	WR	SUPSHIP Various	0.460	0.000		0.000		0.000		0.000	0.000	0.460	Continuing
Other Program Costs	WR	Various Various	11.000	0.000		0.000		0.000		0.000	0.000	11.000	Continuing
		Subtotal	11.460	0.000		0.000		0.000		0.000	0.000	11.460	

Remarks

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603581N: *Littoral Combat Ship (LCS)*	PROJECT 4018: *Littoral Combat Ship Construction*

Management Services ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Acquisition Workforce	Various/ Various	Various Various	0.221	0.000		0.000		0.000		0.000	0.000	0.221	Continuing
		Subtotal	0.221	0.000		0.000		0.000		0.000	0.000	0.221	

Remarks

	Total Prior Years Cost	FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	1,265.871	75.147		41.565		0.000		41.565			

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603581N: *Littoral Combat Ship (LCS)*	**PROJECT** 4018: *Littoral Combat Ship Construction*

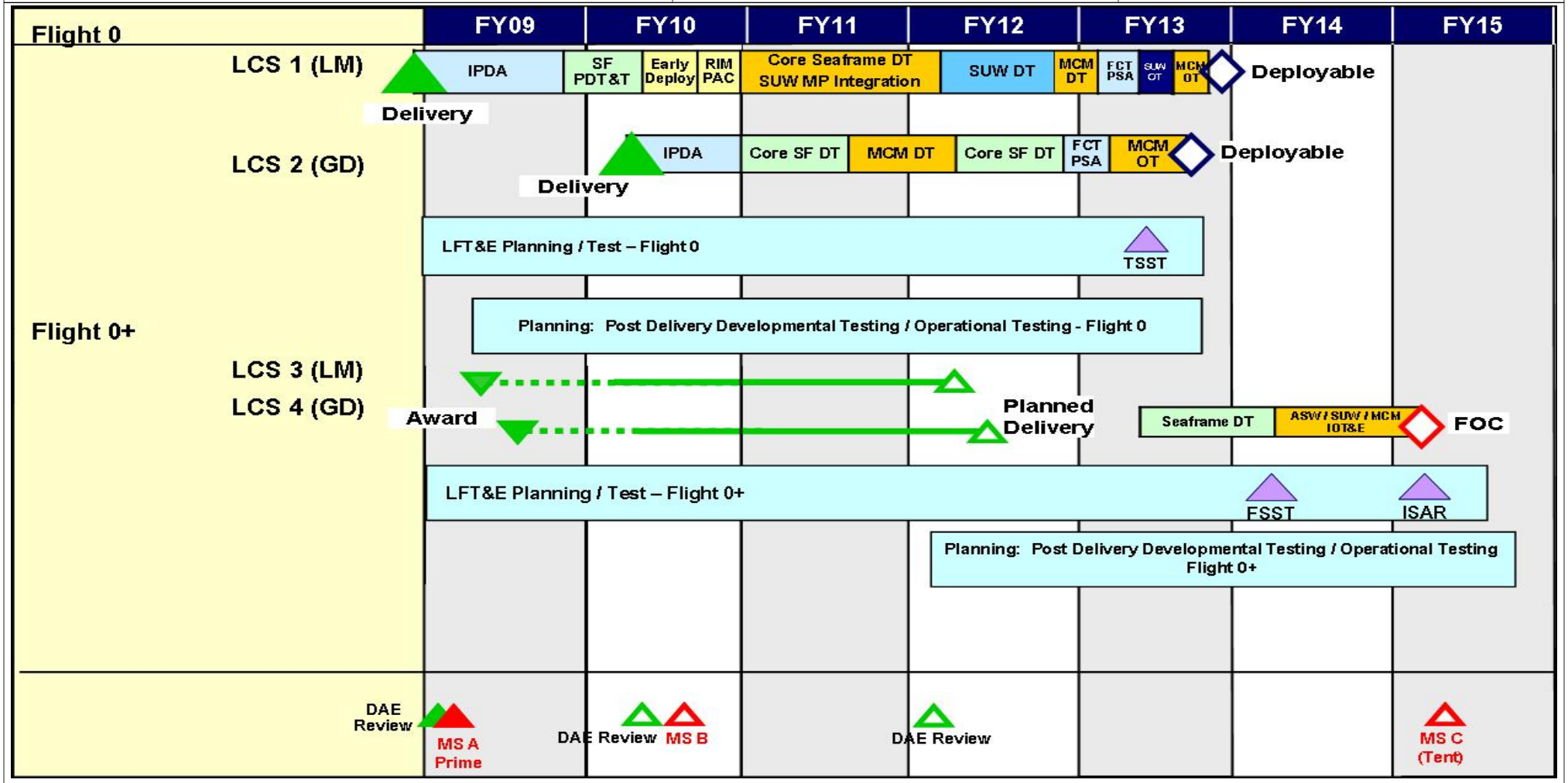


Exhibit R-4A, RDT&E Schedule Details: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603581N: *Littoral Combat Ship (LCS)*	**PROJECT** 4018: *Littoral Combat Ship Construction*

Schedule Details

	Start		End	
Event	**Quarter**	**Year**	**Quarter**	**Year**
Detail Design and Construction - Flight 0	1	2009	4	2009
Milestone B	3	2010	3	2010
LCS 2 Delivery (Flight 0)	1	2010	1	2010
IPDA LCS 1	1	2009	4	2009
IPDA LCS 2	1	2010	4	2010
PSA LCS 1	1	2013	2	2013
PSA LCS 2	4	2012	1	2013

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603581N: *Littoral Combat Ship (LCS)*	PROJECT 9999: *Congressional Adds*	

COST ($ in Millions)	FY 2009 Actual	FY 2010 Estimate	FY 2011 Base Estimate	FY 2011 OCO Estimate	FY 2011 Total Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
9999: *Congressional Adds*	10.273	63.734	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	100.139
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0		

A. Mission Description and Budget Item Justification

Provides resources to support both LCS Mission Package Development and Ship Construction.

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010
Congressional Add: Revised Acquisition Strategy	0.000	59.751

FY 2010 Plans:

Design review to include all existing change pages. Design update will include new FY10 block buy baseline changes, both government and contract initiated or in response to technology obsolescence, update and completion of a neutral format 3-D model. Update of all design documentation into an LCS Technical Data Package (TDP).

Conduct a continuous independent review and approval by a Navy-led team to ensure LCS TDP is "industry neutral" so that any industry team can build the LCS, including reviews by other contractor/ industry teams and special studies for affordability, commonality, and producability.

Develop a detailed Interface Control Document (ICD) between the Selected Ship Systems (S3), which is predominately Combat and C4I systems and networks, and the seaframe to enable the seaframe and S3 to be independently procured.

Update of industry TDP as necessary from baseline to enable use with FY12 block buy from a second industry source, with S3 provided as GFE.

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603581N: *Littoral Combat Ship (LCS)*	**PROJECT** 9999: *Congressional Adds*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010
Congressional Add: MIW Modules Prog - Cong *FY 2010 Plans:* Funding is provided to research and study methods to employ mine warfare mission modules independently of the LCS platform.	0.000	3.983
Congressional Add: Autonomous Acoustic Array Advanced Tubular Solid O *FY 2009 Accomplishments:* Funding is provided for the application of Advanced Tubular Solid Oxide Fuel Cell (SOFC) technology to deliver clean, efficient, and quiet power generation as an alternate power source for the LCS ASW Mission Package (MP).	1.995	0.000
Congressional Add: LCS Common MIssion Package Training Environmnet *FY 2009 Accomplishments:* Funding is provided to accelerate the development of a common Mission Package Trainer to meet near term MCM Mission Package training requirements.	4.488	0.000
Congressional Add: Alternative Use of Mine Warfare Modules *FY 2009 Accomplishments:* Funding is provided to research and study methods to employ mine warfare mission modules independently of the LCS platform.	3.790	0.000
Congressional Adds Subtotals	10.273	63.734

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603581N: *Littoral Combat Ship (LCS)*	**PROJECT** 9999: *Congressional Adds*

C. Other Program Funding Summary ($ in Millions)

N/A

D. Acquisition Strategy

N/A

E. Performance Metrics

Congressional Adds.

Exhibit R-2, RDT&E Budget Item Justification: PB 2011 Navy										DATE: February 2010	
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*				R-1 ITEM NOMENCLATURE PE 0603582N: *Combat System Integration*							
COST ($ in Millions)	**FY 2009 Actual**	**FY 2010 Estimate**	**FY 2011 Base Estimate**	**FY 2011 OCO Estimate**	**FY 2011 Total Estimate**	**FY 2012 Estimate**	**FY 2013 Estimate**	**FY 2014 Estimate**	**FY 2015 Estimate**	**Cost To Complete**	**Total Cost**
Total Program Element	62.472	22.444	24.344	0.000	24.344	26.181	25.516	25.267	23.942	Continuing	Continuing
0164: *Combat System Integration*	62.472	22.444	24.344	0.000	24.344	26.181	25.516	25.267	23.942	Continuing	Continuing

A. Mission Description and Budget Item Justification

A. MISSION DESCRIPTION:
Project 0164: Combat System Integration:

COMNAVSEASYSCOM (SEA 05H) is assigned central Navy responsibility for interoperability, directing the development of policy and architecture for Strike Force (SF) warfare systems engineering and implementation of a common warfare systems engineering process. Furthermore, SEA 05H provides top level direction and execution for certification and assessments which support capability and quality for ships and submarines. SEA 05H has developed processes and tools including the establishment of a force-level warfare systems engineering process, stewardship of the introduction of Combat Systems, Command, Control, Computers, Communications and Intelligence (C5I) modernization and improvement into the Fleet Response Plan (FRP), Command & Control, Communications, Computers, & Combat Systems Integration Modernization Process (C5IMP), configuration management and certification processes, and force-level interoperability assessments using the Distributed Engineering Plant (DEP) land-based testing tool. This project funds the core elements required to conduct Warfare Systems Integration and Interoperability Testing (WSI2T) in accordance with the Naval Warfare Systems Certification Policy (NWSCP), Joint NAVSEA, NAVAIR, and SPAWAR SYSCOM Instruction.

This project funds SF configuration management through the FRP, shore based testing and WSI2T certification of operational computer systems in a test environment similar to their ultimate shipboard operational environment, and interoperability assessments (IA) which are a prerequisite for operational certification of the ships in SF configurations prior to deployment. Force Certification of deploying ships in SF configurations is accomplished through the utilization of the Navy's DEP, which provides operational configurations for all Naval combat systems located at multiple Navy land-based sites located across the country and connected via networking technology. The DEP provides the only opportunity for comprehensive interoperability testing of combat system and C5I configuration items prior to shipboard delivery for operational use in surface combatant platforms and strike group units. It is a U.S. Fleet Forces Command requirement that all SFs undergo IA testing in the DEP prior to deployment. Further, the DEP provides the mechanism to support the Navy's participation in the Joint testing environments as well as the coalition forces through the Combined Forces Battle Laboratories (CFBL) network to allow for assessments of both Joint and Coalition interoperability. Program focus is on new systems and platforms under development.

Exhibit R-2, RDT&E Budget Item Justification: PB 2011 Navy	DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603582N: *Combat System Integration*

As the Navy embarks on Navy Open Architecture (OA), Common Network Interface (CNI) has been selected for upgrade on the LHA, LHD, and LSD ship classes. CNI is an open interface system that modernizes legacy amphibious ships that support the Expeditionary Strike Group (ESG). CNI uses Commercial Off The Shelf (COTS) hardware and common interoperable
software compliant with the Navy's OA standards to integrate the data from ship's sensors, external links, and FORCEnet sources into an operational picture to the warfighter. CNI provides rapid operational capability upgrades via a Rapid Capability Insertion Process (RCIP) using primarily software upgrades. CNI allows for the implementation of the
Integrated Architecture Behavior Model (IABM), FORCEnet and Network centric connectivity by providing the necessary fleet support activities which include: systems engineeringsupport, software support, and integrated logistics support (ILS) to ensure proper coordination and connectivity of hardware and software components for accurate operation.
Funding for CNI development was completed in FY09.

The Navy has also approved the Amphibious Air Warfare (AAW) and Amphibious Improvement Program (AIP) which will integrate Close-In Weapon System (CIWS) radar into the combat system. This is a significant change in how the combat system operates and requires modification of existing test beds to prove this concept and certify it for development.
Additional capabilities that also require certification for deployment are Adaptive Engage Control (AEC), next generation Command and Control Processor (C2P) with Joint Range Extension (JRE) and the introduction of Mode 5, Identification, Friend or Foe (IFF) system.

The Navy, through Automated Test and Retest (ATRT), is developing an automated test capability applicable at each phase of software development that provides reproducible, quantitative evaluation of software performance in a cost and time effective manner. ATRT capability will enable acceleration for testing and re-testing of open architecture software and reinforce a requirement to expedite software implementations and upgrades. ATRT implementations target AEGIS Combat System and the Joint Single Integrated Air Picture (SIAP) Programs within development, and the Ship Self Defense System (SSDS) Program within production, to demonstrate savings for test and evaluation evolutions throughout the acquisition life cycle. Funding for ATRT was completed in FY09.

Exhibit R-2, RDT&E Budget Item Justification: PB 2011 Navy	DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603582N: *Combat System Integration*

B. Program Change Summary ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
Previous President's Budget	64.172	22.558	0.000	0.000	0.000
Current President's Budget	62.472	22.444	24.344	0.000	24.344
Total Adjustments	-1.700	-0.114	24.344	0.000	24.344
• Congressional General Reductions		-0.094			
• Congressional Directed Reductions		0.000			
• Congressional Rescissions	0.000	-0.020			
• Congressional Adds		0.000			
• Congressional Directed Transfers		0.000			
• Reprogrammings	0.000	0.000			
• SBIR/STTR Transfer	-1.700	0.000			
• Program Adjustments	0.000	0.000	24.344	0.000	24.344

Change Summary Explanation

FY11 from previous President's Budget is shown as zero because no FY11-15 data was presented in President's Budget 2010.

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603582N: *Combat System Integration*	PROJECT 0164: *Combat System Integration*	

COST ($ in Millions)	FY 2009 Actual	FY 2010 Estimate	FY 2011 Base Estimate	FY 2011 OCO Estimate	FY 2011 Total Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
0164: *Combat System Integration*	62.472	22.444	24.344	0.000	24.344	26.181	25.516	25.267	23.942	Continuing	Continuing
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0		

A. Mission Description and Budget Item Justification

Project 0164: Combat System Integration:
COMNAVSEASYSCOM (SEA 05H) is assigned central Navy responsibility for interoperability, directing the development of policy and architecture for Strike Force (SF) warfare systems engineering and implementation of a common warfare systems engineering process. Furthermore, SEA 05H provides top level direction and execution for certification and
assessments which support capability and quality for ships and submarines. SEA 05H has developed processes and tools including the establishment of a force-level warfare systems engineering process, stewardship of the introduction of Combat Systems, Command, Control, Computers, Communications and Intelligence (C5I) modernization and
improvement into the Fleet Response Plan (FRP), Command & Control, Communications, Computers, & Combat Systems Integration Modernization Process (C5IMP), configuration management and certification processes, and force-level interoperability assessments using the Distributed Engineering Plant (DEP) land-based testing tool. This project funds
the core elements required to conduct Warfare Systems Integration and Interoperability Testing (WSI2T) in accordance with the Naval Warfare Systems Certification Policy (NWSCP), Joint NAVSEA, NAVAIR, and SPAWAR SYSCOM Instruction.

This project funds SF configuration management through the FRP, shore based testing and WSI2T certification of operational computer systems in a test environment similar to their ultimate shipboard operational environment, and interoperability assessments (IA) which are a prerequisite for operational certification of the ships in SF configurations prior to their deployment. Force Certification of deploying ships in SF configurations is accomplished through the utilization of the Navy's DEP, which provides operational configurations for all Naval combat systems located at multiple Navy land-based sites located across the country and connected via networking technology.
The DEP provides the only opportunity for comprehensive interoperability testing of combat system and C5I configuration items prior to shipboard delivery for operational use in surface combatant platforms and strike group units. It is a U.S. Fleet Forces Command requirement that all SFs undergo interoperability assessment testing in the DEP
prior to deployment. Further, the DEP provides the mechanism to support the Navy's participation in the Joint testing environments as well as the coalition forces through the Combined Forces Battle Laboratories (CFBL) network to allow for assessments of both Joint and Coalition interoperability. Program focus is on new systems and platforms

under development.

As the Navy embarks on Navy Open Architecture (OA), Common Network Interface (CNI) has been selected for upgrade on the LHA, LHD, and CNI is an open interface system that modernizes legacy amphibious ships that support the Expeditionary Strike Group (ESG). CNI uses Commercial Off The Shelf (COTS) hardware and common interoperable software compliant with the Navy's OA standards to integrate the data from ship's sensors, external links, and FORCEnet sources into an operational picture to the warfighter. CNI provides rapid operational capability upgrades via a Rapid Capability Insertion Process (RCIP) using primarily software upgrades. CNI allows for the implementation of the
Integrated Architecture Behavior Model (IABM), FORCEnet and Network centric connectivity by providing the necessary fleet support activities which include: systems engineering support, software support, and integrated logistics support (ILS) to ensure proper coordination and connectivity of hardware and software components for accurate operation. Funding for CNI development was completed in FY09.

The Navy has also approved the Amphibious Air Warfare (AAW) and Amphibious Improvement Program (AIP) which will integrate Close-In Weapon System (CIWS) radar into the combat system. This is a significant change in how the combat system operates and requires modification of existing test beds to prove this concept and certify it for development. Additional capabilities that also require certification for deployment are Adaptive Engage Control (AEC), next generation Command and Control Processor (C2P) with Joint Range Extension (JRE) and the introduction of Mode 5, Identification, Friend or Foe (IFF) system.

The Navy, through Automated Test and Re-Test (ATRT), is developing an automated test capability applicable at each phase of software development that provides reproducible, quantitative evaluation of software performance in a cost and time effective manner. ATRT capability will enable acceleration for testing and re-testing of open architecture
software and reinforce a requirement to expedite software implementations and upgrades. ATRT implementations target AEGIS Combat System and the Joint Single Integrated Air Picture (SIAP) Programs within development, and the Ship Self Defense System (SSDS) Program within production, to demonstrate savings for test and evaluation evolutions
throughout the acquisition life cycle. Funding for ATRT was completed in FY09.

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
Strike Force Requirements Engineering and Analysis (SF)	3.000	0.000	0.000	0.000	0.000
This program maps current interoperability requirements to new ships, such as CVN 21, DDG 1000 and LCS.					

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603582N: *Combat System Integration*	PROJECT 0164: *Combat System Integration*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
FY 2009 Accomplishments: In FY09, the program implemented multi-mission scenarios and interoperability test requirements, evaluated interoperability performance, and advised the Fleet of critical interoperability capabilities and limitations. Implementation of these standards is essential to evaluate emerging combat system capabilities, such as in CG/DDG modernization, LCS and CVN 21.					
DAWDF *FY 2009 Accomplishments:* N/A	0.311	0.000	0.000	0.000	0.000
Platform/Strike Force Certification This program conducts Interoperability Assessments (IA) in support of the Naval Warfare System Certification Plan (NWSCP) using the Distributed Engineering Plant (DEP). *FY 2009 Accomplishments:* Five (5) Systems Engineering Events (SEEs) were conducted for root-cause determination of key interoperability problems and to support development of new force-level warfare system capabilities such as Shipboard Gridlock System (SGS), Fleet requirements and Global Command and Control System (GCCS). *FY 2010 Plans:* The program will support two (2) IAs per year (new ships have priority) and no SEEs. *FY 2011 Base Plans:* The program will conduct two (2) IAs while expanding the number of SEE events from two (2) to three (3) in order to continue support for GCCS, SGS, Fleet and other associated programs under development.	14.381	11.535	12.117	0.000	12.117

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603582N: *Combat System Integration*	PROJECT 0164: *Combat System Integration*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
Fleet Response Plan (FRP)	7.119	4.240	4.875	0.000	4.875
FY 2009 Accomplishments: Efforts focused on transitioning work to support minimum sustainability of Capabilities and Limitations (C&L) documentation, Strike Force Interoperability Officers (SFIOs), and on-site Project Engineers (PEs). The FY09 efforts decreased evaluation from 27 originally planned to 14 Strike Groups within the D-6 window in order to continue development and distribution of Strike Group C&L documentation. This includes support to meet Emergency Surge, Surge, Normal Deployment, and includes Center for Surface Combat Systems (CSCS) training events with updated material from documented findings/ results of underway and Interoperability Certification test events and will support seven (7) SFIOs and four (4) PEs. *FY 2010 Plans:* The program will support four (4) SFIOs, two (2) on-site PEs and C&L documentation each year. *FY 2011 Base Plans:* The program will support four (4) SFIOs, two (2) on-site PEs and C&L documentation each year.					
Combat Systems Certification Support of Platform Certification	5.500	2.169	2.440	0.000	2.440
FY 2009 Accomplishments: The program conducted 9 WSI2Ts, 11 Platform Certification Decisions (PCDs) and 11 Initial Platform Certification Decisions (IPCDs). *FY 2010 Plans:* The program will conduct 16 WSI2Ts, 23 Platform Certification Decisions (PCDs) and 17 Initial Platform Certification Decisions (IPCDs).					

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603582N: *Combat System Integration*	PROJECT 0164: *Combat System Integration*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
FY 2011 Base Plans: The program will conduct 16 WSI2Ts, 23 Platform Certification Decisions (PCDs) and 17 Initial Platform Certification Decisions (IPCDs).					
Navigation System Certification (NAVCERT) NAVSEAINST 9420.4 dated May 02 requires that a Navigation System Certification (NAVCERT) be performed as a result of: initial installation/new construction, major system overhaul/modification/ repair when it is determined to impact the accuracy of navigation data, changes to the navigation baseline configuration, or elapsed time of more than five (5) years since previous NAVCERT. A NAVCERT certifies to NAVSEA, Ship Program Managers (SPMs), Type Commanders (TYCOMs), and Fleet that the Shipboard Navigation Systems are: properly installed and in good physical condition, operating to specified accuracy and requirements under both dockside (static) and at-sea (dynamic) conditions, calibrated and operating to required performance specifications, and that analog and digital navigation data is transmitted and received within specified limits to all shipboard users, specifically combat, aircraft landing and weapon systems. A successful NAVCERT, indicating the Integrated Navigation Suite is certified, is required for Platform Certification Decision (PCD) Milestones and Tactical Tomahawk Weapons Control System (TTWCS), Precision Approach and Landing Systems (PALS), and the Electronic Charting and Display System (ECDIS-N)Certification Test Program. Fleet Message CNSF 211506Z, dated Nov 05 highlights the need to validate safety of navigation as critical to assurance of operational readiness. *FY 2009 Accomplishments:* 31 ships required NAVCERT, specifically 20 CRUDES, five (5) aircraft carriers, and six (6) amphibious ships. *FY 2010 Plans:* 27 ships require NAVCERT, specifically 21 CRUDES, two (2) aircraft carriers, and four (4) amphibious ships.	1.500	1.500	1.500	0.000	1.500

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603582N: *Combat System Integration*	PROJECT 0164: *Combat System Integration*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
FY 2011 Base Plans: 28 ships require NAVCERT, specifically 20 CRUDES, three (3) aircraft carriers, and five (5) amphibious ships.					
DEP Engineering and Operations Distributed Engineering Plant (DEP) engineering and operations performs systems engineering, and operations functions to ensure (DEP) infrastructure supports testing of combat system baselines. The program conducts systems engineering to identify simulation/stimulation requirements necessary to achieve required fidelity for DEP testing at Navy laboratory sites through Verification, Validation and Accreditation (VV&A). *FY 2009 Accomplishments:* The new projected nodes included upgrading Surface Combat Systems Center (SCSC) node. *FY 2010 Plans:* The one (1) node (CSEDS Moorestown, NJ) that has legacy baselines will no longer be supported, the remaining DEP infrastructure can meet requirements with existing nodes. Tests will focus on new systems under development. *FY 2011 Base Plans:* The program will support one VV&A event per year.	7.161	3.000	3.412	0.000	3.412
ATRT Automated Test and Re-Test Automated Test and Re-Test (ATRT) capability implementations target AEGIS combat System, the Joint Single Integrated Air Picture (SIAP) Programs with development and the Ship Self Defense System (SSDS) Program within production to demonstrate savings for test and evaluation evolutions throughout the acquisition life cycle.	10.000	0.000	0.000	0.000	0.000

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603582N: *Combat System Integration*	PROJECT 0164: *Combat System Integration*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
FY 2009 Accomplishments: Targeted demonstrations for AEGIS Combat Systems, SIAP and SSDS to demonstrate capability and savings for test evolutions throughout the acquisition life cycle.					
CNI/OA Transformation Road Map Common Network Interface/Open Architecture (CNI/OA) Transformation Road Map *FY 2009 Accomplishments:* FY09: Continued systems engineering support, software support, and integrated logistics support (ILS) to ensure proper coordination and connectivity of hardware and software components for accurate operation.	13.500	0.000	0.000	0.000	0.000
Accomplishments/Planned Programs Subtotals	62.472	22.444	24.344	0.000	24.344

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total	FY 2012	FY 2013	FY 2014	FY 2015	Cost To Complete	Total Cost
• OPN 2960: *(ICSTD/DEP): Integrated Combat System Test Division/Distributed Engineering Plant*	4.545	4.410	4.445	0.000	4.445	4.472	4.532	4.597	4.664	Continuing	Continuing

D. Acquisition Strategy

RDTEN funding under this line supports independent certification of the integration of major capability upgrades acquired by Program Executive Offices (PEOs) into host Navy Platforms and Strike Forces. The RDTEN engineering and certification activities at field sites does not involve direct procurement of equipment or engineering services, and hence no acquisition strategy is required. The major capability upgrades evaluated under this program fall under their associated PEOs' acquisition strategies.

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
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E. Performance Metrics

TBD

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603582N: *Combat System Integration*	PROJECT 0164: *Combat System Integration*	

Product Development ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
SF Requirements Engineering & Analysis	WR	NSWC DN/PHD/Corona	5.157	0.000		0.000		0.000		0.000	0.000	5.157	Continuing
SF Requirements Engineering & Analysis	WR	Non-NSWCs Various	5.295	0.000		0.000		0.000		0.000	0.000	5.295	Continuing
Platform/Strike Force Certification	WR	NSWC DD/ICSTD/DN	27.550	6.000	Nov 2009	6.000	Nov 2010	0.000		6.000	Continuing	Continuing	Continuing
Platform/Strike Force Certification	WR	Non-NSWCs Various	19.597	3.935	Dec 2009	4.411	Dec 2010	0.000		4.411	Continuing	Continuing	Continuing
Fleet Response Plan (FRP)	WR	NSWC PHD/DN	21.101	3.000	Nov 2009	2.980	Nov 2010	0.000		2.980	Continuing	Continuing	Continuing
Fleet Response Plan (FRP)	WR	Non-NSWCs Various	1.850	1.000	Dec 2009	1.000	Dec 2010	0.000		1.000	Continuing	Continuing	Continuing
Combat Systems Cert ISO Platform Cert	WR	NSWC DN/DD/PHD/ Corona	20.055	2.169	Jan 2010	2.440	Jan 2011	0.000		2.440	Continuing	Continuing	Continuing
Combat Systems Cert ISO Platform Cert	WR	Non-NSWCs Various	1.883	0.000		0.000		0.000		0.000	0.000	1.883	Continuing
Navigation System Certification	WR	SPAWAR Charleston	1.500	1.500	Jan 2010	1.500	Jan 2011	0.000		1.500	Continuing	Continuing	Continuing
DEP Engineering and Operations	WR	NSWC DD/SPAWAR/ San Diego/SCSC/ Wallops	14.371	1.300	Apr 2010	1.500	Apr 2011	0.000		1.500	Continuing	Continuing	Continuing
DEP Engineering and Operations	WR	Non-NSWCs Various	10.152	1.300	May 2010	1.213	May 2011	0.000		1.213	Continuing	Continuing	Continuing
CNI/Design Agent	SS/CPAF		47.926	0.000		0.000		0.000		0.000	0.000	47.926	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603582N: *Combat System Integration*	PROJECT 0164: *Combat System Integration*	

Product Development ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
		General Dynamics Not Specified											
CNI/Software Engineering	WR	NSWC Dahlgren	8.383	0.000		0.000		0.000		0.000	0.000	8.383	Continuing
CNI/Test and Evaluation	WR	CDSA Not Specified	3.922	0.000		0.000		0.000		0.000	0.000	3.922	Continuing
CNI/Systems Engineering	WR	NSWC PHD	2.645	0.000		0.000		0.000		0.000	0.000	2.645	Continuing
CNI/Miscellaneous	WR	Various Various	7.529	0.000		0.000		0.000		0.000	0.000	7.529	Continuing
OA Automated Test and Retest	WR	NSWCs Various	17.500	0.000		0.000		0.000		0.000	0.000	17.500	Continuing
Contract Engineering Support	C/CPFF	Gryphon Technology VA	10.159	1.000	Dec 2009	1.500	Dec 2010	0.000		1.500	Continuing	Continuing	Continuing
Contract Program Management Support	C/CPFF	Delta Resources Inc. VA	5.641	1.000	Dec 2009	1.500	Dec 2010	0.000		1.500	Continuing	Continuing	Continuing
Travel	Allot	NAVSEA HQ Washington, DC	1.050	0.240	Sep 2010	0.300	Sep 2011	0.000		0.300	Continuing	Continuing	Continuing
Interoperability Fixes	WR	NSWCs Various	1.500	0.000		0.000		0.000		0.000	0.000	1.500	Continuing
		Subtotal	234.766	22.444		24.344		0.000		24.344			

Remarks

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603582N: *Combat System Integration*	PROJECT 0164: *Combat System Integration*

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	FY 2010 Cost	FY 2010 Award Date	FY 2011 Base Cost	FY 2011 Base Award Date	FY 2011 OCO Cost	FY 2011 OCO Award Date	FY 2011 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
DAWDF	C/TBD	Not Specified Not Specified	0.311	0.000		0.000		0.000		0.000	0.000	0.311	Continuing
		Subtotal	0.311	0.000		0.000		0.000		0.000	0.000	0.311	

Remarks

	Total Prior Years Cost	FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	235.077	22.444		24.344		0.000		24.344			

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2011 Navy		**DATE:** February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603582N: *Combat System Integration*	**PROJECT** 0164: *Combat System Integration*

CLASSIFICATION:	UNCLASSIFIED	
EXHIBIT R-4, SCHEDULE PROFILE		DATE March 2009
	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND NAME
RDTEN/BA 4	0603582N/COMBAT SYSTEM INTEGRATION	0164/COMBAT SYSTEM INTEGRATION

Fiscal Year	2009				2010				2011				2012				2013				2014				2015			
Quarter	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Months	Oct-Dec	Jan-Mar	Apr-Jun	Jul-Sep	Oct-Dec	Jan-Mar	Apr-Jun	Jul-Sep	Oct-Dec	Jan-Mar	Apr-Jun	Jul-Sep	Oct-Dec	Jan-Mar	Apr-Jun	Jul-Sep	Oct-Dec	Jan-Mar	Apr-Jun	Jul-Sep	Oct-Dec	Jan-Mar	Apr-Jun	Jul-Sep	Oct-Dec	Jan-Mar	Apr-Jun	Jul-Sep
CVN 70/77 WSI2T (PSA) @ ICSTF	1																											
LHA 5 WSI2T RETEST @ DN	1																											
LHD 7/8 WSI2T @ ICSTF	1	2																										
LPD 17/18/20 WSI2T @ ICSTF	1																											
CVN 76 WSI2T @ WI		2	3																									
CVN 76 WSI2T @ ICSTF (NAV ONLY TEST)			3																									
LSD 41/49 CLASS WSI2T @ WI			3																									
LPD 21/22/23 w/GIG-E WSI2T @ ICSTF			3	4																								
LPD 21/22/23 w/GIG-E WSI2T GIG-E TEST @ WI			3	4																								
LCS 1 CORE AD WSI2T			3	4	1																							
CVN 74 WSI2T @ ICSTF				4	1																							
CVN 68/69/75 @ WI				4	1		3	4																				
LCS 1 CORE SW WSI2T				4	1																							
LCS 2 CORE AD WSI2T				4	1	2																						
CVN 73 WSI2T @ ICSTF				4																								
LCS 2 CORE SW WSI2T					1	2																						
CVN 73 @ ICSTF						2	3																					
LHD 1 @ ICSTF							3	4																				
LPD 17/20 @ ICSTF								4																				
LSD 50 AIP WSI2T @ WI								4	1																			
LHD 8 WSI2T @ WI								4	1																			
LHA 5 WSI2T @ DN								4	1																			
LHA 5 Annual Event WSI2T @ DN									1				1															
LCS 1 MCM WSI2T									1																			
LCS 2 MCM WSI2T									1																			
LHD 3/4 @ DN										2																		
CVN 77/70 WSI2T @ WI										2	3																	
LHD 2/5/6 WSI2T @ DN											3	4																
CVN 76 WSI2T @ WI											3	4																
LPD 24/25 OA forward fit WSI2T @ WI											3	4																
CVN 71 WSI2T @ WI (RCOH/CIA)											3	4					1											
LCS 1 ASW WSI2T											3																	
LPD 18 OA Backfit WSI2T @ WI												4	1	2	3													
LCS 2 ASW WSI2T												4	1															
LHD 7 WSI2T @ NSWC DD												4	1															
LCS 1 SUW WSI2T													1															
LCS 2 SUW WSI2T													1															
CVN 69 WSI2T @ NSWC DD														2	3	4												
CVN 78 CSIT/WSI2T @ WI / NSWC DD															3	4	1	2	3	4						2	3	4
LHA 6 WSI2T @ NSWC DD																	1	2	3									
CVN 70/72 WSI2T @ NSWC DD																							3	4	1			

Exhibit R-4A, RDT&E Schedule Details: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603582N: *Combat System Integration*	**PROJECT** 0164: *Combat System Integration*

Schedule Details

	Start		End	
Event	**Quarter**	**Year**	**Quarter**	**Year**
CVN 70/77 WSI2T (PSA) @ ICSTD	1	2009	1	2009
LHA 5 WSI2T RETEST @ Dam Neck (DN)	1	2009	1	2009
LHD 7/8 WSI2T @ ICSTD	1	2009	2	2009
LPD 17/18/20 WSI2T @ ICSTD	1	2009	1	2009
CVN 76 WSI2T @ Wallops Island (WI)	2	2009	3	2009
CVN 76 WSI2T @ ICSTD (NAV ONLY TEST)	3	2009	3	2009
LSD 41/49 CLASS WSI2T @ Wallops Island	3	2009	3	2009
LPD 21/22/23 w/GIG-E WSI2T @ ICSTD	3	2009	4	2009
LPD 21/22/23 w/GIG-E WSI2T GIG-E Test @ WI	3	2009	4	2009
LCS 1 CORE AD WSI2T	3	2009	1	2010
CVN 74 WSI2T @ ICSTD	4	2009	1	2010
CVN 68/69/75 @ Wallops Island	4	2009	3	2010
LCS 1 CORE SW WSI2T	4	2009	1	2010
LCS 2 CORE AD WSI2T	4	2009	2	2010
CVN 73 WSI2T @ ICSTD	4	2009	4	2009
LCS 2 CORE SW WSI2T	1	2010	2	2010
CVN 73 @ ICSTD	2	2010	3	2010
LHD 1 @ ICSTD	3	2010	4	2010

Exhibit R-4A, RDT&E Schedule Details: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603582N: *Combat System Integration*	PROJECT 0164: *Combat System Integration*

	Start		End	
Event	Quarter	Year	Quarter	Year
LPD 17/20 @ ICSTD	4	2010	4	2010
LSD 50 AIP WSI2T @ Wallops Island	4	2010	1	2011
LHD 8 WSI2T @ Wallops Island	4	2010	1	2011
LHA 5 WSI2T @ DN	4	2010	1	2011
LHA 5 Annual Event WSI2T @ DN	1	2011	1	2012
LCS 1 MCM WSI2T	1	2011	1	2011
LCS 2 MCM WSI2T	1	2011	1	2011
LHD 3/4 @ DN	2	2011	2	2011
CVN 77/70 @ Wallops Island	2	2011	3	2011
LHD 2/5/6 WSI2T @ DN	3	2011	4	2011
CVN 76 WSI2T @ Wallops Island	3	2011	4	2011
LPD 24/25 OA Forward Fit WSI2T @ Wallops Island	3	2011	4	2011
CVN 71 WSI2T @ WI (RCOH/CIA)	3	2011	1	2013
LCS 1 ASW WSI2T	3	2011	3	2011
LPD 18 OA Backfit WSI2T @ WI	4	2011	2	2012
LCS 2 ASW WSI2T	4	2011	1	2012
LHD 7 WSI2T @ NSWC/ DD	4	2011	1	2012
LCS 1 SUW WSI2T	1	2012	1	2012
LCS 2 SUW WSI2T	1	2012	1	2012
CVN 69 WSI2T @ NSWC /DD	2	2012	3	2012

Exhibit R-4A, RDT&E Schedule Details: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603582N: *Combat System Integration*	PROJECT 0164: *Combat System Integration*

	Start		End	
Event	Quarter	Year	Quarter	Year
CVN 78 CSIT/WSI2T @ WI/ NSWC/ DD	3	2012	3	2015
LHA 6 WSI2T @ NSWC/ DD	1	2013	2	2013
CVN 70/72 WSI2T @ NSWC /DD	3	2014	1	2015

Exhibit R-2, RDT&E Budget Item Justification: PB 2011 Navy										DATE: February 2010	
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*				R-1 ITEM NOMENCLATURE PE 0603609N: *Conventional Munitions*							
COST ($ in Millions)	**FY 2009 Actual**	**FY 2010 Estimate**	**FY 2011 Base Estimate**	**FY 2011 OCO Estimate**	**FY 2011 Total Estimate**	**FY 2012 Estimate**	**FY 2013 Estimate**	**FY 2014 Estimate**	**FY 2015 Estimate**	**Cost To Complete**	**Total Cost**
Total Program Element	6.368	4.241	5.388	0.000	5.388	4.988	5.491	5.758	6.014	Continuing	Continuing
0363: *Insensitive Munitions Adv. Development*	2.479	3.444	5.388	0.000	5.388	4.988	5.491	5.758	6.014	Continuing	Continuing
1821: *Conventional Fuzed Warfare Package*	3.357	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	165.143
2299: *Non-Nuclear Expendable Ordnance*	0.532	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	88.518
9999: *Congressional Adds*	0.000	0.797	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.707

A. Mission Description and Budget Item Justification

Insensitive Munitions Advanced Development (IMAD) (Project 0363) - Most Navy munitions react violently when exposed to unplanned stimuli such as fire, shock and bullet or fragment impact, thus presenting a great hazard to ships, aircraft and personnel. This program will provide, validate and transition technology to all new weapon developments and
priority weapon systems and enable production of munitions insensitive to these stimuli with no reduction in combat performance. IMAD is the Navy's focused effort on propellants, propulsion units, explosives, warheads, fuses and pyrotechnics to reduce the severity of cook-off and bullet/fragment impact reactions, minimizing the probability for sympathetic detonation, both in normal storage and in use, increasing ship and platform survivability and satisfying performance and readiness requirements.

Conventional Fuzed Warhead Package (Project 1821) - The Navy requires improved lethality of air and surface launched ordnance to defeat advanced threats. This is the only Navy 6.3B RDT&E program that addresses improvements in warhead and fuze technology to meet this requirement. This program is a significant vehicle for orderly planning, and timely and effective transition of Navy 6.2 and 6.3A investments to Engineering and Manufacturing Development (E&MD) phase missile/ weapon systems. This program addresses increased lethality against current and emerging threats, and is responsive to all mission areas anti-air, strike, defense suppression, theater defense and ship defense and supports development of complete ordnance sections. The current on-going projects address significant technology advancements for missile systems by developing mature physical concepts to enhance anti-air kill probability, advanced ordnance with augmented overland cruise missile defense and theater ballistic missile defense capabilities, and advanced seeker technology and development and incorporation of Software Guidance Integrated Fuzing (S/W GIF). The program supports the full spectrum of missile advanced development and technology improvements

Exhibit R-2, RDT&E Budget Item Justification: PB 2011 Navy	DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603609N: *Conventional Munitions*

and in future years will continue to provide the vehicle to address emergent requirements by transitioning mature development efforts into weapon systems with minimal technical and financial risk.

Non-Nuclear Expendable Ordnance (NNEO) (Project 2299) - This item addresses improvements to Navy surface launched (2T) NNEO.

Improved Kinetic Energy Cargo Round (Project 10C120) - To design, develop, and demonstrate technologies and components for a kinetic energy payload for a 5-inch round. The Navy I-KEET program projectile features a forward expulsion mechanism to expel a multi-component kinetic energy payload with significantly increased on-target energy and expanded lethality footprint relative to its predecessor. The I-KEET round, considered to be a product-improved version of the MK182 KE-ET for ship self defense and force protection with higher lethality against a broader array of threats at a greater range.

B. Program Change Summary ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
Previous President's Budget	8.087	3.458	0.000	0.000	0.000
Current President's Budget	6.368	4.241	5.388	0.000	5.388
Total Adjustments	-1.719	0.783	5.388	0.000	5.388
• Congressional General Reductions		-0.017			
• Congressional Directed Reductions		0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds		0.800			
• Congressional Directed Transfers		0.000			
• Reprogrammings	-1.567	0.000			
• SBIR/STTR Transfer	-0.152	0.000			
• Program Adjustments	0.000	0.000	5.388	0.000	5.388

Congressional Add Details ($ in Millions, and Includes General Reductions)	FY 2009	FY 2010
Project: 9999: *Congressional Adds*		
Congressional Add: *Improved Kinetic Energy Cargo Round*	0.000	0.797
Congressional Add Subtotals for Project: 9999	0.000	0.797
Congressional Add Totals for all Projects	0.000	0.797

Exhibit R-2, RDT&E Budget Item Justification: PB 2011 Navy	DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603609N: *Conventional Munitions*

Change Summary Explanation

Technical: Not applicable.

Schedule: Not applicable.

FY11 from previous President's Budget is shown as zero because no FY11-15 data was presented in President's Budget 2010.

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603609N: *Conventional Munitions*	PROJECT 0363: *Insensitive Munitions Adv. Development*	

COST ($ in Millions)	FY 2009 Actual	FY 2010 Estimate	FY 2011 Base Estimate	FY 2011 OCO Estimate	FY 2011 Total Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
0363: *Insensitive Munitions Adv. Development*	2.479	3.444	5.388	0.000	5.388	4.988	5.491	5.758	6.014	Continuing	Continuing
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0		

A. Mission Description and Budget Item Justification

Most Navy munitions react violently when exposed to unplanned stimuli such as fire, shock and bullet impact, thus presenting a great hazard to ships, aircraft and personnel. This program will provide, validate and transition technology to all new weapon developments and priority weapon systems and enable production of munitions insensitive to these stimuli with no reduction in combat performance. The Insensitive Munitions (IM) Program is the Navy's focused effort on propellants, propulsion units, explosives, warheads, fuses and pyrotechnics to reduce the severity of cook-off and bullet/fragment impact reactions, minimizing the probability for sympathetic detonation, both in normal storage and in use, increasing ship survivability and satisfying performance and readiness requirements. Each technology area is divided into subtasks addressing specific munition/munition class IM deficiencies. Energetic materials producibility is demonstrated to assure national capability to produce and load munitions systems. The program leverages are being closely coordinated with other Military Departments, North Atlantic Treaty organization (NATO) and allied countries to eliminate redundant efforts and maximize efficiency. A joint service IM requirement has been developed and through the IM Strategic Planning process, all PEO's are implementing IM in their priority munitions. Insensitive munitions are identified as a DoD critical technology requirement and considered as part of a weapon design. The Insensitive Munitions Advanced Development (IMAD) program matures the technology developed by a variety of Science and Technology (S&T) sources for program management integration into weapons systems to meet the IM technical deficiencies documented in the PEO IM Strategic Plans. IMAD provides the link between S&T programs and the PMs by optimizing IM technologies to meet Navy requirements. IMAD offers risk mitigation for the PMs in terms of IM technical knowledge, expertise and manpower with the State of the Art expertise across IM products. Each technology area is divided into subtasks addressing specific munition and munition class IM deficiencies.

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
Insensitive Munitions Adv. Development	2.479	3.444	5.388	0.000	5.388
Validate and assess weapon systems POA&M's for Insensitive Munitions (IM) compliance. Review Insensitive Munitions Strategic Plan (IMSP) for Navy Compile and analyze weapon system, energetic					

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603609N: *Conventional Munitions*	PROJECT 0363: *Insensitive Munitions Adv. Development*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
material and generic technology IM test data. Perform Threat Hazard Assessments (THAs). Perform analysis of Energetic Material properties logistic process. Review IM Certification and Waivers. Support Insensitive Munitions Council (IMC), Insensitive Munitions Coordination Group (IMCG), and IMC Working Group. Support and develop Insensitive Munitions Technology Tool (IMT2). Support North Atlantic Treaty Organization Standardization Agreement (NATO STANAG) and Advanced Operations (AOP) development. Support Insensitive Munitions Advanced Development (IMAD) program briefs. Support all Navy Joint Services Insensitive Munitions Technical Panel (JSIMTP) meetings. Support Explosive Safety Working Group (ESWG) meetings. Provide task management support for financial management, review of programmatic deliverables and overall task coordination. *FY 2009 Accomplishments:* Demonstrate high explosives that show improved IM characteristics while maintaining or improving operational performance. Evaluate pressed and cast metal accelerating explosives. Complete qualification of high performance booster explosive for multiple weapons systems. Begin qualification of best candidate metal accelerating explosive. Perform Experimental Plastic-Bonded Explosive, Indian Head (PBXIH-18) production evaluation. Perform Class 5 Cyclotetramethylenetetranitramine (HMX) particle size evaluation in Plastic-Bonded Explosive, Navy (PBXN-114) to optimize particle size distribution. Perform a study to show the effect of levels of confinement have on IM response for cookoff of shaped charge warheads. *FY 2010 Plans:* Evaluate and Demonstrate IM gun propulsion systems which provide improved or comparable performance to in-service systems and have improved IM characteristics. Gun propellants are being formulated with less sensitive ingredients to decrease IM response, while still maintaining the energy and performance of the gun system. Less sensitive energetic solids are replacing part of the shock sensitive RDX in these formulations. In addition, less sensitive binder systems are being developed that help by partitioning the energy of the propellant system to help minimize IM response. Initial small-					

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603609N: *Conventional Munitions*	PROJECT 0363: *Insensitive Munitions Adv. Development*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
scale testing of a new propellant formulation to extend the range for the conventional 5" gun shows that these formulations are much less sensitive to shock initiation than currently fielded propellants. Cooperative effort with AGS Long Range Land Attack Projectile (LRLAP) program office to develop a new IM propellant, i.e. formulate, scale-up, test. *FY 2011 Base Plans:* Evaluate and demonstrate IM propellants and propulsion systems which provide improved or comparable performance to in-service systems and better IM characteristics. Combine candidate IM propellants and case concepts to demonstrate compliance with IM and performance requirements. Demonstrate an insensitive multi-mission, high performance rocket motor. Evaluate options for minimum smoke propellants for shoulder launched applications. Evaluated and demonstrated IM boost propellant formulation for future Tomahawk systems which provide improved and comparable performance to in-service systems and better IM characteristics. Combined candidate IM propellants and case concepts to demonstrate compliance with IM and performance requirements. Design a composite booster case for Tomahawk which will improve IM performance for cookoff and impact scenarios. Demonstrate new formulations that will self extinguish while maintaining performance for Advanced Medium-Range Air to Air Missile (AMRAAM), Sidewinder and other air launched systems. Look at new way to develop rocket propellant formulations that meet performance requirements and solve IM deficiencies. IM problems resolution using top down approach.Evaluate ordnance and container concepts. Model applications that reduce and enhance IM warhead design. Assess the operations utility of current and projected IM improvements to determine current state of IM and prioritize future funding for IM technology. Assess shielding evaluation of Tomahawk VLS storage canister. New cooperative effort with Advanced Gun System (AGS) LRLAP to review modeling to solve impact and cookoff with AUR pallet.					
Accomplishments/Planned Programs Subtotals	2.479	3.444	5.388	0.000	5.388

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603609N: *Conventional Munitions*	PROJECT 0363: *Insensitive Munitions Adv. Development*

C. Other Program Funding Summary ($ in Millions)

N/A

D. Acquisition Strategy

NOT APPLICABLE-

The Insensitive Munitions Advanced Development Program (IMAD) is assigned as a Non-ACAT program and therefore does not have program milestones like the ACAT I to IV programs. IMAD develops and evaluates IM technologies for use in Navy weapon systems and is not part of a particular weapon acquisition program.

E. Performance Metrics

Quarterly Program Reviews

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603609N: *Conventional Munitions*	PROJECT 0363: *Insensitive Munitions Adv. Development*

Product Development ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
PROPULSION DEV. AND EVAL.	WR	NAWC DIV/ CHINA LAKE WX	88.295	0.665	Nov 2009	1.123	Nov 2010	0.000		1.123	0.000	90.083	Continuing
EXPLOSIVES DEV. AND EVAL.	WR	NSWC/INDIAN HEAD DIV. WX	72.368	1.038	Nov 2009	1.930	Nov 2010	0.000		1.930	0.000	75.336	Continuing
ORDNANCE DEV. AND EVAL.	WR	NSWC/ DAHLGREN WX	20.376	0.386	Nov 2009	0.325	Nov 2010	0.000		0.325	0.000	21.087	Continuing
GUN PROPULSION AND EVAL.	WR	NSWC/INDIAN HEAD DIV. WX	1.109	0.640	Nov 2009	1.125	Nov 2010	0.000		1.125	0.000	2.874	Continuing
		Subtotal	182.148	2.729		4.503		0.000		4.503	0.000	189.380	

Remarks

Management Services ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
PROGRAM MANAGEMENT SUPT	WR	NOSSA IN HEAD MD	4.397	0.715	Nov 2009	0.885	Nov 2010	0.000		0.885	0.000	5.997	Continuing
		Subtotal	4.397	0.715		0.885		0.000		0.885	0.000	5.997	

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603609N: *Conventional Munitions*	PROJECT 0363: *Insensitive Munitions Adv. Development*

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	FY 2010 Cost	FY 2010 Award Date	FY 2011 Base Cost	FY 2011 Base Award Date	FY 2011 OCO Cost	FY 2011 OCO Award Date	FY 2011 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Remarks													

	Total Prior Years Cost	FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	186.545	3.444		5.388		0.000		5.388	0.000	195.377	

Remarks

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603609N: *Conventional Munitions*	PROJECT 1821: *Conventional Fuzed Warfare Package*	

COST ($ in Millions)	FY 2009 Actual	FY 2010 Estimate	FY 2011 Base Estimate	FY 2011 OCO Estimate	FY 2011 Total Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
1821: *Conventional Fuzed Warfare Package*	3.357	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	165.143
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0		

A. Mission Description and Budget Item Justification

This program provides for orderly planning, timely maturation, and effective transition of Navy 6.2 and 6.3A investments in ordnance technology to missile/weapon systems end item System Development and Demonstration (SD&D) phase development. It is the only Navy 6.3B RDT&E program that addresses improvements in warhead and fuze technology. It focuses on increasing effectiveness against current and emerging threats and is responsive to all mission areas -- anti-air, strike, defense suppression, theater defense, and ship defense. On-going projects make advanced fuze and warhead technology available to and reduce the time and risk for specific system development programs by performing three important functions: (1) identify technology advances with the most potential to improve generic warhead and fuze safety, reliability, and effectiveness, e.g. development and incorporation of Software Guidance Integrated Fuzing - S/W GIF: (2) mature the most promising technologies with a goal of achieving Technology Readiness Level 6, or preferably TRL 7, and (3) transition mature technology to specific cruise missile, surface-to-air missile, and land attack weapons system development programs. The program supports the full spectrum of missile advanced development and technology improvements and in future years will continue to provide the vehicle to address emergent requirements by transitioning mature development efforts into weapon systems with minimal technical and financial risk.

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
Conventional Fuzed Warfare Package *FY 2009 Accomplishments:* N/A	3.357	0.000	0.000	0.000	0.000
Accomplishments/Planned Programs Subtotals	3.357	0.000	0.000	0.000	0.000

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603609N: *Conventional Munitions*	PROJECT 1821: *Conventional Fuzed Warfare Package*

C. Other Program Funding Summary ($ in Millions)

N/A

D. Acquisition Strategy

Raytheon Missile Systems is designing and implementing Fuze enhancements for current missiles like the SM-2 and for future platforms like the SM-6. This evolution in fuzing technology is required to pace current threats to the US Navy.

E. Performance Metrics

Quarterly Program Reviews

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603609N: *Conventional Munitions*	PROJECT 2299: *Non-Nuclear Expendable Ordnance*	

COST ($ in Millions)	FY 2009 Actual	FY 2010 Estimate	FY 2011 Base Estimate	FY 2011 OCO Estimate	FY 2011 Total Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
2299: *Non-Nuclear Expendable Ordnance*	0.532	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	88.518
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0		

A. Mission Description and Budget Item Justification

This budget item addresses improvements to Navy surface launched (2T) Non-Nuclear Expendable Ordnance (NNEO) outside existing operational capabilities. The commodities comprising 2T NNEO are : Major and medium caliber gun ammunition, small arms ammunition, other ship gun ammunition, pyrotechnics, and demolition items. There are no other RDT&E budget items supporting the 2T NNEO program. This project currently supports the close-out of the Guidance Integrated Fuze (GIF) SAASMS receiver Development to TRL 6.

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
Non-Nuclear Expendable Ordnance	0.532	0.000	0.000	0.000	0.000
FY 2009 Accomplishments: N/A					
Accomplishments/Planned Programs Subtotals	0.532	0.000	0.000	0.000	0.000

C. Other Program Funding Summary ($ in Millions)

N/A

D. Acquisition Strategy

Completed development of Guidance Integrated Fuze to Technology Readiness Level 6 and development of GPS SAASM Receiver to Technology Readiness Level of 6.

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603609N: *Conventional Munitions*	PROJECT 2299: *Non-Nuclear Expendable Ordnance*

E. Performance Metrics

Quarterly Program Reviews

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603609N: *Conventional Munitions*	PROJECT 9999: *Congressional Adds*	

COST ($ in Millions)	FY 2009 Actual	FY 2010 Estimate	FY 2011 Base Estimate	FY 2011 OCO Estimate	FY 2011 Total Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
9999: *Congressional Adds*	0.000	0.797	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.707
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0		

A. Mission Description and Budget Item Justification

To design, develop, and demonstrate technologies and components for a kinetic energy payload for a 5-inch round. The Navy I-KEET program projectile features a forward expulsion mechanism to expel a multi-component kinetic energy payload with significantly increased on-target energy and expanded lethality footprint relative to its predecessor. The I-KEET round, considered to be a product-improved version of the MK182 KE-ET for ship self defense and force protection with higher lethality against a broader array of threats at a greater range.

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010
Congressional Add: Improved Kinetic Energy Cargo Round *FY 2010 Plans:* - Further develop payload expulsion, payload dispersion, projectile body design, base plug strengthening, and nose removal; - Demonstrate all components in full scale bench tests and in full scale integrated live-fire warhead tests;	0.000	0.797
Congressional Adds Subtotals	0.000	0.797

C. Other Program Funding Summary ($ in Millions)

N/A

D. Acquisition Strategy

N/A

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603609N: *Conventional Munitions*	PROJECT 9999: *Congressional Adds*

E. Performance Metrics

Quarterly Program Reviews.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2011 Navy	DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603611M: *Marine Corps Assault Vehicles*

COST ($ in Millions)	FY 2009 Actual	FY 2010 Estimate	FY 2011 Base Estimate	FY 2011 OCO Estimate	FY 2011 Total Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
Total Program Element	256.042	292.217	242.765	0.000	242.765	179.041	94.026	51.428	25.660	Continuing	Continuing
0020: *AAAV*	256.042	292.217	242.765	0.000	242.765	179.041	94.026	51.428	25.660	Continuing	Continuing

A. Mission Description and Budget Item Justification

This Program Element (PE) includes funds for the Expeditionary Fighting Vehicle (EFV) Program which will field a successor to the Marine Corps' current amphibious vehicle, the Assault Amphibious Vehicle Model 7A1 (AAV7A1). The EFV will provide the principal means of tactical surface mobility for the Marine Air Group Task Force (MAGTF) during both ship-to-objective maneuvers and sustained combat operations ashore. The EFV will provide the Marine Corps with the capability to execute the full spectrum of military missions from humanitarian operations to conventional combat operations. The EFV replaces the AAV7A1 Vehicle, which was originally fielded in the early 1970s. The EFV is a self-deploying, high-water speed, amphibious, armored, tracked vehicle capable of operating in all weather as well as Nuclear, Biological, and Chemical (NBC) environments.

B. Program Change Summary ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
Previous President's Budget	255.264	293.466	0.000	0.000	0.000
Current President's Budget	256.042	292.217	242.765	0.000	242.765
Total Adjustments	0.778	-1.249	242.765	0.000	242.765
• Congressional General Reductions		-1.218			
• Congressional Directed Reductions		0.000			
• Congressional Rescissions	0.000	-0.031			
• Congressional Adds		0.000			
• Congressional Directed Transfers		0.000			
• Reprogrammings	0.778	0.000			
• SBIR/STTR Transfer	0.000	0.000			
• Program Adjustments	0.000	0.000	242.765	0.000	242.765

Change Summary Explanation

FY11 from previous President's Budget is shown as zero because no FY11-15 data was presented in President's Budget 2010.

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603611M: *Marine Corps Assault Vehicles*	PROJECT 0020: *AAAV*	

COST ($ in Millions)	FY 2009 Actual	FY 2010 Estimate	FY 2011 Base Estimate	FY 2011 OCO Estimate	FY 2011 Total Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
0020: *AAAV*	256.042	292.217	242.765	0.000	242.765	179.041	94.026	51.428	25.660	Continuing	Continuing
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0		

A. Mission Description and Budget Item Justification

This Program Element (PE) includes funds for the Expeditionary Fighting Vehicle (EFV) Program which will field a successor to the Marine Corps' current amphibious vehicle, the Assault Amphibious Vehicle Model 7A1 (AAV7A1). The EFV will provide the principal means of tactical surface mobility for the Marine Air Group Task Force (MAGTF) during both ship-to-objective maneuvers and sustained combat operations ashore. The EFV will provide the Marine Corps with the capability to execute the full spectrum of military missions from humanitarian operations to conventional combat operations. The EFV replaces the AAV7A1 Vehicle, which was originally fielded in the early 1970s. The EFV is a self-deploying, high-water speed, amphibious, armored, tracked vehicle capable of operating in all weather as well as Nuclear, Biological, and Chemical (NBC) environments.

The EFV program is a ACAT-1D program managed by the Marine Corps. The EFV is the next generation of Marine Corps Assault Vehicles being developed to satisfy the requirements of the 21st Century Marine War Fighters. Along with the Landing Craft Air Cushion (LCAC) and the MV-22 Osprey, the EFV will provide the Marine Corps with the tactical mobility assets required within the Expeditionary Maneuver Warfare capstone. Acquisition of the EFV is critical to the Marine Corps. The total EFV requirement is for 573 weapon systems.

The program received approval to enter the System Development and Demonstration (SDD) Phase of the acquisition process during the Milestone II Defense Acquisition Board Readiness Meeting held on 26 November 2000. All program exit criteria were successfully met or exceeded. The initial SDD Phase (2001 through 2008) included validation of manufacturing and production processes, fabrication and testing of SDD vehicles, and finalizing and implementing the Life Cycle Management for EFV. A follow-on SDD Phase beginning in FY 2008 includes continued design, development, and reliability upgrades; increased RAM testing; modification of existing SDD prototypes; and manufacture and testing of seven additional SDD prototype vehicles.

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
Design development, developmental testing, operational testing, and survivability program.	211.540	239.518	178.817	0.000	178.817

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603611M: *Marine Corps Assault Vehicles*	**PROJECT** 0020: *AAAV*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
FY 2009 Accomplishments: Continued engineering and logistics efforts to support design development, manufacturing planning, and design enhancements of the EFV(P) and EFV(C) designs. Continued the EFV survivability program. Continued developmental and reliability test support, and design, integration and testing of MS-C OA identified modifications. Continued design and development of follow-on reliability enhancements, subsystem design modificaitons, and modification of existing vehicles integrating reliabililty design changes. Procured test spares. Continued design, development and manufacture of new SDD prototypes. *FY 2010 Plans:* Continue engineering and logistics efforts to support design development, manufacturing planning, and design enhancements of the EFV(P) and EFV(C) designs. Continue the EFV survivability program. Continue developmental and reliability test support, and design, integration and testing of MS-C OA identified modifications. Continue development of Integrated Electronic Technical Manuals (IETMs). Continue Developmental Testing (DT) and begin Reliability Growth Testing (RGT). Continue design and development of follow-on reliability enhancements, subsystem design modifications, and modification of existing vehicles integrating reliability design changes. Procure test spares. Continue design, development and manufacture of new SDD prototypes, and begin delivery of prototype vehicles. *FY 2011 Base Plans:* Continue engineering and logistics efforts to support design development, manufacturing planning, and design enhancements of the EFV(P) and EFV(C) designs. Continue the EFV survivability program. Continue development of Integrated Electronic Technical Manuals (IETMs). Continue Developmental Testing (DT) and Reliability Growth Testing (RGT). Continue design and development of follow-on reliability enhancements, subsystem design modifications, and modification of existing vehicles integrating reliability design changes. Procure test spares. Support Operational Assessment (OA) of SDD prototypes. Continue system verification (SV) testing and test support, as well as					

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603611M: *Marine Corps Assault Vehicles*	PROJECT 0020: *AAAV*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
design, integration and testing of modifications identified as part of MS-C OA or SV testing. Begin development of Applique Armor.					
Perform developmental testing, operational testing, RAM-D testing, Reliability Growth testing. *FY 2009 Accomplishments:* Performed developmental/operational testing and RAM-D testing. *FY 2010 Plans:* Continue to perform developmental/operational testing and RAM-D testing. Begin Reliability Growth Testing (RGT). *FY 2011 Base Plans:* Continue to perform developmental/operational testing and RGT. Perform Operational Assessment (OA).	8.012	9.420	14.994	0.000	14.994
Provide program support for training development, technical publications and IETMS. *FY 2009 Accomplishments:* Provided program support for training systems development and technical publications and IETMS; developed training systems courseware. *FY 2010 Plans:* Provide program support for training systems development and technical publications and IETMS; development of training systems courseware. *FY 2011 Base Plans:* Provide program support for training systems development and technical publications and IETMS; development of training systems courseware. Increased funding for development of Trainers/ Simulators.	1.764	9.135	16.531	0.000	16.531

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603611M: *Marine Corps Assault Vehicles*	PROJECT 0020: *AAAV*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
Contractor Support	16.098	14.952	17.185	0.000	17.185
FY 2009 Accomplishments: Provided contractor technical, engineering and management support for program planning, analysis and execution. Provided software design, development and integration support. *FY 2010 Plans:* Provide contractor technical, engineering and management support for program planning, analysis and execution. Continue to provide software design, development and integration support. *FY 2011 Base Plans:* Provide contractor technical, engineering and management support for program planning, analysis and execution. Continue to provide software design, development and integration support.					
In-house Support	18.628	19.192	15.238	0.000	15.238
FY 2009 Accomplishments: Provided In-house technical engineering and integrated logistics support for program planning, analysis and execution. Procured ammunition in support of the EFV test program. Performed In-house software design, development, and analysis efforts. *FY 2010 Plans:* Provide In-house technical engineering and integrated logistics support for program planning, analysis and execution. Procure ammunition in support of the EFV test program. Perform In-house software design, development, and analysis efforts. *FY 2011 Base Plans:* Provide In-house technical engineering and integrated logistics support for program planning, analysis and execution. Procure ammunition in support of the EFV test program. Perform In-house software design, development, and analysis efforts.					

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603611M: *Marine Corps Assault Vehicles*	PROJECT 0020: *AAAV*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
Accomplishments/Planned Programs Subtotals	256.042	292.217	242.765	0.000	242.765

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total	FY 2012	FY 2013	FY 2014	FY 2015	Cost To Complete	Total Cost
• PANMC/147500: *EFV*	0.000	0.000	0.000	0.000	0.000	7.161	6.684	8.495	10.348	Continuing	Continuing
• PMC/BA2/202200: *EFV Regular Procurement*	0.000	0.000	0.000	0.000	0.000	66.605	457.673	563.551	577.300	9,690.537	11,550.560
• PMC/BA7 700000: *Initial EFV Spares*	0.000	0.000	0.000	0.000	0.000	17.382	21.307	21.867	22.453	424.749	508.259

D. Acquisition Strategy

The EFV Program acquisition strategy includes the extensive use of test assets, models, simulation, and advanced technology research to optimize vehicle design, reduce Total Ownership Cost (TOC), and control vehicle unit cost. Three fully functional PDRR prototypes were developed and have undergone extensive developmental testing to further vehicle
maturity. During the initial SDD phase of the program, nine prototype vehicles were manufactured and tested extensively in developmental and operational tests. A tenth vehicle was manufactured for use during Full Up System Level Lethality testing. A follow-on SDD phase contract was awarded in Jul 08 to incorporate major reliability modifications into existing prototypes, and manufacture and test seven new SDD prototypes. Low Rate Initial Production (LRIP) is scheduled to begin in FY13. Initial Operational Capability (IOC) and Full Operational Capability (FOC) will occur in FY16 and FY26, respectively. Cost as an independent variable (CAIV) has been institutionalized throughout the program and as such is an integral consideration in all trade studies and decisions. The program has had a highly integrated and extensive test approach since its inception which has included a very strong engineering-model and prototype testing program supported by extensive modeling and simulation techniques which is intended to continue throughout SDD. The program office management strategy includes planning for life cycle support once the system is fielded to more efficiently manage and optimize operating and support requirements and reduce overall program cost.
The EFV management strategy is event driven, designed to ensure a logical progression through the EFV acquisition to reduce risk, ensure affordability, and provide adequate information to decision makers regarding acquisition progress. The EFV Program team is a partnership of government and industry experts, committed to developing the most versatile

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
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combat vehicle, providing the optimum balance of combat effectiveness, affordability, innovation, and technology. The program Integrated Product Teams (IPTs), composed of contractors, sub-contractors, Marines, and government civilians, are the foundation of the EFV acquisition management process. The government, prime contractor, and major
subcontractors are co-located in a highly integrated communication environment that facilitates proactive decision-making processes and flexible execution of plans to support these team and products developments.
The program's contracting approach for the EFV is to award the vast majority of the work to one prime contractor, competitively selected in 1996. GDLS operating through its division General Dynamics Amphibious System will be responsible for designing and producing the vehicle and providing support for testing from PDRR through LRIP. Contracts for Government Furnished Property will be kept to a minimum and will include only property which could not otherwise be available to the contractor. Local Area Network support contract is currently provided by an 8(a) firm. Contract support for programmatic and technical support was competitively awarded in December 2008 as a firm fixed price contract and will continue through FY11.

E. Performance Metrics

Milestone Reviews

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603611M: *Marine Corps Assault Vehicles*	PROJECT 0020: *AAAV*	

Product Development ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
PDRR Contract	C/CPAF	GDLS Woodbridge, VA	399.703	0.000		0.000		0.000		0.000	Continuing	Continuing	Continuing
System Design and Development	SS/Various	GDLS Woodbridge, VA	1,678.336	236.390	Oct 2009	163.993	Oct 2010	0.000		163.993	0.000	2,078.719	Continuing
Other Product Development	Various/ TBD	TBD TBD	0.000	2.329	Mar 2010	13.940	Mar 2011	0.000		13.940	Continuing	Continuing	Continuing
Follow On Product Development	Various/ TBD	TBD TBD	0.000	0.000		0.029		0.000		0.029	Continuing	Continuing	Continuing
Regenerative Filtration	C/CPAF	Army Edgewood Chem/ Bio Center	3.327	0.000		0.000		0.000		0.000	0.000	3.327	Continuing
Survivability Contract	Various/ Various	NSMA Arlington, VA	28.509	0.799	Jun 2010	0.855	Jun 2011	0.000		0.855	Continuing	Continuing	Continuing
Display Technology	SS/CPFF	ISR Corp Baltimore, MD	1.640	0.000		0.000		0.000		0.000	0.000	1.640	Continuing
Intelligent Machining of Advanced Defense Materials	SS/FFP	GDLS Woodbridge, VA	2.914	0.000		0.000		0.000		0.000	0.000	2.914	Continuing
Digital Facsimile Upgrade	SS/FFP	GD C4S Taunton, MA	2.816	0.000		0.000		0.000		0.000	0.000	2.816	Continuing
		Subtotal	2,117.245	239.518		178.817		0.000		178.817			

Remarks

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603611M: *Marine Corps Assault Vehicles*	PROJECT 0020: *AAAV*

Support ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Integrated Logistics Support	Various/ Various	Various Various	20.723	2.114	Mar 2010	4.015	Mar 2011	0.000		4.015	Continuing	Continuing	Continuing
Training Devices/ Simulators	Various/ Various	Various Various	53.489	8.784	Jan 2010	16.081	Jan 2011	0.000		16.081	Continuing	Continuing	Continuing
Tech Data & Pubs Development	Various/ Various	Various Various	1.171	0.350	Mar 2010	0.450	Mar 2011	0.000		0.450	Continuing	Continuing	Continuing
Support Equipment Development	Various/ Various	Various Various	0.431	0.002	Nov 2009	0.000		0.000		0.000	Continuing	Continuing	Continuing
		Subtotal	75.814	11.250		20.546		0.000		20.546			

Remarks

Test and Evaluation ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Developmental, Operational and Live Fire Test & Evaluation	Various/ Various	Various Various	103.622	9.420	Mar 2010	14.994	Mar 2011	0.000		14.994	Continuing	Continuing	Continuing
		Subtotal	103.622	9.420		14.994		0.000		14.994			

Remarks

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603611M: *Marine Corps Assault Vehicles*	PROJECT 0020: *AAAV*

Management Services ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Engineering and Technical Services	Various/ Various	Various Various	51.138	7.637	Mar 2010	10.222	Mar 2011	0.000		10.222	Continuing	Continuing	Continuing
Management Support Services	Various/ Various	Various Various	59.273	6.850	Dec 2009	6.495	Dec 2010	0.000		6.495	Continuing	Continuing	Continuing
Studies and Analyses	Various/ Various	Various Various	0.597	0.465	Mar 2010	0.468	Mar 2011	0.000		0.468	Continuing	Continuing	Continuing
In-House Technical Support	Various/ Various	Various Various	134.457	15.370	Jun 2010	9.363	Jun 2011	0.000		9.363	Continuing	Continuing	Continuing
Program Management Support	Various/ Various	Various Various	23.392	0.372	Mar 2010	0.325	Mar 2011	0.000		0.325	Continuing	Continuing	Continuing
Travel	Various/ Various	Various Various	6.167	1.335	Sep 2010	1.535	Sep 2011	0.000		1.535	Continuing	Continuing	Continuing
		Subtotal	275.024	32.029		28.408		0.000		28.408			

Remarks

	Total Prior Years Cost	FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	2,571.705	292.217		242.765		0.000		242.765			

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603611M: *Marine Corps Assault Vehicles*	PROJECT 0020: *AAAV*

EFV (AAAV) PROGRAM SCHEDULE

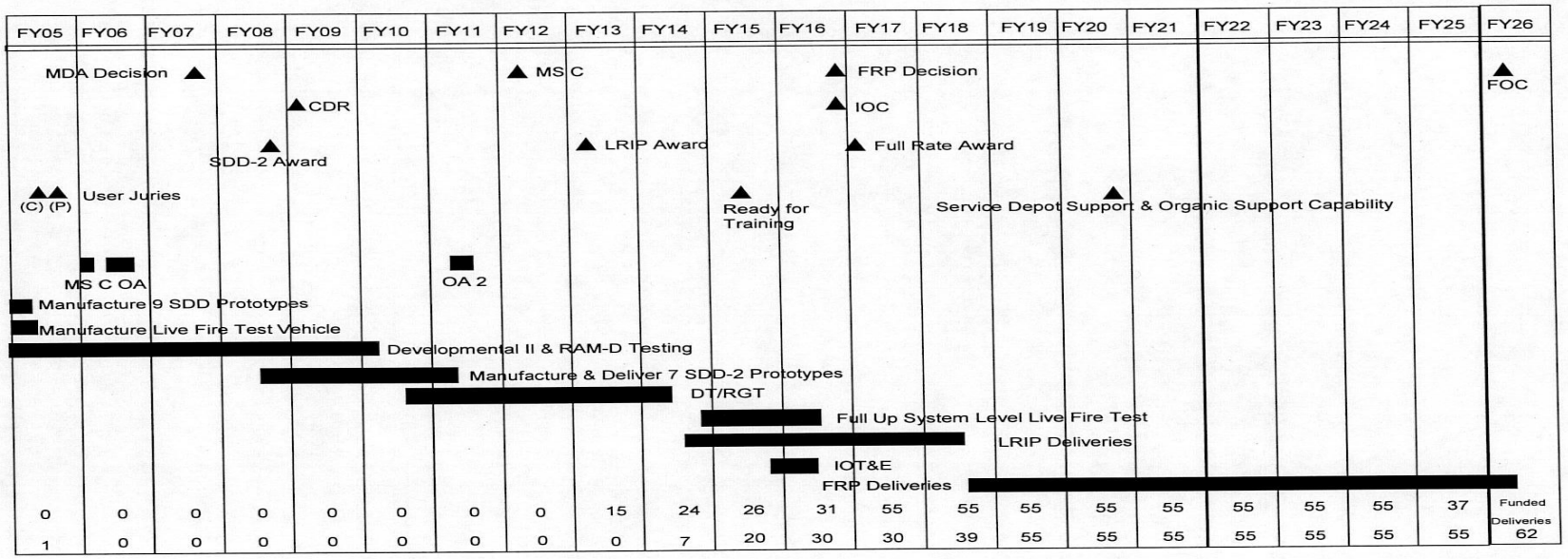

Exhibit R-4A, RDT&E Schedule Details: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603611M: *Marine Corps Assault Vehicles*	**PROJECT** 0020: *AAAV*

Schedule Details

	Start		End	
Event	**Quarter**	**Year**	**Quarter**	**Year**
MS C	1	2012	1	2012
Operational Assessments	2	2011	3	2011
Developmental II & RAM-D Testing	1	2009	1	2010
CDR	1	2009	1	2009
LRIP Contract Award	1	2013	1	2013
LRIP Deliveries Lot 1	3	2014	3	2015
LRIP Deliveries Lot 2	3	2015	4	2015
IOT&E	4	2015	4	2015
Full Up System Level Live Fire Test	4	2014	4	2015
Ready for Training	2	2015	2	2015

Exhibit R-2, RDT&E Budget Item Justification: PB 2011 Navy										DATE: February 2010	
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*				R-1 ITEM NOMENCLATURE PE 0603635M: *Marine Corps Grnd Cmbt/Supt Sys*							
COST ($ in Millions)	**FY 2009 Actual**	**FY 2010 Estimate**	**FY 2011 Base Estimate**	**FY 2011 OCO Estimate**	**FY 2011 Total Estimate**	**FY 2012 Estimate**	**FY 2013 Estimate**	**FY 2014 Estimate**	**FY 2015 Estimate**	**Cost To Complete**	**Total Cost**
Total Program Element	57.718	78.228	40.505	0.000	40.505	138.340	84.480	33.378	37.019	Continuing	Continuing
1964: *Anti-Armor Weapon System*	0.000	1.437	1.250	0.000	1.250	1.275	1.130	1.156	1.002	Continuing	Continuing
2614: *SMAW Follow-On*	13.848	14.331	7.493	0.000	7.493	6.804	9.425	0.358	0.381	Continuing	Continuing
3209: *Joint Light Tactical Vehicle*	38.688	57.680	31.762	0.000	31.762	130.261	73.925	31.864	35.636	Continuing	Continuing
9999: *Congressional Adds*	5.182	4.780	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	54.890

A. Mission Description and Budget Item Justification

This PE supports the demonstration and validation of Marine Corps Ground/Supporting Arms Systems for utilization in Marine Air-Ground Expeditionary Force amphibious operations.

This program is funded under DEMONSTRATION & VALIDATION because it develops and integrates hardware for experimental test related to specific ground weapon system.

B. Program Change Summary ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
Previous President's Budget	65.253	73.798	0.000	0.000	0.000
Current President's Budget	57.718	78.228	40.505	0.000	40.505
Total Adjustments	-7.535	4.430	40.505	0.000	40.505
• Congressional General Reductions		-0.326			
• Congressional Directed Reductions		0.000			
• Congressional Rescissions	0.000	-0.044			
• Congressional Adds		4.800			
• Congressional Directed Transfers		0.000			
• Reprogrammings	-3.900	0.000			
• SBIR/STTR Transfer	-2.438	0.000			
• Program Adjustments	0.000	0.000	40.505	0.000	40.505
• Congressional Recision Adjustments	0.003	0.000	0.000	0.000	0.000
• Congressional Add Adjustments	-1.200	0.000	0.000	0.000	0.000

Exhibit R-2, RDT&E Budget Item Justification: PB 2011 Navy	DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603635M: *Marine Corps Grnd Cmbt/Supt Sys*

Congressional Add Details ($ in Millions, and Includes General Reductions)	FY 2009	FY 2010
Project: 9999: *Congressional Adds*		
Congressional Add: *Expeditionary Capabilities Laboratory*	0.000	2.390
Congressional Add: *Marine Expeditionary Rifle Squad Reconfigurable Vehicle Simulator*	0.000	2.390
Congressional Add: *URBAN OPERATIONS ENVIRONMENTAL LABORATORY*	1.596	0.000
Congressional Add: *ANTI-SNIPER INFRARED TARGETING SYSTEM*	1.990	0.000
Congressional Add: *Marine Sensor Integrated Modular Protection*	1.596	0.000
Congressional Add Subtotals for Project: 9999	5.182	4.780
Congressional Add Totals for all Projects	5.182	4.780

Change Summary Explanation

FY11 from previous President's Budget is shown as zero because no FY11-15 data was presented in President's Budget 2010.

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603635M: *Marine Corps Grnd Cmbt/Supt Sys*	PROJECT 1964: *Anti-Armor Weapon System*	

COST ($ in Millions)	FY 2009 Actual	FY 2010 Estimate	FY 2011 Base Estimate	FY 2011 OCO Estimate	FY 2011 Total Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
1964: *Anti-Armor Weapon System*	0.000	1.437	1.250	0.000	1.250	1.275	1.130	1.156	1.002	Continuing	Continuing
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0		

A. Mission Description and Budget Item Justification

The Anti-Armor Weapons System-Heavy (AAWS-H) program, working in concert with the US Army, will develop and integrate technology improvements into the Improved Target Acquisition System (ITAS) to meet Increment II system requirements as jointly agreed. Improvements will center on integration of a battlefield networking communications capability and a laser designation capability.

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
Contractor conducted systems integration and qualification	0.000	0.814	0.609	0.000	0.609
FY 2010 Plans: Support contractor integration and qualification of positioning antennae improvements to increase accuracy of the Saber Position and Azimuth Determination System (PADS). *FY 2011 Base Plans:* Support contractor completion of final qualification of the PADS antennae improvements and initiate integration and qualification of Saber image enhancement improvements.					
Provide engineer and technical support	0.000	0.298	0.310	0.000	0.310
FY 2010 Plans: Provide Army program management office engineering and test support for the PADS improvements.					

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603635M: *Marine Corps Grnd Cmbt/Supt Sys*	PROJECT 1964: *Anti-Armor Weapon System*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
FY 2011 Base Plans: Provide Army program management office engineering and test support for the image enhancement improvements.					
Provide Government program management/in-house support. *FY 2010 Plans:* Provide USMC program management office engineering and logistical assessment of the PADS improvements. *FY 2011 Base Plans:* Provide USMC program management office engineering and logistical assessment of the image enahacement improvements.	0.000	0.325	0.331	0.000	0.331
Accomplishments/Planned Programs Subtotals	0.000	1.437	1.250	0.000	1.250

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total	FY 2012	FY 2013	FY 2014	FY 2015	Cost To Complete	Total Cost
• PMC/301700 : *Anti Armor System Heavy*	0.000	71.005	20.315	0.000	20.315	19.933	24.837	0.024	0.027	0.000	136.141

D. Acquisition Strategy

FY10 is to conduct the development, integration and qualification of the battlefield networking capability into the ITAS. FY11 funding will continue the integration and qualification of the battelfield networking capability.

E. Performance Metrics

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603635M: *Marine Corps Grnd Cmbt/Supt Sys*	PROJECT 1964: *Anti-Armor Weapon System*

Support ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Anti Armor	C/CPIF	Raytheon McKinney, TX	0.000	0.814	Oct 2009	0.609	Mar 2011	0.000		0.609	Continuing	Continuing	Continuing
		Subtotal	0.000	0.814		0.609		0.000		0.609			

Remarks

Test and Evaluation ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Anti Armor	WR	NSWC Dahlgren, VA	0.000	0.298	Mar 2010	0.310	Oct 2010	0.000		0.310	Continuing	Continuing	Continuing
		Subtotal	0.000	0.298		0.310		0.000		0.310			

Remarks

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603635M: *Marine Corps Grnd Cmbt/Supt Sys*	PROJECT 1964: *Anti-Armor Weapon System*

Management Services ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Anti Armor	Various/ FFP	BAE Garrionville, VA	0.000	0.325	Oct 2009	0.331	Oct 2011	0.000		0.331	Continuing	Continuing	Continuing
		Subtotal	0.000	0.325		0.331		0.000		0.331			

Remarks

	Total Prior Years Cost	FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	1.437		1.250		0.000		1.250			

Remarks

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603635M: *Marine Corps Grnd Cmbt/Supt Sys*	PROJECT 2614: *SMAW Follow-On*	

COST ($ in Millions)	FY 2009 Actual	FY 2010 Estimate	FY 2011 Base Estimate	FY 2011 OCO Estimate	FY 2011 Total Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
2614: *SMAW Follow-On*	13.848	14.331	7.493	0.000	7.493	6.804	9.425	0.358	0.381	Continuing	Continuing
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0		

A. Mission Description and Budget Item Justification

Shoulder-Launched Multipurpose Assault Weapon II (SMAW II). Marine Expeditionary Forces will employ the Shoulder-Launched Multipurpose Assault Weapon II (SMAW II) across the spectrum of conflict, under all environmental conditions, to destroy a variety of ground targets. This requirement relates to The Concept for Future Military Operations on Urbanized Terrain, dated 25 July 1997, which requires Marine units to possess the capability to rapidly breach urban structures in order to facilitate and enhance their mobility in an urban environment. The SMAW II will support the Joint Operating Concept, Major Combat Operations via the Force Application Joint Functional Concept.

The mission of the SMAW II is to provide short-range assault fires in support of infantry forces attacking fortified positions and urban structures under all field and environmental conditions. This includes employment under Mission Oriented Protective Posture (MOPP) IV Level CBRN conditions. A typical operating environment for the SMAW II will consist of a mission duration of 96 hours. During this mission the system will be transported 40 km (25 miles) in the field handling mode, using various tactical means, 50% cross country. The system will be employed in the offense in either close or open terrain and subsequently assigned defensive positions in depth along infantry and vehicle choke points."
During the 96 hours, the expected combat load is six rounds of ammunition per system. The system is spread-loaded among the two-man team. The solution to the Follow-on-to-SMAW (FOTS) requirement is the SMAW II system, which will be developed in two distinct blocks. Block 1 of the SMAW II system consists of new SMAW launcher, which will be physically and functionally compatible with all current SMAW ammunition variants, and a Multipurpose (MP) Fire-From-Enclosure (FFE) SMAW round. Block 2 of the SMAW II system will be the addition of a Wall Breaching (WB) FFE round and a Common Practice (CP) FFE round. During FY09-11, the development and qualification of Block 1 will be completed. Full Rate Production of Block 1 will commence in FY12. During FY12-13, the development and qualification of Block 2 will be completed. Full Rate Production of Block 2 will commence in FY13.

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
Contractor conducted systems integration and qualification.	12.080	8.085	2.436	0.000	2.436

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603635M: *Marine Corps Grnd Cmbt/Supt Sys*	PROJECT 2614: *SMAW Follow-On*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
FY 2009 Accomplishments: Completed system Preliminary Design Review; awarded critical sub-contracts; conducted initial component and sub-system Development Verification Testing (DVT). *FY 2010 Plans:* Complete component, sub-system, system level DVT; complete component, sub-system, system level Critical Design Review (CDR) and Qualification Test Readiness Review (TRR); initiate Qualification hardware build. *FY 2011 Base Plans:* Complete Qualification hardware build; complete System Qualification; complete System Verification Review (SVR) and Functional Configuration Audit (FCA); complete pre-Low Rate Initial Production (LRIP) Verification Review and initiate LRIP.					
Provide engineer and technical support. *FY 2009 Accomplishments:* Provided engineering support for Post Award Conference, Integrated Baseline Review, and Preliminary Design Review; maintained system requirements engineering data; continued development of the Government independent 6-DOF flight simulation model of the selected SMAW-II system; conducted System Safety Program; provided review of all contract technical deliverables. *FY 2010 Plans:* Provide engineering support for the CDR, Qualification TRR, and System Qualification Testing; plan and coordinate all required System Safety Reviews; maintain the requirements engineering data to include review and acceptance of the deliverable draft Product Baseline; continue to develop, refine and operate the Government independent 6-DOF flight simulation model of the SMAW II system; establish the SMAW II test range and conduct Environmental, Insensitive Munitions, Hazard Class, Flight, ESD, EMI, EME, and HERO testing; provide review of all contract technical deliverables.	0.555	5.022	3.239	0.000	3.239

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603635M: *Marine Corps Grnd Cmbt/Supt Sys*	PROJECT 2614: *SMAW Follow-On*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
FY 2011 Base Plans: Provide engineering support for the System Qualification Testing, SVR, FCA, and pre-LRIP PRR; plan and coordinate all required System Safety Reviews; provided engineering support to LRIP First Article Testing (FAT) and Lot Acceptance (LAT); continue to refine and operate the Government independent 6-DOF flight simulation model of the SMAW II system; provide review of all contract technical deliverables.					
Provide Government program management/in-house support. *FY 2009 Accomplishments:* Provided administrative and technical support to all programmatic and technical reviews; maintained programmatic documentation change management system; maintained CDRL deliverables review and management system; participated in all program IPTs; prepared the SMAW II Supportability Plan; maintained the SMAW II LCCE; provided EVMS analytical support; developed and managed Action Item database. *FY 2010 Plans:* Provide administrative and technical support to all programmatic and technical reviews; maintain programmatic documentation change management system; maintain CDRL deliverables review and management system; participate in all program IPTs; update the SMAW II Supportability Plan and prepare all Acquisition Logistics documentation; maintain the SMAW II LCCE; provide EVMS analytical support; manage Action Item database. *FY 2011 Base Plans:* Provide administrative and technical support to all programmatic and technical reviews; maintain programmatic documentation change management system; maintain CDRL deliverables review and management system; participate in all program IPTs; update the SMAW II Supportability Plan and prepare all Acquisition Logistics documentation; maintain the SMAW II LCCE; provide EVMS analytical support; manage Action Item database.	0.993	0.592	0.388	0.000	0.388

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603635M: *Marine Corps Grnd Cmbt/Supt Sys*	**PROJECT** 2614: *SMAW Follow-On*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
Provide operational test support planning and document preparation	0.220	0.632	1.430	0.000	1.430
FY 2009 Accomplishments: Participated in the update to the Test and Evaluation Master Plan (TEMP); planned and conducted the Test Concept Verification Conference (TCVC) and all associated documentation; completed the initial draft of the Failure Definition/Scoring Conference (FD/SC) Charter; provided operational test expertise to all programmatic and technical reviews. *FY 2010 Plans:* Complete initial and final drafts of Operational Test and Evaluation (OT&E) Detailed Test Plan documentation; review all DVT test reports and data; participate in the update to the TEMP; provide operational test expertise to all programmatic and technical reviews. *FY 2011 Base Plans:* Complete all OT&E planning; conduct and report the SMAW II system OT&E; provide operational test expertise to all programmatic and technical reviews.					
Accomplishments/Planned Programs Subtotals	13.848	14.331	7.493	0.000	7.493

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total	FY 2012	FY 2013	FY 2014	FY 2015	Cost To Complete	Total Cost
• PMC/301600: *Follow on to SMAW*	0.000	0.000	21.570	0.000	21.570	64.278	34.471	21.180	19.964	0.000	161.463

D. Acquisition Strategy

FY09-11 strategy is to complete development and qualification of the Block 1 SMAW II system (i.e. new SMAW Launcher and new Multi Purpose Fire From Enclosure (MP FFE) round). FY12-13 strategy is to award sole source contract to Block 1 SMAW II contractor to complete development and qualification of the Block 2 SMAW II system (i.e. a new Wall Breaching (WB) FFE and Common Practice (CP) FFE rounds).

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603635M: *Marine Corps Grnd Cmbt/Supt Sys*	**PROJECT** 2614: *SMAW Follow-On*

E. Performance Metrics

Milestone Reviews

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603635M: *Marine Corps Grnd Cmbt/Supt Sys*	PROJECT 2614: *SMAW Follow-On*

Product Development ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Systems Integration	C/CPFF	Nammo Talley Meza, AZ	14.011	8.085	Oct 2009	2.436	Oct 2010	0.000		2.436	Continuing	Continuing	Continuing
		Subtotal	14.011	8.085		2.436		0.000		2.436			

Remarks

Support ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Engineering and Technical Spt	WR	NSWC Dahlgren, VA	2.080	5.022	Oct 2009	3.239	Oct 2010	0.000		3.239	Continuing	Continuing	Continuing
		Subtotal	2.080	5.022		3.239		0.000		3.239			

Remarks

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603635M: *Marine Corps Grnd Cmbt/Supt Sys*	PROJECT 2614: *SMAW Follow-On*

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	FY 2010 Cost	FY 2010 Award Date	FY 2011 Base Cost	FY 2011 Base Award Date	FY 2011 OCO Cost	FY 2011 OCO Award Date	FY 2011 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Operational Testing and Support	WR	MCOTEA Quantico, VA	0.741	0.632	Oct 2009	1.430	Oct 2010	0.000		1.430	Continuing	Continuing	Continuing
		Subtotal	0.741	0.632		1.430		0.000		1.430			

Remarks

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	FY 2010 Cost	FY 2010 Award Date	FY 2011 Base Cost	FY 2011 Base Award Date	FY 2011 OCO Cost	FY 2011 OCO Award Date	FY 2011 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Mgmt and Engineering Support	Various/ FFP	BAESystems Stafford, VA	1.097	0.592	Oct 2009	0.388	Oct 2010	0.000		0.388	Continuing	Continuing	Continuing
		Subtotal	1.097	0.592		0.388		0.000		0.388			

Remarks

	Total Prior Years Cost	FY 2010 Cost	FY 2010 Award Date	FY 2011 Base Cost	FY 2011 Base Award Date	FY 2011 OCO Cost	FY 2011 OCO Award Date	FY 2011 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	17.929	14.331		7.493		0.000		7.493			

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603635M: *Marine Corps Grnd Cmbt/Supt Sys*	PROJECT 2614: *SMAW Follow-On*	

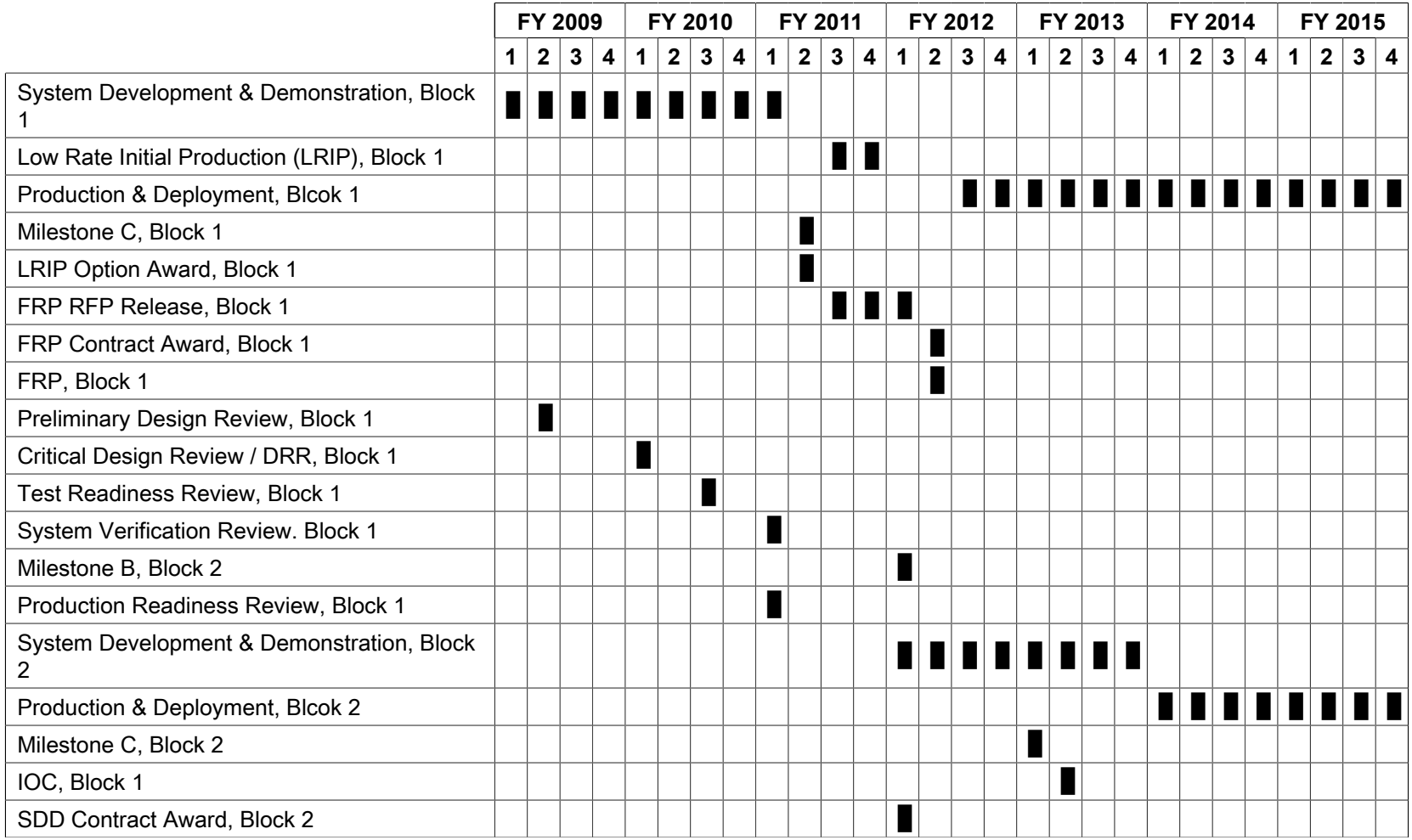

Exhibit R-4, RDT&E Schedule Profile: PB 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603635M: *Marine Corps Grnd Cmbt/Supt Sys*	PROJECT 2614: *SMAW Follow-On*	

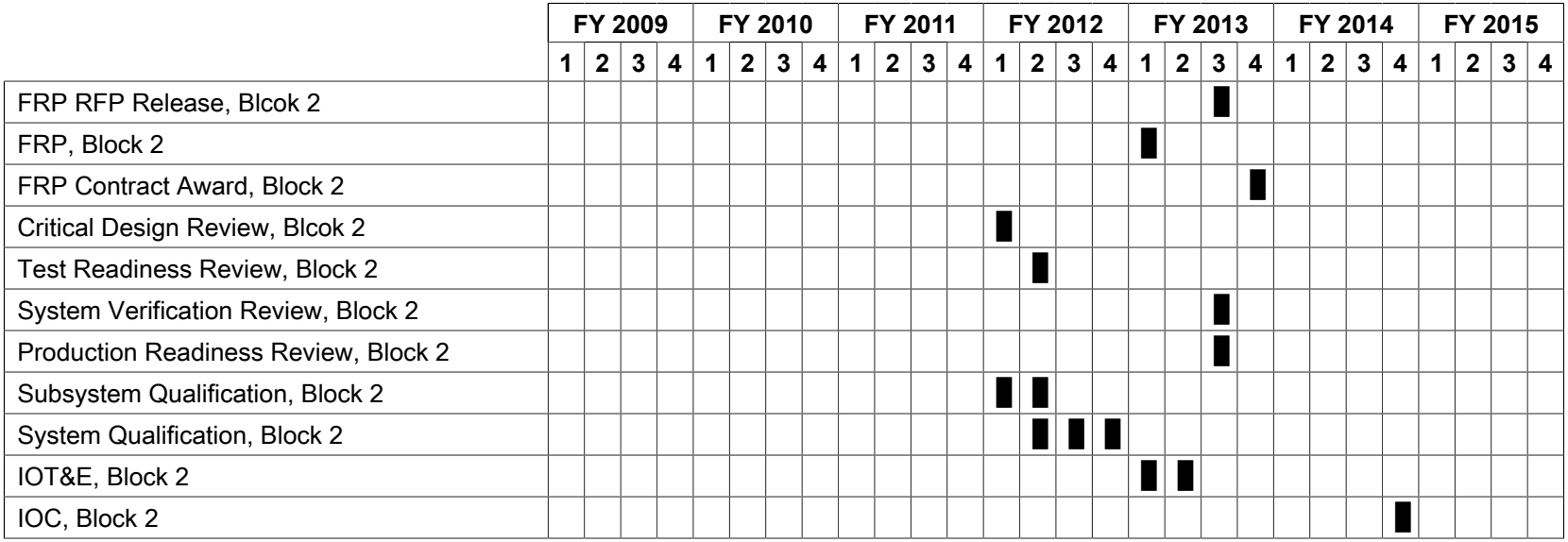

Exhibit R-4A, RDT&E Schedule Details: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603635M: *Marine Corps Grnd Cmbt/Supt Sys*	**PROJECT** 2614: *SMAW Follow-On*

Schedule Details

	Start		End	
Event	**Quarter**	**Year**	**Quarter**	**Year**
System Development & Demonstration, Block 1	1	2009	1	2011
Low Rate Initial Production (LRIP), Block 1	3	2011	4	2011
Production & Deployment, Blcok 1	3	2012	4	2015
Milestone C, Block 1	2	2011	2	2011
LRIP Option Award, Block 1	2	2011	2	2011
FRP RFP Release, Block 1	3	2011	1	2012
FRP Contract Award, Block 1	2	2012	2	2012
FRP, Block 1	2	2012	2	2012
Preliminary Design Review, Block 1	2	2009	2	2009
Critical Design Review / DRR, Block 1	1	2010	1	2010
Test Readiness Review, Block 1	3	2010	3	2010
System Verification Review. Block 1	1	2011	1	2011
Milestone B, Block 2	1	2012	1	2012
Production Readiness Review, Block 1	1	2011	1	2011
System Development & Demonstration, Block 2	1	2012	4	2013
Production & Deployment, Blcok 2	1	2014	4	2015
Milestone C, Block 2	1	2013	1	2013
IOC, Block 1	2	2013	2	2013

Exhibit R-4A, RDT&E Schedule Details: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603635M: *Marine Corps Grnd Cmbt/Supt Sys*	PROJECT 2614: *SMAW Follow-On*

	Start		End	
Event	Quarter	Year	Quarter	Year
SDD Contract Award, Block 2	1	2012	1	2012
FRP RFP Release, Blcok 2	3	2013	3	2013
FRP, Block 2	1	2013	1	2013
FRP Contract Award, Block 2	4	2013	4	2013
Critical Design Review, Blcok 2	1	2012	1	2012
Test Readiness Review, Block 2	2	2012	2	2012
System Verification Review, Block 2	3	2013	3	2013
Production Readiness Review, Block 2	3	2013	3	2013
Subsystem Qualification, Block 2	1	2012	2	2012
System Qualification, Block 2	2	2012	4	2012
IOT&E, Block 2	1	2013	2	2013
IOC, Block 2	4	2014	4	2014

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603635M: *Marine Corps Grnd Cmbt/Supt Sys*	PROJECT 3209: *Joint Light Tactical Vehicle*	

COST ($ in Millions)	FY 2009 Actual	FY 2010 Estimate	FY 2011 Base Estimate	FY 2011 OCO Estimate	FY 2011 Total Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
3209: *Joint Light Tactical Vehicle*	38.688	57.680	31.762	0.000	31.762	130.261	73.925	31.864	35.636	Continuing	Continuing
Quantity of RDT&E Articles	0	2	0	0	0	0	0	0	0		

A. Mission Description and Budget Item Justification

JLTV Family of Vehicles (FOV): The Defense Acquisition Executive's mandate is the JLTV FoV undergo a robust Technology Development Phase, with multiple, competitive prototypes, to assure requirements achievability verified by demonstration of those systems. FY09 and future funding supports the development and testing of JLTV, which is a joint and international R&D program between the Army and Marine Corps, with the Australian Army participating under a Project Arrangement. The JLTV goal is a FoV with companion trailers capable of performing multiple mission roles that will be designed to provide protected, sustained, networked mobility for personnel and payloads across the full Range of Military Operations. JLTV objectives include increased protection and performance over the current fleet; minimizing ownership costs by maximizing commonality, fuel efficiency and other means; and maintaining effective competition throughout the lifecycle. The FoV includes ten (10) sub-configurations (and companion trailers) in three payload categories.

Commonality of components, maintenance procedures, training, etc., between vehicles and trailers is expected to be inherent in FoV solutions within and across payload categories to minimize FoV total ownership cost. Unique service requirements have been minimized. During FY11, major budget activities will support completion of Reliability, Availability and Maintainability (RAM) and performance testing, as well as, live fire evaluations and the generation of test reports. In addition, Milestone (MS) B preparations will come to a conclusion with the milestone decision and award of Engineering Manufacturing Development (EMD) contracts. The Service plans on procuring EMD prototypes in FY12.

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
Prototype Article *FY 2010 Plans:* Design, fabrication & testing of additional prototypes to focus on reliability & survivability enhancements.	0.000	3.600	0.000	0.000	0.000
Primary and Ancillary Hardware Development and Systems Engineering	31.097	29.122	17.491	0.000	17.491

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603635M: *Marine Corps Grnd Cmbt/Supt Sys*	PROJECT 3209: *Joint Light Tactical Vehicle*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
FY 2009 Accomplishments: Commenced Technology Development phase efforts for each of the three vendors, conducted Integrated Baseline Reviews (IBRs) & Preliminary Design Reviews (PDRs), and continued development towards Critical Design Reviews (CDRs). Armor coupons were delivered to the Government and contractors began fabrication of TD prototypes. *FY 2010 Plans:* Conducted CDRs for three vendors in the 1st quarter and will conduct CDRs and PDRs for Australian right hand operation variants. Ballistic hulls to be delivered. Test Readiness Reviews scheduled for 2nd quarter. Vehicles, total of 21 for Army and USMC, and trailer deliveries planned for 3rd quarter. *FY 2011 Base Plans:* Close out TD phase development contracts and test support. Perform source selection activities, obtain MS B decision, and award multiple Engineering and Manufacturing Development (EMD) contracts.					
GFE and Tooling to Support Product Development and Testing *FY 2009 Accomplishments:* Procured various sets of Government Furnished Equipment (GFE) to support integration efforts & developmental testing. *FY 2011 Base Plans:* Procure GFE long lead items required to support EMD prototype integration efforts. Fabrication of prototypes will begin in FY12.	0.609	0.000	1.250	0.000	1.250
Support Test and Evaluation Program with Army *FY 2009 Accomplishments:* Interoperability & information assurance anaylsis & transprotability anaylsis.	0.451	13.088	4.347	0.000	4.347

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603635M: *Marine Corps Grnd Cmbt/Supt Sys*	PROJECT 3209: *Joint Light Tactical Vehicle*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
FY 2010 Plans: Complete armor coupon testing. Complete reliability, availability, & maintainability (RAM) testing, performance testing and begin user evaluations. Prototypes to be delivered in the 3rd quarter. Complete user evaluations. Commence prototype ballistic testing. *FY 2011 Base Plans:* Complete TD phase T&E activities. Produce and staff T&E reports. Support EMD source selection activities.					
ILS and Facilities Documentation/Analysis and Develop Support Engineering *FY 2009 Accomplishments:* Initiated manpower, personel, and training analysis, continued development of logistic planning documentation and strategy. *FY 2010 Plans:* Initiating facilities analysis, at numerous USMC sites, conducting logistics supportability demonstrations and continue development of logistic planning documentation and strategy. *FY 2011 Base Plans:* Complete facilities analysis, support GFE management, and source selection activities.	0.389	4.946	1.628	0.000	1.628
Program Management Support *FY 2009 Accomplishments:* Supported program operations, including start of work meetings, IBRs, PDRs, knowledge point reviews, which support refinement of the Capability Development Document (CDD), and program planning activities in preparation for MS B.	6.142	6.924	7.046	0.000	7.046

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603635M: *Marine Corps Grnd Cmbt/Supt Sys*	PROJECT 3209: *Joint Light Tactical Vehicle*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
FY 2010 Plans: Supporting program operations, including design (e.g., CDRs) and readiness reviews, knowledge point reviews, test events and key program planning activities in preparation of MS B. *FY 2011 Base Plans:* Continue support of program operations and planning activities. Key events include request for proposal (RFP) release, source selection activities, completion of Technology Development (TD) testing and attainment of MS B and EMD contract awards.					
Accomplishments/Planned Programs Subtotals	38.688	57.680	31.762	0.000	31.762

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total	FY 2012	FY 2013	FY 2014	FY 2015	Cost To Complete	Total Cost
• PMC/5095: *JLTV*	0.000	0.000	0.000	0.000	0.000	0.000	33.828	516.752	713.794	Continuing	Continuing
• USA/0603804A - L04: *JLTV-AD R&D*	20.541	32.135	52.925	0.000	52.925	0.000	0.000	0.000	0.000	0.000	105.601
• USA/0604804A - L50: *Light Tactical Veh R&D*	0.000	0.000	0.000	0.000	0.000	66.824	51.508	52.472	53.341	0.000	224.145
• USA/D15603A: *JLTV OPA*	0.000	0.000	0.000	0.000	0.000	0.000	153.029	478.081	858.362	0.000	1,489.472

D. Acquisition Strategy

The JLTV Acquisition Strategy for the Technology Development (TD) phase, FY08-11, is to competitively award multiple contracts. The TD phase contracts were awarded on October 29, 2008 under the full and open competition process to BEA Systems Land & Armament Systems-Ground Systems Division; General Tacticle Vehicles (A Joint Venture Of General Dynamics Land Systems, Inc. and AM General, LLC); and Lockheed Martin Systems Integration. During this phase, the contractors will be required to design the JLTV Family of Vehicles (FoV) to the Preliminary Design Review level and fabricate and test select prototypes and trailers for payload Categories A, B, and C. The fabricated prototypes will undergo developmental testing, as well as, limited user assessments, in a relevant environment, at test centers. The addition of Australian prototypes to the program will further reduce risk. The goal is to ensure the family of prototypes is mature in terms of supporting

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603635M: *Marine Corps Grnd Cmbt/Supt Sys*	PROJECT 3209: *Joint Light Tactical Vehicle*

technologies and full system integration for MS B approval and entry into the Engineering Manufacturing Development EMD phase in FY11. Informed, knowledge-based decisions on acquiring the JLTV capability will require flexibility and agility in the acquisition strategy. The program plans to award two competitive contracts on EMD and will consider early production of technologically mature variants. Prior to Milestone C, the program will down select to (1) contractor. This contractor will then go into operational testing and Low Rate Initial Production (LRIP).

E. Performance Metrics

Milestone Reviews

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603635M: *Marine Corps Grnd Cmbt/Supt Sys*	PROJECT 3209: *Joint Light Tactical Vehicle*

Product Development ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Primary Hardware Development - TD	C/Various	BAE Systems Santa Clara, CA	21.499	10.366	Feb 2010	0.000		0.000		0.000	0.000	31.865	Continuing
Primary Hardware Development - TD	C/Various	General Tactical Vehicles Sterling, MI	16.749	8.989	Feb 2010	0.000		0.000		0.000	0.000	25.738	Continuing
Primary Hardware Development - TD	C/CPFF	Lockheed Martin Owego, NY	18.249	8.717	Feb 2010	0.000		0.000		0.000	0.000	26.966	Continuing
Primary Hardware Development - EMD	Various/ TBD	TBD TBD	0.000	0.000		16.302	Sep 2011	0.000		16.302	Continuing	Continuing	Continuing
Systems Engineering	Various/ Various	Various Various	4.554	1.050		1.189		0.000		1.189	Continuing	Continuing	Continuing
Governmetn Furnished Equipment (GFE)	C/CPIF	Various Various	0.661	0.000		1.250		0.000		1.250	Continuing	Continuing	Continuing
JLTV Technology Demonstrator Design, Build and Eval	C/CPFF	NATC Carson City, NV	1.414	0.000		0.000		0.000		0.000	0.000	1.414	Continuing
Prototype	C/Various	TBD TBD	0.000	3.600	Feb 2010	0.000		0.000		0.000	0.000	3.600	Continuing
		Subtotal	63.126	32.722		18.741		0.000		18.741			

Remarks

In FY11, the Techology Development (TD) phase contract execution concludes and program progresses towards a MS B decision and Engineering Manufacturing Development (EMD) contract(s) awards and initiaiton of EMD design efforts.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603635M: *Marine Corps Grnd Cmbt/Supt Sys*	PROJECT 3209: *Joint Light Tactical Vehicle*

Support ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Training Development	Various/ Various	Various Various	0.175	0.785		0.175	Dec 2010	0.000		0.175	Continuing	Continuing	Continuing
Integrated Logistics Support	Various/ Various	Various Various	2.148	4.161		1.453		0.000		1.453	Continuing	Continuing	Continuing
		Subtotal	2.323	4.946		1.628		0.000		1.628			

Remarks

Facility asssessments commence in FY10. FY11 activities are structured to continue facility assessments and gather, analyze, and incorporate data from TD into EMD logistical planning packages.

Test and Evaluation ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Test Developmental and Evaluation	MIPR	Aberdeen Proving Grounds, MD	0.000	12.200	Feb 2010	3.796	Dec 2010	0.000		3.796	0.000	15.996	Continuing
Test Developmental and Evaluation Oversight & Support	Various/ Various	Various Various	1.169	0.888		0.551	Nov 2010	0.000		0.551	Continuing	Continuing	Continuing
		Subtotal	1.169	13.088		4.347		0.000		4.347			

Remarks

Primary, Government led TD phase developmental test activities conclude in FY11

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603635M: *Marine Corps Grnd Cmbt/Supt Sys*	PROJECT 3209: *Joint Light Tactical Vehicle*

Management Services ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Support	C/FFP	SAIC Dumfries, VA	4.649	2.895	Dec 2009	3.806	Jan 2011	0.000		3.806	Continuing	Continuing	Continuing
Program Management Support	C/CPFF	Various Various	8.097	3.850		3.035		0.000		3.035	Continuing	Continuing	Continuing
Travel	Various/ Various	MCSC Quantico, VA	0.444	0.179		0.205		0.000		0.205	Continuing	Continuing	Continuing
		Subtotal	13.190	6.924		7.046		0.000		7.046			

Remarks

	Total Prior Years Cost	FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	79.808	57.680		31.762		0.000		31.762			

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603635M: *Marine Corps Grnd Cmbt/Supt Sys*	PROJECT 3209: *Joint Light Tactical Vehicle*

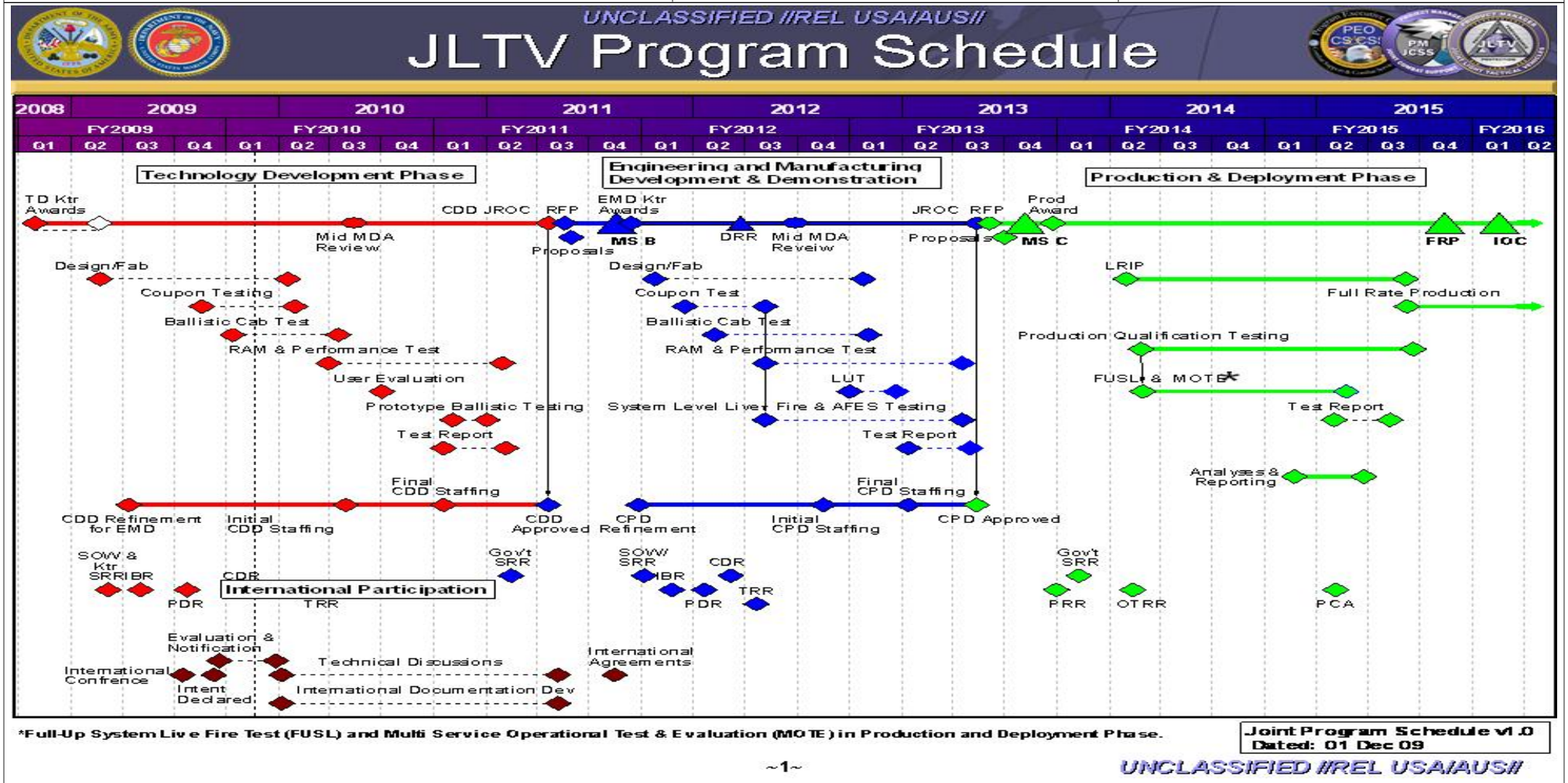

Exhibit R-4A, RDT&E Schedule Details: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603635M: *Marine Corps Grnd Cmbt/Supt Sys*	**PROJECT** 3209: *Joint Light Tactical Vehicle*

Schedule Details

	Start		End	
Event	**Quarter**	**Year**	**Quarter**	**Year**
TD Phase Prototype Development, Design/Fabrication	2	2009	2	2010
TD Phase Test & Evaluation/Reports	4	2009	2	2011
Capabilities Development Document Refinement for EMD	2	2009	3	2011
Analysis of Alternatives	3	2009	3	2011
MS B Decision	4	2011	4	2011
EMD Contract(s) Award	4	2011	4	2011
EMD Design/Fabrication/Testing	4	2011	3	2013
MS C/LRIP Decision	4	2013	4	2013
Multi Service Operational T&E/Full-up System Live Fire Test	2	2014	3	2015
Full Rate Production Decision	4	2015	4	2015

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603635M: *Marine Corps Grnd Cmbt/Supt Sys*	PROJECT 9999: *Congressional Adds*	

COST ($ in Millions)	FY 2009 Actual	FY 2010 Estimate	FY 2011 Base Estimate	FY 2011 OCO Estimate	FY 2011 Total Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
9999: *Congressional Adds*	5.182	4.780	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	54.890
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0		

A. Mission Description and Budget Item Justification

Expeditionary Capabilities Laboratory; Marine Expeditionary Rifle Squad Reconfigurable Vehicle Simulator; Urban Operations Environmental Laboratory; Anti-Sniper Infrared Targeting System; Marine Sensor Integrated Modular Protection

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010
Congressional Add: Expeditionary Capabilities Laboratory *FY 2010 Plans:* Explore bomb detection and counter measures technologies, robotic and sensor technologies, utilization of nanotechnologies, human performance effects and human factors engineering on Marines, and environmental safety concerns.	0.000	2.390
Congressional Add: Marine Expeditionary Rifle Squad Reconfigurable Vehicle Simulator *FY 2010 Plans:* Develop and design a reconfigurable vehicle simulator that replicated interior of multiple mobility platforms and concentrates on JLTV platform as the optimized platform. This effort will provide a mobility integration tool and examine human factors attributes within mobility platforms by fully equipped infantry Marines. Anticipate once funding received contracting effort will be initiated	0.000	2.390
Congressional Add: URBAN OPERATIONS ENVIRONMENTAL LABORATORY	1.596	0.000

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603635M: *Marine Corps Grnd Cmbt/Supt Sys*	**PROJECT** 9999: *Congressional Adds*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010
FY 2009 Accomplishments: Conduct analysis, develop newly emerging non-lethal technologies, and explore novel technological solutions, in support of the development and utilization of non-lethal and nontraditional technologies for military operations particularly in urban and littoral environments by small, highly mobile units.		
Congressional Add: ANTI-SNIPER INFRARED TARGETING SYSTEM *FY 2009 Accomplishments:* Development, exploitation and enhancement of capabilities of Anti-Sniper Infrared Targeting System (ASITS).	1.990	0.000
Congressional Add: Marine Sensor Integrated Modular Protection *FY 2009 Accomplishments:* Developed two prototype systems with one focused on modular protection and the other focused on sensor integration. These two prototypes demonstrated the functionality to develop and design a single integrated system by merging the two designs together. Functional requirements have been developed and prototype designs are being developed for production of 8 systems. These 8 systems will be utilized in user trials in order to determine user preferences, desired attributes, and operational functionality of the system.	1.596	0.000
Congressional Adds Subtotals	5.182	4.780

C. Other Program Funding Summary ($ in Millions)

N/A

D. Acquisition Strategy

N/A

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603635M: *Marine Corps Grnd Cmbt/Supt Sys*	PROJECT 9999: *Congressional Adds*

E. Performance Metrics

N/A

Exhibit R-2, RDT&E Budget Item Justification: PB 2011 Navy										DATE: February 2010	
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*				R-1 ITEM NOMENCLATURE PE 0603654N: *JT Service Explosive Ordn Dev*							
COST ($ in Millions)	**FY 2009 Actual**	**FY 2010 Estimate**	**FY 2011 Base Estimate**	**FY 2011 OCO Estimate**	**FY 2011 Total Estimate**	**FY 2012 Estimate**	**FY 2013 Estimate**	**FY 2014 Estimate**	**FY 2015 Estimate**	**Cost To Complete**	**Total Cost**
Total Program Element	111.850	20.966	25.873	1.000	26.873	25.261	24.667	22.870	17.353	Continuing	Continuing
0377: *JT Service Expl Ord Disp System*	11.616	12.494	16.882	1.000	17.882	14.579	15.878	13.230	9.776	Continuing	Continuing
1317: *EOD Diving System*	2.723	3.520	3.611	0.000	3.611	2.925	2.968	3.037	3.102	Continuing	Continuing
3177: *Joint Counter Radio-Controlled IED Elec Warfare*	93.947	0.000	0.471	0.000	0.471	0.475	0.475	0.475	0.474	Continuing	Continuing
4023: *VSW MCM/Force Protection UUV*	3.564	4.952	4.909	0.000	4.909	7.282	5.346	6.128	4.001	Continuing	Continuing

A. Mission Description and Budget Item Justification

This is a Joint Service Program. This program provides for the development of Explosive Ordnance Disposal tools and equipment for use by all military services. The responsibility is assigned to the Navy as single service manager, by Department of Defense Directive 5160.62 of 26 April 1989, for management of the Joint Service Explosive Ordnance Disposal Research and Development Program. Proliferation of sophisticated types of foreign and domestic ordnance and Improvised Explosive Devices necessitate a continuing development program to provide Explosive Ordnance Disposal personnel of all military services with the special equipment and tools required to support this mission. This program also provides life support related equipment necessary to support the performance of Navy Explosive Ordnance Disposal tasks underwater. This equipment must have inherently low acoustic and magnetic signatures in order to allow the Explosive Ordnance Disposal technician to safely approach, render-safe and dispose of sea mines and other underwater ordnance. This program also provides force protection of all military services against Radio Controlled Improvised Explosive Devices (RCIED) to prevent initiation. The Navy has been designated as DOD Executive Agent and Single Manager for Military Ground-Based Counter Radio-Controlled Improvised Explosive Electronic Warfare (CREW) Technology by DOD Directive 5101.14 of 11 June 2007,requiring RDT&E to develop capabilities that meet joint requirements.

*Beginning in FY10 the Joint Counter Radio Controlled IED Electronic Warfare program will move to RDTEN PE 0604653N.

**FY11-FY15 funding was incorrectly placed in PE 0603654N. Funds should be in PE 0604653N.

***This program element includes $.555M for the Acquisition Workforce in FY 2009.

Exhibit R-2, RDT&E Budget Item Justification: PB 2011 Navy	DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603654N: *JT Service Explosive Ordn Dev*

B. Program Change Summary ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
Previous President's Budget	114.127	21.054	0.000	0.000	0.000
Current President's Budget	111.850	20.966	25.873	1.000	26.873
Total Adjustments	-2.277	-0.088	25.873	1.000	26.873
• Congressional General Reductions		-0.088			
• Congressional Directed Reductions		0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds		0.000			
• Congressional Directed Transfers		0.000			
• Reprogrammings	0.000	0.000			
• SBIR/STTR Transfer	-2.277	0.000			
• Program Adjustments	0.000	0.000	25.873	0.000	25.873
• Rate/Misc Adjustments	0.000	0.000	0.000	1.000	1.000

Change Summary Explanation

Technical: Not applicable.

Schedule: Not applicable.

FY11 from previous President's Budget is shown as zero because no FY11-15 data was presented in President's Budget 2010.

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603654N: *JT Service Explosive Ordn Dev*	PROJECT 0377: *JT Service Expl Ord Disp System*	

COST ($ in Millions)	FY 2009 Actual	FY 2010 Estimate	FY 2011 Base Estimate	FY 2011 OCO Estimate	FY 2011 Total Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
0377: *JT Service Expl Ord Disp System*	11.616	12.494	16.882	1.000	17.882	14.579	15.878	13.230	9.776	Continuing	Continuing
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0		

A. Mission Description and Budget Item Justification

Provides Explosive Ordnance Disposal personnel of all military services with the specialized equipment and tools required to support their mission of detection/location, identification, render-safe, recovery, field and laboratory evaluation, and disposal of unexploded ordnance (UXO) that is a threat to military operations, installations, personnel, or material. UXO includes foreign and domestic, both conventional and non-conventional, including Improvised Explosive Devices (IEDs). Advanced EOD Robot System consists of multiple interoperable robot systems. The first class of robot and the architecture for the system will be developed first, then the other classes of robots will be developed. Project Unit 0377: FY11 OCO Request: Continuous Improvement for the MK1 & MK2 Joint Service EOD robots used by EOD technicians when responding to IED incidents in OIF and OEF. *This project unit includes $.057M for the Acquisition Workforce in FY 2009

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
EOD FUTURE RADIOGRAPHIC SYSTEMS (FRS) AND EOD DECISION SUPPORT SYSTEMS	7.115	6.933	4.657	0.000	4.657
FY 2009 Accomplishments: Conducted Full Rate Production Decision Review for JEOD DSS, initiating production. *FY 2010 Plans:* Conduct Production decision for EOD Future Radiographic System (FRS) and initiate development of increment one for the system. *FY 2011 Base Plans:* Continue development of incremental capabilities for the JEOD DSS and Future Radiographic System.					
ACQUISITION WORKFORCE FUND	0.057	0.000	0.000	0.000	0.000

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603654N: *JT Service Explosive Ordn Dev*	PROJECT 0377: *JT Service Expl Ord Disp System*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
FY 2009 Accomplishments: Funded DoD Acquisition Workforce Fund.					
JOINT LASER ORDNANCE NEUTRALIZATION SYSTEMS (JLONS) *FY 2009 Accomplishments:* Conducted technology development efforts relative to the use of laser energy to neutralize or disrupt insensitive munitions. *FY 2010 Plans:* Continue technology Development for JLONS in preparation for the formal acquisition program. *FY 2011 Base Plans:* Initiate project to expand EOD's capability to detect and/or identify potential Weapons Mass Destruction threats.	2.244	0.961	3.287	0.000	3.287
ADVANCED EOD ROBOTICS *FY 2009 Accomplishments:* Completed development of improved command and control for EOD Robotic systems. *FY 2010 Plans:* Initiate Advanced EOD Robot System acquisition project. Advanced EOD Robot System consists of multiple interoperable robot systems. The first class of robot and the architecture for the system will be developed first, then the other classes of robots will be developed. *FY 2011 Base Plans:* Continue development of Advanced EOD Robot System and develop improved capabilities for existing EOD robot configurations	1.200	3.100	3.857	1.000	4.857

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603654N: *JT Service Explosive Ordn Dev*	PROJECT 0377: *JT Service Expl Ord Disp System*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
FY 2011 OCO Plans: Planned Program OCO ($1M): Continuous Improvement for the MK1 and MK2 Joint Service EOD robots used by EOD technicians when responding to IED incidents in OIF and OEF. Funding required to provide for development of these theater specific tools.					
TCM AN/PLT-XXX SYSTEMS *FY 2009 Accomplishments:* Conducted continuous improvement sub-projects for the fielded TCM systems. *FY 2010 Plans:* Make improvements to fielded TCM systems to include loadset refinements. *FY 2011 Base Plans:* Initiate project to develop capability to determine the state of (or neutralize) Electronic Safe/Arm Fuzes for EOD purpose.	1.000	1.000	3.181	0.000	3.181
UNMANNED AERIAL SYSTEMS *FY 2010 Plans:* Initiate project to develop EOD required capabilities Unmanned Aerial Systems. *FY 2011 Base Plans:* Continue development of Unmanned Aerial Systems Capabilities for the EOD community.	0.000	0.500	1.900	0.000	1.900
Accomplishments/Planned Programs Subtotals	11.616	12.494	16.882	1.000	17.882

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603654N: *JT Service Explosive Ordn Dev*	PROJECT 0377: *JT Service Expl Ord Disp System*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total	FY 2012	FY 2013	FY 2014	FY 2015	Cost To Complete	Total Cost
• OPN/5509: *EOD Equipment*	10.105	5.303	2.000	0.000	2.000	15.200	12.200	12.620	10.243	0.000	67.671

D. Acquisition Strategy

Analysis of Alternatives (AOA) studies are always conducted prior to the initiation of new subprojects. The AOA addresses and emphasizes acquisition strategies of the most cost-effective solution over the subprojects' life-cycle. The acquisition strategies observe the following hierarchy of alternatives: commercial item (including modification), non-developmental item (including modification), and lastly, developmental programs. Contracting for RDT&E, if required, is always competitive and when feasible, production options are included.

E. Performance Metrics

Conducted Full Rate Production Decision Review for JEOD Decision Support System (DSS), initiating production. Conducted Interim Progress Review for EOD Future Radiographic System (FRS).

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603654N: *JT Service Explosive Ordn Dev*	PROJECT 0377: *JT Service Expl Ord Disp System*

Product Development ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Primary Hardware Development	WR	EODTD,IH,MD Not Specified	110.694	4.900	Oct 2009	8.093	Oct 2010	1.000		9.093	Continuing	Continuing	Continuing
Software Development	WR	EODTD, IH, MD Not Specified	16.934	1.500	Oct 2009	1.800	Oct 2010	0.000		1.800	Continuing	Continuing	Continuing
ILS	WR	EODTD, IH,MD Not Specified	41.670	1.250	Oct 2009	1.750	Oct 2010	0.000		1.750	Continuing	Continuing	Continuing
		Subtotal	169.298	7.650		11.643		1.000		12.643			

Remarks

Support ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Support	C/CPFF	ITT, Arlington, VA Not Specified	5.805	0.166	Oct 2009	0.300	Oct 2010	0.000		0.300	Continuing	Continuing	Continuing
		Subtotal	5.805	0.166		0.300		0.000		0.300			

Remarks

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603654N: *JT Service Explosive Ordn Dev*	PROJECT 0377: *JT Service Expl Ord Disp System*

Test and Evaluation ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation	WR	EODTD,IH, MD Not Specified	66.547	1.800	Oct 2009	2.300	Oct 2010	0.000		2.300	Continuing	Continuing	Continuing
Operation Test & Evaluation	WR	EODTD, IH,MD Not Specified	8.983	0.650	Oct 2009	0.300	Oct 2010	0.000		0.300	Continuing	Continuing	Continuing
		Subtotal	75.530	2.450		2.600		0.000		2.600			

Remarks

Management Services ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Manangement Support	WR	EODTD, IH, MD Not Specified	7.143	0.700	Oct 2009	0.435	Oct 2010	0.000		0.435	Continuing	Continuing	Continuing
Miscellaneous	Various/ Various	Various Not Specified	12.620	1.528	Oct 2009	1.904	Oct 2010	0.000		1.904	Continuing	Continuing	Continuing
		Subtotal	19.763	2.228		2.339		0.000		2.339			

Remarks

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603654N: *JT Service Explosive Ordn Dev*	PROJECT 0377: *JT Service Expl Ord Disp System*	

	Total Prior Years Cost	FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	270.396	12.494		16.882		1.000		17.882			

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603654N: *JT Service Explosive Ordn Dev*	**PROJECT** 0377: *JT Service Expl Ord Disp System*

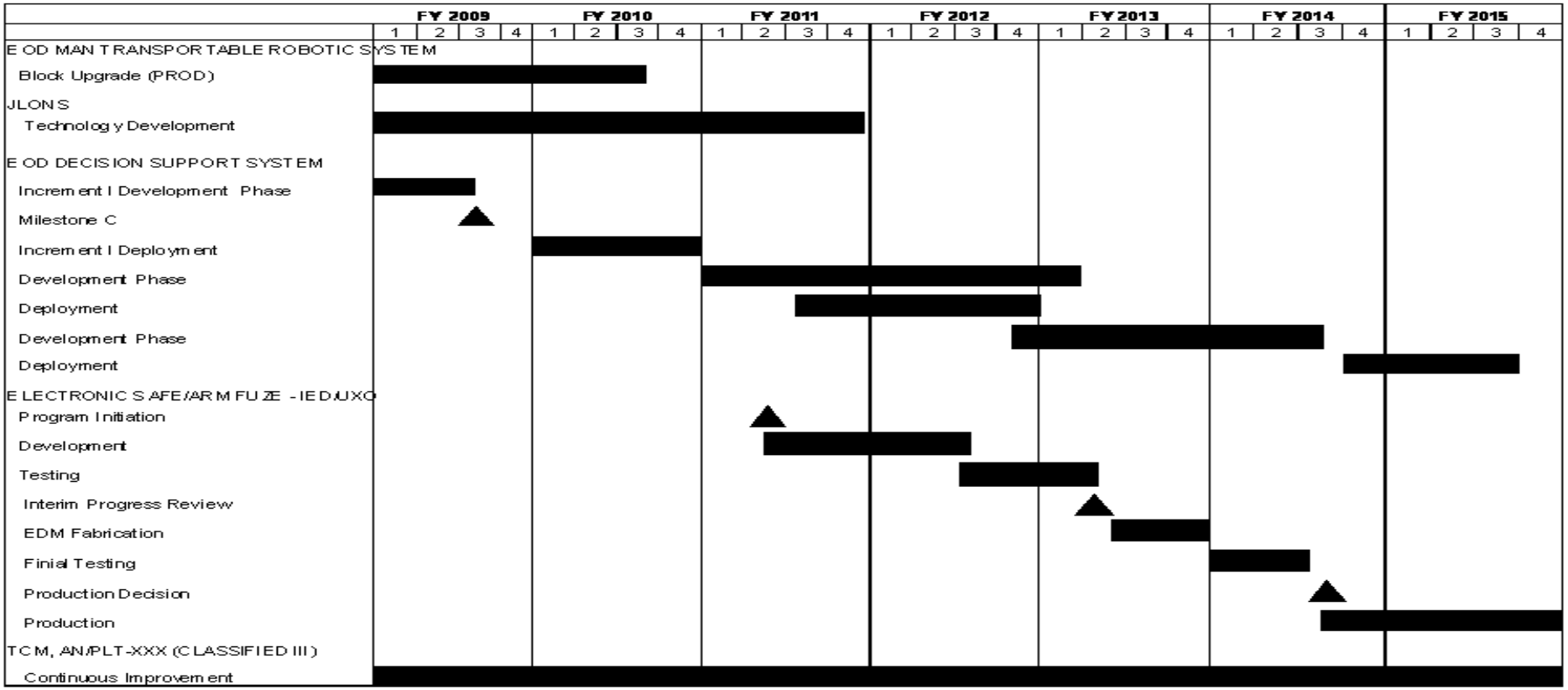

Exhibit R-4, RDT&E Schedule Profile: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603654N: *JT Service Explosive Ordn Dev*	**PROJECT** 0377: *JT Service Expl Ord Disp System*

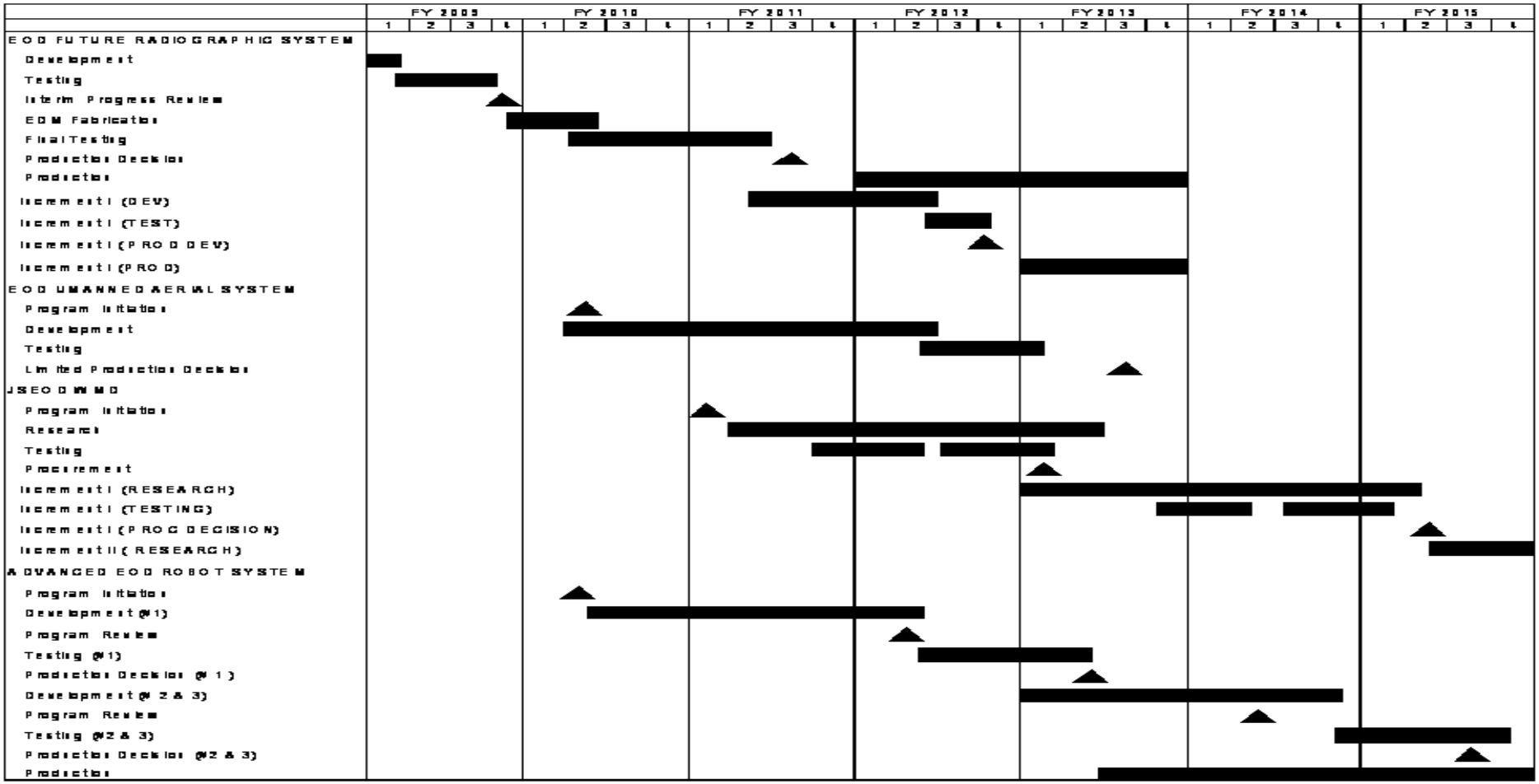

Exhibit R-4A, RDT&E Schedule Details: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603654N: *JT Service Explosive Ordn Dev*	**PROJECT** 0377: *JT Service Expl Ord Disp System*

Schedule Details

	Start		End	
Event	**Quarter**	**Year**	**Quarter**	**Year**
EOD MAN TRANSPORTABLE ROBOTIC SYSTEM	1	2009	1	2009
Block Upgrade (PROD)	1	2009	3	2010
JLONS	1	2009	1	2009
Technology Development	1	2009	4	2011
EOD DECISION SUPPORT SYSTEM	1	2009	1	2009
Increment I Development Phase	1	2009	3	2009
Milestone C	3	2009	3	2009
Increment I Deployment	1	2010	4	2010
Development Phase 1	1	2011	1	2013
Deployment 1	3	2011	4	2012
Development Phase 2	4	2012	3	2014
Deployment 2	4	2014	3	2015
ELECTRONIC SAFE/ARE FUZE -IED/UXO	1	2009	1	2009
Program Initiation 1	2	2011	2	2011
Development 3	2	2011	3	2012
Testing 1	3	2012	2	2013
Interim Progress Review 1	2	2013	2	2013
EDM Fabrication 1	3	2013	4	2013

Exhibit R-4A, RDT&E Schedule Details: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603654N: *JT Service Explosive Ordn Dev*	PROJECT 0377: *JT Service Expl Ord Disp System*

	Start		End	
Event	Quarter	Year	Quarter	Year
Final Testing 1	1	2014	3	2014
Production Decision 1	3	2014	3	2014
Production 1	3	2014	4	2015
TCM, AN/PLT-XXX (CLASSIFIED III)	1	2009	1	2009
Continous Improvement	1	2009	4	2015
EOD FUTURE RADIOGRAPHIC SYSTEM	1	2009	1	2009
Development 4	1	2009	1	2009
Testing 2	2	2009	3	2009
Interim Progress Review 2	4	2009	4	2009
EDM Fabrication 2	4	2009	2	2010
Final Testing 2	2	2010	3	2011
Production Decision 2	3	2011	3	2011
Production 2	1	2012	4	2013
Increment I (DEV)	1	2011	2	2012
Increment I (TEST)	2	2012	3	2012
Increment I (PROD DEV)	3	2012	3	2012
Increment I (PROD)	1	2013	4	2013
EOD UNMANNED AERIAL SYSTEM	1	2009	1	2009
Program Initiation 2	2	2010	2	2010
Development 5	2	2010	2	2012

Exhibit R-4A, RDT&E Schedule Details: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603654N: *JT Service Explosive Ordn Dev*	PROJECT 0377: *JT Service Expl Ord Disp System*

	Start		End	
Event	Quarter	Year	Quarter	Year
Testing 3	3	2012	1	2013
Limited Production Decision	3	2013	3	2013
JS EOD WMD	1	2009	1	2009
Program Initiation 3	1	2011	1	2011
Research	2	2011	2	2013
Testing 4	4	2011	1	2013
Procurement	1	2013	1	2013
Increment I (RESEARCH)	1	2013	2	2015
Increment I (TESTING)	4	2013	1	2015
Increment I (PROC DECISION)	2	2015	2	2015
Increment II (RESEARCH)	2	2015	4	2015
ADVANCED EOD ROBOT SYSTEM	1	2009	1	2009
Program Initiation 4	1	2010	1	2010
Development # 1	2	2010	2	2012
Program Review 1	2	2012	2	2012
Testing (#1)	2	2012	2	2013
Production Decision (#1)	2	2013	2	2013
Development (# 2 & 3)	1	2013	4	2014
Program Review 2	2	2014	2	2014
Testing (# 2 & 3)	4	2014	4	2015

Exhibit R-4A, RDT&E Schedule Details: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603654N: *JT Service Explosive Ordn Dev*	PROJECT 0377: *JT Service Expl Ord Disp System*

	Start		End	
Event	Quarter	Year	Quarter	Year
Production Decision (# 2 & 3)	3	2015	3	2015
Production 3	3	2013	4	2015

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603654N: *JT Service Explosive Ordn Dev*	PROJECT 1317: *EOD Diving System*	

COST ($ in Millions)	FY 2009 Actual	FY 2010 Estimate	FY 2011 Base Estimate	FY 2011 OCO Estimate	FY 2011 Total Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
1317: *EOD Diving System*	2.723	3.520	3.611	0.000	3.611	2.925	2.968	3.037	3.102	Continuing	Continuing
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0		

A. Mission Description and Budget Item Justification

Provides for development of Diver Safety/Life Support Equipment, Advanced Diver Integrated Sensors and Advanced Firing Systems to support Navy Explosive Ordnance Disposal (EOD) underwater operations. The equipment must have inherently low acoustic and magnetic signatures in order to allow the EOD divers to safely approach, render-safe, recover, exploit, and dispose of underwater explosive threats to include sea mines, limpet mines and unexploded ordnance. This project supports the Naval Mine Warfare Certification Plan.

*This project unit includes $.013M for the Acquisition Workforce in FY 2009.

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
DIVER SAFETY & LIFE SUPORT SYSTEMS	0.254	0.831	0.879	0.000	0.879
Diver Safety & Life Support Systems: Develop diver safety tools to include more capable life support systems for EOD, and Mobile Diving & Salvage Units (MDSU) operations. Specific tools include but are not limited to Underwater Breathing Apparatus (UBA), specialized dive masks, heads-up displays, and emergency life support systems.					
FY 2009 Accomplishments: Initiated development of Improvement for Diver Safety related to EOD and UBA.					

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603654N: *JT Service Explosive Ordn Dev*	PROJECT 1317: *EOD Diving System*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
FY 2010 Plans: Develop and test improvements to the Very Shallow Water (VSW)/EOD UBA to enhance diver safety. Develop and test an EOD system (METRES) to detect and measure EOD diver and MCM equipment influence signatures. *FY 2011 Base Plans:* Complete testing and gain approval for use for the VSW/MCM UBA. Complete METRES testing.					
ADVANCED DIVER INTEGRATED SENSORS Develop Advanced Diver Integrated Sensors equipment to enhance EOD and MDSU ability to detect, neutralize and gather intelligence on underwater targets of interest. Requirements include Diver Hull Inspection Navigation System (DHINS) and improvements to the Underwater Imaging System (UIS). *FY 2009 Accomplishments:* Continued UIS improvement system integration and testing through FY09 with ECP approval planned for FY2010. DHINS LRIP planned for FY09. *FY 2010 Plans:* Complete system integration and testing of the DHINS final production configuration. *FY 2011 Base Plans:* Develop and insert mature technologies to the DHINS and UIS as part of a continuous improvement program (CIP) to enhance performance in harsh environments.	2.196	2.239	2.282	0.000	2.282
ACQUISITION WORKFORCE FUND *FY 2009 Accomplishments:* Funded DoD Acquisition Workforce Fund.	0.013	0.000	0.000	0.000	0.000

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603654N: *JT Service Explosive Ordn Dev*	PROJECT 1317: *EOD Diving System*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
ADVANCED FIRING SYSTEM	0.260	0.450	0.450	0.000	0.450
Develops new acquisitions and product improvements to existing systems for below and above water neutralization of underwater threats to support EOD and MDSU operations. *FY 2009 Accomplishments:* Initiated systems integration and testing of spiral 2 AFS that provides a Radio Frequency (RF) capability. *FY 2010 Plans:* Continue system integration and testing of the spiral 2 AFS. *FY 2011 Base Plans:* Test improvements to the AFS to enhance system effectiveness. Initiate Weapons System Explosives Safety Review.					
Accomplishments/Planned Programs Subtotals	2.723	3.520	3.611	0.000	3.611

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total	FY 2012	FY 2013	FY 2014	FY 2015	Cost To Complete	Total Cost
• OPN/0975: *Underwater EOD Program (Cost Code UQ034)*	2.581	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.581
• OPN/0977: *Underwater EOD Program (Cost Code UQ034)*	0.000	2.200	8.900	0.000	8.900	6.000	4.500	3.000	3.200	0.000	27.800
• 0340: *PANMC*	0.000	1.649	0.000	0.000	0.000	1.418	0.000	2.425	0.000	0.000	5.492

D. Acquisition Strategy

Analysis of Alternatives (AOA) studies are always conducted prior to the initiation of new sub-projects. The AOA addresses and emphasizes acquisition strategies of the most cost-effective solution over the sub-projects life-cycle. The acquisition strategies observe the following hierarchy of alternatives: commercial item (including

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603654N: *JT Service Explosive Ordn Dev*	**PROJECT** 1317: *EOD Diving System*

modification), non-developmental item (including modification), and lastly, developmental programs. Contracting for RDT&E, if required, is always competitive and when feasible, production options are included.

E. Performance Metrics

Researched and Developed technologies for the design of Diver Safety Systems, and Advanced Underwater Firing Systems used to render safe, recover, exploit, and dispose of sea limpet mines and unexploded ordnance.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603654N: *JT Service Explosive Ordn Dev*	PROJECT 1317: *EOD Diving System*

Product Development ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Primary Hardware Development	WR	EODTECHDIV IH, MD	37.328	0.907	Oct 2009	0.967	Oct 2010	0.000		0.967	Continuing	Continuing	Continuing
Software Development	WR	EODTECHDIV IH MD	3.192	0.300	Oct 2009	0.300	Oct 2010	0.000		0.300	Continuing	Continuing	Continuing
Systems Engineering	WR	EODTECHDIV IH MD	8.228	0.000		0.000		0.000		0.000	0.000	8.228	Continuing
ILS	WR	EODTECHDIV IH MD	11.916	0.000		0.000		0.000		0.000	0.000	11.916	Continuing
Systems Engineering	WR	NSWC Panama City	0.570	0.250	Oct 2009	0.250	Oct 2010	0.000		0.250	Continuing	Continuing	Continuing
Systems Engineering	WR	SPAWAR San Diego	1.000	0.500	Oct 2009	0.500	Oct 2010	0.000		0.500	Continuing	Continuing	Continuing
		Subtotal	62.234	1.957		2.017		0.000		2.017			

Remarks

Support ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Support1	C/CPFF	ITT Arlington VA	3.537	0.000		0.000		0.000		0.000	0.000	3.537	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603654N: *JT Service Explosive Ordn Dev*	PROJECT 1317: *EOD Diving System*

Support ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Support2	C/CPFF	ITT Arlington VA	1.621	0.430	Oct 2009	0.430	Oct 2010	0.000		0.430	Continuing	Continuing	Continuing
Integrated Logistics Support	C/TBD	Not Specified Not Specified	0.000	0.000		0.000		0.000		0.000	0.000	0.000	Continuing
Configuration Management	C/TBD	Not Specified Not Specified	0.000	0.000		0.000		0.000		0.000	0.000	0.000	Continuing
Technical Data	C/TBD	Not Specified Not Specified	0.000	0.000		0.000		0.000		0.000	0.000	0.000	Continuing
GFE	C/TBD	Not Specified Not Specified	0.000	0.000		0.000		0.000		0.000	0.000	0.000	Continuing
Award Fees	C/TBD	Not Specified Not Specified	0.000	0.000		0.000		0.000		0.000	0.000	0.000	Continuing
		Subtotal	5.158	0.430		0.430		0.000		0.430			

Remarks

Test and Evaluation ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Development Test & Evaluation	WR	EODTECHDIV IH MD	4.337	0.700	Oct 2009	0.750	Oct 2010	0.000		0.750	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603654N: *JT Service Explosive Ordn Dev*	PROJECT 1317: *EOD Diving System*

Test and Evaluation ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Operational Test & Evaluation	WR	EODTECHDIV IH MD	1.560	0.000		0.000		0.000		0.000	0.000	1.560	Continuing
		Subtotal	5.897	0.700		0.750		0.000		0.750			

Remarks

Management Services ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Support	WR	EODTECHDIV IH MD	8.063	0.350	Oct 2009	0.350	Oct 2010	0.000		0.350	0.000	8.763	Continuing
Miscellaneous	WR	Various Various	6.626	0.083	Oct 2009	0.064	Oct 2010	0.000		0.064	0.000	6.773	Continuing
Acquisition Workforce Fund	Various/ Various	Various Various	0.013	0.000		0.000		0.000		0.000	0.000	0.013	Continuing
		Subtotal	14.702	0.433		0.414		0.000		0.414	0.000	15.549	

Remarks

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603654N: *JT Service Explosive Ordn Dev*	PROJECT 1317: *EOD Diving System*	

	Total Prior Years Cost	FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	87.991	3.520		3.611		0.000		3.611			

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603654N: *JT Service Explosive Ordn Dev*	**PROJECT** 1317: *EOD Diving System*

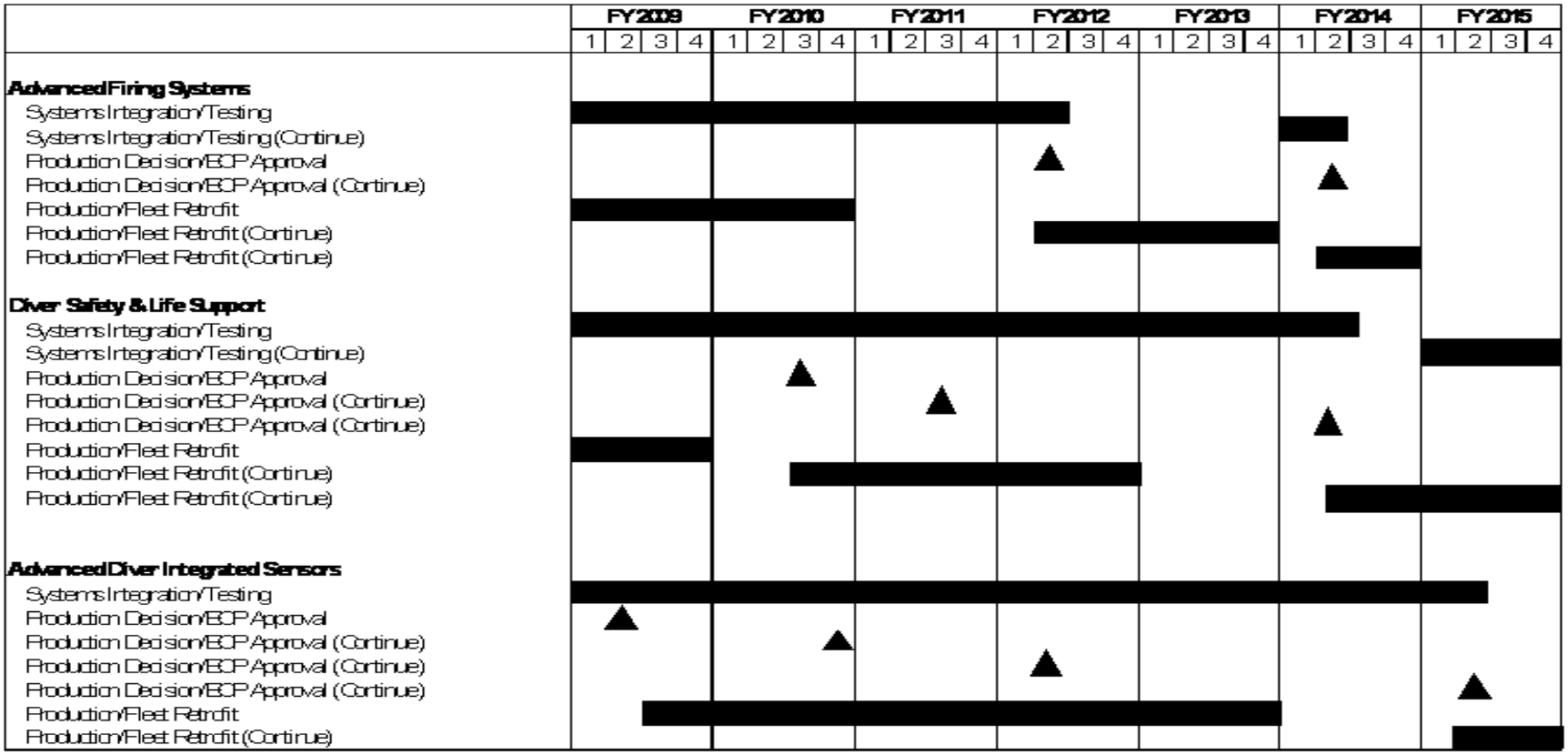

Exhibit R-4A, RDT&E Schedule Details: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603654N: *JT Service Explosive Ordn Dev*	**PROJECT** 1317: *EOD Diving System*

Schedule Details

	Start		End	
Event	**Quarter**	**Year**	**Quarter**	**Year**
ADVANCED FIRING SYSTEMS	1	2009	1	2009
System Integration/Testing 1	1	2009	2	2012
System Integration/Testing (Continue)	1	2014	2	2014
Production Decision/ECP Approval1	2	2012	2	2012
Production Decision/ECP Approval (Continue) 1	2	2014	2	2014
Production/Fleet Retrofit 1	1	2009	4	2010
Production/Fleet Retrofit (Continue) 1	2	2012	4	2013
Production/Fleet Retrofit (Continue) 2	2	2014	4	2014
DIVER SAFETY & LIFE SUPPORT	1	2009	1	2009
System Integration/Testing 2	1	2009	2	2014
Systems Integration/Testing (Continue)	1	2015	4	2015
Production Decision/ECP Approval 2	3	2010	3	2010
Production Decision/ECP Approval (Continue) 2	3	2011	3	2011
Production Decision/ECP Approval (Continue) 3	2	2014	2	2014
Production/Fleet Retrofit 2	1	2009	4	2009
Production/Fleet Retrofit (Continue) 3	3	2010	4	2012
Production/Fleet Retrofit (Continue) 4	2	2014	4	2015
ADVANCED DIVER INTEGRATED SENSORS	1	2009	1	2009

Exhibit R-4A, RDT&E Schedule Details: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603654N: *JT Service Explosive Ordn Dev*	**PROJECT** 1317: *EOD Diving System*

	Start		End	
Event	**Quarter**	**Year**	**Quarter**	**Year**
System Integration/Testing 3	1	2009	2	2015
Production Decision/ECP Approval 3	2	2009	2	2009
Production Decision/ECP Approval (Continue) 4	4	2010	4	2010
Production Decision/ECP Approval (Continue) 5	2	2012	2	2012
Production Decision/ECP Approval (Continue) 6	2	2015	2	2015
Production/Fleet Retrofit 3	3	2009	4	2013
Production/Fleet Retrocit (Continue)	2	2015	4	2015

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603654N: *JT Service Explosive Ordn Dev*	PROJECT 3177: *Joint Counter Radio-Controlled IED Elec Warfare*	

COST ($ in Millions)	FY 2009 Actual	FY 2010 Estimate	FY 2011 Base Estimate	FY 2011 OCO Estimate	FY 2011 Total Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
3177: *Joint Counter Radio-Controlled IED Elec Warfare*	93.947	0.000	0.471	0.000	0.471	0.475	0.475	0.475	0.474	Continuing	Continuing
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0		

A. Mission Description and Budget Item Justification

Provides for the research, development, for all military services against Radio Controlled Improvised Explosive Devices (RCIED) to prevent initiation. The Navy has been designated as DOD Executive Agent and Single Manager for Military Ground-Based Counter Radio-Controlled Improvised Explosive Electronic Warfare (CREW) Technology by DOD Directive 5101.14 of 11 June 2007, requiring RDT&E to develop capabilities that meet joint requirements. Utilize Joint requirements to provide a system of systems approach for a suite of equipment for mounted, dismounted and fixed site operations. CREW development to make rapid improvements to performance, supportability and affordability.

* JCREW Spirals 3.1 and 3.2 are interim solutions funded by the Joint IED Defeat Organization (OSD)
** Beginning in FY10 the Joint Counter Radio Controlled IED Electronic Warfare program will move to PE 0604653N.
***FY11-FY15 funding was incorrectly placed in PE 0603654N. Funds should be in PE 0604653N.

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
Joint Counter Radio-Controlled IED Elec Warfare	93.480	0.000	0.471	0.000	0.471
FY 2009 Accomplishments: Award contracts for the development of Joint CREW 3.3 system. Continue development of CREW Convoy Planning Tool upgrades. *Beginning in FY10 the Joint Counter Radio-Controlled IED Electronic Warfare program will move to PE 0604653N.					

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603654N: *JT Service Explosive Ordn Dev*	PROJECT 3177: *Joint Counter Radio-Controlled IED Elec Warfare*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
FY 2011 Base Plans: Provides for the development, testing, and evaluation of Joint CREW modeling and simulation efforts and upgrades to Joint CREW tactical decision aids. *FY11-FY15 funding was incorrectly placed in PE 0603654N. Funds should be in PE 0604653N.					
ACQUISITION WORKFORCE FUND *FY 2009 Accomplishments:* Funded DoD Acquisition Workforce Fund.	0.467	0.000	0.000	0.000	0.000
Accomplishments/Planned Programs Subtotals	93.947	0.000	0.471	0.000	0.471

C. Other Program Funding Summary ($ in Millions)

N/A

D. Acquisition Strategy

Analysis of Alternatives (AOA) studies are always conducted prior to the initiation of new subprojects. The AOA addresses and emphasizes acquisition strategies of the most cost effective solution over subprojects' life-cycle. The acquisition strategies observe the following hierarchy of alternatives: commercial item (including modification), non-developmental item (including modification), and lastly, developmental programs. Contracting for RDT&E, if required, is always competitive and when feasible, production options are included. Procurements across the services will be combined to gain quantity discounts.

E. Performance Metrics

Gate 6 Milestone B complete 10 Jul 2009; Contract for preliminary design review awarded 01 Oct 2009; Milestone C anticipated Q4 FY11.

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603654N: *JT Service Explosive Ordn Dev*	PROJECT 4023: *VSW MCM/Force Protection UUV*	

COST ($ in Millions)	FY 2009 Actual	FY 2010 Estimate	FY 2011 Base Estimate	FY 2011 OCO Estimate	FY 2011 Total Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
4023: *VSW MCM/Force Protection UUV*	3.564	4.952	4.909	0.000	4.909	7.282	5.346	6.128	4.001	Continuing	Continuing
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0		

A. Mission Description and Budget Item Justification

Provides for development of small affordable, unmanned underwater systems to support Explosive Ordnance (EOD). Mobile Diving and Salvage Units, and Very Shallow Water (VSW) Mine Countermeasures (MCM) mission operations. The equipment must be highly portable in order to support the EOD technician to safely approach, render safe, recover, exploit and dispose of underwater explosive threats to include sea mines, limpet mines and unexploded ordnance. Provides support for the Navy's high priority missions of Maritime Homeland Defense, MCM, including clandestine reconnaissance and mine clearance in support of amphibious operations. Development of EOD UUV systems to support localization render-safe and detailed intelligence gathering of UXO including Underwater Improvised Explosive Devices. This project supports the Naval Mine Warfare Certification Plan.

*This project unit includes $.018M for the Acquisition Workforce in FY 2009.

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
VSW MCM/Force Protection UUV	3.546	4.952	4.909	0.000	4.909
This program supports development, testing and Fleet approval for evolving generations of small affordable Unmanned Underwater Vehicles (UUV), support equipment, and common operator interface systems to address validated requirements in support of Explosive Ordnance Disposal and VSW MCM mission areas. Mission areas include: open and confined areas, hulls, piers and pilings to search, classify, map, re-acquire, identify, and neutralize sea and limpet mines and underwater improvised explosive devices.					

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603654N: *JT Service Explosive Ordn Dev*	PROJECT 4023: *VSW MCM/Force Protection UUV*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
FY 2009 Accomplishments: Continued Spiral Continuous Improvement Program (CIP) for 1st and 2nd Generation systems (including Bottom UUV Localization System (BULS)). Completed requirements definition for 3rd Generation System. Initiated User Operational Evaluation System (UOES) test and evaluation phase for UUV-N. *FY 2010 Plans:* Continue UUV-N UOES testing. Insert mature technologies and validate system retrofit upgrades to VSW MCM and BULS UUVs (continuous improvement program (CIP)) to enhance performance in harsh environments in accordance with ONR technology transition agreements (TTAs). Transition ONR Hull UUV Localization System (HULS) Rapid Technology Transition initiative. Begin UOES prototype testing and validation of HULS. *FY 2011 Base Plans:* Continue UUV-N UOES testing and re-validate UUV-N AOA requirements document. Insert mature technologies and validate systems retrofit upgrades to VSW MCM and BULS UUVs CIP to enhance performance in harsh environments in accordance with ONR technology transition agreements (TTAs). Continue UOES testing and validation of HULS to support requirements re-validation and limited production decision for a preliminary operational capability.					
ACQUISITION WORKFORCE FUND *FY 2009 Accomplishments:* Funded DoD Acquisition Workforce Fund.	0.018	0.000	0.000	0.000	0.000
Accomplishments/Planned Programs Subtotals	3.564	4.952	4.909	0.000	4.909

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603654N: *JT Service Explosive Ordn Dev*	**PROJECT** 4023: *VSW MCM/Force Protection UUV*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total	FY 2012	FY 2013	FY 2014	FY 2015	Cost To Complete	Total Cost
• OPN/0975: *Underwater EOD Program (Cost Code UQ034)*	2.203	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.203
• OPN/0977: *Underwater EOD Program (Cost Code UQ034)*	0.000	7.350	1.000	0.000	1.000	3.200	5.300	8.250	8.250	0.000	33.350

D. Acquisition Strategy

Analysis of Alternatives (AOA) studies are always conducted prior to the initiation of new sub-projects. The AOA addresses and emphasizes acquisitions strategies of the most cost-effective solution over the sub-projects' life -cycle. The acquisition strategies observe the following hierarchy of alternatives: commercial item (including modifications), non-developmental item (including modifications), and lastly, developmental programs. Contracting for RDT&E, if required is always competitive and when feasible, production options are included.

This ongoing program capitalizes on a User Operational Evaluation System (UOES) effort involving Fleet operators engaged in tactical experimentation with prototype UUVs. These UUV operators also participate in detailed requirements analyses and definition. Operational capabilities with UUV have been realized at designated EOD units, with a
competitive acquisition strategy. The addition of enhanced capabilities through an evolutionary acquisition approach to the UUV toolbox is programmed for delivery in accordance with approved CNO requirements and ONR TTAs. Further improvements to the toolbox to add basic mine and underwater explosive threats neutralization capabilities
will be pursued.

E. Performance Metrics

Researched and Developed technologies for the design of Unmanned Underwater Systems to provide enhanced fleet capabilities to locate, classify, and neutralized mines and unexploded ordnance.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603654N: *JT Service Explosive Ordn Dev*	PROJECT 4023: *VSW MCM/Force Protection UUV*

Product Development ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Primary Hardware Development	WR	EODTECHDIV IH, MD	13.041	1.656	Oct 2009	1.541	Oct 2010	0.000		1.541	Continuing	Continuing	Continuing
Systems Engineering	WR	EODTECHDIV IH, MD	8.986	1.140	Oct 2009	0.900	Oct 2010	0.000		0.900	Continuing	Continuing	Continuing
		Subtotal	22.027	2.796		2.441		0.000		2.441			

Remarks

Support ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Support	C/CPFF	ITT ARLINGTON, VA	2.441	0.600	Oct 2009	0.600	Oct 2010	0.000		0.600	Continuing	Continuing	Continuing
		Subtotal	2.441	0.600		0.600		0.000		0.600			

Remarks

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603654N: *JT Service Explosive Ordn Dev*	PROJECT 4023: *VSW MCM/Force Protection UUV*

Test and Evaluation ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation	WR	EODTECHDIV IH, MD	4.476	0.920	Oct 2009	1.250	Oct 2010	0.000		1.250	Continuing	Continuing	Continuing
Operational Test & Evaluation	WR	EODTECHDIV IH, MD	0.974	0.250	Oct 2009	0.200	Oct 2010	0.000		0.200	Continuing	Continuing	Continuing
		Subtotal	5.450	1.170		1.450		0.000		1.450			

Remarks

Management Services ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Support	WR	EODTECHDIV IH, MD	1.343	0.250	Oct 2009	0.250	Oct 2010	0.000		0.250	Continuing	Continuing	Continuing
Miscellaneous	WR	VARIOUS Not Specified	0.979	0.136	Oct 2009	0.168	Oct 2010	0.000		0.168	Continuing	Continuing	Continuing
DAWDF	C/TBD	Not Specified Not Specified	0.018	0.000		0.000		0.000		0.000	0.000	0.018	Continuing
		Subtotal	2.340	0.386		0.418		0.000		0.418			

Remarks

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603654N: *JT Service Explosive Ordn Dev*	PROJECT 4023: *VSW MCM/Force Protection UUV*	

	Total Prior Years Cost	FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	32.258	4.952		4.909		0.000		4.909			

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603654N: *JT Service Explosive Ordn Dev*	**PROJECT** 4023: *VSW MCM/Force Protection UUV*

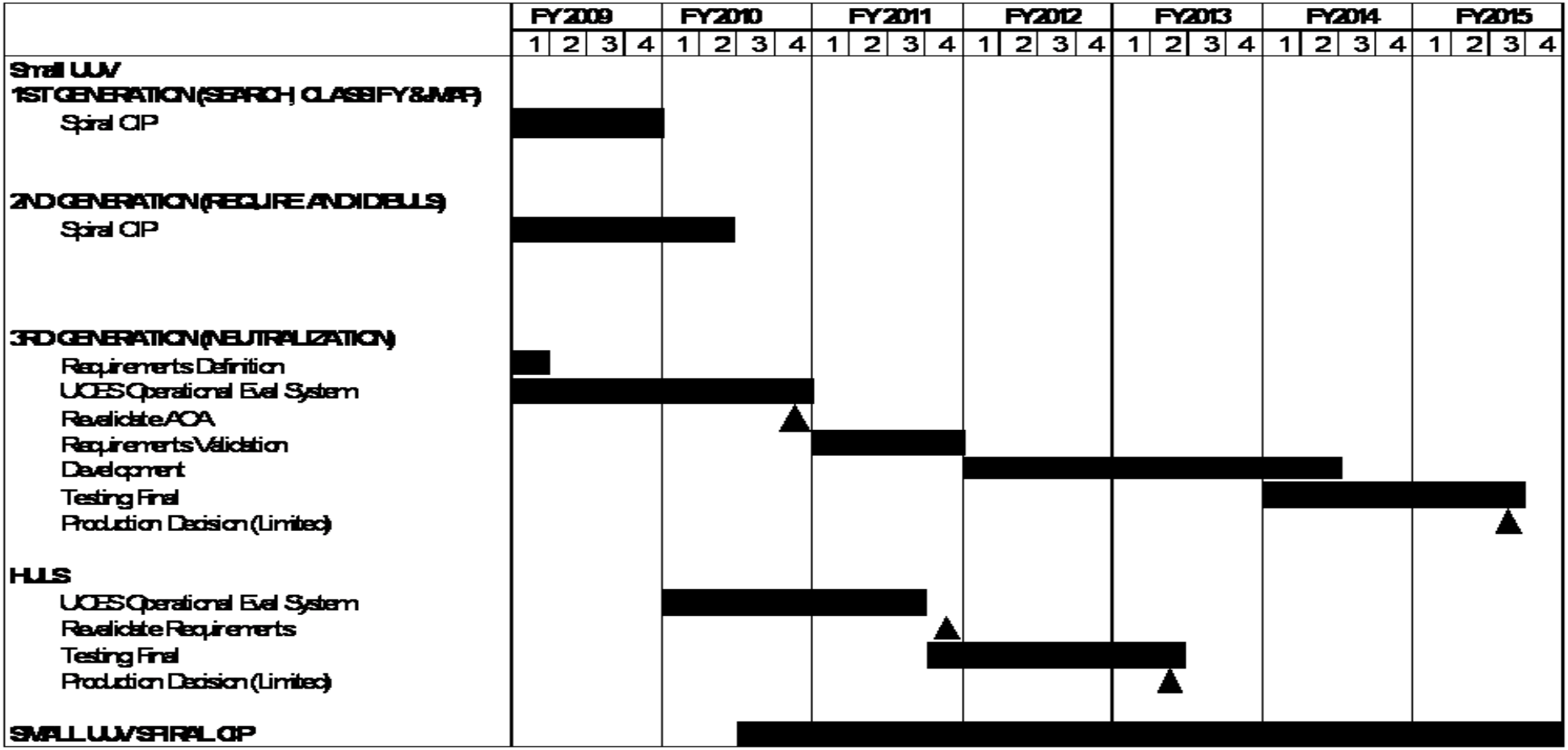

Exhibit R-4A, RDT&E Schedule Details: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603654N: *JT Service Explosive Ordn Dev*	**PROJECT** 4023: *VSW MCM/Force Protection UUV*

Schedule Details

	Start		End	
Event	**Quarter**	**Year**	**Quarter**	**Year**
1ST GENERATION SMALL UUV (SEARCH, CLASSIFY & MAP)	1	2009	1	2009
Spiral CIP 1	1	2009	4	2009
2ND GENERATION (REQUIRE AND ID)/BULS	1	2009	1	2009
Spiral CIP 2	1	2009	2	2010
3RD GENERATION (NEUTRALIZATION)	1	2009	1	2009
Requirements Definition	1	2009	1	2009
UOES Operational Eval System 1	1	2009	4	2010
Revalidate AOA	4	2010	4	2010
Requirements Validation	1	2011	4	2011
Development	1	2012	2	2014
Testing Final 1	1	2014	3	2015
Production Decision (Limited) 1	3	2015	3	2015
HULS	1	2009	1	2009
UOES Operational Eval System 2	1	2010	3	2011
Revalidate Requirements	4	2011	4	2011
Testing Final 2	4	2011	2	2013
Production Decision (Limited) 2	2	2013	2	2013
Spiral CIP 3	3	2010	4	2015

Exhibit R-2, RDT&E Budget Item Justification: PB 2011 Navy										DATE: February 2010	
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*				R-1 ITEM NOMENCLATURE PE 0603658N: *Cooperative Engagement*							
COST ($ in Millions)	**FY 2009 Actual**	**FY 2010 Estimate**	**FY 2011 Base Estimate**	**FY 2011 OCO Estimate**	**FY 2011 Total Estimate**	**FY 2012 Estimate**	**FY 2013 Estimate**	**FY 2014 Estimate**	**FY 2015 Estimate**	**Cost To Complete**	**Total Cost**
Total Program Element	43.424	60.334	52.282	0.000	52.282	45.559	44.614	45.621	46.492	Continuing	Continuing
2039: *COOP Engagement*	38.637	56.351	52.282	0.000	52.282	45.559	44.614	45.621	46.492	Continuing	Continuing
9999: *Congressional Adds*	4.787	3.983	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	36.715

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 capable of fire control quality. CEC distributes sensor data from each ship and 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.

CEC consists of the Data Distribution System (DDS), the Cooperative Engagement Processor (CEP), and Combat System modifications. The DDS encodes and distributes own-ship sensor and engagement data and is a high capacity, jam resistant, directive system providing a precision gridlocking and high throughput of data. The CEP is a high capacity
distributed processor that is able to process force levels of data in near real-time. This data is passed to the ship's combat system as high quality data for which the ship can cue its onboard sensors or use the data to engage targets without actually tracking them. CEC is also incorporating Advanced Capability Build-12 (ACB-12) into the CEC baseline for FY09 - FY13.

The Navy has implementated a Single 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, comms independence. SDP will provide hardware which complies with Category 3 Open Architecture Computing Environment (OACE) standards with rehosted existing software, which will be fielded fleet-wide to allow affordable replacement of obsolete computing system components and eliminate dependencies on "closed" equipment, operating systems, and middleware.

Exhibit R-2, RDT&E Budget Item Justification: PB 2011 Navy	DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603658N: *Cooperative Engagement*

Additionally, CEC is working with the Army to engineer a Joint Track Management (JTM) and sensor measurement fusion capability, which will be implemented in their respective Programs of Record to achieve interoperability across the battle space.

In regard to SDP Backfit, COMOPTEVFOR found the AN/USG-3 (E-2C Airborne CEC) Operationally Effective, but not Operationally Suitable. Reliability and availability issues are addressed by the replacement of four Weapons Replaceable Assemblies (WRAs) with the new SDP. Backfit of the SDP in the E-2C will resolve suitability issues and address National Security Agency (NSA) directed Crypto Modernization requirements with funding provided in FY10 and FY11. The SDP will also be used in E-2D.

In regard to Large Nets, Spiral 1 responds to emergent needs of operational forces and missions. Provides an extensible foundation for capability growth. Provides interoperability with legacy units in Global Mode. Spiral 2 in conjunction with Spiral 1 efforts will provide a 3X increase in DDS network size. This is needed to improve multiple battle group operations. Applicable ships and systems include all CEC deployed units and future fielding to include CG/DDG Modernization, and its Pathfinder Programs. Data Distribution System (DDS) must increase nodes to enable Joint Network Warfare Capabilities with funding provided in FY10 and FY11.

B. Program Change Summary ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
Previous President's Budget	42.999	56.586	0.000	0.000	0.000
Current President's Budget	43.424	60.334	52.282	0.000	52.282
Total Adjustments	0.425	3.748	52.282	0.000	52.282
• Congressional General Reductions		-0.252			
• Congressional Directed Reductions		0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds		4.000			
• Congressional Directed Transfers		0.000			
• Reprogrammings	1.452	0.000			
• SBIR/STTR Transfer	-1.027	0.000			
• Program Adjustments	0.000	0.000	52.282	0.000	52.282

Congressional Add Details ($ in Millions, and Includes General Reductions)	FY 2009	FY 2010
Project: 9999: *Congressional Adds*		
Congressional Add: *Cooperative Engagement Capability Tech Refresh, I*	4.787	3.983

Exhibit R-2, RDT&E Budget Item Justification: PB 2011 Navy	DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603658N: *Cooperative Engagement*

Congressional Add Details ($ in Millions, and Includes General Reductions)	FY 2009	FY 2010
Congressional Add Subtotals for Project: 9999	4.787	3.983
Congressional Add Totals for all Projects	4.787	3.983

Change Summary Explanation

Narrative Explanation:
FY10 - Congressional Add and Economic Assumptions

Technical: Not Applicable.

Schedule: Not Applicable.

FY11 from previous President's Budget is shown as zero because no FY11-15 data was presented in President's Budget 2010.

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603658N: *Cooperative Engagement*	PROJECT 2039: *COOP Engagement*	

COST ($ in Millions)	FY 2009 Actual	FY 2010 Estimate	FY 2011 Base Estimate	FY 2011 OCO Estimate	FY 2011 Total Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
2039: *COOP Engagement*	38.637	56.351	52.282	0.000	52.282	45.559	44.614	45.621	46.492	Continuing	Continuing
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0		

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 capable of fire control quality. CEC distributes sensor data from each ship and 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.

CEC consists of the Data Distribution System (DDS), the Cooperative Engagement Processor (CEP), and Combat System modifications. The DDS encodes and distributes ownship sensor and engagement data and is a high capacity, jam resistant, directive system providing a precision gridlocking and high throughput of data. The CEP is a high capacity
distributed processor that is able to process force levels of data in near real-time. This data is passed to the ship's combat system as high quality data for which the ship can cue its onboard sensors or use the data to engage targets without actually tracking them. CEC is also incorporating Advanced Capability Build-12 (ACB-12) into the CEC baseline for FY09 - FY13.

The Navy has implementated a Single 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, comms independence. SDP will provide hardware which complies with Category 3 Open Architecture Computing Environment (OACE) standards with rehosted existing software, which will be fielded fleet-wide to allow affordable replacement of obsolete computing system components and eliminate dependencies on "closed" equipment, operating systems, and middleware.

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603658N: *Cooperative Engagement*	PROJECT 2039: *COOP Engagement*

Additionally, CEC is working with the Army to engineer a Joint Track Management (JTM) and sensor measurement fusion capability, which will be implemented in their respective Programs of Record to achieve interoperability across the battle space.

In regard to SDP Backfit, COMOPTEVFOR found the AN/USG-3 (E-2C Airborne CEC) Operationally Effective, but not Operationally Suitable. Reliability and availability issues are addressed by the replacement of four Weapons Replaceable Assemblies (WRAs) with the new SDP. Backfit of the SDP in the E-2C will resolve suitability issues and address National Security Agency (NSA) directed Crypto Modernization requirements with funding provided in FY10 and FY11. The SDP will also be used in E-2D.

In regard to Large Nets, Spiral 1 responds to emergent needs of operational forces and missions. Provides an extensible foundation for capability growth. Provides interoperability with legacy units in Global Mode. Spiral 2 in conjunction with Spiral 1 efforts will provide a 3X increase in DDS network size. This is needed to improve multiple battle group operations. Applicable ships and systems include all CEC deployed units and future fielding to include CG/DDG Modernization, and its Pathfinder Programs. Data Distribution System (DDS) must increase nodes to enable Joint Network Warfare Capabilities with funding provided in FY10 and FY11.

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
E-2D	10.430	3.650	2.350	0.000	2.350
FY 2009 Accomplishments: Continued CEC Integration efforts with E-2D. *FY 2010 Plans:* Continue CEC Integration efforts with E-2D. *FY 2011 Base Plans:* Continue CEC Integration efforts with E-2D.					
B/L 2.1 INTEGRATION AND FOT&E TESTING	4.000	10.200	15.000	0.000	15.000
FY 2009 Accomplishments: Continued development, integration and testing of computer program Baseline 2.1 for ACDS, AEGIS, and SSDS platforms. Begin FOT&E teesting and analysis. Continue SDP test analysis.					

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603658N: *Cooperative Engagement*	PROJECT 2039: *COOP Engagement*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
FY 2010 Plans: Continue development, integration and testing of computer program Baseline 2.1 for ACDS, AEGIS, and SSDS platforms. Begin FOT&E teesting and analysis. Continue SDP test analysis. *FY 2011 Base Plans:* Continue development, integration and testing of computer program Baseline 2.1 for ACDS, AEGIS, and SSDS platforms. Begin FOT&E teesting and analysis. Continue SDP test analysis.					
NIFC-CA *FY 2009 Accomplishments:* Continued CEC Integration efforts with NIFC-CA. *FY 2010 Plans:* Continue CEC Integration efforts with NIFC-CA. *FY 2011 Base Plans:* Continue CEC Integration efforts with NIFC-CA.	2.850	2.080	2.080	0.000	2.080
SYSTEMS ENIGNEERING/INTEGRATION AGENT *FY 2009 Accomplishments:* Continued Systems Engineering/Integration Agent (SE/IA) for development and execution of systems engineering processes by NSWC, Dahlgren. *FY 2010 Plans:* Continue Systems Engineering/Integration Agent (SE/IA) for development and execution of systems engineering processes by NSWC, Dahlgren.	1.564	1.612	1.662	0.000	1.662

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603658N: *Cooperative Engagement*	PROJECT 2039: *COOP Engagement*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
FY 2011 Base Plans: Continue Systems Engineering/Integration Agent (SE/IA) for development and execution of systems engineering processes by NSWC, Dahlgren.					
SYSTEM IMPROVEMENTS *FY 2009 Accomplishments:* Continued CEC system improvements including enhanced communications, expansion of networking capability, development of system protection/multi-level secure operational-level secure operations, Cryptologic Modernization, design agent and engineering services. *FY 2010 Plans:* Continue CEC system improvements including enhanced communications, expansion of networking capability, development of system protection/multi-level secure operational-level secure operations, Cryptologic Modernization, design agent and engineering services. *FY 2011 Base Plans:* Continue CEC system improvements including enhanced communications, expansion of networking capability, development of system protection/multi-level secure operational-level secure operations, Cryptologic Modernization, design agent and engineering services.	11.734	26.312	18.733	0.000	18.733
JOINT OPERATIONS *FY 2009 Accomplishments:* Continued participation in system interoperability exercises and Joint Integrated Demonstrations. *FY 2010 Plans:* Continue participation in system interoperability exercises and Joint Integrated Demonstrations.	1.500	1.500	1.500	0.000	1.500

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603658N: *Cooperative Engagement*	PROJECT 2039: *COOP Engagement*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
FY 2011 Base Plans: Continue participation in system interoperability exercises and Joint Integrated Demonstrations.					
FIELD ACTIVITIES *FY 2009 Accomplishments:* Continued field activity support of CEC development efforts (i.e. Technical Direction Agent, In-Service Engineering, Integrated Logistics Support Planning) and program management support. *FY 2010 Plans:* Continue field activity support of CEC development efforts (i.e. Technical Direction Agent, In-Service Engineering, Integrated Logistics Support Planning) and program management support. *FY 2011 Base Plans:* Continue field activity support of CEC development efforts (i.e. Technical Direction Agent, In-Service Engineering, Integrated Logistics Support Planning) and program management support.	6.559	10.997	10.957	0.000	10.957
Accomplishments/Planned Programs Subtotals	38.637	56.351	52.282	0.000	52.282

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total	FY 2012	FY 2013	FY 2014	FY 2015	Cost To Complete	Total Cost
• Various/OPN: *Navy, OPN*	50.180	63.209	69.331	0.000	69.331	62.508	68.488	69.225	46.648	Continuing	Continuing
• Various/SCN: *Navy, SCN*	20.499	7.568	17.006	0.000	17.006	6.680	17.104	0.000	0.000	Continuing	Continuing
• Various/APN: *Navy, APN*	7.689	7.978	16.277	0.000	16.277	24.903	29.636	34.547	35.237	Continuing	Continuing
• Various/RDTEN: *Navy, RDT&E*	0.773	2.200	0.490	0.000	0.490	0.900	0.570	0.556	0.540	Continuing	Continuing

D. Acquisition Strategy

CEC Acquisition Strategy (AS) has been revised and is in route with final signature expected second quarter of FY10.

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603658N: *Cooperative Engagement*	**PROJECT** 2039: *COOP Engagement*

E. Performance Metrics

Complete the Build and test of the Signal Data Processor with the Sierra II Crypto Chip.
Successful completion will result in an Interim Authority to Transmit and NSA full Certification for operation.
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.
Finalize the IFC Kernel development changes and integration with AHE adaptive layer for release 3.
Continue AEGIS Advance Capability Build-12 (ACB-12) CEC integration and demonstration efforts.
Continue Naval Integrated Fire Control - Counter Air (NIFC-CA) CEC integration and demonstation efforts.
Continue E-2D Advance Hawkeye aircraft CEC integration efforts.
Continue Crypto Modernization Tech Refresh efforts.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603658N: *Cooperative Engagement*	PROJECT 2039: *COOP Engagement*	

Product Development ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
AN/USG-2/3 Development	C/CPFF	Raytheon St. Petersburg, FL	30.387	18.770	Dec 2009	13.848	Dec 2010	0.000		13.848	Continuing	Continuing	Continuing
AN/USG-2/3 Development/TDA	C/CPFF	JHU/APL Laurel, MD	24.446	8.000	Dec 2009	8.000	Oct 2010	0.000		8.000	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	Continuing
SI/DA	C/CPAF	Award Fees Not Specified	2.903	0.000		0.000		0.000		0.000	0.000	2.903	Continuing
P3I	C/CPAF	Raytheon St. Petersbrug, FL	11.475	0.000		0.000		0.000		0.000	0.000	11.475	Continuing
DDG 1000	C/CPAF	Raytheon Massuchusetts	10.983	0.000		0.000		0.000		0.000	0.000	10.983	Continuing
DDG 1000	C/CPAF	Award Fees Not Specified	0.447	0.000		0.000		0.000		0.000	0.000	0.447	Continuing
NIFC-CA Integration	Various/ TBD	Various Not Specified	29.479	2.080	Dec 2009	2.080	Dec 2010	0.000		2.080	Continuing	Continuing	Continuing
In-Service Engineering Activity	WR	NSWC Port Hueneme, CA	0.357	0.250	Nov 2009	0.250	Nov 2010	0.000		0.250	Continuing	Continuing	Continuing
Software Support Activity/SEIA	WR	NSWC Dahlgren, VA	8.064	1.612	Nov 2009	1.662	Nov 2010	0.000		1.662	Continuing	Continuing	Continuing
Production Engineering Activity	WR	NSWC Crane, IN	3.094	1.000	Jan 2010	1.000	Nov 2010	0.000		1.000	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603658N: *Cooperative Engagement*	PROJECT 2039: *COOP Engagement*

Product Development ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
JTRS	Various/ TBD	Various Not Specified	8.500	0.000		0.000		0.000		0.000	0.000	8.500	Continuing
Various	Various/ TBD	Miscellaneous Not Specified	5.830	6.289	Jan 2010	3.713	Jan 2011	0.000		3.713	Continuing	Continuing	Continuing
NAVSSI	WR	SPAWAR San Deigo, CA	0.368	0.000		0.000		0.000		0.000	0.000	0.368	Continuing
Certification	MIPR	NSA Fort Meade, MD	0.350	0.250	Feb 2010	0.250	Nov 2010	0.000		0.250	Continuing	Continuing	Continuing
Certification	WR	SPAWAR Charleston, SC	0.780	0.150		0.000		0.000		0.000	Continuing	Continuing	Continuing
Joint Exercises	WR	Various Not Specified	2.244	1.500	Jan 2010	1.500	Nov 2010	0.000		1.500	Continuing	Continuing	Continuing
LBTS Testing	WR	CDSA Damneck Virginia Beach, VA	2.770	1.000	Nov 2009	1.000	Nov 2010	0.000		1.000	Continuing	Continuing	Continuing
Testing Support	Reqn	SCSC Wallops Island, VA	2.630	0.600	Jan 2010	0.629	Nov 2010	0.000		0.629	Continuing	Continuing	Continuing
E-2D Integration	Various/ TBD	Various Not Specified	30.898	3.650	Jan 2010	2.350	Jan 2011	0.000		2.350	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	Continuing
		Subtotal	201.212	45.151		36.282		0.000		36.282			

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603658N: *Cooperative Engagement*	PROJECT 2039: *COOP Engagement*	

Product Development ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract

Remarks

Explanations for the use of "WR, MP, and PD" in the "Contract method & type" column are as follows:

When using "MIPR", these documents are issued to DOD activities that are outside of the Department of the Navy.

When using "Reqn" for Wallops Island, this document is used because this is the only document we can provide to the activity to accomplish taskings for the CEC program.

When using "WR", these documents are sent to Navy activities who obligate funding on their vehicles to accomplish tasking for CEC. These activities are the only ones who can accomplish these tasks for the program.

Test and Evaluation ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Test Support	C/CPFF	Raytheon St. Petersburg, FL	0.000	0.540	Dec 2009	0.794	Dec 2010	0.000		0.794	Continuing	Continuing	Continuing
Test Support	C/CPFF	JHU/APL Laurel, MD	0.000	0.080	Dec 2009	0.118	Oct 2010	0.000		0.118	Continuing	Continuing	Continuing
Test Support	WR	NRL Washington, DC	0.313	0.000		0.000		0.000		0.000	0.000	0.313	Continuing
Test Support	WR	NWSC Port Hueneme, CA	8.376	3.332	Oct 2009	4.900	Oct 2010	0.000		4.900	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603658N: *Cooperative Engagement*	PROJECT 2039: *COOP Engagement*

Test and Evaluation ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Air Operations Test Support	WR	NAVAIR (PMA207) Patuxent River, MD	1.626	2.038	Jan 2010	2.997	Oct 2010	0.000		2.997	Continuing	Continuing	Continuing
Test Data Reduction Analysis	WR	NWAS Corona, CA	4.768	2.450	Oct 2009	3.603	Oct 2010	0.000		3.603	Continuing	Continuing	Continuing
Test Support	WR	COMOPTEVFOR Not Specified	1.929	1.760	Jan 2010	2.588	Oct 2010	0.000		2.588	Continuing	Continuing	Continuing
		Subtotal	17.012	10.200		15.000		0.000		15.000			

Remarks

Explanation for the use of "WR" in the "Contract method & type" column are as follows:

When using "WR", these documents are sent to Navy activities who obligate funding on their vehicles to accomplish tasking for CEC. These activities are the only ones who can accomplish these tasks for the program

Management Services ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Support	C/FFP	Booz Allen & Hamilton Washington, DC	2.430	0.880	Dec 2009	0.880	Dec 2010	0.000		0.880	Continuing	Continuing	Continuing
	C/FFP		0.000	0.120	Dec 2009	0.120	Dec 2010	0.000		0.120	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603658N: *Cooperative Engagement*	PROJECT 2039: *COOP Engagement*

Management Services ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Support		Tech Marine Business Washington, DC											
		Subtotal	2.430	1.000		1.000		0.000		1.000			

Remarks

	Total Prior Years Cost	FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	220.654	56.351		52.282		0.000		52.282			

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603658N: *Cooperative Engagement*	PROJECT 2039: *COOP Engagement*

CEC Program Schedule
as of October 2009

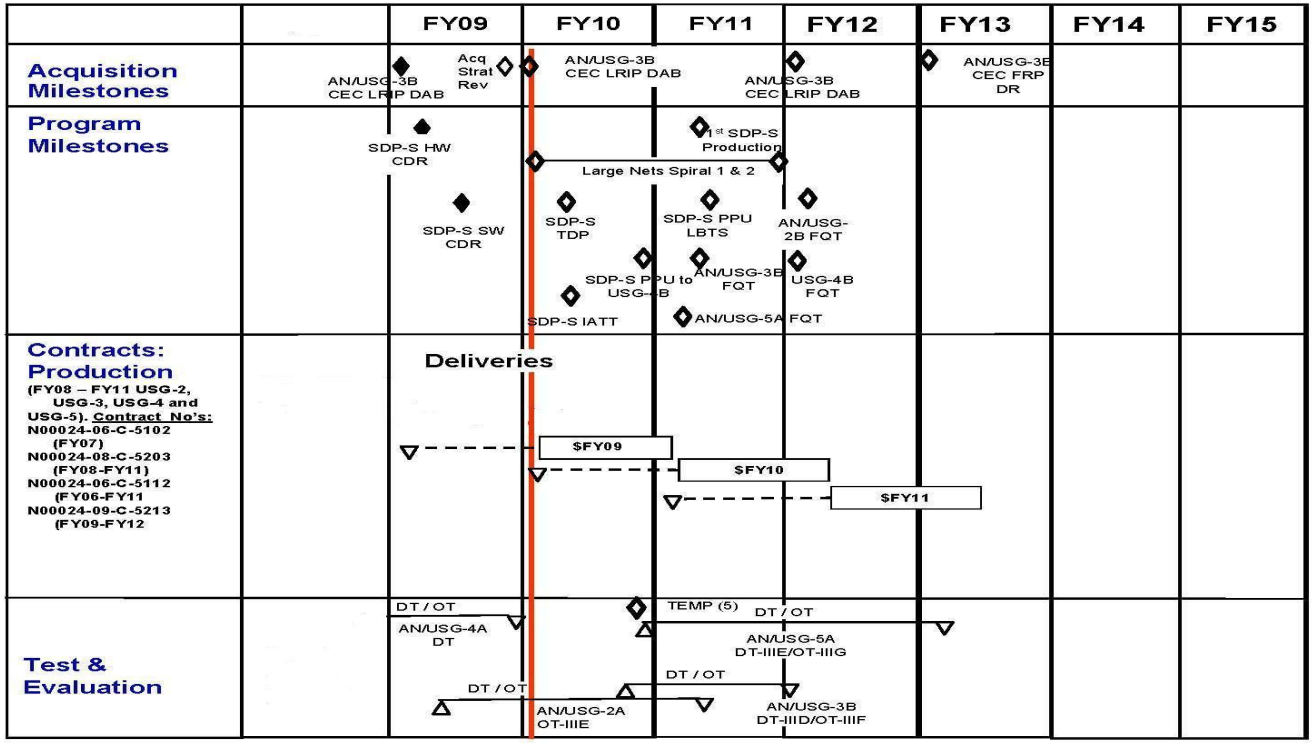

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Exhibit R-4A, RDT&E Schedule Details: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603658N: *Cooperative Engagement*	**PROJECT** 2039: *COOP Engagement*

Schedule Details

	Start		End	
Event	**Quarter**	**Year**	**Quarter**	**Year**
AN/USG-3B CEC LRIP DAB	1	2009	1	2010
Crypto Mod SDP-S H/W CDR	2	2009	2	2009
Crypto Mod SDP-S S/W CDR	3	2009	3	2009
Acquisition Strategy Review	4	2009	4	2009
Large Nets Spiral 1 & 2	1	2010	4	2011
FY09-11 AN/USG-3 - 5 Production Deliveries	1	2009	1	2011
SDP-S TDP	2	2010	2	2010
SDP-S IATT	2	2010	2	2010
SDP-S PPU TO AN/USG-4B	4	2010	4	2010
1st SDP-S Production	2	2011	2	2011
SDP-S PPU Land Base Test Site (LBTS)	2	2011	2	2011
AN/USG-3B FQT	2	2011	2	2011
AN/USG-5A FQT	2	2011	2	2011
AN/USG-3B LRIP DAB	1	2012	1	2012
AN/USG-2B FQT	1	2012	1	2012
AN/USG-4B FQT	1	2012	1	2012
AN/USG-3B CEC FRP DR	1	2013	1	2013
AN/USG-4A DT	1	2009	4	2009

Exhibit R-4A, RDT&E Schedule Details: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603658N: *Cooperative Engagement*	PROJECT 2039: *COOP Engagement*

	Start		End	
Event	Quarter	Year	Quarter	Year
AN/USG-2A OT-IIIE	2	2009	2	2011
TEMP (5)	4	2010	4	2010
AN/USG-3B DT-IIID/OT-IIIF	3	2010	1	2012
AN/USG-5A DT-IIIE/OT-IIIE/OT-IIIG	4	2010	2	2013

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603658N: *Cooperative Engagement*	PROJECT 9999: *Congressional Adds*	

COST ($ in Millions)	FY 2009 Actual	FY 2010 Estimate	FY 2011 Base Estimate	FY 2011 OCO Estimate	FY 2011 Total Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
9999: *Congressional Adds*	4.787	3.983	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	36.715
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0		

A. Mission Description and Budget Item Justification

Congressional Add funding will be used for CEC improvements for Crypto Modernization at Raytheon.

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010
Congressional Add: Cooperative Engagement Capability Tech Refresh, I	4.787	3.983
FY 2009 Accomplishments: Continued CEC system improvements including enhanced communications, expansion of capability, and development of system protection/multi-level secure operational-level operations.		
FY 2010 Plans: Continue CEC system improvements including enhanced communications, expansion of capability, and development of system protection/multi-level secure operational-level operations.		
Congressional Adds Subtotals	4.787	3.983

C. Other Program Funding Summary ($ in Millions)

N/A

D. Acquisition Strategy

N/A

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603658N: *Cooperative Engagement*	PROJECT 9999: *Congressional Adds*

E. Performance Metrics

Congressional add.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2011 Navy	DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603713N: *Ocean Engineering Tech Dev*

COST ($ in Millions)	FY 2009 Actual	FY 2010 Estimate	FY 2011 Base Estimate	FY 2011 OCO Estimate	FY 2011 Total Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
Total Program Element	9.492	17.256	13.560	0.000	13.560	10.251	7.493	7.661	7.819	Continuing	Continuing
0099: *Deep Submergence Bio Med Dev*	3.276	3.299	3.149	0.000	3.149	3.698	3.763	3.848	3.927	Continuing	Continuing
0394: *Shallow Depth Diving EQ*	6.216	13.957	10.411	0.000	10.411	6.553	3.730	3.813	3.892	Continuing	Continuing

A. Mission Description and Budget Item Justification

Developments in this program will enable the U.S. Navy to overcome deficiencies that constrain underwater operations in the areas of search, location, rescue, recovery, salvage, construction, and protection of offshore assets. This program develops medical technology, diver life support equipment, and the vehicles, systems, tools, and procedures to permit manned underwater operations.

B. Program Change Summary ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
Previous President's Budget	7.716	17.328	0.000	0.000	0.000
Current President's Budget	9.492	17.256	13.560	0.000	13.560
Total Adjustments	1.776	-0.072	13.560	0.000	13.560
• Congressional General Reductions		-0.072			
• Congressional Directed Reductions		0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds		0.000			
• Congressional Directed Transfers		0.000			
• Reprogrammings	1.900	0.000			
• SBIR/STTR Transfer	-0.124	0.000			
• Program Adjustments	0.000	0.000	13.560	0.000	13.560

Change Summary Explanation

FY11 from previous President's Budget is shown as zero because no FY11-15 data was presented in President's Budget 2010.

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603713N: *Ocean Engineering Tech Dev*	PROJECT 0099: *Deep Submergence Bio Med Dev*	

COST ($ in Millions)	FY 2009 Actual	FY 2010 Estimate	FY 2011 Base Estimate	FY 2011 OCO Estimate	FY 2011 Total Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
0099: *Deep Submergence Bio Med Dev*	3.276	3.299	3.149	0.000	3.149	3.698	3.763	3.848	3.927	Continuing	Continuing
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0		

A. Mission Description and Budget Item Justification

This project: 1) develops advanced biomedical and bioengineering technology for enhancing medical and life support for submarine escape and rescue; 2) conducts research for diver health, safety and effectiveness; and 3) supports deeper, longer, and more flexible dives. Deliverables for DISSUB (disabled submarine) include: medical procedures for submarine escape and rescue (including new Submarine Rescue Diving and Recompression System (SRDRS)), life support parameters, medical procedures for life support, exposure guidance for atmospheric contaminants, non-chemical CO2 scrubbing, prevention and treatment of decompression illness, and senior survivor expert decision system. Deliverables for diver enhancement include: exposure guidance for diver underwater continuous noise, impulse noise, and underwater blast, exposure guidance for oxygen breathing, collection of operational diving depth/time profiles to predict decompression risk, and enhanced underwater swimming efficiency. Requirements: NAPDD #587-873, Deep Submergence Biomedical Development, 23 November 1999.

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
Deep Submergence Bio Med Dev - Diver Health and Safety	1.788	1.643	1.484	0.000	1.484
Diver Health and Safety Research: Pulmonary oxygen toxicity exposure limits. Procedures for assessing and mitigating risk for diving in contaminated water. Procedure to determine remaining CO2 scrubber duration. Development of advanced insulation garments for diver thermal protection. Develop guidance for optimizing thermal control during decompression. Continue collection of operational dive profiles for advanced modeling. Novel methods for diver thermal protection. Improve resistance to O2 toxicity. Diver anthropometry. Chemical hardening of diving equipment. Predictive index of visual and auditory O2 toxicity. Guidelines for flying after diving. Guidelines for infra- and ultra-sound diver exposure. Develop an advanced diver thermal model. Electronic collection of operational dive data. Diver sound monitor.					

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603713N: *Ocean Engineering Tech Dev*	PROJECT 0099: *Deep Submergence Bio Med Dev*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
FY 2009 Accomplishments: Continued determining the effectiveness of Propranolol for use by DISSUB Survivors to Reduce CO2 production and axiety and effects of Inspired CO2 and breathing resistance on exercise. Continued exercise and diver's thermal environment on nitrogen pptake and elimination. Continued the mechanics of isobaric oxygen pre-breath effectiveness. *FY 2010 Plans:* Begin pulmonary oxygen toxicity exposure limits. Survey of long-term health effects of USN Divers. Continue the mechanics of isobaric oxygen pre-breath effectiveness. Screening tests for susceptibility to Immersion Pulmonary Edema (IPE). Continue the effects of exercise and diver's thermal environment on Nitrogen Uptake and Elimination. *FY 2011 Base Plans:* Continue the pulmonary oxygen toxicity exposure limits. Continue screening tests for susceptibility to Immersion Pulmonary Edema (IPE). Continue the effects of exercise and diver's thermal environment on Nitrogen Uptake and Elimination.					
Deep Submergence Bio Med Dev - Submarine Rescue Submarine Rescue: Decompression procedures for pressurized SRDRS operators. Use of perfluorocarbons to accelerate decompression in submarine rescue. Adjunctive therapies for treating DISSUB survivors. Guidance for food, water, clothing, medical supplies to enhance survival of submarine crews awaiting rescue. Flexible computer generated decompression schedules for wide range of conditions in a DISSUB. Develop DISSUB triage procedures. DISSUB survival trial. Develop oxygen metabolizer for closed vehicles. Treatment guidance for decompression sickness and arterial gas embolism in submarine escape and rescue. Interventions for toxicological problems with rescued submariners. Minimizing decompression sickness and arterial gas embolism with Submarine Escape and Immersion Suit (SEIS) training. Use of pharmacologic agents to reduce decompression risk in submarine rescuees. Development of toxic gas analyzer for use in pressurized DISSUB.	1.472	1.656	1.665	0.000	1.665

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603713N: *Ocean Engineering Tech Dev*	PROJECT 0099: *Deep Submergence Bio Med Dev*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
FY 2009 Accomplishments: Continued Accelerate Decompression for the Submarine Emergency Operating Procedures. Continued the Impact of Nitric Oxide Donor in 70Kg Swine Saturation Drop Out. Continued the Risk Analysis Program for pressurized Sub Escape training. Continued guidance and protection for exposure to Underwater Blast. *FY 2010 Plans:* Continue the Accelerated Decompression for the Submarine Emergency Operating Procedures. Continue the impact of Nitric Oxide Donor in 70Kg Swine Saturation Drop Out. Continue the risk analysis program for pressurized Sub Escape training. Continue Guidance and Protection for Exposure to Underwater Blast. Development of decompression schedule for Submarine Escape and Rescue Using Sheep Model. *FY 2011 Base Plans:* Continue the Impact of Nitric Oxide Donor in 70Kg Swine Saturation Drop Out. Continue development of decompression schedule for Submarine Escape and Rescue Using Sheep Model.					
Deep Submergence Bio Med Dev - Acquisition Workforce Acquisition Workforce *FY 2009 Accomplishments:* Defense Acquisition Workforce Development Fund Requirement	0.016	0.000	0.000	0.000	0.000
Accomplishments/Planned Programs Subtotals	3.276	3.299	3.149	0.000	3.149

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603713N: *Ocean Engineering Tech Dev*	PROJECT 0099: *Deep Submergence Bio Med Dev*

C. Other Program Funding Summary ($ in Millions)

N/A

D. Acquisition Strategy

Integrated thrust area teams (e.g. decompression research) are established with university, commercial and in-house Navy labs to jointly execute biomedical R&D; peer review of research proposals accomplished by independent Technical Advisory Board; annual review of progress by Executive Review Board (CNO/NAVSEA/ONR/BUMED); program management by 0-6 Medical Dept Officer; contracting by competitive process using BAA and leveraging ONR capabilities.

E. Performance Metrics

Quarterly Program Reviews

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603713N: *Ocean Engineering Tech Dev*	PROJECT 0099: *Deep Submergence Bio Med Dev*

Test and Evaluation ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Development Test & Evaluation	WR	NEDU Panama City, FL	9.991	1.958	Oct 2009	1.884	Oct 2010	0.000		1.884	Continuing	Continuing	Continuing
Development Test & Evaluation	WR	NRC Silver Spring, MD	2.187	1.268	Oct 2009	1.189	Oct 2010	0.000		1.189	Continuing	Continuing	Continuing
		Subtotal	12.178	3.226		3.073		0.000		3.073			

Remarks

Management Services ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Support	Various/ Various	Various Various	0.027	0.028		0.031		0.000		0.031	Continuing	Continuing	Continuing
Travel	Various/ Various	Various Various	0.093	0.045		0.045		0.000		0.045	Continuing	Continuing	Continuing
*SBIR Assessment	Various/ Various	Various Various	0.182	0.000		0.000		0.000		0.000	Continuing	Continuing	Continuing
Acquisition Workforce	Various/ Various	Various Various	0.016	0.000		0.000		0.000		0.000	Continuing	Continuing	Continuing
		Subtotal	0.318	0.073		0.076		0.000		0.076			

Remarks

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603713N: *Ocean Engineering Tech Dev*	PROJECT 0099: *Deep Submergence Bio Med Dev*	

	Total Prior Years Cost	FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	12.496	3.299		3.149		0.000		3.149			

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603713N: *Ocean Engineering Tech Dev*	PROJECT 0099: *Deep Submergence Bio Med Dev*

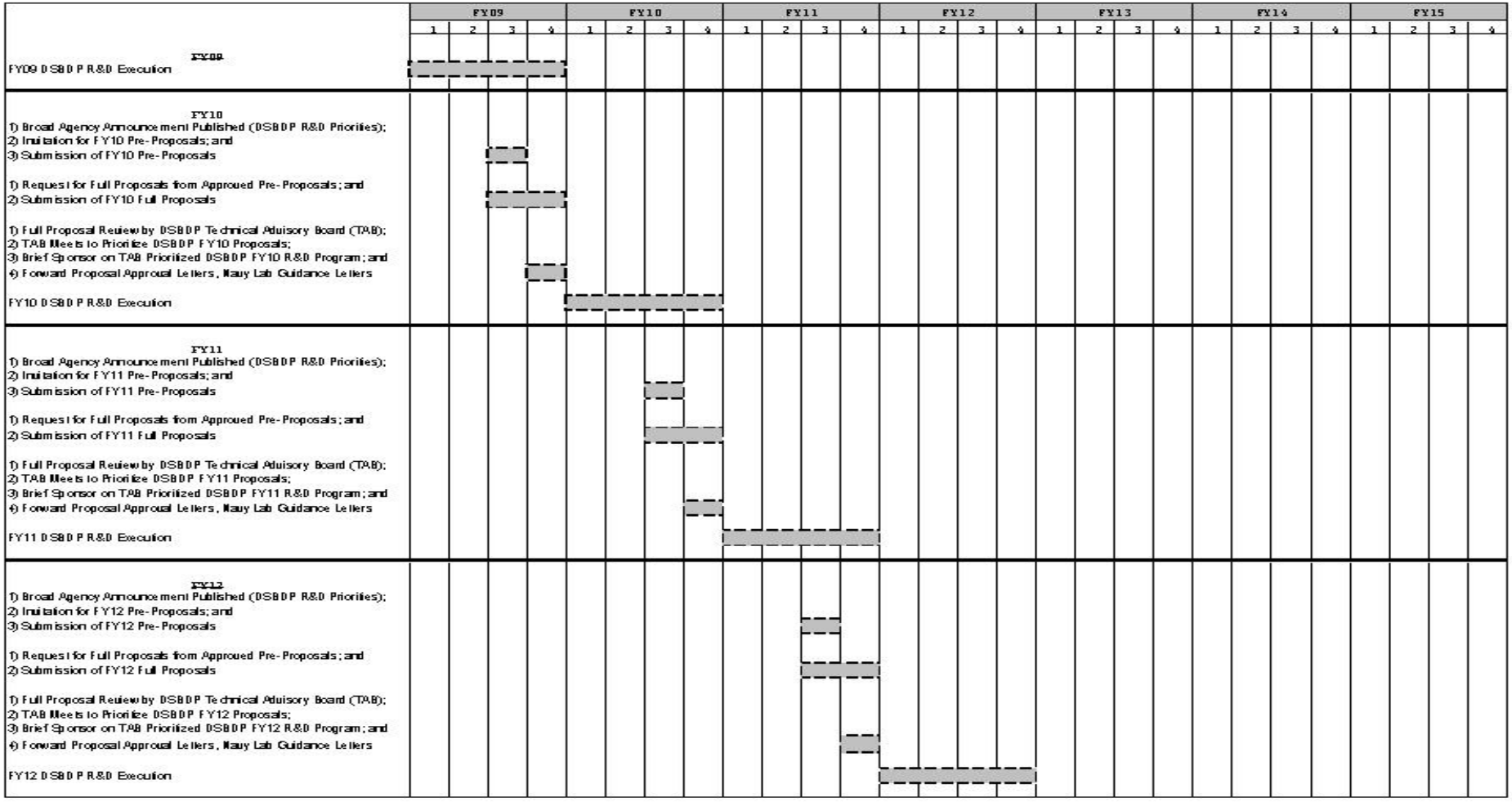

Exhibit R-4A, RDT&E Schedule Details: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603713N: *Ocean Engineering Tech Dev*	PROJECT 0099: *Deep Submergence Bio Med Dev*

Schedule Details

	Start		End	
Event	Quarter	Year	Quarter	Year
FY09 DSBDP R&E Execution	1	2009	4	2009
FY10 Broad Agency Announcement Published (DSBDP) R&D Priorities	3	2009	3	2009
Invitation for FY10 Pre-Proposals	3	2009	3	2009
Submission of FY10 Pre-Proposals	3	2009	3	2009
Request for Full Proposals from Approved FY10 Pre-Proposals	3	2009	4	2009
Submission of FY10 Full Proposals	3	2009	4	2009
Full FY10 Proposal Review by DSBDP Technical Advisory Board (TAB)	4	2009	4	2009
TAB Meets to Prioritize DSBDP FY10 Proposals	4	2009	4	2009
Brief Sponsor on TAB Prioritized DSBDP FY10 R&D Program	4	2009	4	2009
Forward FY10 Proposal Approval Letters, Navy Lab Guidance Letters	4	2009	4	2009
FY10 DSBDP R&D Execution	1	2010	4	2010
FY11 Broad Agency Announcement Published (DSBDP R&D Priorities)	3	2010	3	2010
Invitation for FY11 Pre-Proposals	3	2010	3	2010
Submission of FY11 Pre-Proposals	3	2010	3	2010
Request for Full Proposals from Approved FY11 Pre-Proposals	3	2010	4	2010
Submission of FY11 Full Proposals	3	2010	4	2010
Full FY11 Proposal Review by DSBDP Technical Advisory Board (TAB)	4	2010	4	2010
TAB Meets to Prioritize DSBDP FY11 Proposals	4	2010	4	2010

Exhibit R-4A, RDT&E Schedule Details: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603713N: *Ocean Engineering Tech Dev*	**PROJECT** 0099: *Deep Submergence Bio Med Dev*

	Start		End	
Event	**Quarter**	**Year**	**Quarter**	**Year**
Brief Sponsor on TAB Prioritized DSBDP FY11 R&D Program	4	2010	4	2010
Forward FY11 Proposal Approval Letters, Navy Lab Guidance Letters	4	2010	4	2010
FY11 DSBDP R&D Execution	1	2011	4	2011
FY12 Broad Agency Announcement Published (DSBDP R&D Priorities)	3	2011	3	2011
Invitation for FY12 Pre-Proposals	3	2011	3	2011
Submission of FY12 Pre-Proposals	3	2011	4	2011
Request for Full Proposals from Approved FY12 Pre-Proposals	3	2011	4	2011
Full FY12 Proposal Review by DSBDP Technical Advisory Board (TAB)	4	2011	4	2011
TAB Meets to Prioritize DSBDP FY12 Proposals	4	2011	4	2011
Brief Sponsor on TAB Prioritized DSBDP FY12 R&D Program	4	2011	4	2011
Forward FY12 Proposal Approval Letters, Navy Lab Guidance Letters	4	2011	4	2011
FY12 DSBDP R&D Execution	1	2012	4	2012

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603713N: *Ocean Engineering Tech Dev*	PROJECT 0394: *Shallow Depth Diving EQ*	

COST ($ in Millions)	FY 2009 Actual	FY 2010 Estimate	FY 2011 Base Estimate	FY 2011 OCO Estimate	FY 2011 Total Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
0394: *Shallow Depth Diving EQ*	6.216	13.957	10.411	0.000	10.411	6.553	3.730	3.813	3.892	Continuing	Continuing
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0		

A. Mission Description and Budget Item Justification

This project is to develop systems to support submarine escape, survivability, rescue missions, and conventional diver operations. Diver operations include ship husbandry, salvage/recovery, and submarine rescue operations to support national, as well as, Navy needs around the world. Modern certifiable diving systems that ensure diver safety and allow maximum work efficiency will replace currently antiquated systems. Efforts are currently (through FY13) focused on the Submarine Rescue Diving and Recompression System (SRDRS) to provide a new rapidly deployed emergency submarine rescue capability. SRDRS provides a new capability of pressurized transportation of rescuees from a stricken submarine directly to the decompression system replacing the Deep Submergence Rescue Vehicles and Mother Submarines. SRDRS includes an air transportable rapid Assessment/Underwater Work System (AUWS), a Pressurized Rescue Module (PRM) or Rescue Capable System (RCS), and a Submarine Decompression System (SDS). The AUWS is in service and supports clearing disabled submarine seating surfaces, delivery of emergency life support stores, and disabled submarine assessment. The Submarine Rescue System-Rescue Capable System (SRS-RCS) completed OPEVAL in FY08 and is rescue ready. The Submarine Rescue System-Submarine Decompression System (SRS-SDS) is scheduled for IOC in FY13. The SRDRS will provide a global rapid response capability to support submarine rescue missions with an increase in capability at a fraction of the cost of the currently available systems.

Shallow Depth Diving Equipment managed under SEA00C - This project develops systems to support submarine escape and rescue missions, and conventional diver operations. Diver operations include ship husbandry, salvage/recovery, and submarine rescue operations to support national, as well as, Navy needs around the world. Modern certifiable diving systems that ensure diver safety and allow maximum work efficiency will replace currently antiquated systems. Current plans are to perform R&D in the areas of contaminated water diving, diver thermal protection, and diver sound protection.

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
Shallow Depth Diving EQ - SRDRS	4.958	12.729	9.246	0.000	9.246
Continue design, fabrication, and acceptance testing of the prototype Submarine Decompression System and support equipment. Continue integration of all SRDRS components.					

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603713N: *Ocean Engineering Tech Dev*	PROJECT 0394: *Shallow Depth Diving EQ*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
FY 2009 Accomplishments: The Transfer Under Pressure (TUP) contract option was awarded, TUP System Design Review was completed, the Auxiliary Van material audit was completed, and the Pressurized Flexible Manway 1 and 2 Critical Design Reviews were completed. *FY 2010 Plans:* Plan to complete the following: Pressurized Flexible Manway 3 Critical Design Review, Submarine Decompression Chamber 1 and 2 repairs, Submarine Decompression System Gas Rack fabrication. Also, plan to begin Deck Transfer Lock fabrication. *FY 2011 Base Plans:* Plan to conduct Submarine Decompression System Ship Interface Template System Critical Design Review and deliver Modified Transfer Lock Bases and Pressurized Flexible Manways 1 and 2.					
Shallow Depth Diving EQ - Diving	1.237	1.228	1.165	0.000	1.165
Continue research on contaminated water diving and research on diver thermal protection and CO2 monitors, and diver sound protection. *FY 2009 Accomplishments:* Continued research on contaminated water diving, continued research on diver thermal protection, CO2 monitors, and diver sound protection. Continued research on prototype diver cooling system. *FY 2010 Plans:* Continue research on contaminated water diving, diver thermal protection, CO2 monitors, and diver sound protection. Continue the research on prototype diver cooling system. Begin research on validation of air and oil monitors.					

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603713N: *Ocean Engineering Tech Dev*	PROJECT 0394: *Shallow Depth Diving EQ*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
FY 2011 Base Plans: Continue research on contaminated water diving, CO2 monitors, and diver sound protection. Continue research on the prototype diver cooling system. Continue research on validation of air and oil monitors.					
Shallow Depth Diving Eq - Acquisition Workforce Acquisition Workforce *FY 2009 Accomplishments:* Defense Acquisition Workforce Development Fund Requirement	0.021	0.000	0.000	0.000	0.000
Accomplishments/Planned Programs Subtotals	6.216	13.957	10.411	0.000	10.411

C. Other Program Funding Summary ($ in Millions)

N/A

D. Acquisition Strategy

The Submarine Rescue system (SRS) segment of the SRDRS is largely based on the use of Commercial-Off-the-Shelf (COTS) technology and maximum use of Non-Developmental Items (NDI). The SRS segment is being procured using performance based specifications. Many of the SRS contracts were awarded competitively and were based on technical capability and cost considerations (best value). Program management of SRDRS is accomplished through the use of Program Executive Officer, Submarines (PEO SUB) leadership. This change was enacted in February 2003 realigning the responsibility from SEA00C to PEOSUB. The Prototype system provides full operational capability and no additional procurement is planned. The system is designed to be Government Owned/Commercially Operated/Commercially Maintained (GO/CO/CM).

E. Performance Metrics

Quarterly Program Reviews and Critical Design Reviews

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603713N: *Ocean Engineering Tech Dev*	PROJECT 0394: *Shallow Depth Diving EQ*

Product Development ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Pressurized Rescue Module System (PRMS)	C/CPIF	Oceanworks Ontario, Canada	23.824	0.000		0.000		0.000		0.000	0.000	23.824	Continuing
PRMS	C/FFP	Oceanworks Ontario, Canada	4.150	0.000		0.000		0.000		0.000	0.000	4.150	Continuing
Systems Engineering - Design, Integration	Various/ Various	Oceaneering Hanover, MD	6.803	11.175		7.558		0.000		7.558	Continuing	Continuing	Continuing
Systems Engineering - Technical	Various/ Various	Various Various	0.537	0.000		0.000		0.000		0.000	Continuing	Continuing	Continuing
		Subtotal	35.314	11.175		7.558		0.000		7.558			

Remarks

1. Oceaneering is the prime for SRDRS Transfer Under Pressure (TUP) capability; scheduled for IOC in FY13.

Support ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Development Support	Various/ Various	Various Various	2.443	1.213		1.150		0.000		1.150	Continuing	Continuing	Continuing
Integrated Logistics Support	Various/ Various	Various Various	0.841	0.000		0.000		0.000		0.000	Continuing	Continuing	Continuing
Configuration Management	C/CPAF	Oceaneering Hanover, MD	0.489	0.000		0.000		0.000		0.000	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603713N: *Ocean Engineering Tech Dev*	PROJECT 0394: *Shallow Depth Diving EQ*	

Support ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
		Subtotal	3.773	1.213		1.150		0.000		1.150			

Remarks

Test and Evaluation ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation	Various/ Various	Various Various	3.187	0.000		0.000		0.000		0.000	Continuing	Continuing	Continuing
Operational Test & Evaluation	WR	COMOPTEVFOR Norfolk, VA	0.450	0.075		0.050		0.000		0.050	Continuing	Continuing	Continuing
		Subtotal	3.637	0.075		0.050		0.000		0.050			

Remarks

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603713N: *Ocean Engineering Tech Dev*	PROJECT 0394: *Shallow Depth Diving EQ*

Management Services ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Contractor Engineering Support	Various/ Various	QBS/Various Richmond BC, Canada/Various	0.074	0.000		0.000		0.000		0.000	Continuing	Continuing	Continuing
Government Engineering Support	WR	NFESC Port Hueneme, CA	0.197	0.000		0.000		0.000		0.000	Continuing	Continuing	Continuing
Government Engineering Support	WR	PSNSY/ Various Bremerton, WA/ Various	2.120	0.000		0.077		0.000		0.077	Continuing	Continuing	Continuing
Government Engineering Support	Various/ Various	Various Various	1.859	0.000		0.000		0.000		0.000	Continuing	Continuing	Continuing
Program Management Support	Various/ Various	Various Various	0.706	1.404		1.461		0.000		1.461	Continuing	Continuing	Continuing
Travel	Various/ Various	Various Various	0.384	0.090		0.115		0.000		0.115	Continuing	Continuing	Continuing
SBIR Assessment	Various/ Various	Various Various	0.443	0.000		0.000		0.000		0.000	Continuing	Continuing	Continuing
Acquisition Workforce	Various/ Various	Various Various	0.021	0.000		0.000		0.000		0.000	Continuing	Continuing	Continuing
		Subtotal	5.804	1.494		1.653		0.000		1.653			

Remarks

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603713N: *Ocean Engineering Tech Dev*	PROJECT 0394: *Shallow Depth Diving EQ*	

	Total Prior Years Cost	FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	48.528	13.957		10.411		0.000		10.411			

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603713N: *Ocean Engineering Tech Dev*	PROJECT 0394: *Shallow Depth Diving EQ*

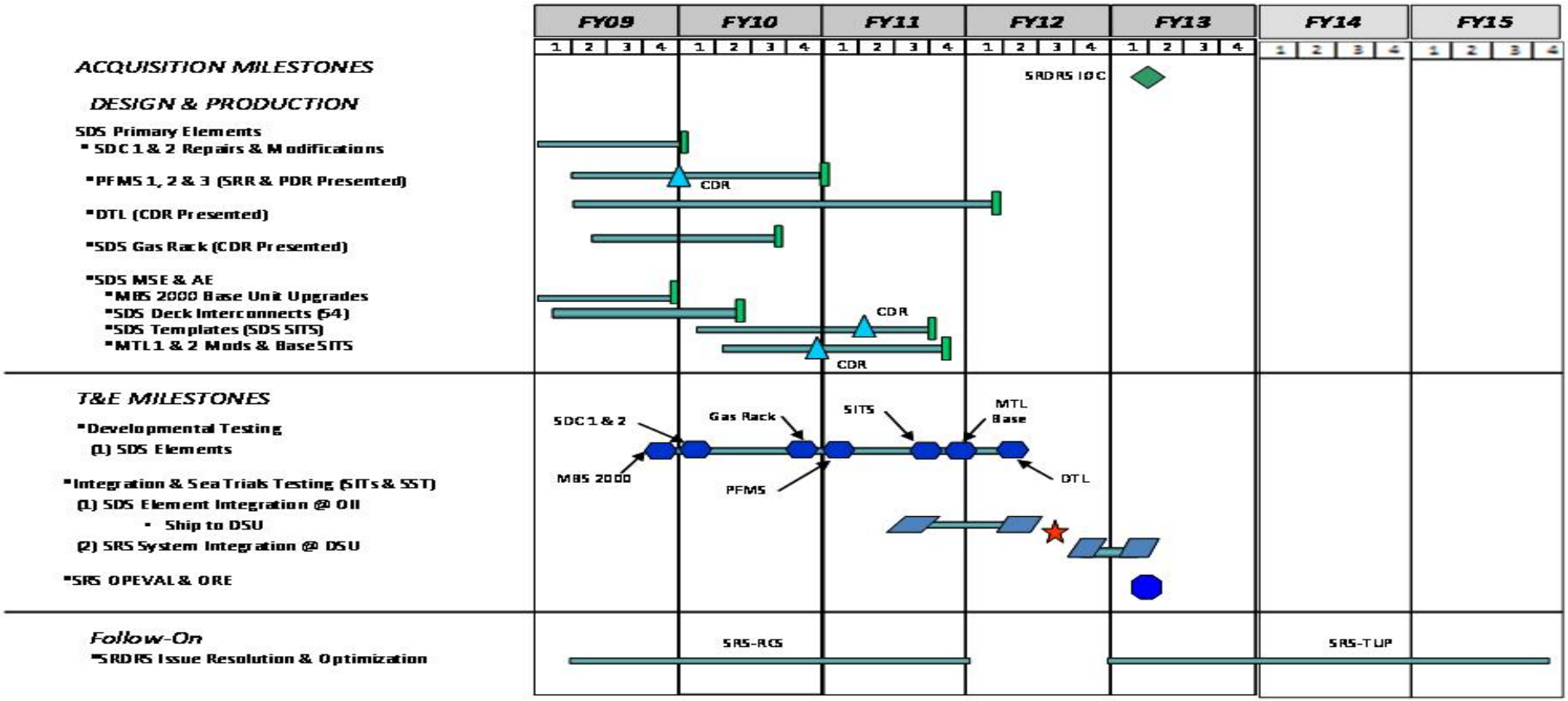

Exhibit R-4A, RDT&E Schedule Details: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603713N: *Ocean Engineering Tech Dev*	PROJECT 0394: *Shallow Depth Diving EQ*

Schedule Details

	Start		End	
Event	Quarter	Year	Quarter	Year
Acquisition Milestones	1	2009	4	2015
SRDRS IOC	1	2013	2	2013
Design & Production-SDS Primary Elements	1	2009	2	2012
SDC 1 & 2 Repairs & Modifications	1	2009	1	2010
PFMS 1, 2, & 3 (SRR & PDR Presented)	2	2009	1	2011
DTL (CDR Presented)	2	2009	2	2012
SDS Gas Rack (CDR Presented)	2	2009	3	2010
SDS MSE & AE	1	2009	4	2011
MBS 2000 Base Unit Upgrades	1	2009	4	2009
SDS Deck Interconnects (54)	1	2009	2	2010
SDS Templates (SDS SITS)	1	2010	4	2011
MTL 1 & 2 Mods & Base SITS	2	2010	4	2011
T&E Milestones	4	2009	2	2012
Developmental Testing (SDS Elements)	4	2009	2	2012
Integration & Sea Trials Testing (SITS & SST)	3	2011	2	2013
SDS Element Integration @ OII	3	2011	2	2012
Ship to DSU	3	2012	3	2012
SRS System Integration @ DSU	4	2012	1	2013

Exhibit R-4A, RDT&E Schedule Details: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603713N: *Ocean Engineering Tech Dev*	PROJECT 0394: *Shallow Depth Diving EQ*

	Start		End	
Event	Quarter	Year	Quarter	Year
SRS OPEVAL & ORE	1	2013	2	2013
Follow-On	2	2009	4	2015
SRDRS Issue Resolution and Optimization	2	2009	4	2015
SRS-RCS	2	2009	1	2012
SRS-TUP	4	2012	4	2015

Exhibit R-2, RDT&E Budget Item Justification: PB 2011 Navy										DATE: February 2010	
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*				R-1 ITEM NOMENCLATURE PE 0603721N: *Environmental Protection*							
COST ($ in Millions)	**FY 2009 Actual**	**FY 2010 Estimate**	**FY 2011 Base Estimate**	**FY 2011 OCO Estimate**	**FY 2011 Total Estimate**	**FY 2012 Estimate**	**FY 2013 Estimate**	**FY 2014 Estimate**	**FY 2015 Estimate**	**Cost To Complete**	**Total Cost**
Total Program Element	20.557	21.372	20.207	0.000	20.207	22.790	22.967	23.588	24.081	Continuing	Continuing
0401: *Shipboard Waste Mgmt*	6.238	6.025	5.911	0.000	5.911	6.681	6.572	6.822	6.970	Continuing	Continuing
0817: *Environmental Sustainability Development (NESDI)*	7.879	5.737	5.995	0.000	5.995	6.661	6.772	6.926	7.070	Continuing	Continuing
9204: *Marine Mammal Research*	5.242	8.813	8.301	0.000	8.301	9.448	9.623	9.840	10.041	Continuing	Continuing
9999: *Congressional Adds*	1.198	0.797	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	14.376

A. Mission Description and Budget Item Justification

Many environmental laws, regulations, and policies impose restrictions on Navy vessels, aircraft, and facilities that interfere with operations and/or increase the cost of operations. The Navy must be able to conduct its national security mission in compliance with applicable environmental requirements in the U.S. and abroad without compromising
performance, safety, or health, while simultaneously minimizing the cost of compliance. This program develops and evaluates processes, hardware, systems, and operational procedures that will allow the Navy to operate in U.S., foreign, and international waters, air, space, and land areas while complying with environmental laws, regulations,
Executive Orders, policies and international agreements. The projects for this program element support the Navy's compliance with the (a) Clean Water Act, (b) Act to Prevent Pollution from Ships, (c) International Convention for the Prevention of Pollution from Ships (MARPOL 73/78), (d) DoD 4715.6 R1, Regulations on Vessels Owned or Operated by the
Department of Defense, (e) OPNAVINST 5090.1B (CH-4), Environmental and Natural Resources Program Manual, (f) 40 CFR Part 9 and Chapter VII (Uniform National Discharge Standards [UNDS] Phase I Standard), (g) Executive Order (EO) 13148, Greening the Government Through Leadership in Environmental Management, (h) Nonindigenous Aquatic Nuisance Prevention and Control Act of 1990, (i) National Invasive Species Act of 1996, (j) 33 CFR 151 Subpart D-Ballast Water Management for Control of Nonindigenous Species in Waters of the United States, (k) Clean Air Act, (l) Federal Insecticide, Fungicide, and Rodenticide Act, (m) Executive Order (EO) 13423 Strengthening Federal Environmental, Energy, and Transportation Management of 24 January, 2007, (n) NAVSEANOTE 5400, NAVSEA Warranted Technical Authorities, (o) NAVSEAINST 5400.97B, Virtual SYSCOM Engineering and Technical Authority Policy, (p) NSWCCD-63-TM-2005/9, Clean Ballast Engineering Analysis Phase II, (q) Northwest Environmental Advocates v. EPA, No. 03-05760, Order Granting Plaintiffs' Motion for Permanent Injunctive Relief at 18 (N.D. Cal. Sept. 18, 2006), (r) Environmental Requirements and Goals for Navy Systems Acquisition, CNO (N4) Memorandum 5090 Ser N4/5U890259 of 20 April 2005, (s) International Convention for the Control and Management of Ships' Ballast Water and Sediments, 31 Feb 2004. References (a) through (m) establish Level I environmental protection requirements for Navy shipboard systems, operations, and discharges in the areas of liquid wastes, hazardous materials, solid

wastes, and other significant afloat environmental concerns. References (n) and (o) establish NAVSEA Technical Authority responsibilities for Ship Environmental Engineering. Project 0401 supports RDT&E efforts that enable Navy ships and submarines to comply with laws, regulations, and policies in six major areas: (1) Liquid Wastes, (2) UNDS Rulemaking, (3) Hazardous Materials and Pollution Prevention, (4) Hull Antifouling Paints, (5) Technical Authority, and (6) Ballast Water Exchange Improvements. A FY10 new start, Ballast Water Exchange Improvements, will provide engineering solutions for managing ballast water discharges to mitigate the transport and release of non-indigenous species. Project 0817 supports RDT&E to develop and validate technologies to enable Navy facilities to comply with environmental laws, regulations, and policies in a cost-effective manner. Project 9204 supports RDT&E to develop planning and monitoring tools for minimizing Fleet contacts with and potential harassment (physiological and behavior) of marine animals including threatened and endangered species in response to Federal laws and regulations and public scrutiny.

B. Program Change Summary ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
Previous President's Budget	20.740	20.661	0.000	0.000	0.000
Current President's Budget	20.557	21.372	20.207	0.000	20.207
Total Adjustments	-0.183	0.711	20.207	0.000	20.207
• Congressional General Reductions		-0.089			
• Congressional Directed Reductions		0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds		0.800			
• Congressional Directed Transfers		0.000			
• Reprogrammings	0.000	0.000			
• SBIR/STTR Transfer	-0.182	0.000			
• Program Adjustments	0.000	0.000	20.207	0.000	20.207
• Rate/Misc Adjustments	-0.001	0.000	0.000	0.000	0.000

Congressional Add Details ($ in Millions, and Includes General Reductions)	FY 2009	FY 2010
Project: 9999: *Congressional Adds*		
Congressional Add: *Compliance Tools Development for Metals in Antifouling Paints*	0.000	0.797
Congressional Add: *PUGET SOUND ANOXIA RESEARCH*	1.198	0.000
Congressional Add Subtotals for Project: 9999	1.198	0.797
Congressional Add Totals for all Projects	1.198	0.797

Exhibit R-2, RDT&E Budget Item Justification: PB 2011 Navy	DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603721N: *Environmental Protection*

Change Summary Explanation

Technical: Not applicable.
Schedule: Not applicable.

FY11 from previous President's Budget is shown as zero because no FY11-15 data was presented in President's Budget 2010.

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603721N: *Environmental Protection*	PROJECT 0401: *Shipboard Waste Mgmt*	

COST ($ in Millions)	FY 2009 Actual	FY 2010 Estimate	FY 2011 Base Estimate	FY 2011 OCO Estimate	FY 2011 Total Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
0401: *Shipboard Waste Mgmt*	6.238	6.025	5.911	0.000	5.911	6.681	6.572	6.822	6.970	Continuing	Continuing
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0		

A. Mission Description and Budget Item Justification

Navy ships and submarines must routinely operate in U.S., international, and foreign waters, and visit numerous U.S. and foreign ports. No body of water is without environmental restrictions that impact the movements and operations of Navy vessels. Environmental requirements tend to be most restrictive in port and in coastal waters,
where the Navy's increasing littoral presence places ships and submarines in discharge-restricted waters for longer periods of time. Growing international cooperation in addressing global environmental concerns is resulting in expanding areas of ocean considered environmentally susceptible, where special prohibitions on ship discharges and
operations are imposed. Navy vessels must comply with applicable environmental legal requirements while maintaining continued access to all waters for operations, exercises, training, and port access. The large crews and limited on-board space of Navy ships and submarines severely constrain their ability to hold wastes for return to port for
shore side disposal. The Shipboard Waste Management RDT&E project evaluates and develops shipboard environmental equipment, systems, technologies, processes, and practices to comply with environmental laws, regulations, Executive Orders, international agreements, foreign-country requirements, and DoD and Navy policies. The project focuses on
providing engineering criteria, design guidance, and performance specifications for selecting, procuring, installing, integrating, and operating environmental equipment and systems on Navy ships and submarines, and on defining and developing processes, procedures and logistics support requirements. Environmental equipment, systems, processes
and practices must meet legal environmental requirements and be reliable, maintainable and achievable at sea, and impose no or low manning burden. Environmental equipment and systems must meet Navy-unique shipboard requirements (performance, space, weight, shock, vibration, electromagnetic compatibility, manning, automation, etc.), incorporate
integrated logistics support, minimize life-cycle cost, and include validated acquisition, design, installation, and operating documentation. Shipboard processes and practices must be feasible and must be compatible with ship and submarine operational, maintenance, manning, habitability, health, and safety requirements. It also addresses
afloat environmental issues other than shipboard wastes, e.g.,hull anti-fouling and access to environmental data for planning Fleet operations and exercises. The Department Head of NAVSEA s Shipboard Environmental Protection Department (SEA 05P25) is the designated Technical Warrant Holder for Ship Environmental Engineering, with responsibility

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603721N: *Environmental Protection*	**PROJECT** 0401: *Shipboard Waste Mgmt*

and accountability for ensuring that ships and submarines are designed and upgraded, and can be operated, in compliance with existing and anticipated environmental requirements while minimizing total ownership cost and manning. This responsibility encompasses legacy platforms and new vessel designs, as well as Fleet operations exercises, and training.

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
Technical Authority	2.376	1.992	2.029	0.000	2.029
FY 2009 Accomplishments: Continue developing environmental equipment/system requirements documentation, design criteria and guidance, specifications and standards, and certification protocols, and perform test and evaluation, to facilitate execution of technical authority for legacy and new-design ship and submarine environmental capabilities. *FY 2010 Plans:* Develop environmental equipment/system requirements documentation, design criteria and guidance, specifications and standards, and certification protocols, and perform test and evaluation, to facilitate execution of technical authority for legacy and new-design ship and submarine environmental capabilities. *FY 2011 Base Plans:* Continue developing environmental equipment/system requirements documentation, design criteria and guidance, specifications and standards, and certification protocols, and perform test and evaluation, to facilitate execution of technical authority for legacy and new-design ship and submarine environmental capabilities.					
Integrated Liquid Wastes	2.650	2.988	2.762	0.000	2.762

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603721N: *Environmental Protection*	PROJECT 0401: *Shipboard Waste Mgmt*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
FY 2009 Accomplishments: Continue support rule making process in development of UNDS. Continue development of Marine Pollution Control Devices (MPCD) treatment systems, technologies and procedures, and evaluation of commercial off-the-shelf (COTS) waste water systems. *FY 2010 Plans:* Continue support rule making process in development of UNDS. Continue development of MPCD treatment systems, technologies and procedures, and evaluation of COTS waste water systems. *FY 2011 Base Plans:* Continue support rule making process in development of UNDS. Continue development of MPCD treatment systems, technologies and procedures, and evaluation of COTS waste water systems.					
Hazardous and Other Major Ship Wastes *FY 2009 Accomplishments:* Continue shipboard hazardous materials substitution and elimination process, and continue test and evaluation of pollution-prevention equipment aboard surface ships and submarines. Continue development and testing of new low/no-copper underwater hull antifouling coatings. *FY 2010 Plans:* Continue shipboard hazardous materials substitution and elimination process, and continue test and evaluation of pollution-prevention equipment aboard surface ships and submarines. Continue development and testing of new low/no-copper underwater hull antifouling coatings. *FY 2011 Base Plans:* Continue shipboard hazardous materials substitution and elimination process, and continue test and evaluation of pollution-prevention equipment aboard surface ships and submarines. Complete development and testing of new low/no-copper underwater hull antifouling coatings.	1.212	0.647	0.748	0.000	0.748

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603721N: *Environmental Protection*	PROJECT 0401: *Shipboard Waste Mgmt*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
Ballast Water Exchange	0.000	0.398	0.372	0.000	0.372
FY 2010 Plans: Conduct surveys of Amphibious Warfare Ships to explore feasible engineering enhancements reduce the time and/or and manpower involved in executing ballast water double exchange. Develop and document double exchange procedures and guidance procedures and prepare documentation and training materials for the new ballast water management guidance. Investigate ballasting data logging options. *FY 2011 Base Plans:* Continue ballast water double exchange surveys and procedural product development.					
Accomplishments/Planned Programs Subtotals	6.238	6.025	5.911	0.000	5.911

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total	FY 2012	FY 2013	FY 2014	FY 2015	Cost To Complete	Total Cost
• RDTEN/0601153N: *Defense Research Sciences*	405.561	429.107	429.767	0.000	429.767	443.593	466.118	480.310	503.304	0.000	3,157.760

D. Acquisition Strategy

RDT&E Contracts are Competitive Procurements.

E. Performance Metrics

Quarterly Program Reviews

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603721N: *Environmental Protection*	PROJECT 0401: *Shipboard Waste Mgmt*

Product Development ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Ancillary Hardware Development	C/Various	Misc. Contracts Not Specified	19.149	0.000		0.000		0.000		0.000	0.000	19.149	Continuing
Primary Hardware Development	C/CPFF	Oceaneering Not Specified	1.000	0.000		0.000		0.000		0.000	0.000	1.000	Continuing
Systems Engineering	C/CPFF	John J. McMullen & Son Not Specified	4.487	0.000		0.000		0.000		0.000	0.000	4.487	Continuing
		Subtotal	24.636	0.000		0.000		0.000		0.000	0.000	24.636	

Remarks

Support ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Software Development	WR	SPAWAR Charleston, SC	10.838	0.000		0.000		0.000		0.000	0.000	10.838	Continuing
		Subtotal	10.838	0.000		0.000		0.000		0.000	0.000	10.838	

Remarks

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603721N: *Environmental Protection*	PROJECT 0401: *Shipboard Waste Mgmt*

Test and Evaluation ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation	WR	NSWCCD, Bethesda, MD Bethesda, MD	165.262	4.790	Nov 2009	4.684	Nov 2010	0.000		4.684	Continuing	Continuing	Continuing
Developmental Test & Evaluation	WR	NRL,Wash,DC Wash,DC	30.230	0.199	Dec 2009	0.232	Dec 2010	0.000		0.232	Continuing	Continuing	Continuing
Developmental Test & Evaluation	WR	SPAWARSYSCEN SD,CA	11.731	0.110	Nov 2009	0.111	Nov 2010	0.000		0.111	Continuing	Continuing	Continuing
Developmental Test & Evaluation	WR	Misc. Govt Labs TBD	22.878	0.050	Nov 2009	0.047	Nov 2010	0.000		0.047	Continuing	Continuing	Continuing
Developmental Test & Evaluation	C/CPFF	SAIC San Diego, CA	15.570	0.000		0.000		0.000		0.000	Continuing	Continuing	Continuing
Developmental Test & Evaluation	C/CPFF	Misc. Contracts TBD	12.814	0.149	Feb 2010	0.140	Feb 2011	0.000		0.140	Continuing	Continuing	Continuing
Process Control Engineering	C/CPFF	M. Rosenblatt & Sons Arlington, VA	5.830	0.717	Feb 2010	0.687	Feb 2011	0.000		0.687	0.000	7.234	Continuing
Developmental Test & Evaluation	C/CPFF	ONR Arlington, VA	0.400	0.000		0.000		0.000		0.000	0.000	0.400	Continuing
Developmental Test & Evaluation	WR	Naval Postgraduate School Monterey, CA	1.800	0.000		0.000		0.000		0.000	0.000	1.800	Continuing
Process Control Engineering	MIPR	EPA, Hdqtrs Washington, DC	0.840	0.000		0.000		0.000		0.000	0.000	0.840	Continuing
		Subtotal	267.355	6.015		5.901		0.000		5.901			

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603721N: *Environmental Protection*	PROJECT 0401: *Shipboard Waste Mgmt*	

Test and Evaluation ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract

Remarks

Management Services ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Travel	Allot	NAVSEA HQ Washington, DC	0.290	0.010	Nov 2009	0.010	Nov 2010	0.000		0.010	0.000	0.310	Continuing
SBIR Assessment	C/TBD	Not Specified Not Specified	0.078	0.000		0.000		0.000		0.000	0.000	0.078	Continuing
		Subtotal	0.368	0.010		0.010		0.000		0.010	0.000	0.388	

Remarks

	Total Prior Years Cost	FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	303.197	6.025		5.911		0.000		5.911			

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603721N: *Environmental Protection*	PROJECT 0401: *Shipboard Waste Mgmt*	

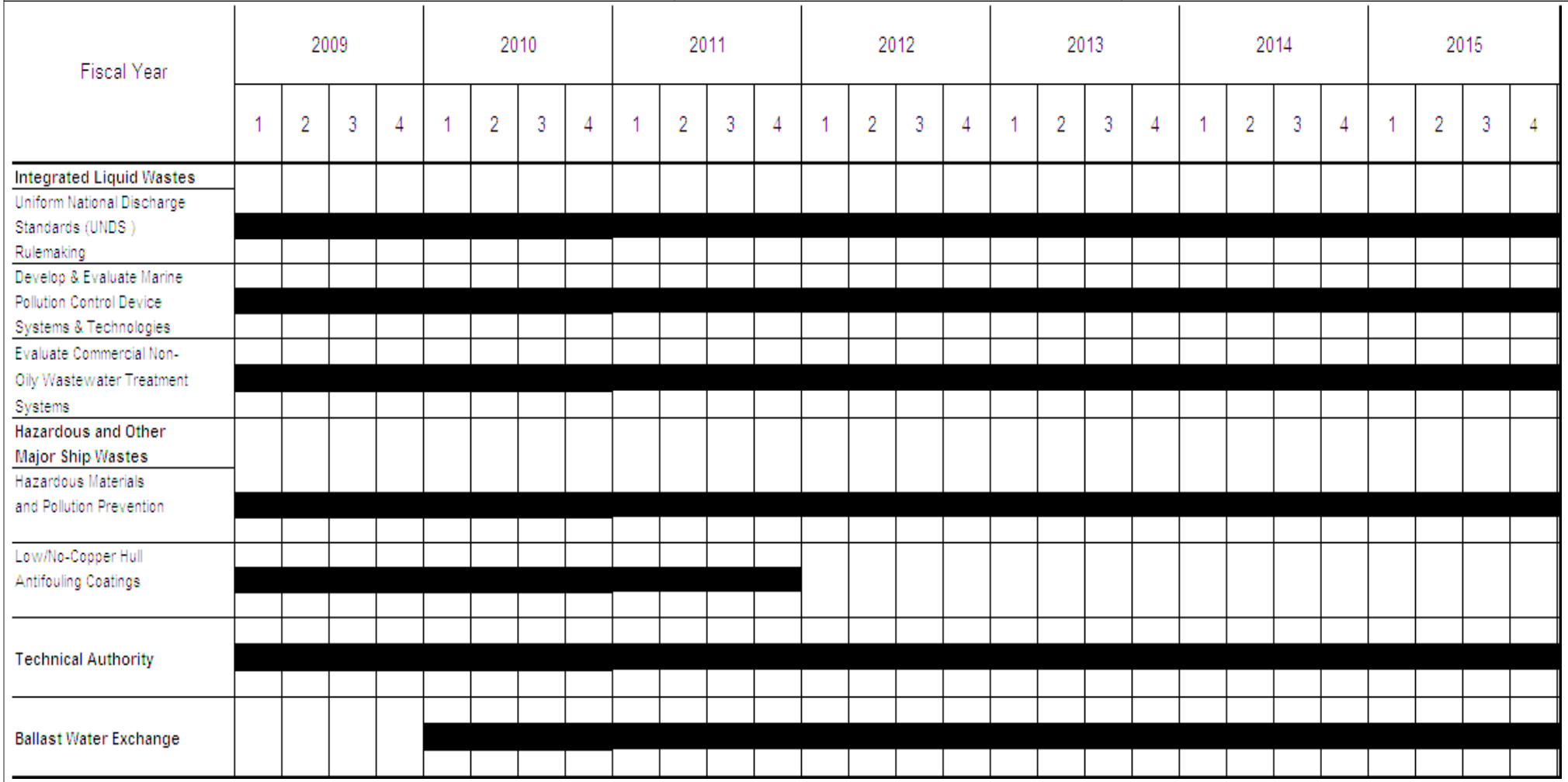

Exhibit R-4A, RDT&E Schedule Details: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603721N: *Environmental Protection*	**PROJECT** 0401: *Shipboard Waste Mgmt*

Schedule Details

	Start		End	
Event	**Quarter**	**Year**	**Quarter**	**Year**
Uniform National Discharge Standards (UNDS) Rulemaking	1	2009	4	2015
Develop & Evaluate Marine Pollution Control Device Systems & Technologies	1	2009	4	2015
Evaluate Commercial Wastewater Treatment Systems	1	2009	4	2015
Hazardous Materials and Pollution Prevention	1	2009	4	2015
Low/No-Copper Hull Antifouling Coatings	1	2009	4	2011
Technical Authority	1	2009	4	2015
Ballast Water Exchange	1	2010	4	2015

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603721N: *Environmental Protection*	PROJECT 0817: *Environmental Sustainability Development (NESDI)*	

COST ($ in Millions)	FY 2009 Actual	FY 2010 Estimate	FY 2011 Base Estimate	FY 2011 OCO Estimate	FY 2011 Total Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
0817: *Environmental Sustainability Development (NESDI)*	7.879	5.737	5.995	0.000	5.995	6.661	6.772	6.926	7.070	Continuing	Continuing
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0		

A. Mission Description and Budget Item Justification

Inherent to the realization of the vision outlined in Sea Power 21 are certain environmental consequences that will, to a lesser or greater degree, impact on the Navy's ability to fully achieve the strategy outlined in the Navy Capability Pillars (NCP) SEA SHIELD, SEA STRIKE, SEA BASING and FORCEnet and the supporting initiatives of SEA WARRIOR, SEA TRIAL and SEA ENTERPRISE. Readiness and training are primary considerations for determining whether any fighting force is at its peak proficiency. The ability to train our forces in a realistic environment is paramount. Today's reality requires training and operating within environmental constraints (national and international laws and agreements), and searching for alternatives to comply with and alleviate those constraints. Moreover, as we develop new systems and technologies in support of Sea Power 21, the Navy must anticipate potential environmental regulations which, while not currently an issue, could in the future adversely impact our ability to project and sustain our forces at home and abroad.

This program identifies pervasive Navy shoreside environmental requirements and develops and validates information, new processes, and technologies that address requirements that pose significant impact on Naval shore activities in complying with environmental laws, regulations, orders, and policies. The goal of the program is to maximize opportunities for significant cost savings while minimizing personnel liabilities, operational costs, and regulatory oversight and preserving or enhancing the ability of Naval shore activities to accomplish their required missions and functions in support of the Navy's transformational strategy. Program investments supports 4 of 5 Environmental Enabling Capabilities (EEC-2 though 5) that are required to meet the objectives of Sea Power 21 as detailed in the POM08 Integrated Navy Environmental Readiness Capability Assessment for Science and Technology (S&T) and Development, test and Evaluation (DT&E).

EEC-2 MAXIMIZE TRAINING AND TESTING RANGE REQUIREMENTS WITHIN ENVIRONMENTAL CONSTRAINTS

This capability addresses environmental impacts and restrictions at Navy land and sea ranges, including munitions testing and manufacturing, to ensure Navy ranges are available to conduct required training and testing operations for the Fleet. Investments in EEC-2 provide validated knowledge, models, and processes to mitigate environmental impacts, restrictions, and costs at Navy training and test ranges to maximize the availability and utilization of the ranges. The results support operational readiness by providing the tools and technologies necessary for sustaining and managing Navy land and sea ranges related to unexploded ordnance (UXO) and munitions, encroachment, air quality, airborne noise, water quality, and wetlands. Capabilities gained include the ability to assess and determine the risks from

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
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underwater UXO, the evaluation and prioritization ordnance contaminated sites for evaluation in environmental programs, and the implementation of range specific best management practices by evaluating and modeling available process, procedures, and technologies.

EEC-3 PLATFORM MAINTENANCE AND REPAIR WITH MINIMAL ENVIRONMENTAL FOOTPRINT

This capability focuses on minimizing or eliminating environmental impact related to Navy and Marine Corps weapon system repair and maintenance operations. Investments in EEC-3 provide valid knowledge, models, process, and technologies to minimize regulated emissions, discharges and hazardous material usage during the repair and maintenance of ships, submarines, and surface/sub-surface vehicles and aircraft and air vehicles. The program supports Fleet operational readiness and Navy acquisition communities by investing in information to understand emerging environmental requirements and to develop innovative processes and technologies that result in savings while reducing the fleet environmental constraints related to platform maintenance. Capabilities and benefits gained include, but are not limited to, the reduction in the usage of heavy metals used in metal finishing (chromium and cadmium), reduced hazardous air pollutant (HAP) emissions, and the development of best management practices and tools to minimize the use of hazardous materials and the generation of hazardous wastes associated with maintaining and repairing ships, submarines and aircraft and unmanned vehicles. Results of program investments will be leveraged across weapon system and platform acquisition to ensure continued reduction in lifecycle costs and long-term environmental compliance burdens to the Fleet.

EEC-4. SUPPORT SHORE READINESS WITHIN ENVIRONMENTAL CONSTRAINTS

Naval shore establishment requires the capability to operate and maintain facilities and provide waterfront and airfield services to the fleet while complying with applicable environmental regulations and minimizing environmental impacts and costs. The program invests in knowledge and innovative processes and technologies that minimize infrastructure and operational costs, regulated emissions, while minimizing discharges and hazardous material usage from ship (waterfront) and aviation operations. Capabilities and benefits gained under EEC-4 include reduced costs associated with wastewater treatment, elimination/reduction in the use of HAPs, ozone depleting substances (ODSs), and volatile organic compounds (VOCs), and the associated reporting requirements, reduced hazardous waste and disposal costs, and improved storm water management.

EEC-5. COST-EFFECTIVE MANAGEMENT OF ENVIRONMENTAL REGULATORY REQUIREMENTS

The environmental compliance regulations require base managers to permit, monitor and report on many processes associated with weapon system and platform operations. Naval shore environmental managers require the capability to efficiently and cost effectively manage these compliance requirements. Under EEC-5, the program invests in improved data collection, methods, and models to assess environmental impacts and ecological risk assessments of Naval operations on harbors, U.S. waterways, and surrounding communities. Benefits include gaining standardized technical environmental management improvements/techniques related to source control, assessment, and monitoring. EEC-5 also provides validated knowledge, models, processes and technologies to improve environmental monitoring and reporting, and to reduce the cost of compliance with regulations applicable to coastal contamination and contaminated sediments.

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B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
Maximize Training & Testing Requirements Within Environmental Constraints	2.115	2.081	2.171	0.000	2.171

FY 2009 Accomplishments:

FY09: Continue providing validated knowledge, models, and processes to mitigate environmental impacts, restrictions, and costs at Navy training and test range to maximize the availability and utilization of the ranges. Continued the analysis of the long term disposition of seafloor cables which will identify cable impacts to the marine environments aiding the sustainment and management of Navy underwater ranges and support new underwater surveillance systems that require the laying of seafloor hardware and cables. Continued the Seafloor Cable Baseline Assessment to establish a baseline condition from which any adverse effects associated with seafloor ranges, in particular, seafloor communication cables can be determined. Continued effort to assess environmental risk associated with abandoned equipment in underwater ranges. Sound Energy Model Assessment on underwater marine environment. Developed a Checklist for Blow-In-Place (BIP) Scenarios.

FY 2010 Plans:

FY10: Continue providing validated knowledge, models, and processes to mitigate environmental impacts, restrictions, and costs at Navy training and test range to maximize the availability and utilization of the ranges. Continued effort to assess environmental risk associated with abandoned equipment in underwater ranges. Continue the assessment of sound energy models on underwater marine environment. Conclusion of efforts on the Seafloor Cable Baseline Assessment will allow decision makers to determine a long term monitoring strategy for the underwater range. Seafloor cable laying strategies and decision tool. Determining the Phototoxic Properties of Energetic Contaminants in Aquatic Environments.

FY 2011 Base Plans:

FY11: Continue providing validated knowledge, models, and processes to mitigate environmental impacts, restrictions, and costs at Navy training and test range to maximize the availability and utilization of the ranges. Continue the assessment of sound energy models on underwater marine

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B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
environment. Continue seafloor cable laying strategy and decision tool. Conclusion of the risk assessment associated with abandoned equipment in underwater ranges. Background Perchlorate Source Characterization at Navy Facilities and Ranges. Long-Term Monitoring Capabilities to Support Natural Resource Management on Navy and Marine Corps Installations and Ranges.					
Maintenance	2.104	0.787	0.848	0.000	0.848
FY 2009 Accomplishments: FY09: Continue providing new systems and processes to minimize regulated emissions, discharges and hazardous material usage resulting from the repair and maintenance of ships, submarines, and aircraft. Completed aircraft sustainment related projects. Developed dry dock best management practices and decision selection tool assisting naval shipyards, stations and bases in meeting the copper discharge standards will conclude. Alternative solvents demonstrations for ship maintenance operations and identification of alternatives for NAVSEA targeted chemicals continued. The development of hazardous material allocation information for ship maintenance continued. Completed acid waste treatment project for cleaning shipboard heat exchangers. Demonstrated a hull bio-fouling cleaning/removal approach. Evaluated the Solvent Extraction Methodologies for the Extraction of Polychlorinated Biphenyls (PCBs) in Shipboard Materials. *FY 2010 Plans:* FY10: Divest investments in EEC3 related to aircraft sustainment. Continue development of dry dock cleaning alternatives. Evaluation of Solvent Extraction Methodologies for the Extraction of Polychlorinated Biphenyls in Shipboard Materials Continue hull bio-fouling cleaning and removal technology. Tools/mitigation measures for coating operations on vessel freeboard areas. Elimination of Overspray in Shipbuilding and Facilities Maintenance Operations.					

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B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
FY 2011 Base Plans: FY11: Complete all aviation sustainment related projects. Continue development of dry dock cleaning alternatives. Complete hull bio-fouling cleaning and removal technology. Continue evaluation of solvent extraction methodologies for the extraction of PCBs in shipboard materials. Continue hull bio-fouling cleaning and removal technology. Continue the elimination of overspray in shipbuilding and facilities maintenance operations. Initiate effort to develop tools/ mitigation measures for coating operations on vessel freeboard areas.					
Support Shore Readiness within Environmental Constraints	2.896	2.475	2.473	0.000	2.473
FY 2009 Accomplishments: FY09: Continue providing new systems and processes to minimize regulated emissions, discharges and hazardous material usage resulting specifically from waterfront support, aviation support, and other base operations. Continued selected demonstrations of alternative solvents for industrial operations. Continued the development of a wastewater treatment system to collect and treat the waste stream for vertical launch missile tubes. Continued investigating improved biofouling control and preventative maintenance planning for permanent oil containment boom systems. Continued Shoreside Ballast Water Treatment effort. Dry dock best management practices tool will assist naval shipyards, naval stations, and submarine bases in meeting the copper discharge standards for NPDES and Stormwater discharges. *FY 2010 Plans:* FY10: Integrating effort related to Shipboard Acid Waste Treatment Technology. This pier-side reclamation system separates heavy metal and marine fouling sludge to allow ship waste water to meet local sanitary sewer discharge limits. Validate a Shipboard Mobile Surface Cleaning Technology. Validation of a mobile surface cleaning technology for critical cleaning of shipboard non-skid and shoreside surfaces to remove contaminants, mitigate pollution from weather deck and stormwater runoff and reduce associated manpower and waste					

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
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B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
management burden. Continue providing new systems and processes to minimize regulated emissions, discharges and hazardous material usage resulting specifically from waterfront support, and other base operations. Realign the program to focus on addressing the fleets high priority needs and investment in processes related to waterfront support to address risks associated with sea level rise and more frequent and intense storm events. Reduced Generation of Shoreside Managed Waste from Pierside Supported Underwater Ship Husbandry Operations. *FY 2011 Base Plans:* FY11: Continue providing new systems and processes to minimize regulated emissions, discharges and hazardous material usage resulting specifically from waterfront support and aviation support operations. Water front mitigation strategies to address sea level rise and more frequent and intense storms. Making Man-made Structures and Altered Habitats in Urban Areas of Navy Harbors More Habitable by Native Species without Compromising Structural Integrity. Shoreside Treatment of Ballast Water.					
Cost-Effective Management of Environmental Regulatory Requirements *FY 2009 Accomplishments:* FY09: Continued providing validated knowledge, models, processes and systems to improve environmental monitoring and reporting, and reduce the cost of compliance with regulations applicable to coastal contamination and contaminated sediments. Abiotic In Situ Treatment of 1,2,3-Trichloropropane to Protect Drinking Water Resources. *FY 2010 Plans:* FY10: The Potable Water Quality Management Guidance Document which provides Navy drinking water program managers with the direction and information for meeting compliance goals contained in the new disinfection byproducts rules. Continue providing validated knowledge, models, processes and system to improve environmental monitoring and reporting, and to reduce the cost of compliance with regulations applicable to coastal contamination and contaminated sediments. Continue effort	0.723	0.394	0.503	0.000	0.503

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B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
to establish guidelines Continue to establish guidelines and limitations for the Use of Biodiesel with Ground Tactical Vehicles. Maximize the use of biodiesel fuels in tactical vehicles and equipment. Demonstrate the practical application of Compound Specific Isotope Analysis (CSIA) associated with Monitored Natural Attenuation (MNA) to provide practical guidelines associated with its use and interpretation. Initiate efforts related to the regulatory requirements associated with climate change and associated emissions and reporting. *FY 2011 Base Plans:* FY11: Continue providing validated knowledge, models, processes and systems to improve environmental monitoring and reporting, and to reduce the cost of compliance with regulations applicable to coastal contamination and contaminated sediments. Reduce Contaminant Transport Associated with Stormwater Runoff. Continue efforts related to Navy contribution to climate change and regulatory requirements.					
DAWDF *FY 2009 Accomplishments:* DAWDF Realignment	0.041	0.000	0.000	0.000	0.000
Accomplishments/Planned Programs Subtotals	7.879	5.737	5.995	0.000	5.995

C. Other Program Funding Summary ($ in Millions)

N/A

D. Acquisition Strategy

This project is categorized as Non-ACAT (Non Acquisition). This project is categorized as Non-ACAT (Non Acquisition). The project delivers a broad spectrum of products that require a variety of acquisition processes to implement. Equipment products for Naval stations and other mission funded activities costing over $100K are often procured centrally through the Navy Pollution Prevention Equipment Program (PPEP) or directly through the base operating budget. Equipment products for Shipyards and other Navy Working Capital Fund (NWCF) activities costing over $100K are procured through their Capital Purchases Program (CPP). For both types of activities, equipment products costing less than $100K, and process changes not requiring the purchase of new equipment such as consumable material or product

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substitutions, are funded through the activity's operating budgets. Occasionally there is a technology that must be implemented as a specialized facility. These are acquired through the Military Construction (MCON) Program. All these acquisition processes are pursued using a common strategy that satisfies the needs of all the critical stakeholders: 1) Fleet end user; 2) Funding sponsor for the Navy end user; 3) Other stakeholders with cognizance over the Navy process or operation being changed, 4) Cognizant environmental federal, state, and local regulators; and 5) The private or government organization that will produce the product.

E. Performance Metrics

Quarterly Budget Reviews

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy		DATE: February 2010
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Product Development ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
EEC 2	Various/ Various	NFESC PT HUENEME, CA	0.532	0.710	Apr 2010	0.750	Aug 2011	0.000		0.750	0.000	1.992	Continuing
EEC 2	Various/ Various	SSC SAN DIEGO, CA	0.261	1.360	Jun 2010	1.315	Mar 2011	0.000		1.315	0.000	2.936	Continuing
EEC 3	Various/ Various	NSWC SAN DIEGO, CA	1.466	0.420	Aug 2010	0.420	Feb 2011	0.000		0.420	0.000	2.306	Continuing
EEC 3a	Various/ Various	NSWC SAN DIEGO, CA	0.769	0.250	Jun 2010	0.435	Jun 2011	0.000		0.435	0.000	1.454	Continuing
EEC 3	Various/ Various	NAWC PATUXENT RIVER, MD	0.395	0.124	Apr 2010	0.000		0.000		0.000	0.000	0.519	Continuing
EEC 4	Various/ Various	NFESC PT HUENEME, CA	2.187	1.624	Jul 2010	1.256	Nov 2011	0.000		1.256	0.000	5.067	Continuing
EEC 4	Various/ Various	NSWC SAN DIEGO, CA	0.100	0.488	Jul 2010	0.662	Feb 2011	0.000		0.662	0.000	1.250	Continuing
EEC 4a	Various/ Various	SSC SAN DIEGO, CA	0.520	0.340	Jan 2010	0.280	Jan 2011	0.000		0.280	0.000	1.140	Continuing
EEC 5	Various/ Various	NFESC PT HUENEME, CA	0.448	0.183	Jan 2010	0.297	Jan 2011	0.000		0.297	0.000	0.928	Continuing
EEC 5	Various/ Various	NSWC SAN DIEGO, CA	0.215	0.000		0.000		0.000		0.000	0.000	0.215	Continuing
EEC 5	Various/ Various	NAWC	0.223	0.000		0.000		0.000		0.000	0.000	0.223	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy		DATE: February 2010
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Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	FY 2010 Cost	FY 2010 Award Date	FY 2011 Base Cost	FY 2011 Base Award Date	FY 2011 OCO Cost	FY 2011 OCO Award Date	FY 2011 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
		PATUXENT RIVER, MD											
EEC 5	Various/ Various	SSC SAN DIEGO, CA	0.467	0.238	Nov 2010	0.580	Jan 2011	0.000		0.580	0.000	1.285	Continuing
EEC2	Various/ Various	NSWCH HI	0.296	0.000		0.000		0.000		0.000	0.000	0.296	Continuing
		Subtotal	7.879	5.737		5.995		0.000		5.995	0.000	19.611	

Remarks

	Total Prior Years Cost	FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	7.879	5.737		5.995		0.000		5.995	0.000	19.611	

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603721N: *Environmental Protection*	PROJECT 0817: *Environmental Sustainability Development (NESDI)*

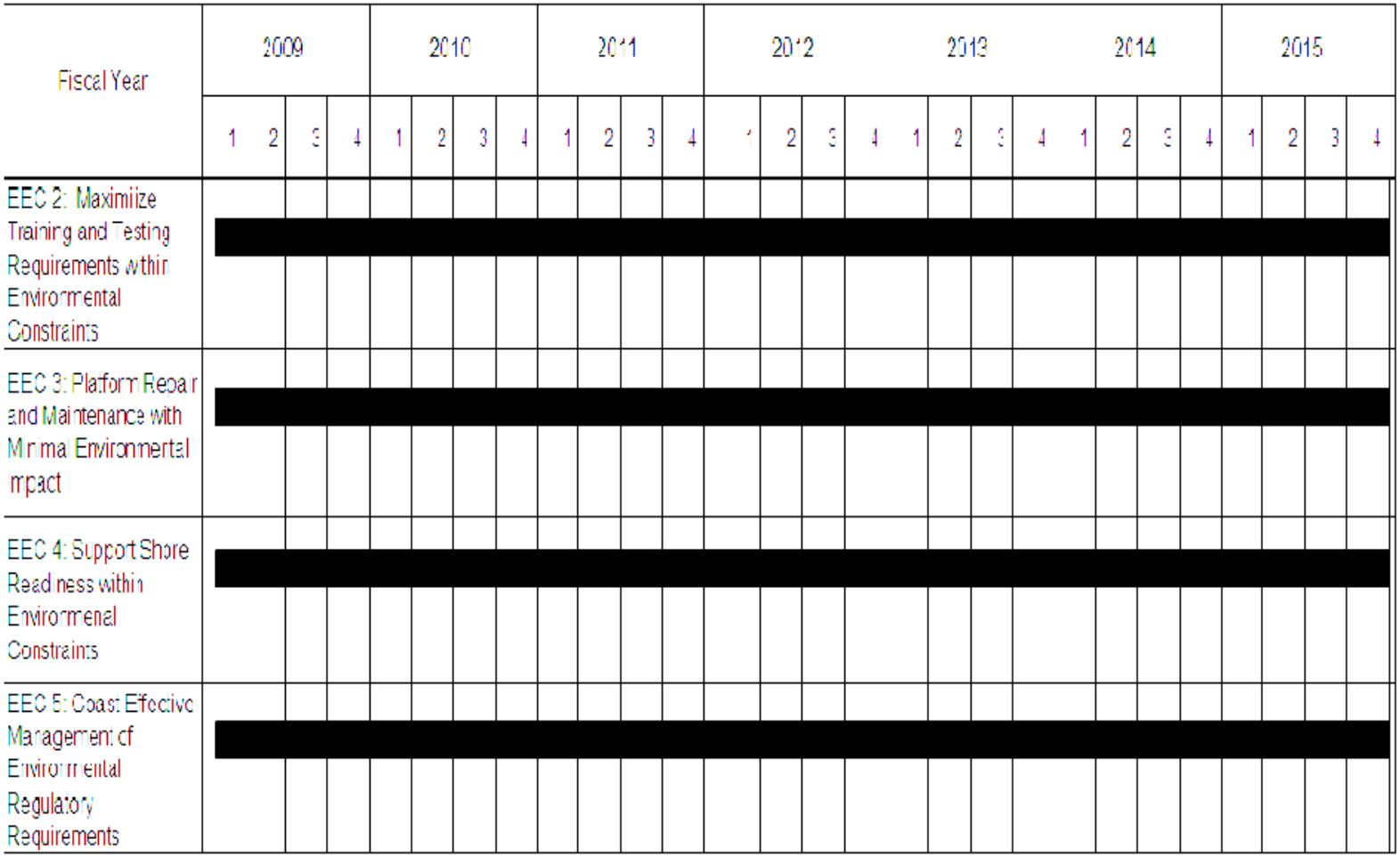

Exhibit R-4A, RDT&E Schedule Details: PB 2011 Navy		DATE: February 2010
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Schedule Details

	Start		End	
Event	**Quarter**	**Year**	**Quarter**	**Year**
EEC 2	1	2009	4	2015
EEC 3	1	2009	4	2015
EEC 4	1	2009	4	2015
EEC 5	1	2009	4	2015

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COST ($ in Millions)	FY 2009 Actual	FY 2010 Estimate	FY 2011 Base Estimate	FY 2011 OCO Estimate	FY 2011 Total Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
9204: *Marine Mammal Research*	5.242	8.813	8.301	0.000	8.301	9.448	9.623	9.840	10.041	Continuing	Continuing
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0		

A. Mission Description and Budget Item Justification

The Navy has been and will continue to be subject to litigation with regard to the potential injuring and killing of marine animals by the use of intense underwater sound. Since Fleet operation and training areas coincide with known or probable marine mammal habitats, migration routes, or breeding areas, the possibility exists that such incidents are likely to continue in the future. The increasing public interest and pressure has resulted in escalating Fleet costs. For example, Fleet and SYSCOM development activities have been interrupted, modified, or altogether cancelled and environmental regulations have, among other things, required new ship construction shock trials to obtain Federal permits and conduct extensive environmental planning that can take several years to complete. The incorporation of mitigation measures in Fleet training operations to minimize the potential adverse effects on protected marine animals can significantly reduce the realism of these operations. In addition, the testing, evaluation, and deployment of new sonar detection and monitoring systems that use active acoustics are under intense public scrutiny for their potential adverse effects on whales and other marine mammals. Navy needs scientific evidence to substantiate its claims of limited or inconsequential adverse effects to marine life from operations.

This project primarily focuses on the development of planning, monitoring, and mitigating tools to aid the Fleet in minimizing contact with and the potential harassment of protected marine animals during operations, exercises, training, and undersea surveillance and weapons testing. These new capabilities will encompass historical and newly

acquired data and analytical models that together can predict marine animal habitats (where they are likely to be) and their natural and expected behavior (diving patterns, prey localization, calling activity, etc.). This project consists of three major areas that will help ensure Navy compliance with the Marine Mammal Protection Act (MMPA).

These areas are (1) Mammal Demographics - Determine the likelihood of the presence of marine mammal species during observed and forecast oceanographic conditions by developing habitat and ecological models. Refine marine mammal survey techniques to optimize the accuracy of abundance estimates in small ocean regions of Navy interest.

Conduct analysis of long range, low frequency marine mammal vocalizations to determine natural variations in population estimates, residency, and migration routes over large ocean regions; (2) Criteria, Thresholds, and Mitigation - Establish criteria and thresholds from which to measure potential impact on marine mammals from Navy training

operations. Determine the effectiveness and usefulness of various mitigation measures in relation to the potential impact of Navy operations on marine mammals; and (3) Passive Acoustic Monitoring - Conduct Passive Acoustic Monitoring of Marine Mammals, particularly on Navy undersea ranges. Several feasibility demonstrations reveal the

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potential of passive acoustic monitoring as a unique form of mitigation and a special tool to obtain critical information about normal marine mammal behavior. Any impact of Navy operations on marine mammals, particularly behavior modification, will be derived after normal variations in marine mammal behavior resulting from natural factors are
determined. Several remaining unknowns must be addressed before passive acoustic monitoring techniques are developed as an institutionalized system available to the Fleet.
Accurate and timely monitoring and predicting the movement of whales and other protected marine animals plus an enhanced knowledge of how marine animals may react to Fleet activities (e.g., physiological and behavioral effects) will reduce Navy interaction with these animals; minimize the risk that legally-imposed monitoring and avoidance
measures will adversely affect Fleet operations and exercises; minimize the substantial costs associated with operations, exercises, and tests that have to be modified or curtailed as a result of concerns about protected marine animals; and will reduce the likelihood of litigation related to actual or anticipated compliance problems with protected animals.

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
Marine Mammal Location, Abundance and Movement	1.462	1.231	1.120	0.000	1.120
FY 2009 Accomplishments: Continued investigations in marine mammal location, abundance, and movement through habitat investigations; predictive models; marine mammal database; and data analysis, protocols and surveys. *FY 2010 Plans:* Continue investigations in marine mammal location, abundance, and movement through habitat investigations; predictive models; marine mammal database; and data analysis, protocols and surveys. *FY 2011 Base Plans:* Continue investigations in marine mammal location, abundance, and movement through habitat investigations; predictive models; marine mammal database; and data analysis, protocols and surveys.					
Criteria and Thresholds, Physiology and Behavior, and Effects of Sound	1.501	2.785	2.678	0.000	2.678

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B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
FY 2009 Accomplishments: Continued investigations in criteria and thresholds, physiology and behavior, and effects of sound through hearing sensitivity; temporary threshold shift (TTS)/Sub-TTS; physical injury models; cumulative effects of sound and/or multiple events; effects of sound on the marine mammal habitat; and workshops. *FY 2010 Plans:* Continue investigations in criteria and thresholds, physiology and behavior, and effects of sound through hearing sensitivity; temporary threshold shift (TTS)/Sub-TTS; physical injury models; cumulative effects of sound and/or multiple events; effects of sound on the marine mammal habitat; and workshops. *FY 2011 Base Plans:* Continue investigations in criteria and thresholds, physiology and behavior, and effects of sound through hearing sensitivity; temporary threshold shift (TTS)/Sub-TTS; physical injury models; cumulative effects of sound and/or multiple events; effects of sound on the marine mammal habitat; and workshops.					
Mitigation Methodologies: Monitoring, New Technology, and Risk Assess *FY 2009 Accomplishments:* Continued mitigation methodologies for monitoring, new technology and risk assessment through passive acoustic monitoring; active acoustic monitoring; improved tag development; alternative monitoring; defining risk assessment variables; model risk assessment and determine mitigation effectiveness. *FY 2010 Plans:* Continue mitigation methodologies for monitoring, new technology and risk assessment through passive acoustic monitoring; active acoustic monitoring; improved tag development; alternative	2.206	2.238	2.067	0.000	2.067

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
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B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
monitoring; defining risk assessment variables; model risk assessment and determine mitigation effectiveness. *FY 2011 Base Plans:* Continue mitigation methodologies for monitoring, new technology and risk assessment through passive acoustic monitoring; active acoustic monitoring; improved tag development; alternative monitoring; defining risk assessment variables; model risk assessment and determine mitigation effectiveness.					
Acoustic Source Propagation *FY 2009 Accomplishments:* Continued investigation of acoustic source propagation through 3-D modeling of multiple acoustic sources. *FY 2010 Plans:* Continue investigation of acoustic source propagation through 3-D modeling of multiple acoustic sources. *FY 2011 Base Plans:* Continue investigation of acoustic source propagation through 3-D modeling of multiple acoustic sources.	0.073	0.070	0.074	0.000	0.074
Living Marine Mammal Resources Research Center (LMRRC) *FY 2010 Plans:* The Living Marine Mammal Resources Research Center (LMRRC) will establish, maintain, and manage a cooperative research program comprised of science and technology (S&T) and research, development, testing, and evaluation (RDT&E) projects; product development; technology transfer; and alliances with academia and the commercial sector to foster the advancement in understanding	0.000	2.489	2.362	0.000	2.362

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603721N: *Environmental Protection*	PROJECT 9204: *Marine Mammal Research*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
and conserving living marine resources. This program will help preserve and protect current and future undersea warfighting capabilities. *FY 2011 Base Plans:* The LMRRC will continue to maintain, and manage a cooperative research program comprised of science and technology (S&T) and research, development, testing, and evaluation (RDT&E) projects; product development; technology transfer; and alliances with academia and the commercial sector to foster the advancement in understanding and conserving living marine resources. This program will help preserve and protect current and future undersea warfighting capabilities.					
Accomplishments/Planned Programs Subtotals	5.242	8.813	8.301	0.000	8.301

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total	FY 2012	FY 2013	FY 2014	FY 2015	Cost To Complete	Total Cost
• RDTEN/0601153N: *Defense Research Sciences*	405.561	429.107	429.767	0.000	429.767	443.593	466.118	480.310	503.304	0.000	3,157.760
• RDTEN/0602435N: *Ocean Warfighting Environment Applied Research*	51.855	53.727	49.491	0.000	49.491	51.279	52.052	53.703	54.989	0.000	367.096
• RDTEN/0602782N: *Mine & Expeditionary Warfare Applied Research*	53.055	43.897	36.833	0.000	36.833	37.836	44.589	51.474	59.179	0.000	326.863
• RDTEN/0603235N: *Common Picture Advanced Technology*	86.583	104.531	96.720	0.000	96.720	55.951	47.983	49.036	40.404	0.000	481.208

D. Acquisition Strategy

(U) RDT&E Contracts are Competitive Procurements.

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603721N: *Environmental Protection*	PROJECT 9204: *Marine Mammal Research*

E. Performance Metrics

Quarterly Program Reviews

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603721N: *Environmental Protection*	PROJECT 9204: *Marine Mammal Research*

Test and Evaluation ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation	WR	NUWC Newport, RI	3.352	0.000		0.000		0.000		0.000	0.000	3.352	Continuing
Developmental Test & Evaluation	SS/CPFF	University of Maryland Michigan	0.680	0.000		0.000		0.000		0.000	0.000	0.680	Continuing
Developmental Test & Evaluation	WR	NPGS Monterey, CA	1.930	0.000		0.000		0.000		0.000	0.000	1.930	Continuing
Developmental Test & Evaluation	MIPR	NOAA Fish Science Center	1.230	0.000		0.000		0.000		0.000	0.000	1.230	Continuing
Developmental Test & Evaluation	C/CPFF	Misc Contracts TBD	0.533	0.000		0.000		0.000		0.000	0.000	0.533	Continuing
Developmental Test & Evaluation	SS/CPFF	Scripps Institute California	5.683	0.000		0.000		0.000		0.000	0.000	5.683	Continuing
Developmental Test & Evaluation	SS/CPFF	U of Wash, APL Washington	0.650	0.000		0.000		0.000		0.000	0.000	0.650	Continuing
Developmental Test & Evaluation	SS/CPFF	Duke Univ. North Carolina	0.425	0.000		0.000		0.000		0.000	0.000	0.425	Continuing
Developmental Test & Evaluation	SS/CPFF	Oregon State Univ. Oregon	0.865	0.000		0.000		0.000		0.000	0.000	0.865	Continuing
Developmental Test & Evaluation	SS/CPFF	Woods Hole Oceanographic Inst Florida	1.301	0.000		0.000		0.000		0.000	0.000	1.301	Continuing
	WR	SPAWAR	1.332	0.000		0.000		0.000		0.000	0.000	1.332	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603721N: *Environmental Protection*	PROJECT 9204: *Marine Mammal Research*

Test and Evaluation ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation		San Diego, CA											
Developmental Test & Evaluation	WR	NSWCCD Bethesda, MD	0.290	0.000		0.000		0.000		0.000	0.000	0.290	Continuing
Developmental Test & Evaluation	WR	NRL Washington, DC	0.140	0.000		0.000		0.000		0.000	0.000	0.140	Continuing
Developmental Test & Evaluation	WR	NATO URC New York	0.485	0.000		0.000		0.000		0.000	0.000	0.485	Continuing
Developmental Test & Evaluation	C/CPFF	Marine Acoustics, Inc. FLorida	1.000	0.000		0.000		0.000		0.000	0.000	1.000	Continuing
Developmental Test & Evaluation	SS/CPFF	San Diego State Univ San Diego, CA	0.771	0.000		0.000		0.000		0.000	0.000	0.771	Continuing
Developmental Test & Evaluation	C/CPFF	ONR Arlington, VA	0.030	0.000		0.000		0.000		0.000	0.000	0.030	Continuing
Developmental Test & Evaluation	WR	NMSA Arlington, VA	1.240	0.000		0.000		0.000		0.000	0.000	1.240	Continuing
Developmental Test & Evaluation	C/CPFF	SPAWARSYSCEN San Diego, CA	0.000	8.813	Dec 2009	8.301	Dec 2010	0.000		8.301	0.000	17.114	Continuing
		Subtotal	21.937	8.813		8.301		0.000		8.301	0.000	39.051	

Remarks

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603721N: *Environmental Protection*	PROJECT 9204: *Marine Mammal Research*	

	Total Prior Years Cost	FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	21.937	8.813		8.301		0.000		8.301	0.000	39.051	

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2011 Navy		**DATE:** February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603721N: *Environmental Protection*	**PROJECT** 9204: *Marine Mammal Research*

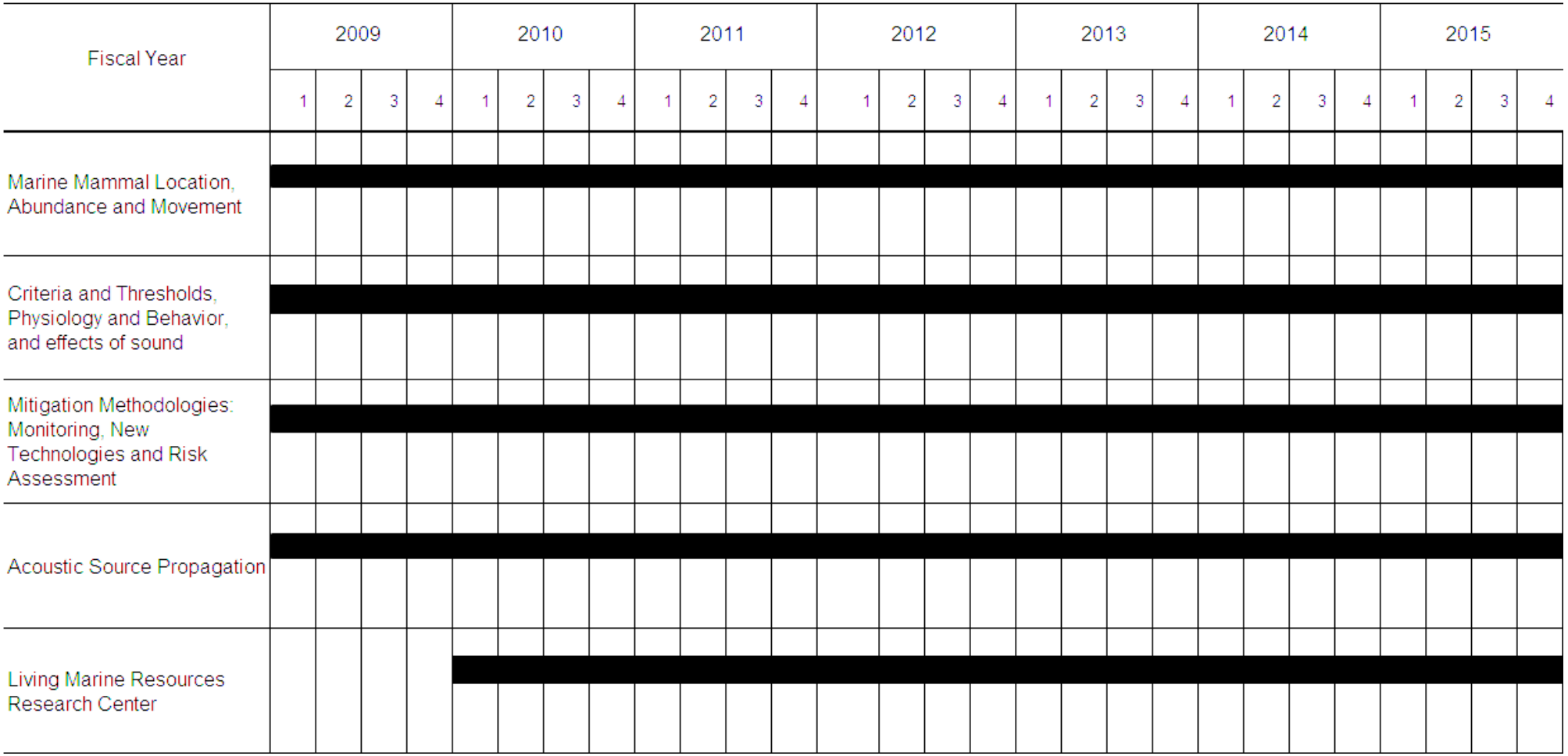

Exhibit R-4A, RDT&E Schedule Details: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603721N: *Environmental Protection*	**PROJECT** 9204: *Marine Mammal Research*

Schedule Details

	Start		End	
Event	**Quarter**	**Year**	**Quarter**	**Year**
Marine Mammal Location, Abundance, and Movement	1	2009	4	2015
Criteria and Thresholds, Physiology and Behavior, and Effects of Sound	1	2009	4	2015
Mitigation Methodologies: Monitoring, New Technology, and Risk Assessment	1	2009	4	2015
Acoustic Source Propagation	1	2009	4	2015
Living Marine Resources Research Center	1	2010	4	2015

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603721N: *Environmental Protection*	PROJECT 9999: *Congressional Adds*	

COST ($ in Millions)	FY 2009 Actual	FY 2010 Estimate	FY 2011 Base Estimate	FY 2011 OCO Estimate	FY 2011 Total Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
9999: *Congressional Adds*	1.198	0.797	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	14.376
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0		

A. Mission Description and Budget Item Justification

Congressional Add

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010
Congressional Add: Compliance Tools Development for Metals in Antifouling Paints *FY 2010 Plans:* Develop a bioavailability model for copper in estuarine and marine waters, and potential alternative bioavailability-based sediment cleanup targets for metal contaminants, to support environmentally protective use of copper-based antifouling coatings on seagoing ships, and develop more site-specific, and thus cost-effective and achievable sediment cleanup targets for metals at Navy and other DoD sites.	0.000	0.797
Congressional Add: PUGET SOUND ANOXIA RESEARCH *FY 2009 Accomplishments:* This Congressional Add is a continuation of Congressional Add Project 9536. This effort will involve the monitoring of the oxygen content of the water in Hood Canal and streams throughout the watershed and will increase understanding of the long-term effects of low-oxygen levels on sealife. The monitoring information will be used to develop a mathematical model of Hood Canal. The model	1.198	0.000

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603721N: *Environmental Protection*	PROJECT 9999: *Congressional Adds*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010
will be used to evaluate the effect of different potential sources of input to Hood Canal that might account for an existing anoxic condition.		
Congressional Adds Subtotals	1.198	0.797

C. Other Program Funding Summary ($ in Millions)

N/A

D. Acquisition Strategy

N/A

E. Performance Metrics

Congressional Add

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Exhibit R-2, RDT&E Budget Item Justification: PB 2011 Navy										DATE: February 2010	
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*				R-1 ITEM NOMENCLATURE PE 0603724N: *Navy Energy Program*							
COST ($ in Millions)	**FY 2009 Actual**	**FY 2010 Estimate**	**FY 2011 Base Estimate**	**FY 2011 OCO Estimate**	**FY 2011 Total Estimate**	**FY 2012 Estimate**	**FY 2013 Estimate**	**FY 2014 Estimate**	**FY 2015 Estimate**	**Cost To Complete**	**Total Cost**
Total Program Element	10.271	18.918	30.403	0.000	30.403	33.750	34.378	29.830	27.473	Continuing	Continuing
0829: *ENERGY CONSERVATION (ADV)*	3.907	3.944	19.579	0.000	19.579	21.645	23.854	25.165	23.065	Continuing	Continuing
0838: *Mobility Fuels (ADV)*	1.676	4.497	10.824	0.000	10.824	12.105	10.524	4.665	4.408	Continuing	Continuing
9999: *Congressional Adds*	4.688	10.477	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	22.593

A. Mission Description and Budget Item Justification

This program supports projects to evaluate, adapt, and demonstrate energy related technologies for Navy aircraft and ship operations to: (a) increase fuel-related weapons systems capabilities such as range and time on station; (b) reduce energy costs; (c) apply energy technologies that improve environmental compliance; (d) relax restrictive fuel specification requirements to reduce cost and increase availability worldwide; (e) provide guidance to fleet operators for the safe use of commercial grade or off-specification fuels when military specification fuels are unavailable or in short supply; and (f) make needed periodic changes to fuel specifications to ensure fuel quality and avoid fleet operating problems. This program supports the achievement of legislated, White house, Department of Defense, and Navy Energy Management Goals. It also responds to direction from the Office of the Secretary of Defense, the Secretary of the Navy, and the Chief of Naval Operations to make up-front investment in technologies that reduce future cost of operation and ownership of the fleet and supporting infrastructure.

B. Program Change Summary ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
Previous President's Budget	10.263	8.476	0.000	0.000	0.000
Current President's Budget	10.271	18.918	30.403	0.000	30.403
Total Adjustments	0.008	10.442	30.403	0.000	30.403
• Congressional General Reductions		-0.078			
• Congressional Directed Reductions		0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds		10.520			
• Congressional Directed Transfers		0.000			
• Reprogrammings	0.041	0.000			
• SBIR/STTR Transfer	-0.033	0.000			
• Program Adjustments	0.000	0.000	30.403	0.000	30.403

Exhibit R-2, RDT&E Budget Item Justification: PB 2011 Navy	DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603724N: *Navy Energy Program*

Congressional Add Details ($ in Millions, and Includes General Reductions)	FY 2009	FY 2010
Project: 9999: *Congressional Adds*		
Congressional Add: *Alt and Renew Energy Prog - Cong*	0.000	2.988
Congressional Add: *Solar Heat Reflective Film for Energy Efficiency*	0.000	3.904
Congressional Add: *Hydrogen Fuel Cell Development*	1.197	0.000
Congressional Add: *Molten Carbonate Fuel Cell Demonstrator*	3.491	3.585
Congressional Add Subtotals for Project: 9999	4.688	10.477
Congressional Add Totals for all Projects	4.688	10.477

Change Summary Explanation
Technical: Not applicable.
Schedule: Not applicable.

FY11 from previous President's Budget is shown as zero because no FY11-15 data was presented in President's Budget 2010.

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603724N: *Navy Energy Program*	PROJECT 0829: *ENERGY CONSERVATION (ADV)*	

COST ($ in Millions)	FY 2009 Actual	FY 2010 Estimate	FY 2011 Base Estimate	FY 2011 OCO Estimate	FY 2011 Total Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
0829: *ENERGY CONSERVATION (ADV)*	3.907	3.944	19.579	0.000	19.579	21.645	23.854	25.165	23.065	Continuing	Continuing
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0		

A. Mission Description and Budget Item Justification

The Energy Conservation Advanced Project is designed to develop and implement energy and maintenance saving improvements into existing Fleet assets. This Fleet driven project will identify mature potential energy saving and maintenance improvement areas, by involvement with Life-Cycle Managers (LCMs), Technical Warrant Holders, In-Service Engineering Agents (ISEAs), PEO, and the Top Management Attention/Top Management Issue (TMA/TMI) community. Potential technology target areas will include: Hull Hydrodynamics, Hull Husbandry, Heating, Ventilation & Air Conditioning (HVAC) Systems, Thermal Management, Propulsion Systems, Electrical Systems, and Power Generation and Storage systems and Aircraft Energy Conservation. The project directly supports Fleet requirements to reduce energy consumption and lower maintenance costs. The project will focus on research and development across the following major areas: Hull Hydrodynamic Sub Project - This project area will accomplish prototype development, laboratory and Fleet testing to determine overall mission and cost effectiveness of these improvements. Hull Husbandry Sub Project - Project funds will be utilized to identify and evaluate new underwater hull coating systems and underwater hull cleaning and maintenance techniques both land based and shipboard to reduce hydrodynamic drag on the hull and thereby increase fuel efficiency. HVAC Sub Projects - Project funds will be utilized to accomplish prototype development, land and shipboard testing to determine overall mission and cost effectiveness of these improvements. Thermal Management Sub Project - Project funds will be utilized to identify and evaluate potential uses for Thermal Management techniques designed to reduce overall shipboard heat generation and reduce the overall need for HVAC. Propulsion Systems Sub Project - Project funds will be utilized to identify requirements and perform land based and ship board testing of ship propulsion system improvements, on Gas Turbine and Diesel Engine systems to reduce overall fuel consumption and lower maintenance costs. (SCD# 1801 - Online Waterwash System for Gas Turbine Motor/Gas Turbine Generator (GTM/GTG), SCD# 1808 Power Conservation Management) Electrical Systems Project - Project funds will be utilized to identify requirements and perform land based and ship board testing of ship electrical system improvements, to reduce overall fuel consumption and lower maintenance costs. (SCD# 1817 Variable Speed Drive VSD) for 1000 Gal. Firemain System, (SCD# 1818 VSD-IMP for 2000 Gal. Fire pumps) Power Generation & Storage System Project - This project area will accomplish prototype development, laboratory and Fleet testing to determine overall effectiveness of these improvements. Project includes the development of high efficiency, small capacity HVAC compressor for DG83AF/ LPD17CL and evaluate engine, air vehicle technologies and operational modifications to assess potential benefits in approving aircraft fuel efficiencies.

B. Accomplishments/Planned Program ($ in Millions)

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603724N: *Navy Energy Program*	PROJECT 0829: *ENERGY CONSERVATION (ADV)*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
Power Generation and Storage Project Power Generation & Storage System Sub Project - This project area will accomplish prototype development, laboratory and Fleet testing to determine overall mission and cost effectiveness of these improvements *FY 2009 Accomplishments:* Conducted investigations of various power generation and storage technologies available for shipboard installation. *FY 2010 Plans:* Develop Business Case Analyses on most promising Power Generation and Storage technologies identified and reviewed for shipboard installations. Continue to identify new fuel saving technologies in Power Generation & Storage. *FY 2011 Base Plans:* Conduct Land Based / Model testing , develop design, prepare Ship Change Document (SCD) for new fuel saving initiatives identified in Power Generation and storage technologies functional area. Continue to identify new fuel saving technologies in Power Generation & Storage.	0.191	0.202	0.202	0.000	0.202
Hull Hydrodynamic Sub Project Hull Hydrodynamic Sub Project - This project area will accomplish prototype development, laboratory and Fleet testing to determine overall mission and cost effectiveness of these improvements. *FY 2009 Accomplishments:* Continued development of Stern Flap design for Landing Ship Dock (LSD) and Landing Helicopter Dock (LHD) class of ships, commenced installation of stern flaps on LSD 41 and LHD 3 for evaluation.	0.988	1.025	1.200	0.000	1.200

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603724N: *Navy Energy Program*	PROJECT 0829: *ENERGY CONSERVATION (ADV)*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
FY 2010 Plans: Complete installation of Stern Flaps and commence test and evaluation, prepare report and update (SCD) for implementation. Continue to identify additional fuel saving measures in Hull Hydrodynamics. *FY 2011 Base Plans:* Conduct Land Based / Model testing, develop design, prepare SCD (s) for new fuel saving initiatives identified. Continue to identify additional fuel saving measures in Hull Hydrodynamics.					
Hull Husbandry Sub Project Hull Husbandry Sub Project - Project funds will be utilized to identify and evaluate new underwater hull coating systems and underwater hull cleaning and maintenance techniques both land based and shipboard to reduce hydrodynamic drag on the hull and thereby increase fuel efficiency. *FY 2009 Accomplishments:* Continued development of efforts to apply advanced coating to LSD ships and guided missile destroyers. Applied advanced coating to hull of USS PORT ROYAL and USS COLE and propellers of USS GUNSTON HALL . *FY 2010 Plans:* Continue shipboard test, and evaluation of coatings including diver inspections, evaluation of cleaning methods, development of cleaning procedures and measurement of effectiveness. Continue to identify new fuel saving initiatives in Hull Husbandry *FY 2011 Base Plans:* Develop Business Case Analysis based on test results of coating applications and continue development , test and evaluation of new fuel savings initiatives identified. Continue to identify new fuel saving initiatives in Hull Husbandry.	1.576	1.430	1.354	0.000	1.354

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603724N: *Navy Energy Program*	PROJECT 0829: *ENERGY CONSERVATION (ADV)*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
HVAC Sub Project	0.191	0.200	2.736	0.000	2.736
HVAC Sub Project - Project funds will be utilized to accomplish prototype development, land and shipboard testing to determine overall mission and cost effectiveness of these improvements. *FY 2009 Accomplishments:* Conducted research of improvements to Heating Ventilation Air Conditioning (HVAC) controls aimed at reducing shipboard electrical load and therefore energy demand. *FY 2010 Plans:* Develop Business Case Analyses on most promising HVAC identified controls technology reviewed for shipboard installations. Continue to identify additional fuel saving measures in HVAC. *FY 2011 Base Plans:* Complete testing of hi-efficiency, large capacity HVAC compressor project and includes increase to leverage technology to develop hi-efficiency, small capacity HVAC compressor for DG83AF/ LPD17CL. Continue to identify additional fuel saving measures in HVAC.					
Thermal Management Sub Project	0.191	0.200	0.220	0.000	0.220
Thermal Management Sub Project - Project funds will be utilized to identify and evaluate potential uses for Thermal Management techniques designed to reduce overall shipboard heat generation and reduce the overall need for HVAC. *FY 2009 Accomplishments:* Conducted research of improvements to Thermal Management Technologies aimed at reducing shipboard electrical load and therefore energy demand.					

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603724N: *Navy Energy Program*	PROJECT 0829: *ENERGY CONSERVATION (ADV)*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
FY 2010 Plans: Develop Business Case Analyses on most promising Thermal Management technologies identified and reviewed for shipboard installations. Continue to identify additional fuel saving technologies in Thermal Management. *FY 2011 Base Plans:* Conduct Land Based/Model testing,develop design, prepare Ship Change Document (SCD) for new fuel saving initiatives identified in Thermal management technologies functional area. Continue to identify additional fuel saving technologies in Thermal Management.					
Propulsion Systems Sub Project Propulsion Systems Sub Project - Project funds will be utilized to identify, perform land based and ship board testing of ship propulsion system improvements, on Gas Turbine and Diesel Engine systems to reduce overall fuel consumption and lower maintenance costs. (SCD# 1801 - Online Waterwash System for GTM/GTG, SCD# 1808 Power Conservation Management). *FY 2009 Accomplishments:* Installed Online Water Wash (OLWW) system on USS PREBLE and commenced evaluation and test. *FY 2010 Plans:* Continue to evaluate performance of OLWW, report results and identify additional fuel saving measures in Propulsion Systems Functional area. Continue to identify additional fuel saving technologies in Propulsion Systems *FY 2011 Base Plans:* Conduct Land Based testing and shipboard installation and evaluation of new fuel saving initiatives identified. Continue to identify additional fuel saving technologies in Propulsion Systems.	0.450	0.513	0.550	0.000	0.550

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603724N: *Navy Energy Program*	PROJECT 0829: *ENERGY CONSERVATION (ADV)*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
Electrical Systems SubProject	0.301	0.374	0.374	0.000	0.374
Electrical Systems SubProject-Project funds will be utilized to identify and perform land based and ship board testing of ship electrical system improvements to reduce energy. *FY 2009 Accomplishments:* Development of solid state lighting (SSL) technologies on landing ship dock (LSD) 41/49 Class to reduce overall electrical energy loads therefore energy demand. *FY 2010 Plans:* Complete installation of SSL Lighting prototypes in berthing, passageways and welldecks and commence test and evaluation, prepare report and update Ship Change Document (SCD) for implementation. Continue to identify new fuel saving technologies in Electrical Systems. *FY 2011 Base Plans:* Conduct Land Based/Model testing, develop design, prepare SCD(s) for new fuel saving initiatives identified in Electrical Systems. Continue to identify new fuel saving technologies in Electrical Systems.					
Aircraft Energy Conservation	0.000	0.000	12.943	0.000	12.943
Evaluate technologies to determine potential benifits in reducing fuel consumption. *FY 2011 Base Plans:* Initiate study to evaluate increase of F-18 carrier weight limits. Conduct studies to evaluate engine and air vechicle technologies and operational modifications to assess potential benifits in approving aircraft fuel efficiencies.					
DAWDF	0.019	0.000	0.000	0.000	0.000

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603724N: *Navy Energy Program*	PROJECT 0829: *ENERGY CONSERVATION (ADV)*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
FY 2009 Accomplishments: DAWDF Realignment					
Accomplishments/Planned Programs Subtotals	3.907	3.944	19.579	0.000	19.579

C. Other Program Funding Summary ($ in Millions)

N/A

D. Acquisition Strategy

This is a non-acquisition program that develops, evaluates and validates mature technologies in support of Fleet fuel and maintenance savings.

E. Performance Metrics

Actual performance of energy conservation initiatives are measured against initially projected fuel savings measured in Barrels of Fuel saved based on ship demonstration testing.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603724N: *Navy Energy Program*	PROJECT 0829: *ENERGY CONSERVATION (ADV)*

Product Development ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Primary Hardware Development	WR	NSWC Carderock Bethesda, MD	0.761	0.399	Oct 2009	1.060	Oct 2010	0.000		1.060	Continuing	Continuing	Continuing
Systems Engineering	WR	NSWC Carderock Bethesda, MD	0.756	0.403	Nov 2009	0.673	Nov 2010	0.000		0.673	Continuing	Continuing	Continuing
Engineering Development 1	WR	NSWC Carderock Bethesda, MD	1.422	0.757	Dec 2009	1.055	Dec 2010	0.000		1.055	Continuing	Continuing	Continuing
Engineering Development 2	WR	NSWC Carderock Bethesda, MD	1.472	0.786	May 2010	1.087	May 2011	0.000		1.087	Continuing	Continuing	Continuing
Engineering Development	Various/ Various	TBD TBD	0.000	0.000		11.050	Jul 2011	0.000		11.050	Continuing	Continuing	Continuing
		Subtotal	4.411	2.345		14.925		0.000		14.925			

Remarks

Test and Evaluation ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Developmental Test and Evaluation	WR	NSWC Carderock Bethesda, MD	1.530	0.785	Nov 2009	1.198	Mar 2011	0.000		1.198	Continuing	Continuing	Continuing
Operational Test and Evaluation	WR	NSWC Carderock Bethesda, MD	0.382	0.201	Nov 2009	0.898	Dec 2010	0.000		0.898	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603724N: *Navy Energy Program*	PROJECT 0829: *ENERGY CONSERVATION (ADV)*

Test and Evaluation ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Live Fire Test and Evaluation	WR	NSWC Carderock Bethesda, MD	0.382	0.210	Mar 2010	0.000		0.000		0.000	Continuing	Continuing	Continuing
		Subtotal	2.294	1.196		2.096		0.000		2.096			

Remarks

Management Services ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Support	WR	NSWC Carderock Bethesda, MD	0.536	0.283	Oct 2009	0.506	Oct 2010	0.000		0.506	Continuing	Continuing	Continuing
Program Management Support	WR	NAWCAD PAX Patuxent River, MD	0.000	0.000		1.909	Jan 2011	0.000		1.909	Continuing	Continuing	Continuing
Travel	Allot	NAVSEA HQ Dahlgren, VA	0.076	0.041	Jul 2010	0.043	Feb 2011	0.000		0.043	Continuing	Continuing	Continuing
Test Assets	WR	NSWC Carderock Bethesda, MD	0.152	0.079	Mar 2010	0.100	Mar 2011	0.000		0.100	Continuing	Continuing	Continuing
DAWDF	C/FP	Not Specified Not Specified	0.019	0.000		0.000		0.000		0.000	Continuing	Continuing	Continuing
		Subtotal	0.783	0.403		2.558		0.000		2.558			

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603724N: *Navy Energy Program*	PROJECT 0829: *ENERGY CONSERVATION (ADV)*

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	FY 2010 Cost	FY 2010 Award Date	FY 2011 Base Cost	FY 2011 Base Award Date	FY 2011 OCO Cost	FY 2011 OCO Award Date	FY 2011 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Remarks													

	Total Prior Years Cost	FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	7.488	3.944		19.579		0.000		19.579			

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603724N: *Navy Energy Program*	**PROJECT** 0829: *ENERGY CONSERVATION (ADV)*

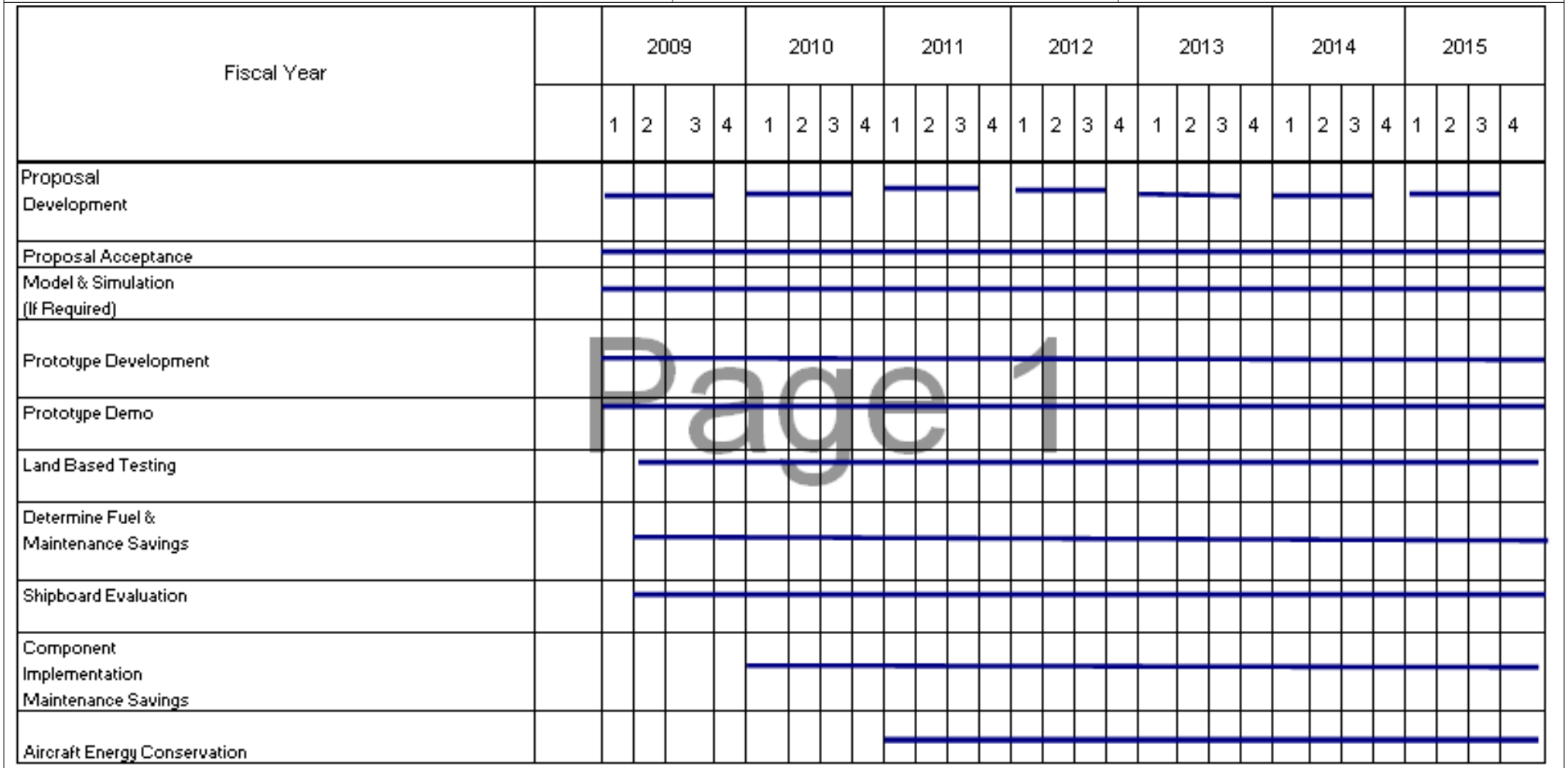

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Exhibit R-4A, RDT&E Schedule Details: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603724N: *Navy Energy Program*	**PROJECT** 0829: *ENERGY CONSERVATION (ADV)*

Schedule Details

	Start		End	
Event	**Quarter**	**Year**	**Quarter**	**Year**
Proposal Development 1	1	2009	3	2009
Proposal Development 2	1	2010	3	2010
Proposal Development 3	1	2011	3	2011
Proposal Development 4	1	2012	3	2012
Proposal Development 5	1	2013	3	2013
Proposal Development 6	1	2014	3	2014
Proposal Development 7	1	2015	3	2015
Proposal Acceptance	1	2009	4	2015
Modeling and Simulation	1	2009	4	2015
Prototype Development	1	2009	4	2015
Prototype Demonstration	1	2009	4	2015
Land-Based Testing	2	2009	4	2015
Determine Fuel and Maintenance Savings	2	2009	4	2015
Shipboard Evaluation	2	2009	4	2015
Component Implementation Maintenance Savings	1	2010	4	2015
Aircraft Energy Conservation	1	2011	3	2015

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603724N: *Navy Energy Program*	PROJECT 0838: *Mobility Fuels (ADV)*	

COST ($ in Millions)	FY 2009 Actual	FY 2010 Estimate	FY 2011 Base Estimate	FY 2011 OCO Estimate	FY 2011 Total Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
0838: *Mobility Fuels (ADV)*	1.676	4.497	10.824	0.000	10.824	12.105	10.524	4.665	4.408	Continuing	Continuing
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0		

A. Mission Description and Budget Item Justification

This project provides data through laboratory, component, engine and fuel system tests which relate the effects of changes in Navy fuel procurement specification properties and chemistries to the performance and reliability of Naval ship and aircraft engine and fuel systems. This information is required to: (a) develop, validate and execute the test protocols necessary to approve fuels derived from non-petroleum feedstocks; (b) determine the extent to which unnecessarily restrictive specification features can be relaxed to reduce cost and increase availability worldwide; (c) provide guidance to fleet operators for the safe use of off-specification or commercial grade fuels when military specification fuels are unavailable or in short supply; (d) make needed periodic changes to fuel specifications to ensure fuel quality and avoid fleet operating problems while accommodating evolutionary changes in fuel supply industry and (e) improve the capability to provide fuel quality surveillance in the field. Continued volatility and rapid escalation of the cost of fuel has placed additional pressures on the Navy budgets responsible for maintaining and sustaining the Navy tactical fleet both now and in the future. These pressures have placed an added emphasis on the potential utilization of lower cost commercial fuels and/or fuels derived from non-petroleum sources as a potential means of stabilizing the current and anticipated price volatility. Recent problems with petroleum based fuel quality have demonstrated the adverse affects fuel related problems can have on ship and aircraft system performance, reliability and readiness. While the impacts on readiness, additional maintenance costs, and the cost of lost equipment are often difficult to fully quantify they are often many times the cost of this program. This potential risk of fuel related problems over the next decade, given the unknowns of supply, feedstocks, environmental regulations and the introduction of new theaters of operation will continue to increase. This project represents the only investment designed to maintain the Navy's ability to operate as a "smart" customer for fuels that cost over $4.0 B per year for procurement, transport, storage and consumption and are essential to fleet operations.

The increase in project 0838 in PE 0603724N from FY10 to FY11 is to support the Navy's effort to test and certify alternative fuels for Navy ship and aircraft utilization. The increased funding is for procurement of test fuel and to conduct the large scale engine and system tests required to approve alternative fuel candidates for inclusion into the Navy's JP-5 and F-75 specifications. ARRA funding was provided to accelerate the development of the test requirements and to validate them using the F-18 as the lead the fleet test vehicle. The funding provided in project 0838 in PE 0603724N is to expand the ARRA sponsored efforts across additional aircraft and ship systems.

This funding is the Navy's only investment in the approval of alternative fuels for tactical applications and directly supports the Navy energy goals of increased energy security and environmental stewardship.

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603724N: *Navy Energy Program*	PROJECT 0838: *Mobility Fuels (ADV)*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
Aircraft Fuels	0.848	2.247	4.313	0.000	4.313
Perform development, test and evaluation work on Naval aircraft fuels to: a) determine the extent to which unnecessarily restrictive specification features can be relaxed to reduce cost and increase availability worldwide; b) provide guidance and approval to fleet operators for the safe use of military aircraft that include new additives or are derived from non-petroleum sources ; c) make needed periodic changes to the fuel specifications to ensure fuel quality and avoid fleet operating problems while accommodating evolutionary changes in the fuel supply industry and d) improve fleet methods to ensure fuel quality. *FY 2009 Accomplishments:* Continue development of equipment/fuel qualification protocol to evaluate and approve alternative fuels. Continue development and test prototype of multi-property shipboard-based sensors and instruments to rapidly determine critical jet fuel properties. *FY 2010 Plans:* Complete development of Navy qualification protocol to evaluate and approve alternative fuels. Transition multi-property shipboard-based sensors and instruments to rapidly determine critical jet fuel properties. Initiate development dual compatible (ship and aircraft) lubricity improving additive. *FY 2011 Base Plans:* Down select initial alternative fuel candidate and initiate testing to validate protocol. Continue development of dual compatible (ship and aircraft) lubricity improving additive.					
Ship Fuels	0.820	2.250	6.511	0.000	6.511
Performs development, test and evaluation work on Naval ship propulsion fuels to: a) determine the extent to which unnecessarily restrictive specification features can be relaxed to reduce cost and increase availability worldwide; b) provide guidance to fleet operators for the safe use of off-					

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603724N: *Navy Energy Program*	PROJECT 0838: *Mobility Fuels (ADV)*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
specification or commercial grade fuels when military fuels are unavailable or in limited supply; and c) make needed periodic changes to fuel specifications to ensure fuel quality and avoid fleet operating problems while accommodating evolutionary changes in the fuel supply industry including fuel derived from non-petroleum sources. *FY 2009 Accomplishments:* Continue development of a qualification procedure to evaluate and approve utilization of synthetic and ultra-clean, low sulfur ship fuels. Complete development of shipboard-based sensors and instruments to rapidly determine critical ship fuel properties. Continue review of the F-76 ship distillate fuel specification and test requirements evaluation to remove any unnecessary requirements to increase availability. *FY 2010 Plans:* Continue development of Navy protocol to evaluate and approve alternative fuels. Test shipboard-based sensors to rapidly determine critical fuel properties. Initiate development dual compatible (ship and aircraft) lubricity improving additive. *FY 2011 Base Plans:* Complete development of Navy protocol to evaluate and approve alternative fuels. Down select initial alternative fuel candidate and initiate validation of evaluation and approval protocol. Transition shipboard sensor(s) to rapidly determine critical fuel properties. Continue development of dual compatible (ship and aircraft) lubricity improving additive.					
DAWDF *FY 2009 Accomplishments:* DAWDF Realignment	0.008	0.000	0.000	0.000	0.000
Accomplishments/Planned Programs Subtotals	1.676	4.497	10.824	0.000	10.824

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603724N: *Navy Energy Program*	**PROJECT** 0838: *Mobility Fuels (ADV)*

C. Other Program Funding Summary ($ in Millions)

N/A

D. Acquisition Strategy

Alternative Fuel Efforts including testing and fuel procurement efforts in FY10-13 will be competitively contracted, and performed under Cost Plus Fixed Fee (CPFF) and Firm Fixed Price (FFP) contracts.

E. Performance Metrics

Program will develop Alternate Fuel test and certification protocols for 100% of all Naval aircraft and ships. Program will evaluate biofuels, biofuel chemistry and components tests as defined in test and certification protocols.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603724N: *Navy Energy Program*	PROJECT 0838: *Mobility Fuels (ADV)*	

Product Development ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Systems Engineering	WR	NRL Washington, D.C.	0.625	0.200	Feb 2010	0.200	Nov 2010	0.000		0.200	Continuing	Continuing	Continuing
Systems Engineering	WR	NAWCAD Patuxent River, MD	3.657	0.800	Nov 2009	0.800	Nov 2010	0.000		0.800	Continuing	Continuing	Continuing
Engineering Development	Various/ TBD	TBD TBD	0.000	0.000		2.201	Feb 2011	0.000		2.201	Continuing	Continuing	Continuing
		Subtotal	4.282	1.000		3.201		0.000		3.201			

Remarks

Test and Evaluation ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation	Various/ Various	Various Various	2.816	1.894	Feb 2011	6.001	Jan 2012	0.000		6.001	Continuing	Continuing	Continuing
Developmental Test & Evaluation	MIPR	Army Tank/Arm Warren, MN	0.228	0.000		0.000		0.000		0.000	0.000	0.228	-0.001
		Subtotal	3.044	1.894		6.001		0.000		6.001			

Remarks

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603724N: *Navy Energy Program*	PROJECT 0838: *Mobility Fuels (ADV)*

Management Services ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Support	Various/ Various	Various Various	2.620	1.603	Mar 2011	1.622	Jan 2012	0.000		1.622	Continuing	Continuing	Continuing
Program Management Support	MIPR	SRI San Antonio, TX	0.696	0.000		0.000		0.000		0.000	Continuing	Continuing	Continuing
Program Management Support	WR	NAVSEA Washington, DC	0.100	0.000		0.000		0.000		0.000	0.000	0.100	-0.001
Program Management Support	WR	NSWC Philadelphia, PA	0.088	0.000		0.000		0.000		0.000	0.000	0.088	-0.001
DAWDF Realignment Issue 74408	Various/ TBD	Not Specified Not Specified	0.008	0.000		0.000		0.000		0.000	0.000	0.008	-0.001
		Subtotal	3.512	1.603		1.622		0.000		1.622			

Remarks

	Total Prior Years Cost	FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	10.838	4.497		10.824		0.000		10.824			

Remarks

Exhibit R-4, **RDT&E Schedule Profile:** PB 2011 Navy		**DATE:** February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603724N: *Navy Energy Program*	**PROJECT** 0838: *Mobility Fuels (ADV)*

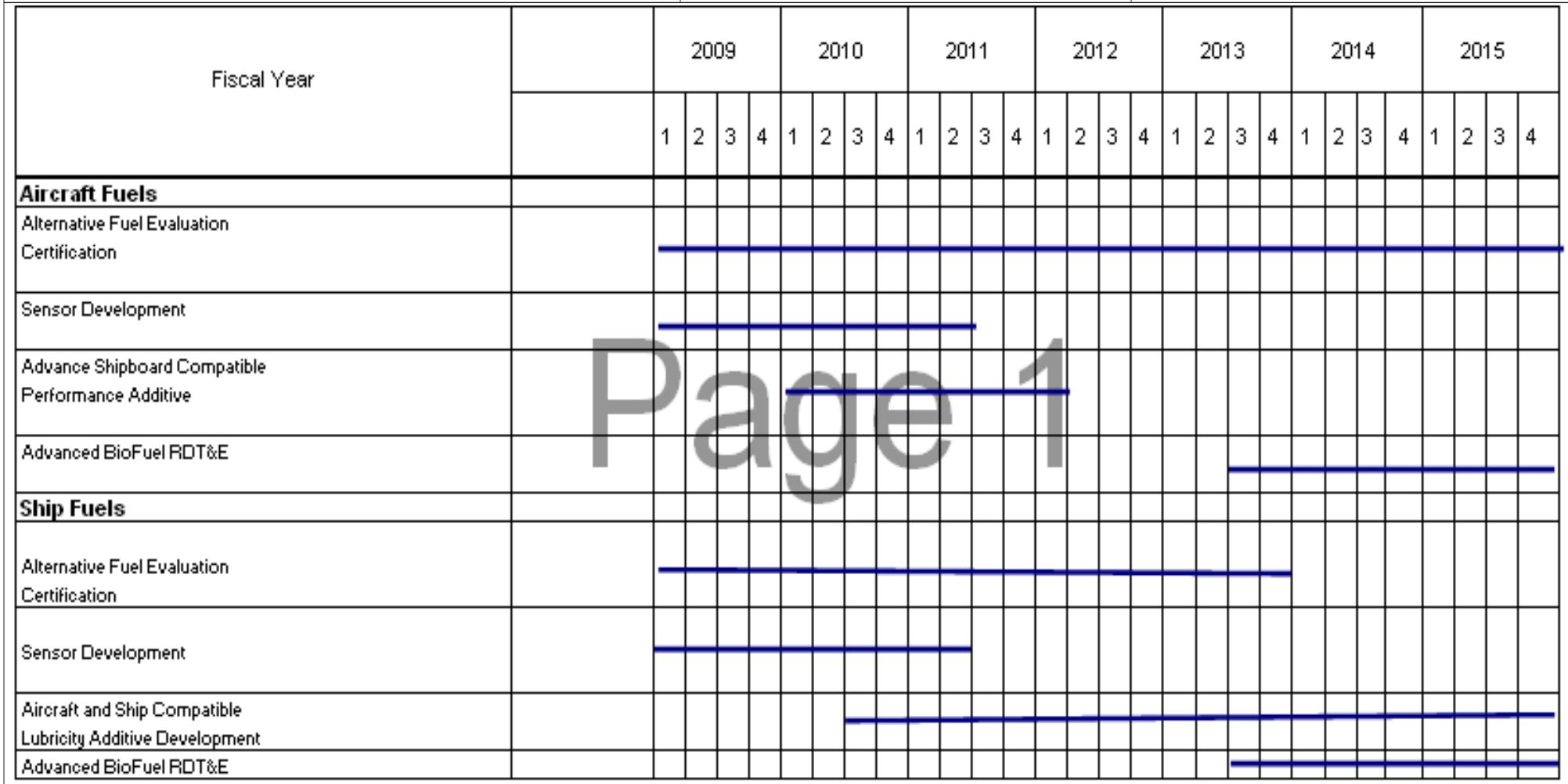

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Exhibit R-4A, RDT&E Schedule Details: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603724N: *Navy Energy Program*	**PROJECT** 0838: *Mobility Fuels (ADV)*

Schedule Details

	Start		End	
Event	**Quarter**	**Year**	**Quarter**	**Year**
Aircraft Fuels Alternate Fuel Evaluation/Certification	1	2009	4	2015
Aircraft Fuels Sensor Development	1	2009	2	2011
Aircraft Fuels Advance Shipboard Compatible Performance Additive	1	2010	1	2012
Aircraft Fuels Advanced BioFuel RDT&E	3	2013	4	2015
Ship Fuels Alternate Fuel Evaluation/Certification	1	2009	4	2013
Ship Fuels Sensor Development	1	2009	2	2011
Ship Fuels Aircraft and Ship Compatible Lubricity Additive Development	3	2010	4	2015
Ship Fuels Advanced BioFuel RDT&E	3	2013	4	2015

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603724N: *Navy Energy Program*	PROJECT 9999: *Congressional Adds*	

COST ($ in Millions)	FY 2009 Actual	FY 2010 Estimate	FY 2011 Base Estimate	FY 2011 OCO Estimate	FY 2011 Total Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
9999: *Congressional Adds*	4.688	10.477	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	22.593
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0		

A. Mission Description and Budget Item Justification

Congressional Add

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010
Congressional Add: Alt and Renew Energy Prog - Cong *FY 2010 Plans:* Initiate study to evaluate increase of F-18 carrier weight limits.	0.000	2.988
Congressional Add: Solar Heat Reflective Film for Energy Efficiency *FY 2010 Plans:* Initiate development of Solar Reflective Film for vehicles and buildings. The project will develop and commercialize an advanced form of 3M Solar Reflective Film to help the US Military to improve the energy efficiency of all its facilities throughout the world by decreasing the size and weight of climate control and exterior components for vehicles and buildings.	0.000	3.904
Congressional Add: Hydrogen Fuel Cell Development	1.197	0.000

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603724N: *Navy Energy Program*	PROJECT 9999: *Congressional Adds*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010
FY 2009 Accomplishments: The Hydrogen Fuel Cell Development project will transfer a microfiber fuel cell technology's manufacturing process from a research and development level to a manufacturing environment and evaluate various parameters including production speed and product quality. Development and scale up of extrustion process to verify high speed production capability. Optimization of current Unicell production processes to meet manufacturing level production of extrusion process. Optimization and scale-up of fuel cell system production processes.		
Congressional Add: Molten Carbonate Fuel Cell Demonstrator *FY 2009 Accomplishments:* The key performance objective is to manufacture, install, commission, operate and maintain a 300 kilowatt (KW) MCFC power system at Submarine Base, located at Groton, CT. Selected operational parameters will be monitored, recorded, analyzed, and reported over a time period of 36 months. *FY 2010 Plans:* The Government will exercise an option or options to increase the installed capacity of the MCFC power system from 300 kilowatt to a maximum 1.4 megawatt (MW).	3.491	3.585
Congressional Adds Subtotals	4.688	10.477

C. Other Program Funding Summary ($ in Millions)

N/A

D. Acquisition Strategy

N/A

E. Performance Metrics

Congressional Add

Exhibit R-2, RDT&E Budget Item Justification: PB 2011 Navy										DATE: February 2010	
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*				R-1 ITEM NOMENCLATURE PE 0603725N: *Facilities Improvement*							
COST ($ in Millions)	**FY 2009 Actual**	**FY 2010 Estimate**	**FY 2011 Base Estimate**	**FY 2011 OCO Estimate**	**FY 2011 Total Estimate**	**FY 2012 Estimate**	**FY 2013 Estimate**	**FY 2014 Estimate**	**FY 2015 Estimate**	**Cost To Complete**	**Total Cost**
Total Program Element	18.034	10.039	3.746	0.000	3.746	3.820	3.877	3.970	4.052	Continuing	Continuing
0995: *Naval Facilities System*	1.777	1.823	1.784	0.000	1.784	1.806	1.834	1.879	1.918	Continuing	Continuing
3155: *Force Protection Ashore*	2.295	2.162	1.962	0.000	1.962	2.014	2.043	2.091	2.134	Continuing	Continuing
9999: *Congressional Adds*	13.962	6.054	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	30.324

A. Mission Description and Budget Item Justification

This program provides for capabilities to a) overcome performance limitations and reduce the life cycle cost of shore facilities, and b) provide protection against terrorist attacks for shore installations and their operations. The program focuses on technical and operational issues of specific Navy interest, where there are no unbiased test validated Commercial Off the Shelf (COTS) solutions available, and where timely capabilities may not materialize without specific demonstration or validation by the Navy. Additionally, the program completes the development of technologies originating from Navy, DOD and other sources of Science and Technology programs, including the National Science Foundation (NSF), the National Institute of Standards and Technology (NIST) and Department of Energy (DOE). Validated technologies are implemented in the Navy's Military Construction (MILCON) and Facilities, Sustainment Restoration and Modernization (FSRM) program, and Antiterrorism and Force Protection (ATFP) Other Procurement, Navy (OP,N) program. Project 0995 addresses the following Navy facilities requirements during FY 2009 through FY 2015: Advance Technology for Waterfront Facilities Repair and Upgrade, Facilities Technologies to Reduce the Cost of Facilities Sustainment, Restoration and Modernization, and Modular Hybrid Pier for reducing the total ownership cost of future facilities and enable new planning options through relocatable waterfront facilities. This project is consistent with recommendation of two National Academy of Sciences Reports: "The Role of Federal Agencies in Fostering New Technology and Innovation in Building" and "Federal Policies to Foster Innovation and Improvement in Constructed Facilities." Starting in FY2006 the Force Protection Ashore Project 3155, addresses selective topics in modeling; and material technologies to reduce the vulnerability of installations; and reduce the acquisition and operating costs of protective technologies. The demonstrations and validations provide the independent, technical and operational test.

Exhibit R-2, RDT&E Budget Item Justification: PB 2011 Navy	DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603725N: *Facilities Improvement*

B. Program Change Summary ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
Previous President's Budget	18.832	4.002	0.000	0.000	0.000
Current President's Budget	18.034	10.039	3.746	0.000	3.746
Total Adjustments	-0.798	6.037	3.746	0.000	3.746
• Congressional General Reductions		-0.043			
• Congressional Directed Reductions		0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds		6.080			
• Congressional Directed Transfers		0.000			
• Reprogrammings	-0.798	0.000			
• SBIR/STTR Transfer	0.000	0.000			
• Program Adjustments	0.000	0.000	3.746	0.000	3.746

Congressional Add Details ($ in Millions, and Includes General Reductions)	FY 2009	FY 2010
Project: 9999: *Congressional Adds*		
Congressional Add: *Photovoltaic Rooftop Systems for Military Housing*	0.000	1.195
Congressional Add: *Permanent Magnet Linear Generator Power Buoy Syste*	1.995	1.912
Congressional Add: *KINETIC HYDROPOWER SYSTEM (KHPS) TURBINE*	2.393	0.000
Congressional Add: *SWIMMER DETECTION SONAR NETWORK*	3.190	0.000
Congressional Add: *Hydrokinetic Power Generator*	1.596	1.593
Congressional Add: *Regenerative Fule Cell Back-up Power*	1.197	1.354
Congressional Add: *Testing of Critical Comonents for Ocean Alternativ*	1.995	0.000
Congressional Add: *Wave Energy PowerBuoy Generating Systems for the D*	1.596	0.000
Congressional Add Subtotals for Project: 9999	13.962	6.054
Congressional Add Totals for all Projects	13.962	6.054

Exhibit R-2, RDT&E Budget Item Justification: PB 2011 Navy	DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603725N: *Facilities Improvement*

Change Summary Explanation

Technical: Not applicable.

Schedule: Not applicable.

FY11 from previous President's Budget is shown as zero because no FY11-15 data was presented in President's Budget 2010.

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603725N: *Facilities Improvement*	PROJECT 0995: *Naval Facilities System*	

COST ($ in Millions)	FY 2009 Actual	FY 2010 Estimate	FY 2011 Base Estimate	FY 2011 OCO Estimate	FY 2011 Total Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
0995: *Naval Facilities System*	1.777	1.823	1.784	0.000	1.784	1.806	1.834	1.879	1.918	Continuing	Continuing
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0		

A. Mission Description and Budget Item Justification

This program provides the Navy with new engineering capabilities that are required to overcome specific performance limitations of Naval shore facilities while reducing the cost of sustaining the Naval shore infrastructure. The program focuses available RDT&E resources on satisfying facility requirements where the Navy is a major stakeholder or where there are no test validated Commercial Off the Shelf (COTS) solutions available, and a timely solution will not emerge without a Navy sponsored demonstration and validation. The program completes the development and validation of facility technologies originating in Navy Science and Technology programs, plus a variety of other sources which includes the National Science Foundation (NSF) and the National Institute of Standards and Technology (NIST). Validated technologies are implemented in the Navy's Military Construction (MILCON) and Facilities, Sustainment Restoration and Modernization Programs (FSRP). Project 0995 is addressing three Navy facilities requirements during the fiscal years FY 2009 through FY 2011: Waterfront Facilities Repair and Upgrade, Facilities Technologies to Reduce the Cost of Facilities, Sustainment, Restoration and Modernization and the Modular Hybrid Pier (MHP). The execution of this program is consistent with the findings and recommendation of two National Academy of Sciences Reports: "The Role of Federal Agencies in Fostering New Technology and Innovation in Building" and "Federal Policies to Foster Innovation and Improvement in Constructed Facilities."

Waterfront Facilities Repair and Enhancement: About 75% of the Navy's waterfront facilities are over 45 years old. They were designed for a service life of 25 years and to satisfy the mission requirements existing at that time. The over aged reinforced concrete requires costly and repetitive repairs. In addition, to accomplish more pier side ship maintenance and thus reduce drydock costs, these piers must be strengthened to support concentrated crane loads up to 140 tons, when piers were originally designed for no concentrated loads. At that time piers were designed to service one, possibly two particular ship classes, berthing felexibility is now limited by mooring configuratoions and varied hotel service requirements. This sub-project addresses new materials design methods, and retrofit methods to extend the service life of existing waterfront facilities by an additional 15 or more years The project also adresses updating the mission based service, environmental and protection loading requirements imposed by changes in platforms, operations and threats. Other initiatives include: enhanced facilties management processes, using facilites information modeling (FIM) technogy and waterfront utility service enhancements using modules to achieve flexible berthing arranagements consistant with current and future platform mooring configurations and hotel service requirements. Using this new technology at a cost of $1-2M for repairs and upgrades per pier will result in $50M in cost avoidance for demolition and replacement.

Technologies To Reduce The Cost of Facilities, Sustainment, Restoration and Modernization (FSRM): FSRM issues of high operational significance are addressed on a priority basis .The costs to correct these critical facility deficiencies are over $3.1B as reported in the FY 2000 Annual Inspection Summary (AIS). Current Navy

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603725N: *Facilities Improvement*	PROJECT 0995: *Naval Facilities System*

FSRM funding levels are insufficient to prevent the continued growth of the backlog of mission and safety critical maintenance and repairs. This effort will demonstrate and validate the cost and reliability of advanced technologies in order to assure their acceptance and implementation in traditionally conservative public works and construction industries. The effort will accelerate the validation, commercialization, and wide-spread implementation of the facility technologies urgently required to reduce the cost of correcting the deficiencies in the Navy's FSRM backlog. Estimated returns on these investments are better than 60 to 1.

MODULAR HYBRID PIER (MHP): Modular Hybrid Pier started in FY02 to achieve completions required by construction acquisition schedules. The Navy is faced with the necessity of recapitalizing a large portion of its waterfront infrastructure over the next several decades. The Modular Hybrid Pier initiative develops and validates innovative material and design technologies for a mission-flexible waterfront infrastructure characterized by significantly reduced total ownership cost and increased mission flexibility. The proceeding sub-project Waterfront Facilities Repair and Upgrade will enable the Navy to economically extend the useful service life of existing piers and wharves. While reducing the need for immediate replacement, eventual replacement will be required. This MHP sub-project provides improved technology for new piers. Emerging innovative structural and materials technologies, particularly those that will transition from the Navy's applied research and advanced development program, will provide enhanced-capability. Structures may have a comparable initial cost yet have far less maintenance and repair costs. Use of advanced materials and high performance lightweight concrete will produce structures that have twice the economic service life of the conventional piers. Modular design will enable off-site fabrication in pre-cast plants that will shorten the duration of construction and lower the cost relative to conventional on-site demolition followed by on site/on base construction. Plant fabrication will vastly improve quality and result in repair-free durability because of superior performance concrete with post-tensioning technologies. The modular concept will facilitate change-out of components for modifications to increase capacity to adapt to future ship designs. Mobility due to barge configuration will enable relocatability of structural platform modules through flotation is a significant new capability option which will save money and provides new military worth/ planning and deployment options. An economic analysis has shown that a modular hybrid (deployable) pier will have a Net Present Value (NPV) cost that is $15M less over its service life than that for a conventional pier constructed of ordinary reinforced concrete. The MHP, partly because of following the sea levels will have superior operational benefits to ship/port operations. The knowledge from this pier project will enable other concrete facility options that are fabricated offsite and relocatable for adjustment to basing changes. The technology of concrete and reinforcement and corrosion proofing will have wide spread applicability to all concrete construction.

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
Naval Facilities System	1.777	1.823	1.784	0.000	1.784
FY 2009 Accomplishments: FY09: Completed simulation and modeling of MHP hydrodynamic response. Completed design of full scale prototype MHP.					

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603725N: *Facilities Improvement*	PROJECT 0995: *Naval Facilities System*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
FY 2010 Plans: FY10: Develop plans for operational test of 1st MHP prototype. Apply MHP technology lessons to other-than-pier floating/relocatable facility options. *FY 2011 Base Plans:* FY11: Summarize measurements of corrosion on test bed. Test and evaluate enhanced MHP mooring for performance across desired wide range of seismic & cyclonic loads. Address technical issues as posed in the test and evaluation plan (TEMP) and in TEMP adendum. Transition of MHP 35% technology design to MCON P-440. Develop cost factors for update of MCON planning process.					
Accomplishments/Planned Programs Subtotals	1.777	1.823	1.784	0.000	1.784

C. Other Program Funding Summary ($ in Millions)

N/A

D. Acquisition Strategy

N/A

E. Performance Metrics

Quarterly Program Reviews

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603725N: *Facilities Improvement*	PROJECT 0995: *Naval Facilities System*	

Product Development ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Waterfron Facilities Repair & Upgrade	Various/ Various	NFESC Pt Hueneme, CA	1.760	0.290	Feb 2010	0.203	Feb 2011	0.000		0.203	Continuing	Continuing	Continuing
Facilities, Sustainment, Restoration and Modernization Tech	Various/ Various	NFESC Pt Hueneme, CA	3.853	1.036	Feb 2010	1.084	Feb 2011	0.000		1.084	Continuing	Continuing	Continuing
Modular Hybrid Pier (CA)	Various/ Various	NFESC Pt Hueneme, CA	3.393	0.497	Feb 2010	0.350	Feb 2011	0.000		0.350	Continuing	Continuing	Continuing
Modular Hybrid Pier (WA)	Various/ Various	BergerAbam Seattle, WA	1.463	0.000		0.147	May 2011	0.000		0.147	0.000	1.610	Continuing
		Subtotal	10.469	1.823		1.784		0.000		1.784			

Remarks

Total Prior Years Cost summation does not include performing activities from projects completed in prior years.

*** All funding vehicle are WX document type....****

	Total Prior Years Cost	FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	10.469	1.823		1.784		0.000		1.784			

Remarks

Exhibit R-4, **RDT&E Schedule Profile:** PB 2011 Navy		**DATE:** February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603725N: *Facilities Improvement*	**PROJECT** 0995: *Naval Facilities System*

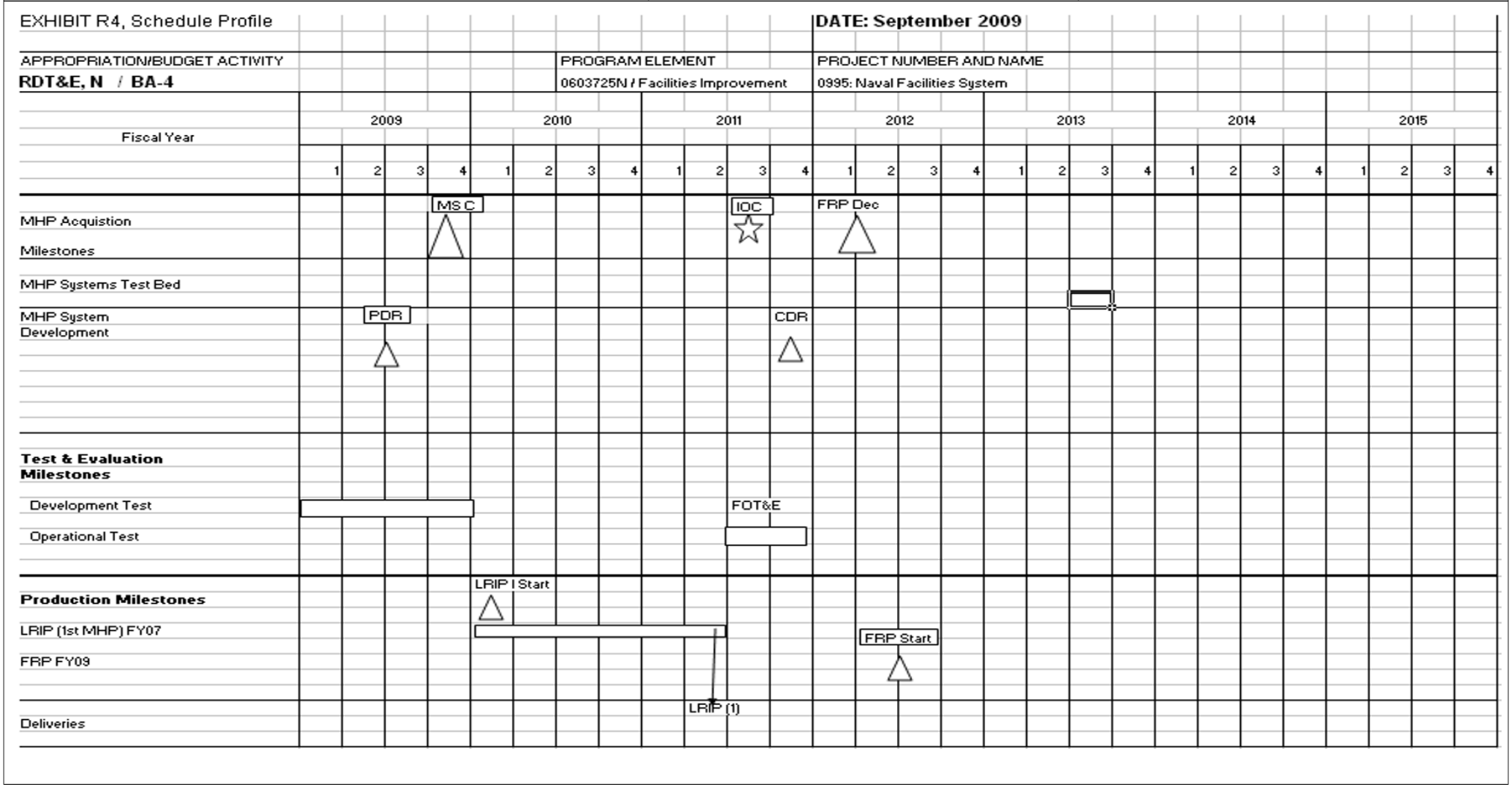


Exhibit R-4A, RDT&E Schedule Details: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603725N: *Facilities Improvement*	**PROJECT** 0995: *Naval Facilities System*

Schedule Details

	Start		End	
Event	**Quarter**	**Year**	**Quarter**	**Year**
Combined Developmental/Operational Testing (DT/OT)	1	2009	1	2009
Preliminary Design Review (PDR)	2	2009	2	2009
Milestone C (MS C)	4	2009	4	2009
Start Low-Rate Initial Production I (LRIP) A	1	2010	4	2010
Start Low-Rate Initial Production I (LRIP) B	1	2011	4	2011
Low-Rate Initial Production Delivery	2	2011	2	2011
Follow-On Operational Test & Evaluation (FOT&E)	3	2011	4	2011
IOC	3	2011	3	2011
Critical Design Review (CDR)	4	2011	4	2011
Full Rate Production (FRP) Decision	1	2012	2	2012
Full Rate Produciton Start	2	2012	3	2012

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603725N: *Facilities Improvement*	PROJECT 3155: *Force Protection Ashore*	

COST ($ in Millions)	FY 2009 Actual	FY 2010 Estimate	FY 2011 Base Estimate	FY 2011 OCO Estimate	FY 2011 Total Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
3155: *Force Protection Ashore*	2.295	2.162	1.962	0.000	1.962	2.014	2.043	2.091	2.134	Continuing	Continuing
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0		

A. Mission Description and Budget Item Justification

Protection of the Navy Installations against terrorist activities requires development and deployment of advanced technology for force protection capabilities that are cost effective. Manpower costs of protection systems with today's technology are very high . Performance is not adequate to reduce vulnerability cost-effectively. This Antiterrorism and Force Protection Ashore Project will develop, demonstrate and validate technologies for the following: access control and perimeter denial; waterside protection against craft and swimmer intrusion; secure and efficient operations centers and emergency centers (including human and information support systems); construction integrated surveillance sensors and robotic systems for intruder detection; material systems to improve utilities security and recovery; and material concepts to reduce injury and death. Through demonstration and validation of risk modeling and simulation models, the potential of emerging technologies will be evaluated and installation security strategies that reduce manpower and other costs will be formulated. Installation protection concepts against attacks from the air will be identified and jointly demonstrated. These demonstrations and validations derive from advanced technology from science and technology programs of government academia and industry. The technology produces data for performance specifications for competitive procurement. All work will be coordinated with other programs and through industry forums as appropriate.

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
Force Protection Ashore	2.295	2.162	1.962	0.000	1.962
FY 2009 Accomplishments: FY 09: Provided and initiated advanced prototype development and demonstrations for ATFP applications at Naval Installations as follows. - Completed and demonstrated (full scale) a multi-perimeter (both outer and inner) rapid estimating method/model for perimeter security to installations. - Develop and demonstrated advanced prototypes of inclement weather sensors for detecting intruders; transitioned from ONR Future Navy Capabilities (FNC) program.					

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603725N: *Facilities Improvement*	PROJECT 3155: *Force Protection Ashore*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
- Develop advanced prototypes and tested Intelligent Video technology for waterfront and on-land security applications --- transitioned from ONR Future Navy Capabilities (FNC) program. - Develop advanced prototypes of low frequency continuous wave system to warn and stop (i.e. neutralize) intruding diver/swimmers approaching Navy piers and ships (transitioned from ONR S&T) *FY 2010 Plans:* FY10: Continue, complete and initiate advanced prototype development and demonstration for ATFP applications at Naval installations as follows: - Continue the development of inclement weather mid range IR sensors for detecting intruders at installation perimeter. - Continue development, demonstration and integration of intelligent video in security systems. - Initiate demonstration of low frequency continuous wave sensors to warn and stop intruding malevolent divers and swimmers approaching Navy piers and ships. - Develop prototype floating barrier to protect ships against swarms of attacking boats. *FY 2011 Base Plans:* FY 11: Continue, complete and initiate advanced prototypes developments as follows: - Complete, integrate and demonstrate mid range infrared sensor for detecting in inclement weather and low visibility conditions at perimeter security applications. - Initiate advanced prototype development of millimeter wave length sensors (lower cost) for surveillance applications at installations -- transition from ONR S&T FNC program. - Complete development and demonstrate full scale prototypes of floating barriers against swarm attack boats. - Complete and demonstrate low frequency continuous wave system to interdict intruding swimmers/ divers.					
Accomplishments/Planned Programs Subtotals	2.295	2.162	1.962	0.000	1.962

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603725N: *Facilities Improvement*	PROJECT 3155: *Force Protection Ashore*

C. Other Program Funding Summary ($ in Millions)

N/A

D. Acquisition Strategy

Demonstration and validation is conducted for maximum transfer and interaction with industry such as to influence the industry COTS with the results of this demonstration and prototype validation. Acquisition is based on performance specifications enabled by this project.

E. Performance Metrics

Quarterly Program Reviews

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603725N: *Facilities Improvement*	PROJECT 3155: *Force Protection Ashore*

Product Development ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Force Protection Ashore (CA)	WR	NFESC Pt Hueneme, CA	0.729	0.881	Jan 2010	0.801	Jan 2011	0.000		0.801	Continuing	Continuing	Continuing
Force Protection Ashore (Crane)	WR	NSWC Dahlgren Panama City, Crane	1.600	0.981	Jan 2010	0.861	Jan 2011	0.000		0.861	Continuing	Continuing	Continuing
Force Protection Ashore (VA)	WR	ONR Arlington, VA	0.000	0.300	Jan 2010	0.300	Dec 2010	0.000		0.300	Continuing	Continuing	Continuing
		Subtotal	2.329	2.162		1.962		0.000		1.962			

Remarks

New start in FY06.

	Total Prior Years Cost	FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	2.329	2.162		1.962		0.000		1.962			

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2011 Navy		**DATE:** February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603725N: *Facilities Improvement*	**PROJECT** 3155: *Force Protection Ashore*

CLASSIFICATION:

EXHIBIT R4, Schedule Profile — **DATE: Jan 2010**

APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT	PROJECT NUMBER AND NAME
RDT&E, N / BA-4	0603725N / Facilities Improvement	3155 / Force Protection Ashore/Subproj: Perimeter Estimating Model/Method

Fiscal Year	2009				2010				2011				2012				2013				2014				2015			
	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
Technology Assessment																												
Concept of Employment																												
System Development																												
Spiral 1 Development																												
Spiral 2 Development																												
Test & Evaluation Milestones																												
Development Test																												
Operational Test		△																										
Production Milestones																												
Procurement Specification																												
Deliveries																												

R-4 Schedule Profile

Exhibit R-4, RDT&E Schedule Profile: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603725N: *Facilities Improvement*	PROJECT 3155: *Force Protection Ashore*

CLASSIFICATION:

EXHIBIT R4, Schedule Profile — **DATE: Jan 2010**

APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT	PROJECT NUMBER AND NAME
RDT&E, N / BA-4	0603725N / Facilities Improvement	3155 / Force Protection Ashore/Subproj: Inclement Weather Sensor System (mid range IR)

Fiscal Year	2009				2010				2011				2012				2013				2014				2015			
	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
Technology Assessment																												
Concept of Employment																												
System Development																												
Spiral 1 Development (LPR)	△																											
Spiral 2 Development (TF&I9)			△		△																							
Test & Evaluation Milestones																												
Development Test					△																							
Operational Test		△					△																					
Production Milestones																												
Procurement Specification								△																				
Deliveries																												

R-4 Schedule Profile

Exhibit R-4, RDT&E Schedule Profile: PB 2011 Navy		**DATE:** February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603725N: *Facilities Improvement*	**PROJECT** 3155: *Force Protection Ashore*

CLASSIFICATION:

EXHIBIT R4, Schedule Profile — **DATE: Jan 2010**

APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT	PROJECT NUMBER AND NAME
RDT&E, N / BA-4	0603725N / Facilities Improvement	3155 / Force Protection Ashore/Subproj: Intelligent Video

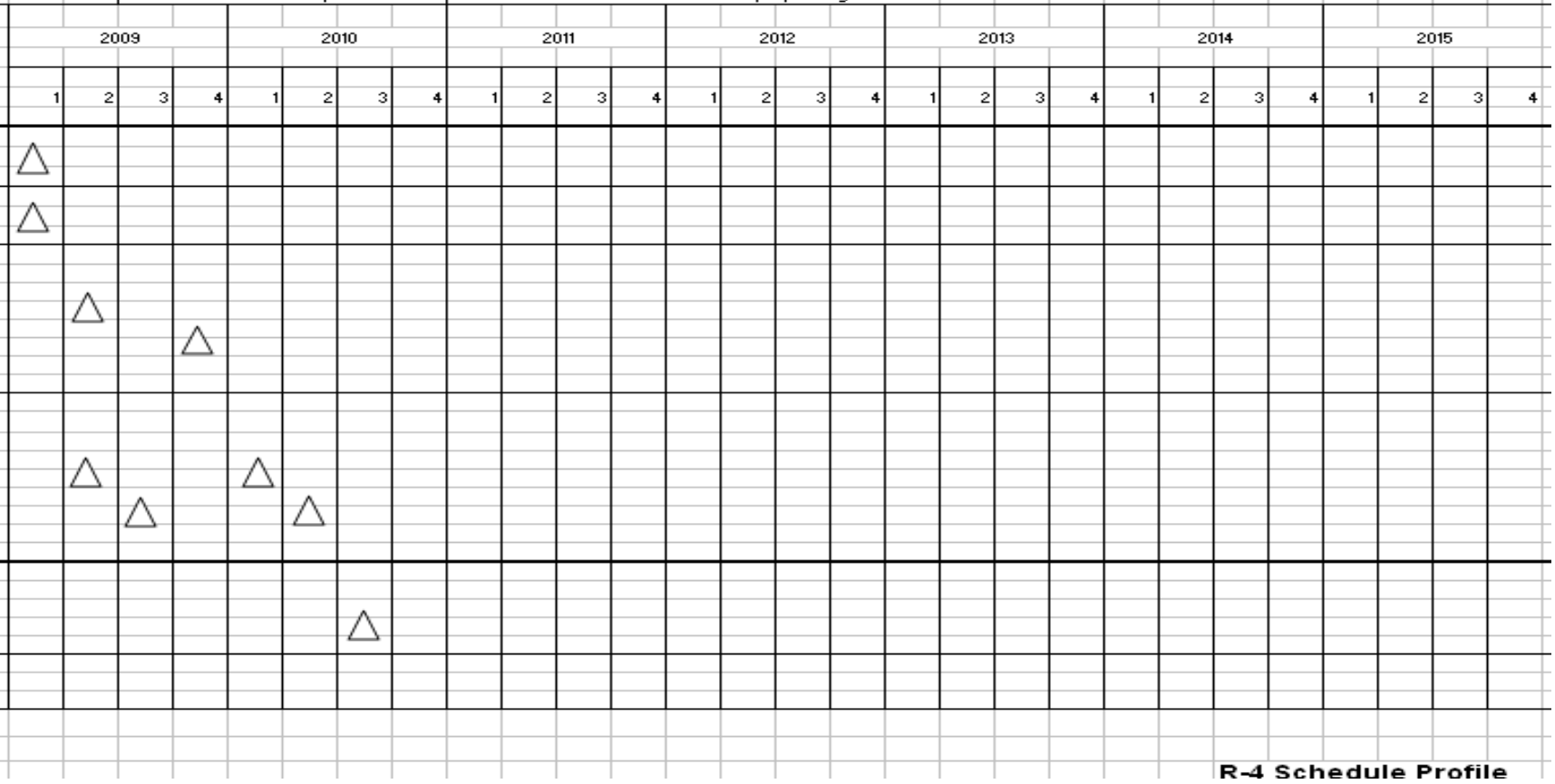


Exhibit R-4, RDT&E Schedule Profile: PB 2011 Navy		**DATE:** February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603725N: *Facilities Improvement*	**PROJECT** 3155: *Force Protection Ashore*

CLASSIFICATION:

EXHIBIT R4, Schedule Profile — **DATE: Jan 2010**

APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT	PROJECT NUMBER AND NAME
RDT&E, N / BA-4	0603725N / Facilities Improvement	3155 / Force Protection Ashore/Subproj: Low Frequency Continuous Wave

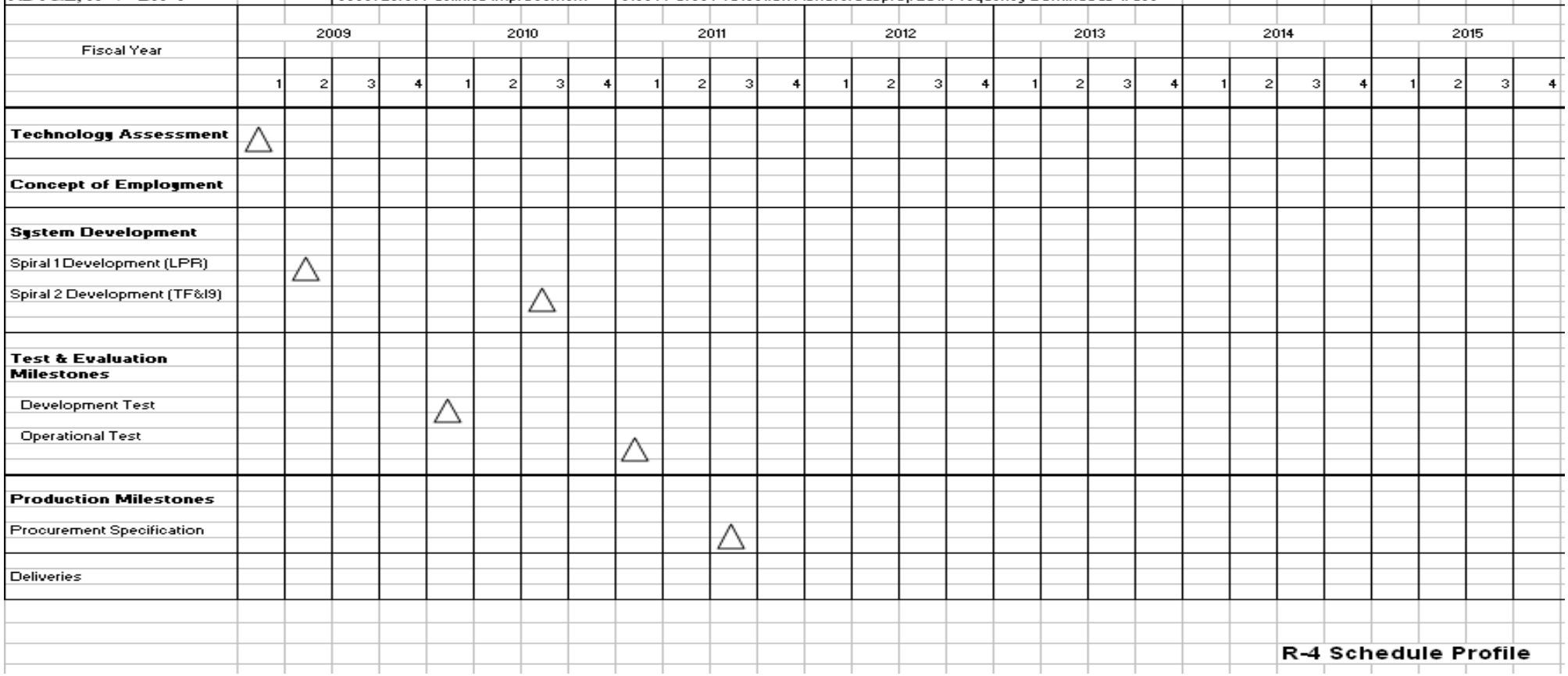
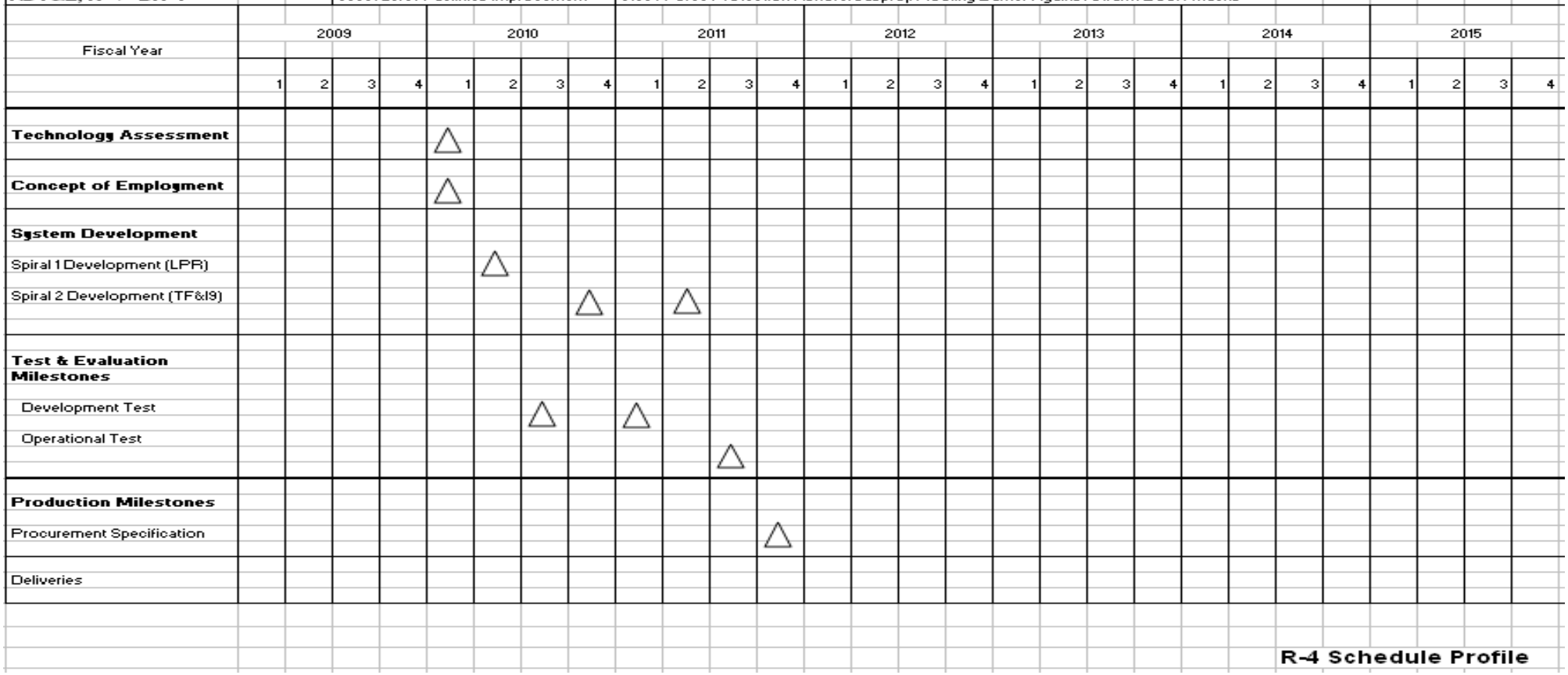


Exhibit R-4, RDT&E Schedule Profile: PB 2011 Navy		**DATE:** February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603725N: *Facilities Improvement*	**PROJECT** 3155: *Force Protection Ashore*

CLASSIFICATION:

EXHIBIT R4, Schedule Profile — **DATE: Jan 2010**

APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT	PROJECT NUMBER AND NAME
RDT&E, N / BA-4	0603725N / Facilities Improvement	3155 / Force Protection Ashore/Subproj: Floating Barrier Against Swarm Boat Attacks



R-4 Schedule Profile

Exhibit R-4, RDT&E Schedule Profile: PB 2011 Navy		**DATE:** February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603725N: *Facilities Improvement*	**PROJECT** 3155: *Force Protection Ashore*

CLASSIFICATION:

EXHIBIT R4, Schedule Profile — **DATE: Jan 2010**

APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT	PROJECT NUMBER AND NAME
RDT&E, N / BA-4	0603725N / Facilities Improvement	3155 / Force Protection Ashore/Subproj: Millimeter Wave Detection System

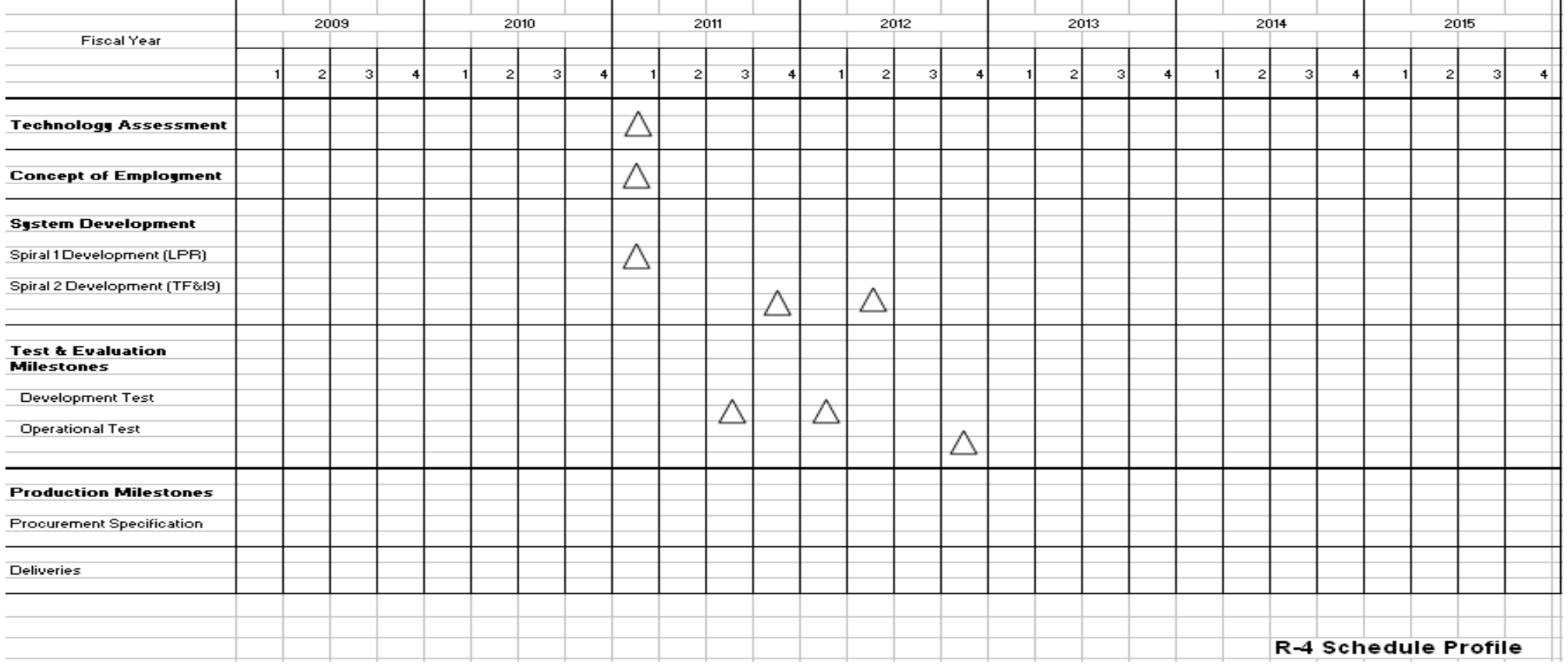


Exhibit R-4A, RDT&E Schedule Details: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603725N: *Facilities Improvement*	PROJECT 3155: *Force Protection Ashore*

Schedule Details

	Start		End	
Event	Quarter	Year	Quarter	Year
Subproj: Perimeter Estmating Model/Method: Test & Eveluation (OT) -	2	2009	2	2010
Subproj: Inclement Weather Sensor System (mid range IR): Sprial Development (LPN)	1	2009	1	2009
Subproj: Inclement Weather Sensor System (mid range IR): Sprial Development (TF&I9)	2	2009	1	2010
Subproj: Inclement Weather Sensor System (mid range IR): Test & Evaluation (DT)	1	2010	1	2010
Subproj: Inclement Weather Sensor System (mid range IR): Test & Evaluation (TO)	2	2009	3	2010
Subproj: Inclement Weather Sensor System (mid range IR): Procurement Specification	4	2010	4	2010
Subproj: Intelligent Video:Technology Assessment	1	2009	1	2009
Subproj: Intelligent Video: Concept of Employment	1	2009	1	2009
Subproj: Intelligent Video: Sprial Development (LPR)	2	2009	2	2009
Subproj: Intelligent Video: Sprial Development (TF&I9)	4	2009	4	2009
Subproj: Intelligent Video: Test & Evaluation (DT)	2	2009	1	2010
Subproj: Intelligent Video: Test & Evaluation (OT)	3	2009	2	2010
Subproj: Intelligent Video: Procurement Specification	3	2010	3	2010
Subproj: Low Frequency Continuous Wave: Technology Assessment	1	2009	1	2009
Subproj: Low Frequency Continuous Wave: Sprial Development (LPR)	2	2009	2	2009
Subproj: Low Frequency Continuous Wave: Sprial Development (TF&I9)	2	2009	3	2010
Subproj: Low Frequency Continuous Wave: Test & Evaluation (DT)	1	2010	1	2010
Subproj: Low Frequency Continuous Wave: Test & Evaluation (OT)	1	2011	1	2011

Exhibit R-4A, RDT&E Schedule Details: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603725N: *Facilities Improvement*	PROJECT 3155: *Force Protection Ashore*

	Start		End	
Event	Quarter	Year	Quarter	Year
Subproj: Low Frequency Continuous Wave: Procurement Specification	3	2011	3	2011
Subproj: Floating Barrier Against Swarm Boat Attacks: Technology Assessment	1	2010	1	2010
Subproj: Floating Barrier Against Swarm Boat Attacks: concept of Employment	1	2010	1	2010
Subproj: Floating Barrier Against Swarm Boat Attacks: Spiral Development (LPR)	2	2010	2	2010
Subproj: Floating Barrier Against Swarm Boat Attacks: Spiral Development (TF&I9)	4	2010	2	2011
Subproj: Floating Barrier Against Swarm Boat Attacks: Test & Eveluation (DT)	3	2010	1	2011
Subproj: Floating Barrier Against Swarm Boat Attacks: Test & Eveluation (OT)	3	2011	3	2011
Subproj: Floating Barrier Against Swarm Boat Attacks: Procurement Specification	4	2011	4	2011
Subproj: Millimeter Wave Detection System: Technology Assessment	1	2011	1	2011
Subproj: Millimeter Wave Detection System: Concept of Employment	1	2011	1	2011
Subproj: Millimeter Wave Detection System: Sprial Development (LPR)	1	2011	1	2011
Subproj: Millimeter Wave Detection System: Sprial Development (TF&I9)	4	2011	2	2012
Subproj: Millimeter Wave Detection System: Test & Evaluation (DT)	3	2011	4	2012

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603725N: *Facilities Improvement*	PROJECT 9999: *Congressional Adds*	

COST ($ in Millions)	FY 2009 Actual	FY 2010 Estimate	FY 2011 Base Estimate	FY 2011 OCO Estimate	FY 2011 Total Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
9999: *Congressional Adds*	13.962	6.054	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	30.324
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0		

A. Mission Description and Budget Item Justification

Congressional interest items.

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010
Congressional Add: Photovoltaic Rooftop Systems for Military Housing *FY 2010 Plans:* N/A	0.000	1.195
Congressional Add: Permanent Magnet Linear Generator Power Buoy Syste *FY 2009 Accomplishments:* The program involved numerical and physical modeling to facilitate scaling the Phase I PMLG buoy design from 5kW to full capacity, estimated at between 100 kW and 250 kW. This effort performed the remaining hydrodynamic modeling, identify the preferred direct drive rotary system, created a functional conceptual design, perform key experimental testing in Oregon State University wave and electric motor research laboratories, complete a preliminary design and design review, and establish the plan for a full scale design and build including cost and energy production estimates. These project and research steps are sequentially accomplished and are necessary to ensure a plan with flexibility and integrity toward identifying a cost effective and survivable wave energy conversion device. Through the sequential development of numerical modeling and experimental tests the most	1.995	1.912

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603725N: *Facilities Improvement*	PROJECT 9999: *Congressional Adds*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010
feasible direct drive rotary power take-off system design concept will be identified. This will then become the subject of a preliminary full-scale design. The preliminary design will be used for system evaluation, energy production estimates, cost estimates, and a preliminary design review. This project provided the information necessary for the determination of commercial feasibility before proceeding to a complete system design and full scale ocean testing *FY 2010 Plans:* The program will involve numerical and physical modeling to facilitate scaling the Phase I PMLG buoy design from 5kW to full capacity, estimated at between 100 kW and 250 kW. This effort will perform the remaining hydrodynamic modeling, identify the preferred direct drive rotary system, create a functional conceptual design, perform key experimental testing in Oregon State University wave and electric motor research laboratories, complete a preliminary design and design review, and establish the plan for a full scale design and build including cost and energy production estimates. These project and research steps are sequentially accomplished and are necessary to ensure a plan with flexibility and integrity toward identifying a cost effective and survivable wave energy conversion device. Through the sequential development of numerical modeling and experimental tests the most feasible direct drive rotary power take-off system design concept will be identified. This will then become the subject of a preliminary full-scale design. The preliminary design will be used for system evaluation, energy production estimates, cost estimates, and a preliminary design review. This project will provide the information necessary for the determination of commercial feasibility before proceeding to a complete system design and full scale ocean testing.		
Congressional Add: KINETIC HYDROPOWER SYSTEM (KHPS) TURBINE *FY 2009 Accomplishments:* Conduced a technical, operational, environmental and business study to determine the feasibility of generating power at a suitable location in Puget Sound using the Kinetic Hydropower Turbine System, from which power can be transmitted to a local commercial power grid or to a naval base(s) grid. The study, including the explorations for data will address:	2.393	0.000

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603725N: *Facilities Improvement*	PROJECT 9999: *Congressional Adds*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010
1) the presence of suitably strong tidal currents to generate electricity with the kinetic turbines; 2) Proximity of such sites to ports and other infrastructure to facilitate cost effective construction and operational sustainment; 3) Proximity to electrical power grids/interconnections for distribution; 4) Adequate avoidance considerations for navigational Channels; 5) Regulatory and permitting issues; and 6) Environmental compatibility with fish/fisheries, marine mammals, other water uses and other environmental and demographic considerations. The study will conclusively identify all issues to enable effective discussions for agreements among Navy and Industry parties for the project continuation with design, fabrication, installation and demonstration C power generation, transmission, and cost effective power generation-grid operations and business activities to serve the Navy needs. Initiate critical design and tests of long lead components concurrently with the feasibility engineering and business study.		
Congressional Add: SWIMMER DETECTION SONAR NETWORK *FY 2009 Accomplishments:* Developed, installed and demonstrated at the Portsmouth, NH Naval Shipyard water environment the Swimmer Detection Sonar Network, previously demonstrated successfully at Singapore and elsewhere. An advanced development prototype will be developed, installed, and tested to demonstrate performance in the temperature, salinity, currents, aqua-life, debris and industrial noise regime of the shipyard's waters. Consideration shall be given to installation designs to enable potential continuing development or operation if the fiscal year 2008 activities demonstrate adequate performance.	3.190	0.000
Congressional Add: Hydrokinetic Power Generator	1.596	1.593

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603725N: *Facilities Improvement*	PROJECT 9999: *Congressional Adds*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010
FY 2009 Accomplishments: This project provided build and demonstrated a low-head hydrokinetic power generation system based on the phenomenon of vortex induced vibration. A fully developed system will be capable of supplying power to Navy facilities or instrumentation clusters. Vortex Hydrokinetic Power technology, (AKA Vortex Induced Vibration Aquatic Clean Energy or VIVACE), uses the phenomenon of vortex induced vibrations to extract useful kinetic energy from ocean and river currents. The technology is scalable and can produce energy over a wide range of current speeds, starting as low as 1 knot. VIVACE installations are submerged, non-obtrusive, environmentally compatible, modular, and have a high energy density. Once developed, this type of power generation can used for supporting Navy power needs in a number of areas including: power for coastal naval bases, instrumentation stations, autonomus underwater vehicle (AUV) battery recharge, off-shore stations, and idle ships. *FY 2010 Plans:* This project will build and demonstrate a low-head hydrokinetic power generation system based on the phenomenon of vortex induced vibration. A fully developed system will be capable of supplying power to Navy facilities or instrumentation clusters. Vortex Hydrokinetic Power technology, (AKA Vortex Induced Vibration Aquatic Clean Energy or VIVACE), uses the phenomenon of vortex induced vibrations to extract useful kinetic energy from ocean and river currents. The technology is scalable and can produce energy over a wide range of current speeds, starting as low as 1 knot. VIVACE installations are submerged, non-obtrusive, environmentally compatible, modular, and have a high energy density. Once developed, this type of power generation can used for supporting Navy power needs in a number of areas including: power for coastal naval bases, instrumentation stations, autonomus underwater vehicle (AUV) battery recharge, off-shore stations, and idle ships.		
Congressional Add: Regenerative Fule Cell Back-up Power	1.197	1.354

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603725N: *Facilities Improvement*	PROJECT 9999: *Congressional Adds*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010
FY 2009 Accomplishments: Investigated material issues, hydrogen storage issues, and improved fuel cells to allow and fabrication of a regenerative Proton Exchange Membrane (PEM) fuel power system suitable for tactical applications. *FY 2010 Plans:* Continued to investigate material issues, hydrogen storage issues, and improved fuel cells to allow and fabrication of a regenerative Proton Exchange Membrane (PEM) fuel power system suitable for tactical applications.		
Congressional Add: Testing of Critical Comonents for Ocean Alternativ *FY 2009 Accomplishments:* The contractor design, construct and operate a heat exchanger test facility at the Hawaii Natural Energy Laboratory of Hawaii Authority (NELHA). The goal of this project is to provide heat transfer performance, corrosion and biofouling testing of heat exchangers in order to develop heat exchangers for use in commercial size Ocean Thermal Energy Conversion (OTEC) Plants. Heat exchanger performance modeling and new design development is intended to proceed in parallel with testing and share data and results from the test program. Heat exchanger test goals include: Design, develop and fully test a practical set of heat exchangers for use in commercial size OTEC plant; Determine the long term and short term corrosion characteristics of heat exchanger designs currently being considered for use; Determine if any difference exists between corrosion characteristics of 2200 feet deep water from 40" intake pipe at NELHA and 3000 feet deep water on 55" intake pipe at NELHA; evaluate anti-fouling techniques and demonstrate their successful operation; Test the performance of evaporators and condensers with both seawater and ammonia flows at various seawater and ammonia flow rates; Evaluate heat exchangers in parallel and series flow arrangements on both the seawater and ammonia circuits; Identify and/or originate heat exchanger design software that can accurately predict the performance obtained from heat exchanger testing; Analyze, evaluate and put into prototype form	1.995	0.000

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603725N: *Facilities Improvement*	PROJECT 9999: *Congressional Adds*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010
new heat exchanger designs to investigate heat exchanger arrangements, candidate materials, anti-corrosion processes and fabrication alternatives that require testing and evaluation.		
Congressional Add: Wave Energy PowerBuoy Generating Systems for the D *FY 2009 Accomplishments:* In conjunction with the U.S. Navy, the contractor will continue development of wave power technology as an alternate electric power source on DoD Bases and ultimately deliver power to Hawaiian Electric's grid. An advanced and efficient PowerBuoy will be interconnected at the offshore test site and deliver power to the Marine Corps Base, Hawaii (MCBH) grid through the submarine power cable. Buoy ocean testing will generate an operating history for wave power electrical generating systems at Naval bases. Program Objectives: Demonstrate wave power as a reliable alternative electric power source for power systems for DoD Bases; Evaluate the feasibility of wave power unit as a scaled up capacity power station; Deliver power to Hawaiian Electric's electrical grid.	1.596	0.000
Congressional Adds Subtotals	13.962	6.054

C. Other Program Funding Summary ($ in Millions)

N/A

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 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603725N: *Facilities Improvement*	PROJECT 9999: *Congressional Adds*

Product Development ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
PERMANENT MAGNET LINEAR GENERATOR POWER BYOY SYSTEM	Various/ Various	NFESC PT HUENEME, CA	1.995	1.912	Aug 2010	0.000		0.000		0.000	0.000	3.907	Continuing
KINETIC HYDROPOWER SYSTEM (KHPS) TURBINE	Various/ Various	NFESC PT HUENEME, CA	2.393	0.000		0.000		0.000		0.000	0.000	2.393	Continuing
SWIMMER DETECTION SONAR NETWORK	Various/ Various	ONR ARLINGTON, VA	3.190	0.000		0.000		0.000		0.000	0.000	3.190	Continuing
HYDROKINETIC POWER GENERATOR	Various/ Various	NFESC PT HUENEME, CA	1.596	1.593	Aug 2010	0.000		0.000		0.000	0.000	3.189	Continuing
REGENERATIVE FULE CELL BACK-UP POWER	Various/ Various	NAWC CHINA LAKE, CA	1.197	1.354		0.000		0.000		0.000	0.000	2.551	Continuing
PHOTOVOLTAIC ROOFTOP SYSTEMS FOR MILITARY HOUSING	C/FP	Not Specified Not Specified	0.000	1.195		0.000		0.000		0.000	0.000	1.195	Continuing
TESTING OF CRITICAL COMONENTS FOR OCEAN ALTERNATIVE	Various/ Various	NFESC PT HUENEME, CA	1.995	0.000		0.000		0.000		0.000	0.000	1.995	Continuing
WAVE ENERGY POWERBUOY GENERTING SYSTEMS	C/FP	NFESC PT HUENEME, CA	1.596	0.000		0.000		0.000		0.000	0.000	1.596	Continuing
		Subtotal	13.962	6.054		0.000		0.000		0.000	0.000	20.016	

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603725N: *Facilities Improvement*	PROJECT 9999: *Congressional Adds*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	FY 2010 Cost	FY 2010 Award Date	FY 2011 Base Cost	FY 2011 Base Award Date	FY 2011 OCO Cost	FY 2011 OCO Award Date	FY 2011 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Remarks													

	Total Prior Years Cost	FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	13.962	6.054		0.000		0.000		0.000	0.000	20.016	

Remarks

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Exhibit R-2, RDT&E Budget Item Justification: PB 2011 Navy										DATE: February 2010	
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*				R-1 ITEM NOMENCLATURE PE 0603739N: *Navy Logistic Productivity*							
COST ($ in Millions)	**FY 2009 Actual**	**FY 2010 Estimate**	**FY 2011 Base Estimate**	**FY 2011 OCO Estimate**	**FY 2011 Total Estimate**	**FY 2012 Estimate**	**FY 2013 Estimate**	**FY 2014 Estimate**	**FY 2015 Estimate**	**Cost To Complete**	**Total Cost**
Total Program Element	18.514	15.039	4.139	0.000	4.139	4.232	3.905	3.996	4.022	Continuing	Continuing
2955: *JEDMICS*	2.754	2.908	2.871	0.000	2.871	2.926	2.979	3.046	3.109	Continuing	Continuing
3223: *Logistics R&D*	0.000	0.980	0.890	0.000	0.890	0.927	0.926	0.950	0.913	Continuing	Continuing
3225: *Ordnance PHST*	0.000	0.395	0.378	0.000	0.378	0.379	0.000	0.000	0.000	0.000	1.152
9999: *Congressional Adds*	15.760	10.756	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	72.208

A. Mission Description and Budget Item Justification

Includes development and evaluation of incentive systems for improving the productivity of civilian and military personnel. Identifies barriers to increased productivity and evaluates the effect of removing them. Develops techniques for easing the introduction of new technology to the work place. Identifies and evaluates methods for improving the quality of work-life.

Excludes civilian and military manpower and their related costs and military construction costs which are included in appropriate Management and Support elements in this program.

B. Program Change Summary ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
Previous President's Budget	17.798	4.301	0.000	0.000	0.000
Current President's Budget	18.514	15.039	4.139	0.000	4.139
Total Adjustments	0.716	10.738	4.139	0.000	4.139
• Congressional General Reductions		-0.062			
• Congressional Directed Reductions		0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds		10.800			
• Congressional Directed Transfers		0.000			
• Reprogrammings	0.800	0.000			
• SBIR/STTR Transfer	-0.084	0.000			
• Program Adjustments	0.000	0.000	4.139	0.000	4.139

Exhibit R-2, RDT&E Budget Item Justification: PB 2011 Navy	DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603739N: *Navy Logistic Productivity*

Congressional Add Details ($ in Millions, and Includes General Reductions)	FY 2009	FY 2010
Project: 9999: *Congressional Adds*		
Congressional Add: *Hawaii National Guard Integrated Information Command System*	0.000	1.275
Congressional Add: *NSWC Corona Item Unique Identification Center*	0.000	1.434
Congressional Add: *Photonic Integration Foundry*	0.000	2.390
Congressional Add: *Real-time Tactical Intelligence Collection System*	0.000	1.195
Congressional Add: *UNIQUE IDENTIFICATION OF TANGIBLE ITEMS*	2.991	0.000
Congressional Add: *Thin Film Materials for Advanced Applications*	2.992	1.275
Congressional Add: *HIGHLY INTEGRATED OPTICAL INTERCONNECTS FOR ADV AI*	1.596	0.797
Congressional Add: *Advanced Naval Logistics*	1.596	2.390
Congressional Add: *RFID Tech Program*	0.798	0.000
Congressional Add: *Zero-Standoff HERO-Compliant RFID*	1.596	0.000
Congressional Add: *Field Support for Fiber Optic Cable*	1.596	0.000
Congressional Add: *Integrated Product Support Data Management System*	0.997	0.000
Congressional Add: *NAVAIR Distance Support Environment*	0.798	0.000
Congressional Add: *In Transit Visibility*	0.800	0.000
Congressional Add Subtotals for Project: 9999	15.760	10.756
Congressional Add Totals for all Projects	15.760	10.756

Change Summary Explanation

Technical: Not applicable.

Schedule: Not applicable.

Exhibit R-2, RDT&E Budget Item Justification: PB 2011 Navy	DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603739N: *Navy Logistic Productivity*

FY11 from previous President's Budget is shown as zero because no FY11-15 data was presented in President's Budget 2010.

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603739N: *Navy Logistic Productivity*	PROJECT 2955: *JEDMICS*	

COST ($ in Millions)	FY 2009 Actual	FY 2010 Estimate	FY 2011 Base Estimate	FY 2011 OCO Estimate	FY 2011 Total Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
2955: *JEDMICS*	2.754	2.908	2.871	0.000	2.871	2.926	2.979	3.046	3.109	Continuing	Continuing
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0		

A. Mission Description and Budget Item Justification

In FY85 Congress directed the Services and Defense Logistics Agency to permanently capture, manage and control engineering data in digital format so it would be available to support competitive spares re-procurement. The Joint Engineering Data Management Information & Control System (JEDMICS) program manages and controls 106,000,000 engineering images and has 25,000 authorized users responsible for over 70,000 user sessions per month. Over 2.5 million digital images are retrieved each month. New data and new users are added each month as DoD re-engineers its business processes to take advantage of digital data that is managed and controlled for corporate reuse. The JEDMICS system is deployed at 11 interoperable sites that service 600 locations worldwide. Data stored in JEDMICS is used for Logistics Support, Spares re-procurement, Weapons Systems procurement, Engineering, Maintenance, Distribution, Manufacturing, Air National Guard and Deployed Engineering Technical Services organizations. JEDMICS facilitates work process re-design since it brings the electronic drawings to the desktop, shop floor or flight line in real time eliminating walk, wait and slack time to retrieve drawings. Additionally, Administrative Lead Time, Repair Turn Around Time, Engineering Change Proposal processing time, demilitarization time, and all cycle times dependent on engineering data have decreased with the real time availability of digital engineering data. JEDMICS also facilitates Electronic Commerce since it produces digital technical data packages that can be forwarded along with an electronic order. Funds are for Commercial Off The Shelf (COTS) test, evaluation and integration. JEDMICS development efforts are required to integrate and test COTS upgrades.

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
JEDMICS Development	2.679	2.831	2.796	0.000	2.796
Conduct development efforts associated with JEDMICS software releases. Conduct COTS requirements definition, evaluation, integration and testing of annual baseline releases. Conduct technology insertion of the JEDMICS system that is required to protect the $21B digital data asset managed in JEDMICS.					

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603739N: *Navy Logistic Productivity*	PROJECT 2955: *JEDMICS*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
FY 2009 Accomplishments: Developed and integrated JEDMICS Software Release 3.10. *FY 2010 Plans:* Develop and integrate JEDMICS Software Release 3.11. *FY 2011 Base Plans:* Develop and integrate JEDMICS Software Release 3.12.					
JEDMICS Test Conduct test and readiness reviews and functional performance tests on JEDMICS system. *FY 2009 Accomplishments:* FY09: Completed Developmental Testing (DT) of JEDMICS Software Release 3.9. Initiated DT of JEDMICS Software Release 3.10. *FY 2010 Plans:* FY10: Complete DT of JEDMICS Software Release 3.10. Initiate DT of JEDMICS Software Release 3.11. *FY 2011 Base Plans:* Complete DT of JEDMICS Software Release 3.11. Initiate DT of JEDMICS Software Release 3.12.	0.025	0.025	0.025	0.000	0.025
JEDMICS Evaluation & Review Conduct technical evaluations and configuration control reviews of JEDMICS system. *FY 2009 Accomplishments:* Conducted technical evaluations and reviews for JEDMICS Software Release 3.11.	0.050	0.052	0.050	0.000	0.050

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603739N: *Navy Logistic Productivity*	PROJECT 2955: *JEDMICS*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
FY 2010 Plans: Conduct technical evaluations and reviews for JEDMICS Software Release 3.12. *FY 2011 Base Plans:* Conduct technical evaluations and reviews for JEDMICS Software Release 3.13.					
Accomplishments/Planned Programs Subtotals	2.754	2.908	2.871	0.000	2.871

C. Other Program Funding Summary ($ in Millions)

N/A

D. Acquisition Strategy

Execution of sole-source negotiated requirements type contract for engineering, design, development and test efforts. Performance-based reviews conducted quarterly by the Project Management Office.

E. Performance Metrics

1. Complete testing, integration, & upgrade of three (3) major embedded Commercial Off-the-Shelf (COTS) products.
2. Test & integrate system Information Assurance Vulnerability Management (IAVM) software patch upgrades four (4) times.
3. Complete development, testing, & integration of a minimum twenty (20) corrected high-priority software problem reports.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603739N: *Navy Logistic Productivity*	PROJECT 2955: *JEDMICS*

Support ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Development Support	C/Various	Various Various	0.305	0.214	Oct 2009	0.154	Oct 2010	0.000		0.154	0.157	0.830	Continuing
Software Development	C/Various	Various Various	0.216	0.000		0.000		0.000		0.000	0.000	0.216	Continuing
Software Development	SS/Various	Northrop Grumman Information McLean, VA	19.903	2.617	Nov 2009	2.642	Nov 2010	0.000		2.642	17.815	42.977	42.997
		Subtotal	20.424	2.831		2.796		0.000		2.796	17.972	44.023	42.997

Remarks

Remarks: Funds are for development efforts associated with Commercial Off The Shelf (COTS) obsolescence on the fully deployed COTS Intensive Joint Engineering Data Management Infomation & Control System (JEDMICS). Funds are for COTS evaulation, integration, and test and evaluation. The common baseline will be regained and obsolete COTS software and hardware will be replaced. Baseline releases will protect joint interoperability, upgrade operating systems for security patches and supportable versions, support integration to replace obsolete COTS, and upgrade the Oracle database to supportable versions.

SS/Various is a Sole Source - Indefinite Delivery/Requirements contract

Test and Evaluation ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation	Various/ Various	Various Various	2.370	0.025	Oct 2009	0.025	Oct 2010	0.000		0.025	0.150	2.570	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603739N: *Navy Logistic Productivity*	PROJECT 2955: *JEDMICS*	

Test and Evaluation ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
		Subtotal	2.370	0.025		0.025		0.000		0.025	0.150	2.570	

Remarks

Supports testing and evaluation of baseline releases in a user environment.

Management Services ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Government Engineering Support	Various/ Various	Various Various	1.083	0.000		0.000		0.000		0.000	0.000	1.083	Continuing
Program Management Support	WR	Various Various	0.197	0.016	Oct 2009	0.013		0.000		0.013	0.104	0.330	Continuing
Travel	Various/ Various	Various Various	0.214	0.036		0.037		0.000		0.037	0.234	0.521	Continuing
		Subtotal	1.494	0.052		0.050		0.000		0.050	0.338	1.934	

Remarks

Supports requirements management at the Prime Contractor location and program related travel by government employees.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603739N: *Navy Logistic Productivity*	PROJECT 2955: *JEDMICS*	

	Total Prior Years Cost	FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	24.288	2.908		2.871		0.000		2.871	18.460	48.527	42.997

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603739N: *Navy Logistic Productivity*	PROJECT 2955: *JEDMICS*

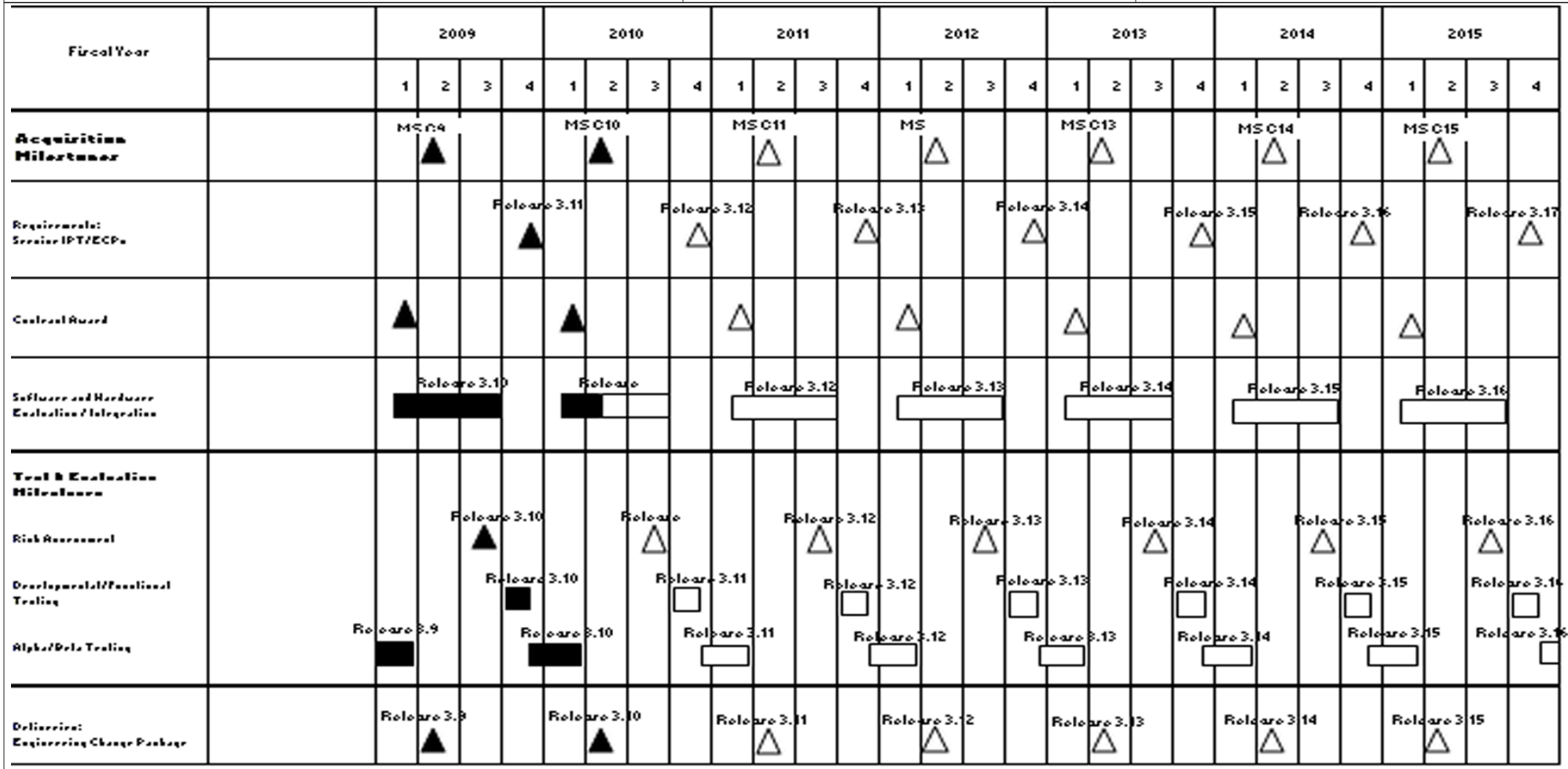

Exhibit R-4A, RDT&E Schedule Details: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603739N: *Navy Logistic Productivity*	**PROJECT** 2955: *JEDMICS*

Schedule Details

	Start		End	
Event	**Quarter**	**Year**	**Quarter**	**Year**
Alpha/Beta Testing Release 3.9	1	2009	1	2009
2009 Contract Award	1	2009	1	2009
Software Hardware Evaluation/Integration Release 3.10	1	2009	3	2009
Engineering Change Package Release 3.9	2	2009	2	2009
Milestone C9 (MS C9) Release 3.9	2	2009	2	2009
Risk Assessment Release 3.10	3	2009	3	2009
Developmental/Functional Testing Release 3.10	4	2009	4	2009
Service IPT/ECPs Release 3.11	4	2009	4	2009
Alpha/Beta Testing Release 3.10	4	2009	1	2010
2010 Contract Award	1	2010	1	2010
Software Hardware Evaluation/Integration Release 3.11	1	2010	3	2010
Engineering Change Package Release 3.10	2	2010	2	2010
Milestone C10 (MS C10) Release 3.10	2	2010	2	2010
Risk Assessment Release 3.11	3	2010	3	2010
Developmental/Functional Testing Release 3.11	4	2010	4	2010
Service IPT/ECPs Release 3.12	4	2010	4	2010
Alpha/Beta Testing Release 3.11	4	2010	1	2011
2011 Contract Award	1	2011	1	2011

Exhibit R-4A, RDT&E Schedule Details: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603739N: *Navy Logistic Productivity*	PROJECT 2955: *JEDMICS*

	Start		End	
Event	Quarter	Year	Quarter	Year
Software Hardware Evaluation/Integration Release 3.12	1	2011	3	2011
Engineering Change Package Release 3.11	2	2011	2	2011
Milestone C11 (MS C11) Release 3.11	2	2011	2	2011
Risk Assessment Release 3.12	3	2011	3	2011
Developmental/Functional Testing Release 3.12	4	2011	4	2011
Service IPT/ECPs Release 3.13	4	2011	4	2011
Alpha/Beta Testing Release 3.12	4	2011	1	2012
2012 Contract Award	1	2012	1	2012
Software Hardware Evaluation/Integration Release 3.13	1	2012	3	2012
Engineering Change Package Release 3.12	2	2012	2	2012
Milestone C12 (MS C12) Release 3.12	2	2012	2	2012
Risk Assessment Release 3.13	3	2012	3	2012
Developmental/Functional Testing Release 3.13	4	2012	4	2012
Service IPT/ECPs Release 3.14	4	2012	4	2012
Alpha/Beta Testing Release 3.13	4	2012	1	2013
2013 Contract Award	1	2013	1	2013
Software Hardware Evaluation/Integration Release 3.14	1	2013	3	2013
Engineering Change Package Release 3.13	2	2013	2	2013
Milestone C13 (MS C13) Release 3.13	2	2013	2	2013
Risk Assessment Release 3.14	3	2013	3	2013

Exhibit R-4A, RDT&E Schedule Details: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603739N: *Navy Logistic Productivity*	PROJECT 2955: *JEDMICS*

	Start		End	
Event	Quarter	Year	Quarter	Year
Developmental/Functional Testing Release 3.14	4	2013	4	2013
Service IPT/ECPs Release 3.15	4	2013	4	2013
Alpha/Beta Testing Release 3.14	4	2013	1	2014
2014 Contract Award	1	2014	1	2014
Software Hardware Evaluation/Integration Release 3.15	1	2014	3	2014
Engineering Change Package Release 3.14	2	2014	2	2014
Milestone C14 (MS C14) Release 3.14	2	2014	2	2014
Risk Assessment Release 3.15	3	2014	3	2014
Developmental/Functional Testing Release 3.15	4	2014	4	2014
Service IPT/ECPs Release 3.16	4	2014	4	2014
Alpha/Beta Testing Release 3.15	4	2014	1	2015
2015 Contract Award	1	2015	1	2015
Software Hardware Evaluation/Integration Release 3.16	1	2015	3	2015
Engineering Change Package Release 3.15	2	2015	2	2015
Milestone C15 (MS C15) Release 3.15	2	2015	2	2015
Risk Assessment Release 3.16	3	2015	3	2015
Developmental/Functional Testing Release 3.16	4	2015	4	2015
Service IPT/ECPs Release 3.17	4	2015	4	2015
Alpha/Beta Testing Release 3.16	4	2015	4	2015

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603739N: *Navy Logistic Productivity*	PROJECT 3223: *Logistics R&D*	

COST ($ in Millions)	FY 2009 Actual	FY 2010 Estimate	FY 2011 Base Estimate	FY 2011 OCO Estimate	FY 2011 Total Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
3223: *Logistics R&D*	0.000	0.980	0.890	0.000	0.890	0.927	0.926	0.950	0.913	Continuing	Continuing
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0		

A. Mission Description and Budget Item Justification

Stable annual funding is required to facilitate implementation and execution of a robust, flexible Logistics R&D program that will provide the means for Naval Supply Systems Command (NAVSUP) to effectively pursue solutions to mission-related capability/technology gaps. The NAVSUP Logistics R&D program has an established infrastructure and business process for ensuring that R&D funds are applied to projects that address high priority enterprise needs established in accordance with OPNAV goals and the NAVSUP Commander's Guidance.

From a process perspective, Log R&D investments are governed by a NAVSUP enterprise-wide Executive Steering Group (ESG) chaired by the NAVSUP Vice Commander, and comprised of SES and Command leadership representatives. The ESG ratifies capability/technology gaps identified by all activities within the enterprise, and then assesses and prioritizes all proposed Log R&D initiatives in accordance with their potential for filling the established gap and generating return on investment.

The established Log R&D business management process has currently identified capability/technology gaps in the following general areas: 1) the need to develop technology enhancements promoting the movement of shipboard supply operations ashore, especially as it relates to optimally manned ships, 2) developing and/or modernizing shipboard equipment, material or processes for which NAVSUP exercises Technical Authority, 3) developing and modernizing Information Technology (IT) and Automatic Identification Technology (AIT) applications to enhance performance of supply chain management and logistics functions (e.g., remote diagnostics/ prognostics, in-transit visibility, unique item identification) that are not supported by Navy ERP, and 4) collaborating with acquisition program managers to reduce total ownership costs. This modest R&D investment will establish a NAVSUP Logistics R&D Program to explore additional technologies and significantly increase potential cost savings.

Examples of specific issues/projects that are under consideration for investment of Log R&D funding as a result of the FY10 NAVSUP capability gap and initiative review include: Automated inventory management system; Shipboard ozone laundering; Improved general purpose protective equipment (helmet protection and anti-vibration gloves); Non-plastic waste bags; Counterfeit parts detection methodology; Afloat automatic identification technology architecture.

This list of potential projects for addressing capability gaps will be updated and prioritized over time, under the oversight of the NAVSUP Log R&D ESG, to ensure that funds allocated provide the highest return on investment consistent with Navy/NAVSUP goals and objectives.

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603739N: *Navy Logistic Productivity*	PROJECT 3223: *Logistics R&D*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
Automated Inventory Management System	0.000	0.325	0.541	0.000	0.541
FY 2010 Plans: Automated Inventory Management System. Use of commercial warehouse management software and wireless Automatic Identification Technologies (AIT) to streamline afloat supply commodity management on large aviation platforms (CVN/LHA/LHD). Funds to provide initial year of multi-year Integrated Product & Process Development (IPPD) effort. *FY 2011 Base Plans:* Continuation of objectives identified in FY10.					
Shipboard Ozone Laundering	0.000	0.150	0.080	0.000	0.080
FY 2010 Plans: Shipboard ozone laundering. Development and test of ozone laundering for shipboard use to reduce total operating costs and reduce environmental impact (energy and chemical) usage. *FY 2011 Base Plans:* Continuation of FY10 Plans if necessary					
Improved General Purpose Protective Equipment	0.000	0.100	0.052	0.000	0.052
FY 2010 Plans: Improved General Purpose Protective Equipment. Develop a helmet for shipboard, facility & aircraft maintenance personnel that incorporates hearing protection, air supply, face protection and a means to communicate; Develop anti-vibration protective gloves for maintenance, repair and construction personnel. Follow-on projects in FY11.					

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603739N: *Navy Logistic Productivity*	PROJECT 3223: *Logistics R&D*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
FY 2011 Base Plans: Continuation of FY10 projects if necessary.					
Non-Plastic Waste Bags *FY 2010 Plans:* Non-plastic waste bags. Develop an alternative to plastic trash bags with similar performance characteristics, yet not containing plastic, in order to decrease the amount of plastic waste required to be processed aboard Navy vessels. *FY 2011 Base Plans:* Continuation of FY10 Projects if necessary.	0.000	0.155	0.083	0.000	0.083
Counterfeit Parts Detection Methodology *FY 2010 Plans:* Counterfeit parts detection methodology. Develop a methodology utilizing existing databases and tools for the detection and mitigation of counterfeit parts in the naval aircraft supply chain. Mitigating counterfeit parts will reduce maintenance and AVDLR costs, while improving safety. *FY 2011 Base Plans:* Continuation of FY10 Projects if necessary	0.000	0.125	0.067	0.000	0.067
Afloat Automatic Identification Technology Architecture *FY 2010 Plans:* Afloat Automatic Identification Technology architecture. Establish an afloat AIT architecture that parallels the ashore solution and provides better visibility and reduces shipboard manning requirements. Funds to provide initial year of multi-year Integrated Product & Process Development (IPPD) effort.	0.000	0.125	0.067	0.000	0.067

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603739N: *Navy Logistic Productivity*	PROJECT 3223: *Logistics R&D*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
FY 2011 Base Plans: Continuation of FY10 projects if necessary					
Accomplishments/Planned Programs Subtotals	0.000	0.980	0.890	0.000	0.890

C. Other Program Funding Summary ($ in Millions)

N/A

D. Acquisition Strategy

The acquisition strategy for each individual sub-project (below) has not yet been determined and will be determined during FY10.

Automated Inventory Management System: Use of commercial warehouse management software and wireless Automatic Identification Technologies (AIT) to streamline afloat supply commodity management on large aviation platforms (CVN/LHA/LHD). Funds to provide initial year of multi-year Integrated Product & Process Development (IPPD) effort.

Shipboard Ozone Laundering: Development and test of ozone laundering for shipboard use to reduce total operating costs and reduce environmental impact (energy and chemical) usage.

Improved General Purpose Protective Equipment: Develop a helmet for shipboard, facility & aircraft maintenance personnel that incorporates hearing protection, air supply, face protection and a means to communicate; Develop anti-vibration protective gloves for maintenance, repair and construction personnel.

Non-Plastic Waste Bags: Develop an alternative to plastic trash bags with similar performance characteristics, yet not containing plastic, in order to decrease the amount of plastic waste required to be processed aboard Navy vessels.

Counterfeit Parts Detection Methodology: Develop a methodology utilizing existing databases and tools for the detection and mitigation of counterfeit parts in the naval aircraft supply chain. Mitigating counterfeit parts will reduce maintenance and AVDLR costs, while improving safety.

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603739N: *Navy Logistic Productivity*	**PROJECT** 3223: *Logistics R&D*

Afloat Automatic Identification Technology Architecture: Establish an afloat AIT architecture that parallels the ashore solution and provides better visibility and reduces shipboard manning requirements. Funds to provide initial year of multi-year Integrated Product & Process Development (IPPD) effort.

E. Performance Metrics

TBD

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603739N: *Navy Logistic Productivity*	PROJECT 3225: *Ordnance PHST*	

COST ($ in Millions)	FY 2009 Actual	FY 2010 Estimate	FY 2011 Base Estimate	FY 2011 OCO Estimate	FY 2011 Total Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
3225: *Ordnance PHST*	0.000	0.395	0.378	0.000	0.378	0.379	0.000	0.000	0.000	0.000	1.152
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0		

A. Mission Description and Budget Item Justification

The Ordnance Packaging Handling Storage and Transportation (PHST) RDT&E resources focus on developing new Ordnance Handling Equipment (OHE) to replace the 25+ year old equipment presently used by the Fleet for Underway Replenishment (UNREP) operations. This OHE is a high cost and maintenance item. Development of new OHE takes advantage of new technology such as the CH-60 helicopter, which has double the lift capacity of the CH-46. OHE is used daily by the war fighter to conduct Connected Replenishment (CONREP) and Vertical Replenishment (VERTREP). A sample of these efforts includes redesigning the MK 105 sling to increase efficiency during VERTREP, condensing entire families of slings down to fewer and more efficient pieces of gear, developing a stream strongback and the associated equipment necessary to complement, not compromise, the Heavy UNREP initiative of the future, etc. The new sling designs being developed take advantage of present and future manufacturing and operational capabilities. This initiative improves availability, reliability, and maintainability while reducing overall cost. The end result will be a Fleet that has been properly equipped to conduct UNREP with more efficiency.

The PHST Center is developing a baseline of the current naval ordnance PHST logistics system. This baseline will identify inefficiencies and recommend hardware and operational enhancements in the area of modal change, thus providing an investment strategy for future Naval PHST operations by conducting an end-to-end study.

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
Ordnance PHST Development	0.000	0.395	0.378	0.000	0.378
Develop new Ordnance Handling Equipment (OHE) to replace the 25+ year old equipment presently in Fleet use to include: 1) Re-design Mk 105 Pendant Sling to optimize cost and throughput during Vertical Replenishment; 2) New concept development to replace 12x12 and 14x14 ft. Nylon Cargo Nets ; 3) Design a new STREAM Strongback to compliment the Fleet's Heavy UNREP initiative of the future; 4) Condense Mk 85, 86, 87, and 100 family of pallet slings into fewer pieces gear to optimize					

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603739N: *Navy Logistic Productivity*	PROJECT 3225: *Ordnance PHST*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
cost and efficiency during CONREP; and 5) Re-design the Mk 45 Handlift Truck. Ordnance Packaging Handling Storage and Transportation (PHST) will additionally conduct a baseline study of the current Naval PHST logistics system to identify inefficiencies and recommend hardware and operational enhancements. *FY 2010 Plans:* Develop new MK-105 Pendant Sling. Develop 8X8, 12X12, and 14X14 ordnance specific nylon cargo nets. Begin baseline work on current PHST Logistics Study, Begin redesign of MK-45 Handlift Truck. *FY 2011 Base Plans:* Design new Heavy Lift Stream Strongback. Condense MK-85 Series Pallet Slings to fewer pieces. Complete redesign of MK-45 Handlift Truck. Develop recommended list of hardware and operational enhancements from Baseline Logistics Study.					
Accomplishments/Planned Programs Subtotals	0.000	0.395	0.378	0.000	0.378

C. Other Program Funding Summary ($ in Millions)

N/A

D. Acquisition Strategy

Execution of in-house engineering, design, development and test efforts. Performance-based reviews conducted quarterly or as required by the Project Management Office.

E. Performance Metrics

1. Reduce procurement costs of current the Mk 105 sling design by 20%.
2. Conduct successful Developmental Testing (DT) of a new Mk 105 Hoisting Sling Design.
3. Reduce Mk 85 series pallet sling requirements by 25%.
4. Establish a PHST logistics baseline and identify 8 points for improvement.
5. Conduct a successful Preliminary Design Review (PDR) for a Heavy Lift STREAM Strongback.

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603739N: *Navy Logistic Productivity*	**PROJECT** 3225: *Ordnance PHST*

6. Complete Mk 45 Handlift Truck re-design / improvements to dead-man brake system and hoisting mechanism.

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603739N: *Navy Logistic Productivity*	PROJECT 9999: *Congressional Adds*	

COST ($ in Millions)	FY 2009 Actual	FY 2010 Estimate	FY 2011 Base Estimate	FY 2011 OCO Estimate	FY 2011 Total Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
9999: *Congressional Adds*	15.760	10.756	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	72.208
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0		

A. Mission Description and Budget Item Justification

Congressional Add

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010
Congressional Add: Hawaii National Guard Integrated Information Command System *FY 2010 Plans:* Provide relevant, real-time situational information to all levels of command from the Hawaii National Guard to Hawaii State Civil Defense to civilian responders in the field.	0.000	1.275
Congressional Add: NSWC Corona Item Unique Identification Center *FY 2010 Plans:* Develop NSWC Corona Item Unique Identification Center.	0.000	1.434
Congressional Add: Photonic Integration Foundry *FY 2010 Plans:* Develop enabling photonic integrated circuit technologies required for next generation Navy avionics.	0.000	2.390
Congressional Add: Real-time Tactical Intelligence Collection System	0.000	1.195

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603739N: *Navy Logistic Productivity*	PROJECT 9999: *Congressional Adds*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010
FY 2010 Plans: Improve existing language translation equipment by adding larger vocabularies and more translation capability.		
Congressional Add: UNIQUE IDENTIFICATION OF TANGIBLE ITEMS *FY 2009 Accomplishments:* Provide a means to track items from cradle to grave and provide the means to track the requirement footprint, streamline vendor payment via the Supply Chain, and provide procurement accountability.	2.991	0.000
Congressional Add: Thin Film Materials for Advanced Applications *FY 2009 Accomplishments:* Development of X-ray Lithography (XRL) / Collimated Plasma Lithography (CPL) mask materials/ technology. *FY 2010 Plans:* Continued development of X-ray Lithography (XRL) / Collimated Plasma Lithography (CPL) mask materials/technology.	2.992	1.275
Congressional Add: HIGHLY INTEGRATED OPTICAL INTERCONNECTS FOR ADV AI *FY 2009 Accomplishments:* Develop optical interconnects integrated into printed circuit boards typically used by the electronics industry.	1.596	0.797

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603739N: *Navy Logistic Productivity*	**PROJECT** 9999: *Congressional Adds*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010
FY 2010 Plans: Continue to develop optical interconnects integrated into printed circuit boards typically used by the electronics industry.		
Congressional Add: Advanced Naval Logistics *FY 2009 Accomplishments:* Implementation of commercial software for advanced forecasting and spare parts requirements determination and integration with Navy ERP. *FY 2010 Plans:* Continued implementation within Navy ERP framework and addressing additional, previously unidentified capabilities requirements. Investigation of applicability of this tool as a standard requirements determination approach for all DOD Services.	1.596	2.390
Congressional Add: RFID Tech Program *FY 2009 Accomplishments:* Maximize DLA benefits from Automatic Identification Technologies (AIT) through demonstration and assessment projects aligned with DLA distribution center operations in CONUS, OCONUS, and expeditionary locations.	0.798	0.000
Congressional Add: Zero-Standoff HERO-Compliant RFID *FY 2009 Accomplishments:* Design and development of hardware and software that allow safe testing, certification and implementation of RFID technology for asset visibility, reduced manpoower burden and better asset accountability in the supply pipeline.	1.596	0.000

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603739N: *Navy Logistic Productivity*	PROJECT 9999: *Congressional Adds*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010
Congressional Add: Field Support for Fiber Optic Cable *FY 2009 Accomplishments:* Develop a high quality, low cost field repair technology for fiber optic cables being installed in a number of the Navy's aerospace platforms. Fusion splicing technology is currently used by the commercial telecom industry to repair optical fiber quickly and permanently. This congressional add takes the existing technology and modifies it to work in the military aerospace environment to improve fiber optic logistics footprint.	1.596	0.000
Congressional Add: Integrated Product Support Data Management System *FY 2009 Accomplishments:* Implementation of material management functions with commercial off-the-shelf systems and standard DOD data systems. Providing timely access to accurate, actionable informatoin across logistics processes which enable real-time situational awareness and execution. Development of supply chain management strategies that promote the use of shared data via an information exchange that supports coordination and collaboration between DOD functions and activities. Implementation of COTS PLM technologies as part of an initiative to improve Navy Maintenance Figure of Merit (MFOM) reporting and Readiness Based Sparing data collection and analyses, and acquisition and modernization provess improvements for platforms under the cognizance of PEO Ships. Accelerate timeliness and quality of NAVSUP ERP implementation.	0.997	0.000
Congressional Add: NAVAIR Distance Support Environment *FY 2009 Accomplishments:* Identified the requirements for a single, integrated configuration managed Product Data Management (PDM) system that can easily interoperate with existing systems and be used across the Navy Enterprise (Acquisition, Fleet, Maintenance, Supply, Training) that provides an effective fleet	0.798	0.000

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603739N: *Navy Logistic Productivity*	PROJECT 9999: *Congressional Adds*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010
interaction mechanism while simultaneously providing a way to establish, maintain and communicate weapon system product information to the Fleet, the contractor community and NAVAIR.		
Congressional Add: In Transit Visibility *FY 2009 Accomplishments:* Implentation and integration of ePortation real time work flow management tools with existing systems and processes to improve and augment capabilities of the military logistician. Provide real time tracking and management of all materiel and compatability with both active and passive RFID systems, eliminating error, increasing accuracy and efficiency of cargo tracking.	0.800	0.000
Congressional Adds Subtotals	15.760	10.756

C. Other Program Funding Summary ($ in Millions)

N/A

D. Acquisition Strategy

Not required for Congressional Adds

E. Performance Metrics

Not required for Congressional Adds

Exhibit R-2, RDT&E Budget Item Justification: PB 2011 Navy										DATE: February 2010	
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*				R-1 ITEM NOMENCLATURE PE 0603755N: *Ship Self Defense - DEM/VAL*							
COST ($ in Millions)	**FY 2009 Actual**	**FY 2010 Estimate**	**FY 2011 Base Estimate**	**FY 2011 OCO Estimate**	**FY 2011 Total Estimate**	**FY 2012 Estimate**	**FY 2013 Estimate**	**FY 2014 Estimate**	**FY 2015 Estimate**	**Cost To Complete**	**Total Cost**
Total Program Element	9.784	6.931	4.385	0.000	4.385	3.476	3.528	3.607	3.679	Continuing	Continuing
2133: *QRCC*	4.639	3.548	3.439	0.000	3.439	3.476	3.528	3.607	3.679	Continuing	Continuing
2184: *Force Advanced Warfare Concept Technology*	5.145	3.383	0.946	0.000	0.946	0.000	0.000	0.000	0.000	0.000	84.041

A. Mission Description and Budget Item Justification

This program incorporates efforts dedicated to the enhancement of ship defense against Anti-Air Warfare (AAW) and other evolving threats. Its primary focus is on the development of technologies, systems, and procedures necessary to defeat the evolving Anti-Ship Cruise Missile (ASCM) threat and then it expands to allow for application of these technologies in other warfighting areas. These projects focus on ship defense improvements through the development of advanced concepts and capabilities that will enhance both defense in depth of ships in a force and self defense of individual ships in a littoral war-fighting environment.

Quick Reaction Combat Capability (QRCC) Requirements Analysis Working Group (RAWG), Project 2133, provides independent analysis for a variety of combat system AAW self-defense cost-benefits trade, ship class performance studies, and force protection strategic plan development.

Force Advanced Warfare Concept Technology (FACT), Project 2184, demonstrates concepts and capabilities that will enhance the warfighting ability of ships and aircraft and enable
the coupling of the Force into a single, distributed weapon system through more effective use of tactical data, and force sensors and weapons.

During FY09, FACT's Ocean Surveillance Initiative (OSI) continued prototyping of technologies to provide a complete, accurate, wide area, persistent surface track picture in a tactical theater of interest. The emphasis of these technologies was on the planning and detection capabilities required to simultaneously track all surface targets within view of the radar. During FY10 and FY11, the Innovation Team will begin development and prototyping of technologies to provide a Strike Group with a Geo-Referenced Common Tactical Maritime Picture (CTMP), incorporating several hundred thousand square miles of accurate, real time surface track data from aircraft such as Broad Area Maritime Surveillance
(BAMS) P-3, P-8, and MH-60R. FACT will begin to develop technologies for integration of the tactical surface picture into surface combat systems such as Aegis and Ship Self Defense System (SSDS) and technologies to disseminate the Common Tactical Maritime Picture amongst the Expeditionary Strike Group (CSG/ESG). The Innovation Team will also analyze
and assess the feasibility of wide area Anti-Submarine Warfare (ASW) sensor netting.

Exhibit R-2, RDT&E Budget Item Justification: PB 2011 Navy	DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603755N: *Ship Self Defense - DEM/VAL*

B. Program Change Summary ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
Previous President's Budget	10.966	6.960	0.000	0.000	0.000
Current President's Budget	9.784	6.931	4.385	0.000	4.385
Total Adjustments	-1.182	-0.029	4.385	0.000	4.385
• Congressional General Reductions		-0.029			
• Congressional Directed Reductions		0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds		0.000			
• Congressional Directed Transfers		0.000			
• Reprogrammings	-0.883	0.000			
• SBIR/STTR Transfer	-0.299	0.000			
• Program Adjustments	0.000	0.000	4.385	0.000	4.385

Change Summary Explanation

Technical: Not applicable.

Schedule: Not applicable.

FY11 from previous President's Budget is shown as zero because no FY11-15 data was presented in President's Budget 2010.

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603755N: *Ship Self Defense - DEM/VAL*	PROJECT 2133: *QRCC*	

COST ($ in Millions)	FY 2009 Actual	FY 2010 Estimate	FY 2011 Base Estimate	FY 2011 OCO Estimate	FY 2011 Total Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
2133: *QRCC*	4.639	3.548	3.439	0.000	3.439	3.476	3.528	3.607	3.679	Continuing	Continuing
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0		

A. Mission Description and Budget Item Justification

The Requirements and Analysis Working Group (RAWG) provides independent analysis for a variety of combat system trade-offs, ship class performance studies, and force protection strategic plan development.

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
QRCC	4.639	3.548	3.439	0.000	3.439

FY 2009 Accomplishments:

Provided independent analysis for a variety of combat system AAW self-defense cost-benefits trade, ship class performance studies, and force protection strategic plan development.

FY 2010 Plans:

The QRCC RAWG will continue to analyze Ship Self Defense as well as force level performance impacts on self-defense capabilities. QRCC will provide leadership and management of the Common ASCM Anti Ship Cruise Missile (ACSM) Threat Characterization process for PEO IWS. The RAWG will continue to analyze Ship Self Defense Probability of Raid Annihilation (PRA) capabilities and respond to the PEO and OPNAV sponsors emergent tasking and participate and attend PRA working group meetings.

FY 2011 Base Plans:

Continue to analyze Ship Self Defense as well as force level performance impacts on self-defense capabilities. QRCC will provide leadership and management of the Common ASCM Anti Ship Cruise

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603755N: *Ship Self Defense - DEM/VAL*	PROJECT 2133: *QRCC*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
Missile (ACSM) Threat Characterization process for PEO IWS. The RAWG will continue to analyze Ship Self Defense PRA capabilities and respond to the PEO and OPNAV sponsors emergent tasking and participate and attend PRA working group meetings.					
Accomplishments/Planned Programs Subtotals	4.639	3.548	3.439	0.000	3.439

C. Other Program Funding Summary ($ in Millions)

N/A

D. Acquisition Strategy

N/A

E. Performance Metrics

1) Successfully complete 90% of assigned self-defense analysis tasks in support of OPNAV N86 POM/PR budget decisions and PEO IWS program reviews.

2) Successfully respond to 90% of all emergent tasks in support of OPNAV N86 / PEO IWS self-defense analysis questions.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603755N: *Ship Self Defense - DEM/VAL*	PROJECT 2133: *QRCC*	

Product Development ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
System Engineering	WR	Dahlgren, NSWC DD WR	4.622	3.548	Feb 2010	3.439	Nov 2010	0.000		3.439	Continuing	Continuing	Continuing
		Subtotal	4.622	3.548		3.439		0.000		3.439			

Remarks

Management Services ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Defense Acquisition Workforce Development Fund	C/TBD	Various Various	0.017	0.000		0.000		0.000		0.000	0.000	0.017	Continuing
		Subtotal	0.017	0.000		0.000		0.000		0.000	0.000	0.017	

Remarks

	Total Prior Years Cost	FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	4.639	3.548		3.439		0.000		3.439			

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603755N: *Ship Self Defense - DEM/VAL*	PROJECT 2133: *QRCC*	

	Total Prior Years Cost	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total	Cost To Complete	Total Cost	Target Value of Contract

Remarks

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603755N: *Ship Self Defense - DEM/VAL*	PROJECT 2184: *Force Advanced Warfare Concept Technology*	

COST ($ in Millions)	FY 2009 Actual	FY 2010 Estimate	FY 2011 Base Estimate	FY 2011 OCO Estimate	FY 2011 Total Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
2184: *Force Advanced Warfare Concept Technology*	5.145	3.383	0.946	0.000	0.946	0.000	0.000	0.000	0.000	0.000	84.041
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0		

A. Mission Description and Budget Item Justification

The Force Advanced Warfare Concept Technology (FACT) Program is an advanced development effort designed to demonstrate Advanced Force concepts and capabilities that will significantly improve our Force defense in depth, including both local area and self defense capabilities against current and future threats. FACT improvements are designed to enhance the warfighting ability of ships and aircraft and to enable coupling of the Force into a single, distributed weapon system and towards more effective use of tactical data and the cooperative use of all the force sensors and weapons. These capabilities will provide the ship offensive flexibility needed to meet the threat brought about by increasing numbers of highly sophisticated weapons held by potentially hostile third world countries. FACT defines requirements and develops prototype systems or modifications to existing systems to test new concepts for the coordination of Force operations. FACT is a model innovation cell which consistently delivers advanced war-fighting capability that addresses current Fleet shortfalls and needs quickly and cost effectively. Some examples of prototype systems now in production are AN/SPS-48C Detection Data Converter, AN/SPS-48E Environmental Control Feature, Shipboard Gridlock System/Automatic Correlation (SGS/AC) and Dial-a-Track Quality (Link-11 Quality Selection). Other FACT developments include the Automatic Identification System and the Multi-Frequency Link-11 capability; Dual Net Multi-Frequency Link-11 Force Threat Evaluation Weapons Assignment; the prototype Area Air Defense Commander and the Joint Targeting Attack and Assessment Capability (JTAAC).

During FY09, FACT's OSI continued prototyping of technologies to provide a complete, accurate, wide area, persistent surface track picture in a tactical theater of interest. The emphasis of these technologies was on the planning and detection capabilities required to simultaneously track all surface targets within view of the radar. During FY10 and FY11, the Innovation Team will begin development and prototyping of technologies to provide a Strike Group with a Geo-Referenced CTMP, incorporating several hundred thousand square miles of accurate, real time surface track data from aircraft such as BAMS, P-3, P-8, and MH-60R. FACT will begin to develop technologies for integration of the tactical surface picture in to surface combat systems such as Aegis and SSDS and technologies to disseminate the CTMP amongst the Expeditionary Strike Group (CSG/ESG). The Innovation Team will also analyze and assess the feasibility of wide area Anti-Submarine Warfare (ASW) sensor netting.

B. Accomplishments/Planned Program ($ in Millions)

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603755N: *Ship Self Defense - DEM/VAL*	PROJECT 2184: *Force Advanced Warfare Concept Technology*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
Force Advanced Warfare Concept Technology	5.109	3.383	0.946	0.000	0.946

Conduct critical FACT initiative proof of concept experiments. Provide top level programmatic support, technical analysis and assist in the development processes, procedures and documentation that impact the execution of the FACT program requirements. On-going development of an OSI prototype which will leverage the end to end capability realized by JTAAC and have the objective goal of attaining a tactically significant probability of detection, continuous track, and correct classification of small and medium sized vessels at sea state 5. Conduct critical experiments in support of the OSI.

FY 2009 Accomplishments:

The OSI development will continue with emphasis on advanced prototyping and transition of technologies for planning and detection capabilities required to detect and track surface targets to generate a Common Tactical Surface Picture in support of Over the Horizon Targeting mission; including documenting mission requirements as well as generate associated technical specifications and standards. Provide top level support, technical analysis and assist in the development processes, procedures and documentation that impact the execution of the Ocean Surveillance.

FY 2010 Plans:

The Innovation Team will develop technologies for a proof of concept demonstration of multi-platform, multi-sensor data fusion algorithms. The Innovation Team will analyze and begin development of the concepts and technologies necessary to merge the CTMP data to create and disseminate the CTMP among the USN battlegroup in a particular theater of interest. The Innovation Team will also analyze and provide options for wide area ASW sensor netting.

FY 2011 Base Plans:

The Innovation Team will continue to develop technologies for a proof of concept demonstration of multi-platform, multi-sensor data fusion algorithms. The Innovation Team will continue to analyze and development of the concepts and technologies necessary to merge the CTMP data to create and

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603755N: *Ship Self Defense - DEM/VAL*	PROJECT 2184: *Force Advanced Warfare Concept Technology*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
disseminate the CTMP among the USN battlegroup in a particular theater of interest. The Innovation Team will continue to analyze and provide options for wide area ASW sensor netting.					
Defense Acquistion Workforce Fund (DAWF) *FY 2009 Accomplishments:* Funded DAWF	0.036	0.000	0.000	0.000	0.000
Accomplishments/Planned Programs Subtotals	5.145	3.383	0.946	0.000	0.946

C. Other Program Funding Summary ($ in Millions)

N/A

D. Acquisition Strategy

Not Applicable

E. Performance Metrics

Quarterly program reviews

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603755N: *Ship Self Defense - DEM/VAL*	PROJECT 2184: *Force Advanced Warfare Concept Technology*	

Product Development ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Primary Hardware Development	C/TBD	APL/Laurel, MD SS/CPFF	13.628	2.962	Nov 2009	0.696	Nov 2010	0.000		0.696	0.000	17.286	Continuing
		Subtotal	13.628	2.962		0.696		0.000		0.696	0.000	17.286	

Remarks

Support ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Support Costs	C/TBD	DELTA/Arlington, VA C/CPAF	5.873	0.421	Nov 2009	0.250	Nov 2010	0.000		0.250	0.000	6.544	Continuing
		Subtotal	5.873	0.421		0.250		0.000		0.250	0.000	6.544	

Remarks

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603755N: *Ship Self Defense - DEM/VAL*	PROJECT 2184: *Force Advanced Warfare Concept Technology*

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	FY 2010 Cost	FY 2010 Award Date	FY 2011 Base Cost	FY 2011 Base Award Date	FY 2011 OCO Cost	FY 2011 OCO Award Date	FY 2011 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Defense Acquisition Workforce Development Fund	C/TBD	Various Various	0.036	0.000		0.000		0.000		0.000	0.000	0.036	Continuing
		Subtotal	0.036	0.000		0.000		0.000		0.000	0.000	0.036	

Remarks

	Total Prior Years Cost	FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	19.537	3.383		0.946		0.000		0.946	0.000	23.866	

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603755N: *Ship Self Defense - DEM/VAL*	PROJECT 2184: *Force Advanced Warfare Concept Technology*

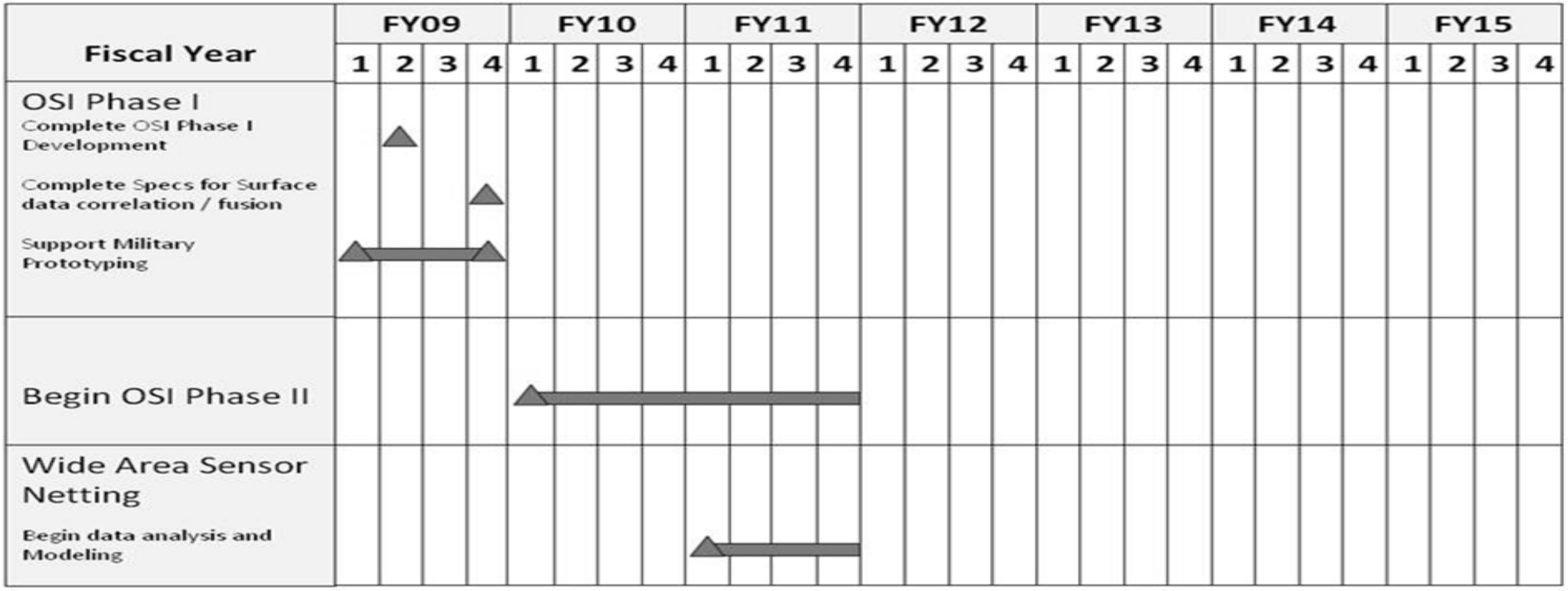

Exhibit R-4A, RDT&E Schedule Details: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603755N: *Ship Self Defense - DEM/VAL*	**PROJECT** 2184: *Force Advanced Warfare Concept Technology*

Schedule Details

	Start		End	
Event	**Quarter**	**Year**	**Quarter**	**Year**
Complete OSI Phase I Development	2	2009	2	2009
Complete specs for surface data correlation / fusion	4	2009	4	2009
Support Military Prototypes	1	2009	4	2009
Begin OSI Phase II	1	2010	4	2011
Wide Area ASW Sensor Netting - Begin analysis and modeling	1	2011	4	2011

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Exhibit R-2, RDT&E Budget Item Justification: PB 2011 Navy										DATE: February 2010	
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*				R-1 ITEM NOMENCLATURE PE 0603790N: *NATO Research and Deve*							
COST ($ in Millions)	**FY 2009 Actual**	**FY 2010 Estimate**	**FY 2011 Base Estimate**	**FY 2011 OCO Estimate**	**FY 2011 Total Estimate**	**FY 2012 Estimate**	**FY 2013 Estimate**	**FY 2014 Estimate**	**FY 2015 Estimate**	**Cost To Complete**	**Total Cost**
Total Program Element	10.767	10.152	9.196	0.000	9.196	9.962	10.271	10.504	10.723	Continuing	Continuing
2293: *NATO Cooperative R & D*	10.767	10.152	9.196	0.000	9.196	9.962	10.271	10.504	10.723	Continuing	Continuing

A. Mission Description and Budget Item Justification

In accordance with Title 10 United States Code, Section 2350a, this Program Element (PE) provides funding for research and development (R&D) programs with approved allies under international agreements. These funds can only be applied to work efforts in the U.S., and the Under Secretary of Defense, Acquisition and Technology and Logistics (USD, AT&L) must approve each international agreement. The program provides funds for multiple projects under separately approved international agreements as well as funds that support the establishment of such agreements. Each international agreement is summarized in a separate Summary Statement of Intent (SSOI) that also states why the project serves to increase the defense capabilities of the U.S. The SSOI is used to obtain Project approval by the Department of the Navy and the Office of the Secretary of Defense.

This program historically does not meet established execution benchmarks. NATO R&D cooperative programs differ from other Research, Development, Test and Evaluation (RDT&E) programs because issuance of funding from this PE coincides with the signature of international agreements. These signatures occur throughout the fiscal year and often encounter unexpected delays during the staffing and negotiation phases of agreement processing prior to signature.

B. Program Change Summary ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
Previous President's Budget	10.094	10.194	0.000	0.000	0.000
Current President's Budget	10.767	10.152	9.196	0.000	9.196
Total Adjustments	0.673	-0.042	9.196	0.000	9.196
• Congressional General Reductions		-0.042			
• Congressional Directed Reductions		0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds		0.000			
• Congressional Directed Transfers		0.000			
• Reprogrammings	0.800	0.000			
• SBIR/STTR Transfer	-0.127	0.000			
• Program Adjustments	0.000	0.000	9.196	0.000	9.196

Exhibit R-2, RDT&E Budget Item Justification: PB 2011 Navy	DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603790N: *NATO Research and Deve*

Change Summary Explanation

Technical: Not applicable.

Schedule: Not applicable.

FY11 from previous President's Budget is shown as zero because no FY11-15 data was presented in President's Budget 2010.

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603790N: *NATO Research and Deve*	PROJECT 2293: *NATO Cooperative R & D*	

COST ($ in Millions)	FY 2009 Actual	FY 2010 Estimate	FY 2011 Base Estimate	FY 2011 OCO Estimate	FY 2011 Total Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
2293: *NATO Cooperative R & D*	10.767	10.152	9.196	0.000	9.196	9.962	10.271	10.504	10.723	Continuing	Continuing
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0		

A. Mission Description and Budget Item Justification

In accordance with Title 10 U.S. Code Section 2350a, this project provides funding for research and development projects with approved allies under international agreements. These funds can only be applied to work efforts in the U.S., and the Office of Secretary of Defense must approve each international agreement. The program provides funds for multiple projects under separately approved international agreements as well as funds that support the establishment of such agreements. Each international agreement is summarized in a separate SSOI which also states why the project serves to increase the conventional defense capabilities of the U.S. The SSOI is used to obtain project approval by the Department of the Navy and the Office of the Secretary of Defense.

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
NATO Cooperative R & D	10.767	10.152	9.196	0.000	9.196
FY 2009 Accomplishments: - Continued to plan and/or support approved cooperative projects. - Continued support for the Failure Prediction of Composite and Hybrid Naval Structures (DYCOSS-3D) cooperative project between the U.S. and the Netherlands. - Continued support for Torpedo Guidance and Control; False Targets cooperative project between the U.S. and the U.K. - Completed support for Amendment One to the Advanced Radar Technology Integrated System Testbed (ARTIST) cooperative project between the U.S and the U.K. - Completed support for the Advanced Hull Materials and Structures Technology (AHM&ST) cooperative project between the U.S. and Japan. - Completed support for the Multiplexed Fiber Laser Sensors cooperative project between the U.S. and Australia.					

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603790N: *NATO Research and Deve*	PROJECT 2293: *NATO Cooperative R & D*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
- Completed support for the Open Architecture Radar Interface Standard Project (OARIS) cooperative project between the U.S. and multiple nations. - Completed support for the Medusa Joint Capability Technology Demonstration (JCTD) cooperative project between the U.S. and the Republic of Korea. - Completed support for High Frequency (HF) Radar Science and Technology cooperative project between the U.S. and Australia. - Initiated support for Advanced Non-Acoustic Sensing Technologies cooperative project between the U.S. and Sweden. - Initiated support for the Coalition Maritime Missile Defense Battle Management C4I (BMC4I PA2) Architecture Definition cooperative project between the U.S. and multiple nations. - Initiated support for Enhancing and Validating the Dynamic System Mechanics Advanced Simulation (DYSMAS) to meet Emerging Modeling and Simulation Changes cooperative project between the U.S. and Germany. - Initiated support for the Surface Combatant Aluminum Structure Design cooperative project between the U.S., Finland and Germany. - Initiated support for the Submarine Hydrodynamics Maneuvering & Control cooperative project between the U.S. and the U.K. Acquisition Workforce Fund - Funded DoD Acquisition Workforce Fund. *FY 2010 Plans:* - Continue to plan and/or support FY09 approved cooperative projects less those noted as completed above. - Complete support for Infrared Search and Track (IRST) Definition Project cooperative project between the U.S. and multiple nations. - Complete support for Torpedo Guidance and Control; False Targets cooperative project between the U.S. and the U.K.					

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603790N: *NATO Research and Deve*	PROJECT 2293: *NATO Cooperative R & D*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
- Complete support for Advanced Non-Acoustic Sensing Technologies cooperative project between the U.S. and Sweden. - Plan support for the Coalition Network for Secure Information Sharing (CoNSIS) cooperative project between the U.S. and multiple nations. - Plan support for Advanced Electromagnetic Silencing Technologies cooperative project between the U.S. and the U.K. - Plan support for the Maritime Missile Defense Modeling and Simulation Synthetic Interoperability Testing and Evaluation (Site) cooperative project between the U.S. and multiple nations. - Plan support for Submarine Communication Buoy Replacement cooperative project between the U.S. and the U.K. - Plan support for the Alternate Material Propeller cooperative project between the U.S. and Australia. - Plan support for the Coalition Distributed Engineering Plant Baseline Architecture (CDEP-BA) cooperative project between the U.S. and multiple nations. - Plan support for the Defensive Aids Suite/Next Generation Torpedo Defense cooperative project between the U.S. and the U.K. - Plan support for the Six Degrees of Freedom (6DOF) Amendment 1 cooperative project between the U.S. and Italy. - Plan support for the Submarine Sonar Telemetry cooperative project between the U.S. and the U.K. - Plan support for the Submarine Advanced Autopilot Development cooperative project between the U.S. and the U.K. - Plan support for the Ballistic Missile Defense Open Architecture Research Follow-On Cooperative Development (BMDOAR-FCD) cooperative project between the U.S. and Japan. - Plan support for the Ice Capable Surface Combatant cooperative project between the U.S. and Finland. - Plan support for Ultra Heavy-Lift Amphibious Connector (UHAC) Development and Testing cooperative project between the U.S. and the Republic of Singapore.					

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603790N: *NATO Research and Deve*	PROJECT 2293: *NATO Cooperative R & D*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
FY 2011 Base Plans: - Continue to plan and/or support FY10 approved cooperative projects less those noted as complete above. - Plan support for Advanced Fiber Optic Miniaturized Acoustic Sensors cooperative project between the U.S. and Australia. - Plan support for the Submarine Composite Secondary Structures cooperative project between the U.S. and the U.K.					
Accomplishments/Planned Programs Subtotals	10.767	10.152	9.196	0.000	9.196

C. Other Program Funding Summary ($ in Millions)

N/A

D. Acquisition Strategy

Not applicable.

E. Performance Metrics

The intent of the North Atlantic Treaty Organization (NATO) cooperative R&D program is to provide "start-up" funds for projects seeking allied contributions into cooperative research and development projects with the U.S. The primary metric used in the program is foreign contributions into projects supported by the program. The performance goal is met if total foreign contributions into projects exceed total NATO cooperative R&D program funds by over 100%.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603790N: *NATO Research and Deve*	PROJECT 2293: *NATO Cooperative R & D*

Product Development ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
NAVSEA	C/FP	Not Specified Not Specified	2.851	3.516		2.040		0.000		2.040	Continuing	Continuing	Continuing
NSWC	C/FP	Not Specified Not Specified	2.167	2.814		3.140		0.000		3.140	Continuing	Continuing	Continuing
NUWC	C/FP	Not Specified Not Specified	0.552	0.450		0.000		0.000		0.000	Continuing	Continuing	Continuing
SPAWAR	C/FP	Not Specified Not Specified	0.345	0.858		0.650		0.000		0.650	Continuing	Continuing	Continuing
NAVAIR	C/FP	Not Specified Not Specified	0.000	0.500		0.500		0.000		0.500	Continuing	Continuing	Continuing
NRL	C/FP	Not Specified Not Specified	0.300	0.200		0.400		0.000		0.400	Continuing	Continuing	Continuing
NAWC	C/FP	Not Specified Not Specified	2.000	0.500		0.000		0.000		0.000	Continuing	Continuing	Continuing
Miscellaneous	C/FP	Not Specified Not Specified	2.503	1.314		2.466		0.000		2.466	Continuing	Continuing	Continuing
		Subtotal	10.718	10.152		9.196		0.000		9.196			

Remarks

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603790N: *NATO Research and Deve*	PROJECT 2293: *NATO Cooperative R & D*

Support ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
ACQ Workforce Fund	Various/ Various	Various Various	0.049	0.000		0.000		0.000		0.000	0.000	0.049	Continuing
		Subtotal	0.049	0.000		0.000		0.000		0.000	0.000	0.049	

Remarks

	Total Prior Years Cost	FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	10.767	10.152		9.196		0.000		9.196			

Remarks

Exhibit R-2, RDT&E Budget Item Justification: PB 2011 Navy										DATE: February 2010	
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*				R-1 ITEM NOMENCLATURE PE 0603795N: *Land Attack Tech*							
COST ($ in Millions)	**FY 2009 Actual**	**FY 2010 Estimate**	**FY 2011 Base Estimate**	**FY 2011 OCO Estimate**	**FY 2011 Total Estimate**	**FY 2012 Estimate**	**FY 2013 Estimate**	**FY 2014 Estimate**	**FY 2015 Estimate**	**Cost To Complete**	**Total Cost**
Total Program Element	15.966	6.809	0.905	0.000	0.905	0.548	0.555	0.466	0.395	Continuing	Continuing
2156: *Naval Surface Fire Support*	0.377	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	434.402
2325: *Naval Fires Control System*	1.227	1.233	0.905	0.000	0.905	0.548	0.555	0.466	0.395	Continuing	Continuing
9999: *Congressional Adds*	14.362	5.576	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	136.671

A. Mission Description and Budget Item Justification

The Naval Surface Fire Support (NSFS) (Project 2156) - Mission supports the Land Attack Technology program element. To meet the United States Marine Corp (USMC) requirements for NSFS, the Navy will assess projectiles and systems capable of meeting requirements including range, lethality, accuracy, and responsiveness. The NSFS program included development of a 5" Extended Range Guided Munition (ERGM) with a coupled Global Positioning System (GPS)/Inertial Navigation System (INS) to be fired from the 5"/62 gun (a modification of the existing 5"/54 gun). ERGM was cancelled by USD(AT&L) on 25 July 2008. Cancellation created the need to conduct an Analysis of Alternatives (AoA) to determine new solution for NSFS.

The Naval Fires Control System (NFCS) (Project 2325) - Automates shipboard land attack battle management duties to be interoperable and consistent with joint C4ISR systems. This shipboard system will significantly improve the Navy's ability to support Operational Maneuver from the Sea (OMFTS).

The Affordable Weapons System (AWS) (Project 9359A) - Affordable Weapon System-Program previously funded under Project 9359C to conduct a Phase I Study for an Affordable Weapon System (AWS). Phase I included mission concept analysis, mission analysis, system architecture analysis, fly-away cost analysis with life cycle cost impacts, and system engineering for a sea-based land attack and strike mission capable precision strike weapon. The proposed system(s) will operate from ships with potential sea-based Navy/Marine Corps aircraft launch and submarine capability of defeating targets at standoff ranges, and can rapidly complete the engagement phase consistent with making the kill chain short. The potential AWS(s) will not exceed $250K in fly-away cost. Phase II was funded to exercise contract options for contractor preferred system concept(s), which will be supported by system engineering, best material approach(es), risk analysis, and future plans, while updating fly-away costs and life cycle impacts.

Exhibit R-2, RDT&E Budget Item Justification: PB 2011 Navy	DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603795N: *Land Attack Tech*

76mm Swarmbuster Capability (Project 9D60A) - (FY09/FY10) Supports efforts to integrate the MK 75 with Close-In Weapons System (CIWS) for ASuW capability against swarming boats.

Hybrid Propellant for Medium and Large Caliber Ammunition (Project 10C130) - Funding will assess potential usage of domestically produced propellants to support performance goals of the Navy.

76mm Testing and Integration (Project 9E34A) - New effort will support the testing and integration of the 76mm MK 75 Mod 2 Gun Mount being integrated with the MK 160 Fire Control System and Optical Sight System.

B. Program Change Summary ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
Previous President's Budget	17.971	1.238	0.000	0.000	0.000
Current President's Budget	15.966	6.809	0.905	0.000	0.905
Total Adjustments	-2.005	5.571	0.905	0.000	0.905
• Congressional General Reductions		-0.029			
• Congressional Directed Reductions		0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds		5.600			
• Congressional Directed Transfers		0.000			
• Reprogrammings	-1.995	0.000			
• SBIR/STTR Transfer	-0.010	0.000			
• Program Adjustments	0.000	0.000	0.905	0.000	0.905

Congressional Add Details ($ in Millions, and Includes General Reductions)	FY 2009	FY 2010
Project: 9999: *Congressional Adds*		
Congressional Add: *Hybrid Propellant for Medium and Large Caliber Ammunition*	0.000	3.983
Congressional Add: *AFFORDABLE WEAPON SYSTEM (AWS)*	11.169	0.000
Congressional Add: *76mm Swarmbuster Capability*	1.596	1.593
Congressional Add: *76MM Testing and Integration*	1.597	0.000

Exhibit R-2, RDT&E Budget Item Justification: PB 2011 Navy	DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603795N: *Land Attack Tech*

Congressional Add Details ($ in Millions, and Includes General Reductions)	FY 2009	FY 2010
Congressional Add Subtotals for Project: 9999	14.362	5.576
Congressional Add Totals for all Projects	14.362	5.576

Change Summary Explanation

Technical: Not applicable.

Schedule: Not applicable.

FY11 from previous President's Budget is shown as zero because no FY11-15 data was presented in President's Budget 2010.

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603795N: *Land Attack Tech*	PROJECT 2156: *Naval Surface Fire Support*	

COST ($ in Millions)	FY 2009 Actual	FY 2010 Estimate	FY 2011 Base Estimate	FY 2011 OCO Estimate	FY 2011 Total Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
2156: *Naval Surface Fire Support*	0.377	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	434.402
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0		

A. Mission Description and Budget Item Justification

The Naval Surface Fire Support (NSFS) program included development of a 5"/62 gun system (a modification to the existing 5"/54 gun) and a 5" Extended Range Guided Munition (ERGM) with a coupled Global Positioning System (GPS) and an Inertial Navigation System (INS).

An Acquisition Decision Memorandum (ADM) signed by USD (AT&L) on July 25, 2008 cancelled the ERGM program and authorized conducting Analysis of Alternatives (AoA) for Joint Fires.

The AoA study was completed in September 2009.

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
Accomplishments/Effort/Subtotal Cost	0.358	0.000	0.000	0.000	0.000
FY 2009 Accomplishments: Contract close-out efforts and Phase I of Analysis of Alternatives (AoA).					
DAWDF	0.019	0.000	0.000	0.000	0.000
Defense Acquisition Workforce Development Fund					
FY 2009 Accomplishments: N/A					
Accomplishments/Planned Programs Subtotals	0.377	0.000	0.000	0.000	0.000

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603795N: *Land Attack Tech*	**PROJECT** 2156: *Naval Surface Fire Support*

C. Other Program Funding Summary ($ in Millions)

N/A

D. Acquisition Strategy

The ERGM program was cancelled. AoA study was conducted to determine program strategy. AoA was completed in September 2009.

E. Performance Metrics

Not Applicable - program cancelled.

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603795N: *Land Attack Tech*	PROJECT 2325: *Naval Fires Control System*	

COST ($ in Millions)	FY 2009 Actual	FY 2010 Estimate	FY 2011 Base Estimate	FY 2011 OCO Estimate	FY 2011 Total Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
2325: *Naval Fires Control System*	1.227	1.233	0.905	0.000	0.905	0.548	0.555	0.466	0.395	Continuing	Continuing
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0		

A. Mission Description and Budget Item Justification

Naval Fires Control System (NFCS) covers the mission planning and coordination for current and future Naval Surface Fire Support system requirements. NFCS plans, coordinates and manages the firing of Naval Surface Fires Support (NSFS) weapon systems including the 5"/62 caliber gun and Conventional Munitions. The NFCS phase I is interfacing with the Advanced TOMAHAWK Weapons Control Systems (ATWCS) and the Tactical TOMAHAWK Weapons Control Systems (TTWCS) in order for NFCS to share the Advanced Tactical Display Console (ATDC) with ATWCS and TTWCS. Funding provides software and system engineering analysis and development, reuse and integration of government and commercial computer programs to support extended range munitions and other naval weapon applications.

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
DAWDF Defense Acquisition Workforce Development Fund *FY 2009 Accomplishments:* N/A	0.006	0.000	0.000	0.000	0.000
Software/System Engineering *FY 2009 Accomplishments:* Funding provided software and system engineering analysis and development. Reuse and integration of government and commercial computer programs to support extended range munitions and other naval weapon applications.	0.721	0.699	0.665	0.000	0.665

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603795N: *Land Attack Tech*	PROJECT 2325: *Naval Fires Control System*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
FY 2010 Plans: Funding will provide software and system engineering analysis and development. Reuse and integration of government and commercial computer programs to support extended range munitions and other naval weapon applications. *FY 2011 Base Plans:* Funding will provide software and system engineering analysis and development. Reuse and integration of government and commercial computer programs to support extended range munitions and other naval weapon applications.					
Technical Design Agent *FY 2009 Accomplishments:* Funding provided Technical Design Agent support, joint requirements investigation and Concept of Operations (CONOPs) scenario development. *FY 2010 Plans:* Funding will provide Technical Design Agent support, joint requirements investigation and Concept of Operations (CONOPs) scenario development. *FY 2011 Base Plans:* Funding will provide Technical Design Agent support, joint requirements investigation and Concept of Operations (CONOPs) scenario development.	0.100	0.100	0.100	0.000	0.100
C4I Systems *FY 2009 Accomplishments:* Funding provided C4I and combat system interface investigation with analysis in relation to developing C4I systems and technologies.	0.100	0.200	0.140	0.000	0.140

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603795N: *Land Attack Tech*	PROJECT 2325: *Naval Fires Control System*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
FY 2010 Plans: Funding will provide continued support for C4I and combat system interface investigation and analysis in relation to developing C4I systems and technologies. *FY 2011 Base Plans:* Funding will provide continued support for C4I and combat system interface investigation and analysis in relation to developing C4I systems and technologies.					
Logistic Support *FY 2009 Accomplishments:* Funding supported developmental test and evaluation, and logistic support element developments. *FY 2010 Plans:* Funding supports developmental test and evaluation, and logistics support elements development.	0.100	0.100	0.000	0.000	0.000
Operational Development *FY 2009 Accomplishments:* Funding supported operational test and evaluation and logistics support element developments. *FY 2010 Plans:* Funding supports operational test and evaluation, and logistics support element developments.	0.200	0.134	0.000	0.000	0.000
Accomplishments/Planned Programs Subtotals	1.227	1.233	0.905	0.000	0.905

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603795N: *Land Attack Tech*	PROJECT 2325: *Naval Fires Control System*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total	FY 2012	FY 2013	FY 2014	FY 2015	Cost To Complete	Total Cost
• 5112: *OPN*	1.690	1.387	1.086	0.000	1.086	1.109	1.118	1.137	1.158	0.000	8.685

D. Acquisition Strategy

A sole source contract was awarded to GDIS for Phase 1 software development. NSWC/DD took over this function from GDIS and will remain the software developer. The hardware developer is NUWC-KP.

E. Performance Metrics

Quarterly Program Reviews and semi-annual Product Certification Panels Reviews.

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603795N: *Land Attack Tech*	PROJECT 9999: *Congressional Adds*	

COST ($ in Millions)	FY 2009 Actual	FY 2010 Estimate	FY 2011 Base Estimate	FY 2011 OCO Estimate	FY 2011 Total Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
9999: *Congressional Adds*	14.362	5.576	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	136.671
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0		

A. Mission Description and Budget Item Justification

Project 9359A
Affordable Weapons System (AWS) - FY09 $11,169K
Program previously funded under Project 9359C to conduct a Phase I Study for an Affordable Weapon System (AWS). Phase I included mission concept analysis, mission analysis, system architecture analysis, fly-away cost analysis with life cycle cost impacts, and system engineering for a sea-based land attack and strike mission capable precision strike weapon. The proposed system(s) will operate from ships with potential sea-based Navy/Marine Corps aircraft launch and submarine capability of defeating targets at standoff ranges, and can rapidly complete the engagement phase consistent with making the kill chain short. The potential AWS(s) will not exceed $250K in fly-away cost. Phase II was funded to exercise contract options for contractor preferred system concept(s), which will be supported by system engineering, best material approach(es), risk analysis, and future plans, while updating fly-away costs and life cycle impacts.

Project 9D60A
76mm Swarmbuster Capability - FY09 $1,596K
Began efforts to integrate the MK 75 with Close-In Weapons System (CIWS) for ASuW capability against swarming boats.

76mm Swarmbuster Capability - FY10 $1,593K
Continue efforts to integrate the MK 75 with Close-In Weapons System (CIWS) for ASuW capability against swarming boats.

Project 10C130
Hybrid Propellant for Medium and Large Caliber Ammunition - FY10 $3,983K
Funding will assess potential usage of domestically produced propellants to support performance goals of the Navy.

Project 9E34A
76mm Testing and Integration - FY09 $1,597K
This new effort will support the testing and integration of the 76mm MK 75 Mod 2 Gun Mount being integrated with the MK 160 Fire Control System and Optical Sight System.

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603795N: *Land Attack Tech*	PROJECT 9999: *Congressional Adds*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010
Congressional Add: Hybrid Propellant for Medium and Large Caliber Ammunition *FY 2010 Plans:* USN qualification of Hybrid Propellant that meets Navy goals and capability requirements.	0.000	3.983
Congressional Add: AFFORDABLE WEAPON SYSTEM (AWS) *FY 2009 Accomplishments:* Program previously funded under Project 9359C to conduct a Phase I Study for an Affordable Weapon System (AWS). Phase I included mission concept analysis, mission analysis, system architecture analysis, fly-away cost analysis with life cycle cost impacts, and system engineering for a sea-based land attack and strike mission capable precision strike weapon. The proposed system(s) will operate from ships with potential sea-based Navy/Marine Corps aircraft launch and submarine capability of defeating targets at standoff ranges, and can rapidly complete the engagement phase consistent with making the kill chain short. The potential AWS(s) will not exceed $250K in fly-away cost. Phase II was funded to exercise contract options for contractor preferred system concept(s), which will be supported by system engineering, best material approach(es), risk analysis, and future plans, while updating fly-away costs and life cycle impacts.	11.169	0.000
Congressional Add: 76mm Swarmbuster Capability *FY 2009 Accomplishments:* Funding supported development and testing of system to support integration of MK 75 with CIWS. *FY 2010 Plans:* Continue supporting development and testing of system to support integration of MK 75 with CIWS.	1.596	1.593

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603795N: *Land Attack Tech*	PROJECT 9999: *Congressional Adds*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010
Congressional Add: 76MM Testing and Integration *FY 2009 Accomplishments:* Funding supported the testing and integration of the 76mm MK 75 Mod 2 Gun Mount.	1.597	0.000
Congressional Adds Subtotals	14.362	5.576

C. Other Program Funding Summary ($ in Millions)

N/A

D. Acquisition Strategy

N/A

E. Performance Metrics

Quarterly Program Reviews.

Exhibit R-2, RDT&E Budget Item Justification: PB 2011 Navy	DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603851M: *Joint Non-Lethal Weapons Testing*

COST ($ in Millions)	FY 2009 Actual	FY 2010 Estimate	FY 2011 Base Estimate	FY 2011 OCO Estimate	FY 2011 Total Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
Total Program Element	50.424	49.086	43.272	0.000	43.272	50.974	50.994	50.355	51.394	Continuing	Continuing
2319: *Non-Lethal Weapons*	46.036	46.776	43.272	0.000	43.272	50.974	50.994	50.355	51.394	Continuing	Continuing
9999: *Congressional Adds*	4.388	2.310	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	14.511

A. Mission Description and Budget Item Justification

The DoDs Joint Non-Lethal Weapons Program (JNLWP) was established by the Secretary of Defense, who assigned centralized responsibility for DoD joint research and development of non-lethal weapons and technology to the Commandant of the Marine Corps as the Executive Agent. The Under Secretary of Defense for Acquisition, Technology and Logistics (USD AT&L) provides direct oversight of the JNLWP.

The efforts described in this Program Element (PE) reflect Joint Service research and development (R&D) investment decisions provided by the Joint NLW Integrated Product Team, a multi-service flag level corporate board that executes the JNLWP for the Commandant of the Marine Corps. Research conducted is based on the needs and capabilities of the Services, the Special Operations Command, and the Coast Guard, as identified in the DoDs Non-Lethal Weapons Joint Capabilities Document. This coordinated joint R&D development approach addresses mutual capability gaps and assures the best non-lethal technologies and equipment are provided to the operating forces while eliminating duplicative Service investment.

This program funds Joint Service research, development, test and evaluation of non-lethal weapon (NLW) systems and technologies that by their design, provide a new non-lethal capability to minimize fatal or permanent injuries and undesired damage to property and the environment. Instead, these systems are designed to stun, incapacitate, or hinder

movement of individuals, crowds, or equipment. The availability of NLWs allows commanders less than lethal options, particularly in urban warfare and military operations other than war, i.e., peacekeeping, humanitarian assistance and disaster relief, as well as special operations.

The Joint Non-Lethal Weapons Directorate was established by the Commandant of the Marine Corps to manage the day to day research and development activities of the Joint Non-Lethal Weapons Program. The JNLWP funding is distributed amongst the USA, USAF, USN, USMC, SOCOM, and USCG in support of NLW research and development efforts. Each Service is responsible for their procurement and operating support costs.

Exhibit R-2, RDT&E Budget Item Justification: PB 2011 Navy	DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603851M: *Joint Non-Lethal Weapons Testing*

B. Program Change Summary ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
Previous President's Budget	49.150	46.971	0.000	0.000	0.000
Current President's Budget	50.424	49.086	43.272	0.000	43.272
Total Adjustments	1.274	2.115	43.272	0.000	43.272
• Congressional General Reductions		-0.205			
• Congressional Directed Reductions		0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds		2.320			
• Congressional Directed Transfers		0.000			
• Reprogrammings	0.001	0.000			
• SBIR/STTR Transfer	-0.722	0.000			
• Program Adjustments	0.000	0.000	43.272	0.000	43.272
• Rate/Misc Adjustments	0.000	0.000	0.000	0.000	0.000
• Congressional Recision Adjustments	-0.005	0.000	0.000	0.000	0.000
• Congressional Add Adjustments	2.000	0.000	0.000	0.000	0.000

Congressional Add Details ($ in Millions, and Includes General Reductions)	FY 2009	FY 2010
Project: 9999: *Congressional Adds*		
Congressional Add: *Non-Lethal Defense Technologies*	0.000	2.310
Congressional Add: *Boat Trap System For Port Security/Water Craft Int*	2.393	0.000
Congressional Add: *Eye Safe Laser Warning Systems*	1.995	0.000
Congressional Add Subtotals for Project: 9999	4.388	2.310
Congressional Add Totals for all Projects	4.388	2.310

Change Summary Explanation

FY11 from previous President's Budget is shown as zero because no FY11-15 data was presented in President's Budget 2010.

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603851M: *Joint Non-Lethal Weapons Testing*	PROJECT 2319: *Non-Lethal Weapons*	

COST ($ in Millions)	FY 2009 Actual	FY 2010 Estimate	FY 2011 Base Estimate	FY 2011 OCO Estimate	FY 2011 Total Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
2319: *Non-Lethal Weapons*	46.036	46.776	43.272	0.000	43.272	50.974	50.994	50.355	51.394	Continuing	Continuing
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0		

A. Mission Description and Budget Item Justification

This project develops non-lethal weapon (NLW) systems that by their design, provide a new non-lethal capability to minimize fatal or permanent injuries and undesired damage to property and the environment. Instead, these systems are designed to stun, incapacitate, or hinder movement of individuals, crowds, or equipment. The availability of NLWs allows commanders less than lethal options, particularly in urban warfare and military operations other than war, i.e., peacekeeping, humanitarian assistance and disaster relief, as well as special operations.

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
*Modeling and Simulation (M&S) of NLWs.	1.379	1.101	1.167	0.000	1.167
FY 2009 Accomplishments: Continue modeling and simulation (M&S) of NLWs in warfighter training/war gaming models and performance effects data collection/population to demonstrate/analyze NL effects and optimize training.					
FY 2010 Plans: Continue modeling and simulation (M&S) of NLWs in warfighter training/war gaming models and performance effects data collection/population to demonstrate/analyze NL effects and optimize training.					

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603851M: *Joint Non-Lethal Weapons Testing*	PROJECT 2319: *Non-Lethal Weapons*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
FY 2011 Base Plans: Continue modeling and simulation (M&S) of NLWs in warfighter training/war gaming models and performance effects data collection/population to demonstrate/analyze NL effects and optimize training.					
*Evaluations of NLWs. *FY 2009 Accomplishments:* Continue evaluation of NLWs by Service warfighting laboratories and Joint Forces Command (JFCOM) for direct user feedback of various non-lethal (NL) technologies and munitions. *FY 2010 Plans:* Continue evaluation of NLWs by Service warfighting laboratories and Joint Forces Command (JFCOM) for direct user feedback of various non-lethal (NL) technologies and munitions. *FY 2011 Base Plans:* Continue evaluation of NLWs by Service warfighting laboratories and Joint Forces Command (JFCOM) for direct user feedback of various non-lethal (NL) technologies and munitions.	1.357	1.402	1.486	0.000	1.486
*JNLW Program's execution oversight and technologies database support. *FY 2009 Accomplishments:* Continue execution oversight, administration and support of the Joint NLW Program and technologies database. *FY 2010 Plans:* Continue execution oversight, administration and support of the Joint NLW Program and technologies database.	3.393	3.563	3.777	0.000	3.777

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603851M: *Joint Non-Lethal Weapons Testing*	PROJECT 2319: *Non-Lethal Weapons*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
FY 2011 Base Plans: Continue execution oversight, administration and support of the Joint NLW Program and technologies database.					
*Pursuit of new technology for NL capabilities. *FY 2009 Accomplishments:* Continued pursuit of new technology through open competition of industry, academia and government laboratory sources for NL capabilities.	0.118	0.000	0.000	0.000	0.000
*Airburst Non-Lethal Munition *FY 2009 Accomplishments:* Continue development of the XM112 40mm extended range NL munition for the next generation combat weapon which exploits air-burst munitions with NL payloads at longer ranges with existing systems. *FY 2010 Plans:* Continue development of the XM112 40mm extended range NL munition for the next generation combat weapon which exploits air-burst munitions with NL payloads at longer ranges with existing systems.	3.000	2.600	0.000	0.000	0.000
*Program Support of the Joint NLW Program. *FY 2009 Accomplishments:* Continue program support efforts for each Service's coordination and participation in the Joint NLW Program. This includes SOCOM and USCG.	2.055	2.125	2.253	0.000	2.253

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603851M: *Joint Non-Lethal Weapons Testing*	PROJECT 2319: *Non-Lethal Weapons*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
FY 2010 Plans: Continue program support efforts for each Service's coordination and participation in the Joint NLW Program. This includes SOCOM and USCG. *FY 2011 Base Plans:* Continue program support efforts for each Service's coordination and participation in the Joint NLW Program. This includes SOCOM and USCG.					
*Active Denial Technology (ADT) Transition. *FY 2009 Accomplishments:* Continue maturation of active denial technologies in preparation for transition to joint acquisition programs of record. Changes between FY10 and FY11 capture solid state ADT transitions from Advanced Technology Development to higher levels of research and development. *FY 2010 Plans:* Continue maturation of active denial technologies in preparation for transition to joint acquisition programs of record. Changes between FY10 and FY11 capture solid state ADT transitions from Advanced Technology Development to higher levels of research and development. *FY 2011 Base Plans:* Continue maturation of active denial technologies in preparation for transition to joint acquisition programs of record. Changes between FY10 and FY11 capture solid state ADT transitions from Advanced Technology Development to higher levels of research and development.	4.429	1.000	1.950	0.000	1.950
*Distributed Sound and Light Array (DSLA). *FY 2009 Accomplishments:* Continue multi-sensory counter-personnel research on non-lethal acoustical/optical weapons for use as a hail and warning device.	0.500	0.270	0.000	0.000	0.000

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
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B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
FY 2010 Plans: Continue multi-sensory counter-personnel research on non-lethal acoustical/optical weapons for use as a hail and warning device.					
*Studies and Analysis *FY 2009 Accomplishments:* Continue medical and NL casualty data research and collection; human effects assessments; acceptability analysis; and technical studies/analysis of emerging technologies for possible NL application. *FY 2010 Plans:* Continue medical and NL casualty data research and collection; human effects assessments; acceptability analysis; and technical studies/analysis of emerging technologies for possible NL application. *FY 2011 Base Plans:* Continue medical and NL casualty data research and collection; human effects assessments; acceptability analysis; and technical studies/analysis of emerging technologies for possible NL application.	6.031	6.031	5.232	0.000	5.232
*JNLW Emerging Technologies *FY 2009 Accomplishments:* Continue the advanced development of emerging technologies into the acquisition process to satisfy critical joint mission tasks. Increases to this line item represent maturing technology transitions from advanced technology development efforts.	11.086	16.780	15.216	0.000	15.216

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
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B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
FY 2010 Plans: Continue the advanced development of emerging technologies into the acquisition process to satisfy critical joint mission tasks. Increases to this line item represent maturing technology transitions from advanced technology development efforts. *FY 2011 Base Plans:* Continue the advanced development of emerging technologies into the acquisition process to satisfy critical joint mission tasks. Increases to this line item represent maturing technology transitions from advanced technology development efforts.					
*System development and Design of technology development. *FY 2009 Accomplishments:* Continue system development and design of technology development downselected items to proceed into the acquisition cycle to provide NL technology solutions to critical joint mission tasks. *FY 2010 Plans:* Continue system development and design of technology development downselected items to proceed into the acquisition cycle to provide NL technology solutions to critical joint mission tasks. *FY 2011 Base Plans:* Continue system development and design of technology development downselected items to proceed into the acquisition cycle to provide NL technology solutions to critical joint mission tasks.	7.062	7.390	6.672	0.000	6.672
*Develop/expand the NATO Measures of Effectives (MOE) efforts. *FY 2009 Accomplishments:* Continue to develop/expand the NATO Measures of Effectives (MOE) efforts, chaired by the U.S. to provide input for Defense Capabilities Initiative (DCI) and NATO assessment of NLW in the Defense	1.026	1.854	1.873	0.000	1.873

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603851M: *Joint Non-Lethal Weapons Testing*	PROJECT 2319: *Non-Lethal Weapons*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
planning process. Expanded interaction with component commander (COCOM) staffs to identify emerging NLW capabilities and their utility in theater operations and Homeland Security missions. *FY 2010 Plans:* Continue to develop/expand the NATO Measures of Effectives (MOE) efforts, chaired by the U.S. to provide input for Defense Capabilities Initiative (DCI) and NATO assessment of NLW in the Defense planning process. Expanded interaction with component commander (COCOM) staffs to identify emerging NLW capabilities and their utility in theater operations and Homeland Security missions. *FY 2011 Base Plans:* Continue to develop/expand the NATO Measures of Effectives (MOE) efforts, chaired by the U.S. to provide input for Defense Capabilities Initiative (DCI) and NATO assessment of NLW in the Defense planning process. Expanded interaction with component commander (COCOM) staffs to identify emerging NLW capabilities and their utility in theater operations and Homeland Security missions.					
*Mission Payload Module Non Lethal Weapon System (formerly TUGV) *FY 2009 Accomplishments:* Continue development of a tube launched NL munition for integration on HMMWVs, tactical vehicles, boats and ships, with a range of 30-150 meters (T) and 10 - 500 meters (O). Mission Payload Module (MPM) will provide an improved Non-Lethal (NL) capability applicable to controlling crowds, denying/ defending areas, controlling access and engaging threats while providing increased standoff for protection of friendly forces. The weapons platform will provide greater range, area coverage, duration of effects, selectability, and scalability for these non-lethal effects than current NLW systems. *FY 2010 Plans:* Continue development of a tube launched NL munition for integration on HMMWVs, tactical vehicles, boats and ships, with a range of 30-150 meters (T) and 10 - 500 meters (O). Mission Payload Module (MPM) will provide an improved Non-Lethal (NL) capability applicable to controlling crowds, denying/	3.800	2.060	3.046	0.000	3.046

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603851M: *Joint Non-Lethal Weapons Testing*	PROJECT 2319: *Non-Lethal Weapons*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
defending areas, controlling access and engaging threats while providing increased standoff for protection of friendly forces. The weapons platform will provide greater range, area coverage, duration of effects, selectability, and scalability for these non-lethal effects than current NLW systems. *FY 2011 Base Plans:* Continue development of a tube launched NL munition for integration on HMMWVs, tactical vehicles, boats and ships, with a range of 30-150 meters (T) and 10 - 500 meters (O). Mission Payload Module (MPM) will provide an improved Non-Lethal (NL) capability applicable to controlling crowds, denying/ defending areas, controlling access and engaging threats while providing increased standoff for protection of friendly forces. The weapons platform will provide greater range, area coverage, duration of effects, selectability, and scalability for these non-lethal effects than current NLW systems.					
*Joint Integration Program (JIP). *FY 2009 Accomplishments:* Continue to select and test newly developed commercial products that may meet the Joint Services' requirements for specific NL capability set common items. *FY 2010 Plans:* Continue to select and test newly developed commercial products that may meet the Joint Services' requirements for specific NL capability set common items. *FY 2011 Base Plans:* Continue to select and test newly developed commercial products that may meet the Joint Services' requirements for specific NL capability set common items.	0.800	0.600	0.600	0.000	0.600
Accomplishments/Planned Programs Subtotals	46.036	46.776	43.272	0.000	43.272

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603851M: *Joint Non-Lethal Weapons Testing*	**PROJECT** 2319: *Non-Lethal Weapons*

C. Other Program Funding Summary ($ in Millions)

N/A

D. Acquisition Strategy

The JNLW Program strategy is to continue to pursue the fielding of NLW systems through modifying Commercial-Off-The-Shelf (COTS) products for near term capabilities and the development of new technology NLW systems in various stages of acquisition. These are balanced with efforts in modeling and simulation, experimentation, and state-of-the-art
technology investment. The acquisition strategy for each weapon system is largely Lead Service dependent. The JNLWP provides RDT&E funding while the Services are responsible for procurement and operations and maintenance funding. For complex development programs, such as directed energy research, JNLWP RDT&E funds will augment Service RDT&E
funding in support of joint applications.

E. Performance Metrics

Milestone Reviews

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603851M: *Joint Non-Lethal Weapons Testing*	PROJECT 2319: *Non-Lethal Weapons*

Product Development ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
NLW Product Development	MIPR	ARDEC Picatinny, NJ	30.488	5.200		5.500		0.000		5.500	0.000	41.188	Continuing
NLW Product Development	MIPR	SOCOM McDill AFB, FL	10.641	1.580		1.956		0.000		1.956	0.000	14.177	Continuing
NLW Product Development	WR	NSWC Various	13.813	2.500		2.842		0.000		2.842	0.000	19.155	Continuing
NLW Product Development	MIPR	USAF Eglin AFB, FL	13.615	1.849		1.500		0.000		1.500	0.000	16.964	Continuing
NLW Product Development	MIPR	USAF Kirtland AFB, NM	20.061	1.000		1.000		0.000		1.000	0.000	22.061	Continuing
NLW Product Development	MIPR	USAF Brooks AFB, TX	32.084	6.500		5.539		0.000		5.539	0.000	44.123	Continuing
NLW Product Development	MIPR	JWCF Fort Monroe, VA	12.157	0.000		0.000		0.000		0.000	0.000	12.157	Continuing
NLW Product Development	Various/ Various	MCSC Quantico, VA	15.787	0.350		0.350		0.000		0.350	0.000	16.487	Continuing
NLW Product Development	MIPR	NSMA Arlington, VA	21.277	2.000		1.000		0.000		1.000	0.000	24.277	Continuing
NLW Product Development	C/CPFF	MCLB Albany, GA	8.316	0.000		0.000		0.000		0.000	0.000	8.316	Continuing
NLW Product Development	MIPR	M&S Various	14.642	1.101		1.167		0.000		1.167	0.000	16.910	Continuing
NLW Product Development	Various/ Various	JIP Various	11.212	0.700		0.600		0.000		0.600	0.000	12.512	Continuing
			63.541	21.217		19.020		0.000		19.020	0.000	103.778	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603851M: *Joint Non-Lethal Weapons Testing*	PROJECT 2319: *Non-Lethal Weapons*	

Product Development ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
NLW Product Development	Various/ Various	Uniformed Services Various											
		Subtotal	267.634	43.997		40.474		0.000		40.474	0.000	352.105	

Remarks

Joint Program funds are distributed amongst the USA, USAF, USN, USMC, SOCOM, and USCG in support of NLW research and development efforts.

Support ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
NLW Support Cost	WR	MCSC Quantico, VA	10.216	0.318		0.337		0.000		0.337	0.000	10.871	Continuing
NLW Support Cost	WR	NSWC Dahlgren, VA	10.376	1.311		1.311		0.000		1.311	0.000	12.998	Continuing
NLW Support Cost	Various/ Various	Various Various	29.126	0.650		0.650		0.000		0.650	0.000	30.426	Continuing
		Subtotal	49.718	2.279		2.298		0.000		2.298	0.000	54.295	

Remarks

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603851M: *Joint Non-Lethal Weapons Testing*	PROJECT 2319: *Non-Lethal Weapons*

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	FY 2010 Cost	FY 2010 Award Date	FY 2011 Base Cost	FY 2011 Base Award Date	FY 2011 OCO Cost	FY 2011 OCO Award Date	FY 2011 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
MPM T&E Cost	Various/ Various	Various Various	2.553	0.500		0.500		0.000		0.500	0.000	3.553	Continuing
		Subtotal	2.553	0.500		0.500		0.000		0.500	0.000	3.553	

Remarks

	Total Prior Years Cost	FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	319.905	46.776		43.272		0.000		43.272	0.000	409.953	

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603851M: *Joint Non-Lethal Weapons Testing*	PROJECT 2319: *Non-Lethal Weapons*	

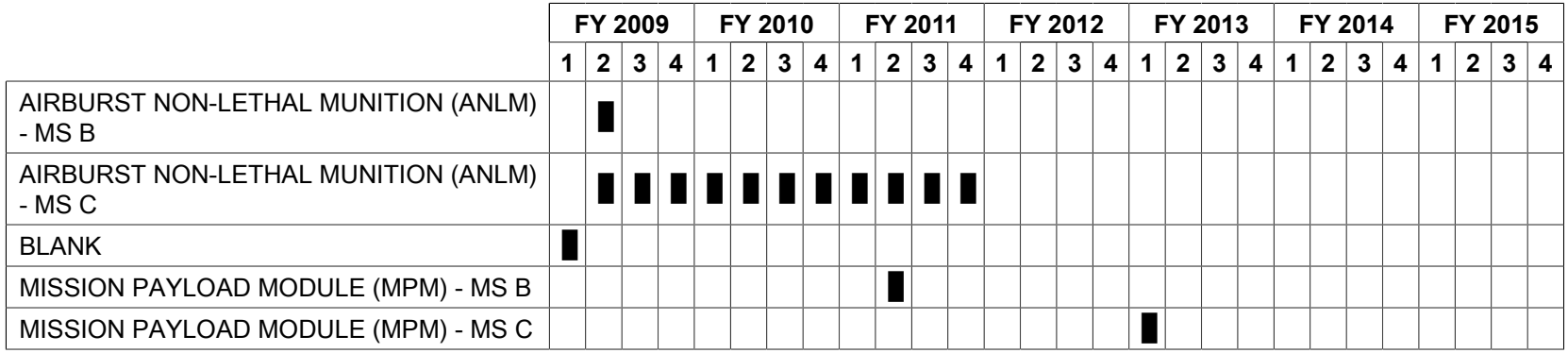

Exhibit R-4A, RDT&E Schedule Details: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603851M: *Joint Non-Lethal Weapons Testing*	**PROJECT** 2319: *Non-Lethal Weapons*

Schedule Details

	Start		End	
Event	**Quarter**	**Year**	**Quarter**	**Year**
AIRBURST NON-LETHAL MUNITION (ANLM) - MS B	2	2009	2	2009
AIRBURST NON-LETHAL MUNITION (ANLM) - MS C	2	2009	4	2011
BLANK	1	2009	1	2009
MISSION PAYLOAD MODULE (MPM) - MS B	2	2011	2	2011
MISSION PAYLOAD MODULE (MPM) - MS C	1	2013	1	2013

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603851M: *Joint Non-Lethal Weapons Testing*	PROJECT 9999: *Congressional Adds*	

COST ($ in Millions)	FY 2009 Actual	FY 2010 Estimate	FY 2011 Base Estimate	FY 2011 OCO Estimate	FY 2011 Total Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
9999: *Congressional Adds*	4.388	2.310	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	14.511
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0		

A. Mission Description and Budget Item Justification

This project develops non-lethal weapon (NLW) systems that by their design, provide a new non-lethal capability to minimize fatal or permanent injuries and undesired damage to property and the environment. As identified in the Non-Lethal Effects Joint Capabilities Document, the ability to non-lethally stop vehicles is the top capability gap as identified by the Services.

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010
Congressional Add: Non-Lethal Defense Technologies *FY 2010 Plans:* C10C131 - This Congressional plus-up is intended to assist in the cross-comparison of technology, human effects and long term programmatics of several new initiatives and the independent technical assessment of Joint Non-Lethal Weapons.	0.000	2.310
Congressional Add: Boat Trap System For Port Security/Water Craft Int *FY 2009 Accomplishments:* C9878A - This Congressional plus-up was intended to advance technology to broaden the boat trap system effectiveness against several threat water-crafts.	2.393	0.000
Congressional Add: Eye Safe Laser Warning Systems	1.995	0.000

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603851M: *Joint Non-Lethal Weapons Testing*	**PROJECT** 9999: *Congressional Adds*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010
FY 2009 Accomplishments: C9D09A - This Congressional plus-up was intended to advance technology to further develop eye safe laser warning systems. The Service requirement for this item is based on the need to develop eye safe systems to prevent warfighter mishaps in accordance with the laser safety review board guidance.		
Congressional Adds Subtotals	4.388	2.310

C. Other Program Funding Summary ($ in Millions)

N/A

D. Acquisition Strategy

The JNLW Program strategy is to continue to pursue the fielding of NLW systems through modifying Commercial-Off-The-Shelf (COTS) products for near term capabilities and the development of new technology NLW systems in various stages of acquisition. These are balanced with efforts in modeling and simulation, experimentation, and state-of-the-art
technology investment. The acquisition strategy for each weapon system is largely Lead Service dependent. The JNLWP provides RDT&E funding while the Services are responsible for procurement and operations and maintenance funding. For complex development programs, such as directed energy research, JNLWP RDT&E funds will augment Service RDT&E
funding in support of joint applications.

E. Performance Metrics

N/A

Exhibit R-2, RDT&E Budget Item Justification: PB 2011 Navy	DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603860N: *JT Precision Approach & Ldg Sys*

COST ($ in Millions)	FY 2009 Actual	FY 2010 Estimate	FY 2011 Base Estimate	FY 2011 OCO Estimate	FY 2011 Total Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
Total Program Element	74.060	149.680	159.151	0.000	159.151	123.959	114.109	61.210	0.000	0.000	887.471
2329: *JPALS*	74.060	138.726	121.165	0.000	121.165	74.713	79.686	39.211	0.000	0.000	732.863
3228: *JPALS 1B*	0.000	10.954	37.986	0.000	37.986	49.246	34.423	21.999	0.000	0.000	154.608

A. Mission Description and Budget Item Justification

This program element provides for the development, integration, and testing of the Joint Precision Approach and Landing System (JPALS), which will be applicable to Department of Defense (DoD) Ground systems, DoD aircraft, and Navy and Coast Guard air capable surface ships. JPALS will provide a rapidly deployable, adverse weather, adverse terrain, day-night precision approach and landing capability. Operating environments include fixed or permanent ground facilities, tactical facilities, and shipboard. JPALS will be interoperable with civil landing systems. The JPALS program was established in response to the Joint Mission Need Statement (MNS) for Precision Approach and Landing Capability (PALC), which was approved by the Chief of Naval Operations on 28 July 1994 and the Chief of Staff of the Air Force on 8 August 1994. The PALC MNS was validated by the Joint Requirements Oversight Council (JROC) on 29 August 1995. Army Joint Service participation was included in the 28 May 1996 Principal Deputy Under Secretary of Defense (Acquisition and Technology) Milestone 0 Acquisition Decision Memorandum (ADM), which also designated the Air Force as the Lead Service. In March 2004, the JPALS Overarching Integrated Program Team (OIPT) determined that the MNS should be converted to an Initial Capabilities Document (ICD). The JPALS ICD was approved by the JROC on 19 September 2005. On 21 July 2007 JROCM approved the JPALS Capability Development Document (CDD) and designated the Navy as the Lead Service. The Analysis of Alternatives (AoA) was finalized in 3Q FY2007.

Exhibit R-2, RDT&E Budget Item Justification: PB 2011 Navy	DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603860N: *JT Precision Approach & Ldg Sys*

B. Program Change Summary ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
Previous President's Budget	76.822	150.304	0.000	0.000	0.000
Current President's Budget	74.060	149.680	159.151	0.000	159.151
Total Adjustments	-2.762	-0.624	159.151	0.000	159.151
• Congressional General Reductions		-0.624			
• Congressional Directed Reductions		0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds		0.000			
• Congressional Directed Transfers		0.000			
• Reprogrammings	0.000	0.000			
• SBIR/STTR Transfer	-1.809	0.000			
• Program Adjustments	0.000	0.000	159.151	0.000	159.151
• Rate/Misc Adjustments	-0.953	0.000	0.000	0.000	0.000

Change Summary Explanation

Technical: Not applicable.
Schedule: Not applicable.

FY11 from previous President's Budget is shown as zero because no FY11-15 data was presented in President's Budget 2010.

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603860N: *JT Precision Approach & Ldg Sys*	PROJECT 2329: *JPALS*	

COST ($ in Millions)	FY 2009 Actual	FY 2010 Estimate	FY 2011 Base Estimate	FY 2011 OCO Estimate	FY 2011 Total Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
2329: *JPALS*	74.060	138.726	121.165	0.000	121.165	74.713	79.686	39.211	0.000	0.000	732.863
Quantity of RDT&E Articles	0	1	1	0	1	0	0	0	0		

A. Mission Description and Budget Item Justification

JPALS Increment 1A provides for development, integration, installation, and test of Sea-Based JPALS to meet IOC of CVN. This effort includes the build and test of Ship Global Positioning System/Inertial Navigation System (GPS/INS) based precision approach and landing systems to replace obsolete SPN-46 and SPN-35 Systems. Additionally, this requirement supports the JPALS Integration on Amphibious and DDG class ships (TACAN Replacement) and provides critical enabling technology for Joint Strike Fighter and Navy Unmanned Combat Air System (UCAS).

One JPALS Land and one JPALS Ship based Engineering Development Model (EDM) test article will be delivered in FY 2010 to support system development and demonstration. User listed below:

FY10 - 1 unit for CTR Ship Integration Lab (SIL)

FY11 - 1 unit for Govt Landing Systems Test Facility (LSTF)

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
JPALS EMD Increment 1A - Shipboard	69.990	133.893	117.996	0.000	117.996
JPALS Increment 1A provides for development, integration, installation, and test of Sea-Based JPALS to meet IOC of CVN. This effort includes the build and test of Ship Global Positioning System/Inertial Navigation System (GPS/INS) based precision approach and landing systems to replace obsolete SPN-46 and SPN-35 Systems. Additionally, this requirement supports the JPALS Integration on Amphibious and DDG class ships (TACAN Replacement) and provides critical enabling technology for Joint Strike Fighter and Navy Unmanned Combat Air System (UCAS).					

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603860N: *JT Precision Approach & Ldg Sys*	**PROJECT** 2329: *JPALS*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
FY 2009 Accomplishments: First full year of EMD, completed SFR. *FY 2010 Plans:* Complete PDR and first EDM delivery. *FY 2011 Base Plans:* Complete CDR, begin JSF flight and CV certification, begin IT 1-3 test events and AIG delivery.					
JPALS EMD Increment 1A - Aircraft Integration Guide (AIG) Air Integration Guide is principle deliverable of the JPALS SDD contract. This guide will serve as the integration document for air platforms. *FY 2009 Accomplishments:* Developed initial iteration of the AIG. *FY 2010 Plans:* Continue development of the AIG. *FY 2011 Base Plans:* Begin Initial A/C integrations.	4.070	4.833	3.169	0.000	3.169
Accomplishments/Planned Programs Subtotals	74.060	138.726	121.165	0.000	121.165

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603860N: *JT Precision Approach & Ldg Sys*	**PROJECT** 2329: *JPALS*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total	FY 2012	FY 2013	FY 2014	FY 2015	Cost To Complete	Total Cost
• OPN/2867: *JPALS*	0.000	0.000	0.000	0.000	0.000	0.000	0.000	15.723	72.865	90.153	178.741

D. Acquisition Strategy

Technology Development (TD) phase was conducted jointly by NAVAIRSYSCOM (PMA213), USAF Electronic Systems Command (Global Air) and multiple industry partners. This effort provided the concept of operations, performance specifications and technology readiness levels necessary to provide the foundation from which to launch the Increment 1 SDD phase development. In March 2007, overall joint program leadership transferred from the USAF to the USN. The JPALS 1A phase reached MS B on 27 June 2008 and the SDD phase development contract was awarded on 17 July 2008 and tasking consists of seabased JPALS, related ship and airborne reference systems, end-to-end software algorithms, necessary ship installation hardware, test equipment, system simulation software, and other RDT&E deliverable products to the joint team. The SDD contact was decided after full and open competition. Future procurement of airborne systems will consist of modifications to Original Equipment Manufacture (OEM) aircraft integration and to existing avionics. Seabased JPALS will be developed by the Navy with government owned or non-proprietary algorithms to an open system architecture in order to facilitate the compatible integration of many different aircraft and avionics architectures. As Lead Service, the Navy will manage the Joint Program to develop all JPALS increments. An updated JPALS Acquisition Strategy separates Increment 1 into two Increments (Inc 1A & Inc 1B). JPALS Increment 1A provides for development, integration, installation, and test of Sea-Based JPALS to meet IOC of CVN. Additionally, this requirement supports the JPALS Integration on Amphibious ships and DDG class ships and provides critical enabling technology for Joint Strike Fighter and Navy UCAS. JPALS Increment 1B provides for integration and testing into the avionics of F/A -18E/F, EA-18G, and MH-60R. This is the first phase of the carrier airwing (CVW) integration to JPALS. This second phase of aircraft integration provides JPALS capable aircraft for CVN-79 work-ups and deployment.

E. Performance Metrics

MS B conducted 27 June 2008 and approval granted for program progression to EMD phase. PDR conducted first quarter FY 2010. CDR planned for first quarter FY2011.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603860N: *JT Precision Approach & Ldg Sys*	PROJECT 2329: *JPALS*

Product Development ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Primary Hardware Development	C/CPIF	Raytheon Fullerton CA	77.004	78.304	Jan 2010	63.556	Jan 2011	0.000		63.556	58.816	277.680	278.694
Aircraft Integration-Non Specific	Various/ FFP	Var Var	0.644	0.479	Dec 2009	0.308	Jan 2011	0.000		0.308	0.721	2.152	Continuing
Aircraft Integration-F/ A-18 E/F/G	SS/CPAF	Boeing Herndon VA	1.953	2.323	Dec 2009	0.123	Jan 2011	0.000		0.123	4.713	9.112	9.112
Aircraft integration-MH-60 R/S	SS/CPAF	Lockheed Martin Manassas VA	1.869	1.549	Dec 2009	0.103	Jan 2011	0.000		0.103	3.508	7.029	7.029
Aircraft Integration-F22 JSF	SS/CPAF	Lockheed Martin Manassas VA	0.000	0.000		0.093	Jan 2011	0.000		0.093	0.900	0.993	0.993
Aircraft Integration-MH60 R/S	SS/CPAF	Sikorsky CT	0.000	0.000		0.062	Jan 2011	0.000		0.062	1.713	1.775	1.775
Aircraft Integration-E2D	SS/CPAF	Northrup Grumann Not Specified	0.000	0.000		0.093	Jan 2011	0.000		0.093	0.900	0.993	0.993
Aircraft Integration-Systems Engineering	WR	NAWCAD Pax River, MD	1.775	15.831	Dec 2009	0.977	Dec 2010	0.000		0.977	6.116	24.699	Continuing
Ship integration	WR	NAWCAD Pax River, MD	12.448	5.471	Dec 2009	7.129	Dec 2010	0.000		7.129	12.321	37.369	Continuing
Award Fee	C/CPAF	Var Var	4.572	4.584	Aug 2010	3.112	Aug 2011	0.000		3.112	5.881	18.149	18.149
Primary hardware Development-TD	Various/ Various	Var Var	105.504	0.000		0.000		0.000		0.000	0.000	105.504	Continuing
		Subtotal	205.769	108.541		75.556		0.000		75.556	95.589	485.455	316.745

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603860N: *JT Precision Approach & Ldg Sys*	PROJECT 2329: *JPALS*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	FY 2010 Cost	FY 2010 Award Date	FY 2011 Base Cost	FY 2011 Base Award Date	FY 2011 OCO Cost	FY 2011 OCO Award Date	FY 2011 Total Cost	Cost To Complete	Total Cost	Target Value of Contract

Remarks

Remarks: Conducts non-recurring engineering efforts under the EMD contract including requirements identification. Conducts System Requirements Review, System Function Review, Preliminary Design Review and Integrated Baseline Review under the EMD contract. Begins airwing integration to support CVN-21 efforts. Target Value listed for EMD contract is based on latest Program Office Estimate. No award fees have been awarded to date.

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	FY 2010 Cost	FY 2010 Award Date	FY 2011 Base Cost	FY 2011 Base Award Date	FY 2011 OCO Cost	FY 2011 OCO Award Date	FY 2011 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Development Support	Various/ Various	Var Var	21.514	0.000		0.000		0.000		0.000	0.000	21.514	Continuing
Systems Engineering Support-SDD	Various/ Various	Var Var	7.726	7.881	Dec 2009	15.846	Dec 2010	0.000		15.846	27.119	58.572	Continuing
Integrated Logistics Support	WR	NAWCAD Pax River, MD	5.954	1.478	Dec 2009	3.659	Dec 2010	0.000		3.659	9.417	20.508	Continuing
		Subtotal	35.194	9.359		19.505		0.000		19.505	36.536	100.594	

Remarks

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603860N: *JT Precision Approach & Ldg Sys*	PROJECT 2329: *JPALS*

Test and Evaluation ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation	WR	NAWCAD Pax River, MD	9.372	9.451	Dec 2009	10.331	Dec 2010	0.000		10.331	32.919	62.073	Continuing
Operational Test & Evaluation	WR	COMOPTEVFOR Norfolk VA	0.939	0.381	Dec 2009	0.389	Dec 2010	0.000		0.389	10.182	11.891	Continuing
		Subtotal	10.311	9.832		10.720		0.000		10.720	43.101	73.964	

Remarks

Remarks: DT focuses on EMD phase test documentation planning and test range coordination. Develops DT test cases. Monitoring of EMD contractor system integration build up. Operational test activities include test and evaluation master plan requirements into test cases.

Management Services ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Government Engineering Support	WR	NAWCAD Pax River, MD	24.346	8.106	Dec 2009	12.362	Dec 2010	0.000		12.362	10.316	55.130	Continuing
Program Management Support-Cost	WR	NAWCAD Pax River, MD	7.007	1.000	Dec 2009	1.100	Dec 2010	0.000		1.100	3.400	12.507	Continuing
PM Support-MSS	C/CPFF	Amelex California, MD	4.651	1.372	Dec 2009	1.402	Dec 2010	0.000		1.402	4.206	11.631	11.631
Travel	WR	NAVAIR Pax River, MD	1.402	0.516	Dec 2009	0.520	Dec 2010	0.000		0.520	1.560	3.998	Continuing
		Subtotal	37.406	10.994		15.384		0.000		15.384	19.482	83.266	11.631

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603860N: *JT Precision Approach & Ldg Sys*	PROJECT 2329: *JPALS*

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	FY 2010 Cost	FY 2010 Award Date	FY 2011 Base Cost	FY 2011 Base Award Date	FY 2011 OCO Cost	FY 2011 OCO Award Date	FY 2011 Total Cost	Cost To Complete	Total Cost	Target Value of Contract

Remarks

Remarks: Tasking includes execution of EMD contract activities, coordination of Prime Mission Product and support contractor activities, coordination with other USN aircraft and ship program offices, development of ship installation drawings, and non-recurring engineering support.

	Total Prior Years Cost	FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	288.680	138.726		121.165		0.000		121.165	194.708	743.279	328.376

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603860N: *JT Precision Approach & Ldg Sys*	**PROJECT** 2329: *JPALS*

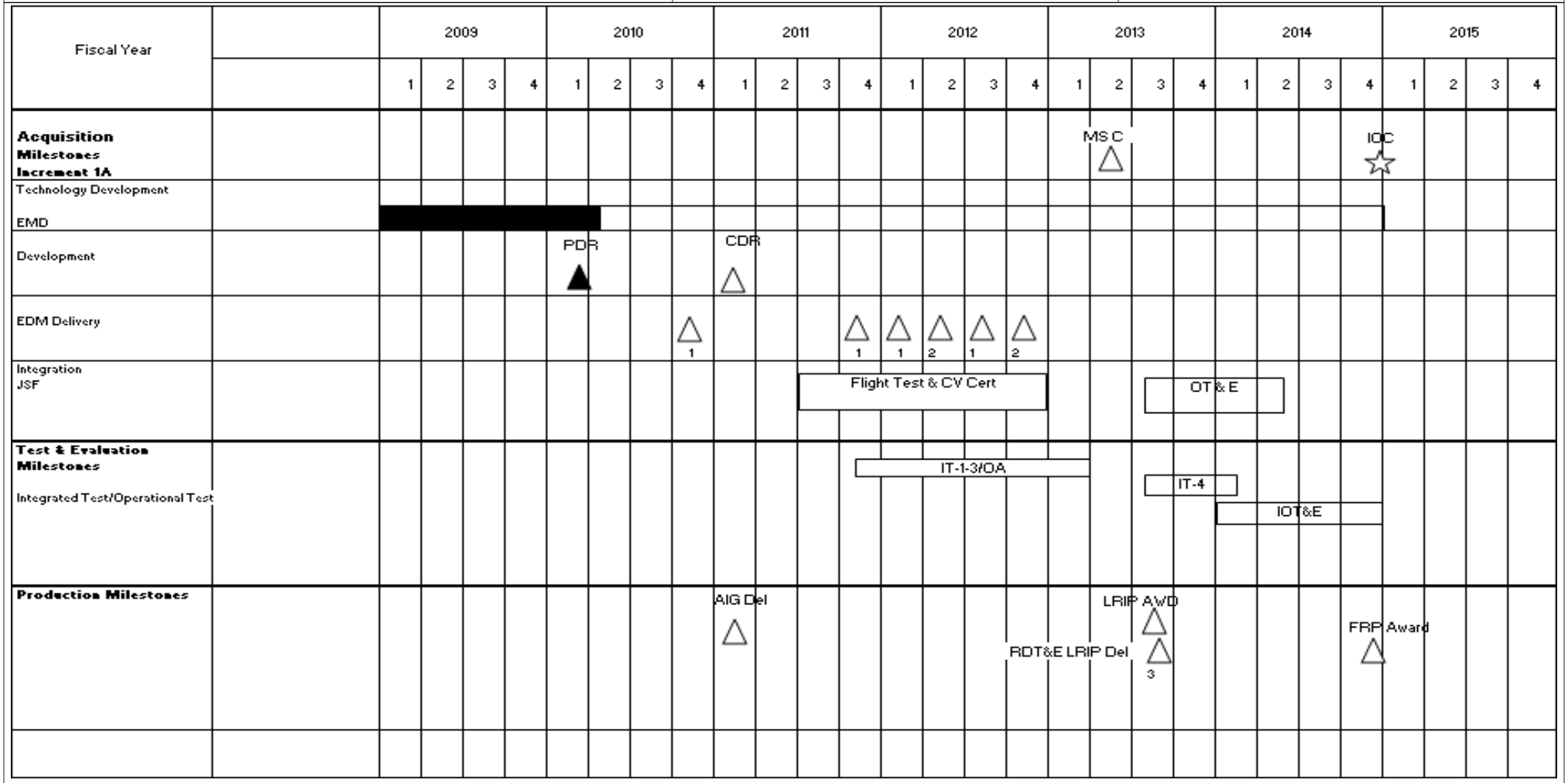

Exhibit R-4A, RDT&E Schedule Details: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603860N: *JT Precision Approach & Ldg Sys*	**PROJECT** 2329: *JPALS*

Schedule Details

	Start		End	
Event	**Quarter**	**Year**	**Quarter**	**Year**
Engineering Model Demonstration	1	2009	4	2014
Preliminary Design Review (PDR)	1	2010	1	2010
Critical Design Review (CDR)	1	2011	1	2011
AIG Delivery	1	2011	1	2011
EDM 1 Delivery	4	2010	4	2010
EDM 2 Delivery	4	2011	4	2011
EDM 3 Delivery	1	2012	1	2012
EDM 4 Delivery	2	2012	2	2012
EDM 5 Delivery	2	2012	2	2012
EDM 6 Delivery	3	2012	3	2012
EDM 7 Delivery	4	2012	4	2012
EDM 8 Delivery	4	2012	4	2012
JSF Flight Test & CV Cert	3	2011	4	2012
JSF OT&E	3	2013	2	2014
IT-1-3/OA	4	2011	1	2013
IT-4	3	2013	1	2014
IOT&E	1	2014	4	2014
MS C	2	2013	2	2013

Exhibit R-4A, RDT&E Schedule Details: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603860N: *JT Precision Approach & Ldg Sys*	PROJECT 2329: *JPALS*

	Start		End	
Event	Quarter	Year	Quarter	Year
IOC	4	2014	4	2014
LRIP Contract Award	3	2013	3	2013
RDT&E LRIP Delivery	3	2013	3	2013
FRP Contract Award	4	2014	4	2014

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603860N: *JT Precision Approach & Ldg Sys*	PROJECT 3228: *JPALS 1B*	

COST ($ in Millions)	FY 2009 Actual	FY 2010 Estimate	FY 2011 Base Estimate	FY 2011 OCO Estimate	FY 2011 Total Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
3228: *JPALS 1B*	0.000	10.954	37.986	0.000	37.986	49.246	34.423	21.999	0.000	0.000	154.608
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0		

A. Mission Description and Budget Item Justification

The JPALS Acquisition Strategy separates JPALS into two Increments sharing the same PE. JPALS Increment 1A provides for development , integration, installation, and test of Sea-Based JPALS to meet IOC of CVN. JPALS Increment 1B, beginning in FY-10, provides for integration and testing into the avionics of F/A -18E/F, EA-18G, and MH-60R. This is the first phase of the carrier air wing (CVW) integration to JPALS.

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
Fixed Wing Integration	0.000	10.954	28.137	0.000	28.137
This effort includes development, integration, installation, and testing of the F/A-18E/F and EA-18G. This provides the Navy with fixed wing aircraft which are JPALS capable in FY 2015 and out. This is the first phase of the carrier air wing (CVW) integration to JPALS. *FY 2010 Plans:* Complete Trade studies and begin design activities for F/A-18E/F, E/A-18G. *FY 2011 Base Plans:* Complete MS B, continue design activities for F/A-18E/F, E/A-18G.					
Rotary Wing Integration	0.000	0.000	9.849	0.000	9.849
This effort includes development, integration, installation, and testing of the MH-60 R/S. This provides the Navy with rotary wing aircraft which are JPALS capable in FY 2015 and out. This is the first phase of the CVW and DDG integration to JPALS.					

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603860N: *JT Precision Approach & Ldg Sys*	PROJECT 3228: *JPALS 1B*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
FY 2011 Base Plans: Begin integration and design activities for MH60R.					
Accomplishments/Planned Programs Subtotals	0.000	10.954	37.986	0.000	37.986

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total	FY 2012	FY 2013	FY 2014	FY 2015	Cost To Complete	Total Cost
• APN/0573: *JPALS*	0.000	0.000	0.000	0.000	0.000	0.000	0.000	14.500	51.598	526.000	592.098

D. Acquisition Strategy

Technology Development (TD) phase was conducted jointly by NAVAIRSYSCOM (PMA213), USAF Electronic Systems Command (Global Air) and multiple industry partners. This effort provided the concept of operations, performance specifications and technology readiness levels necessary to provide the foundation from which to launch the Increment 1 SDD phase development. In March 2007, overall joint program leadership transferred from the USAF to the USN. The JPALS 1A phase reached MSB on 27 June 2008 and the SDD phase development contract was awarded on 17 July 2008 and tasking consists of seabased JPALS, related ship and airborne reference systems, end-to-end software algorithms, necessary ship installation hardware, test equipment, system simulation software, and other RDT&E deliverable products to the joint team. The SDD contact was decided after full and open competition. Future procurement of airborne systems will consist of modifications to Original Equipment Manufacture (OEM) aircraft integration and to existing avionics. Seabased JPALS will be developed by the Navy with government owned or non-proprietary algorithms to an open system architecture in order to facilitate the compatible integration of many different aircraft and avionics architectures. As Lead Service, the Navy will manage the Joint Program to develop all JPALS increments. An updated JPALS Acquisition Strategy separates Increment 1 into two Increments (Inc 1A & Inc 1B). JPALS Increment 1A provides for development, integration, installation, and test of Sea-Based JPALS to meet IOC of CVN. Additionally, this requirement supports the JPALS Integration on Amphibious ships and DDG class ships and provides critical enabling technology for Joint Strike Fighter and Navy UCAS. JPALS Increment 1B provides for integration and testing into the avionics of F/A -18E/F, EA-18G, and MH-60R. This is the first phase of the carrier airwing (CVW) integration to JPALS. This second phase of aircraft integration provides JPALS capable aircraft for CVN-79 work-ups and deployment.

E. Performance Metrics

MS B scheduled for 1st quarter 2011.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603860N: *JT Precision Approach & Ldg Sys*	PROJECT 3228: *JPALS 1B*

Product Development ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Aircraft Integration-Non Specific	Various/ Various	Var Var	0.000	3.843	Dec 2009	9.031	Dec 2010	0.000		9.031	5.330	18.204	Continuing
Aircraft Integration-F/ A-18 E/F/G	SS/CPAF	Boeing Herndon VA	0.000	5.745	Dec 2009	18.203	Dec 2010	0.000		18.203	35.170	59.118	59.236
Aircraft Integration-MH60 R/S	SS/CPAF	Lockheed Martin VA	0.000	0.000		5.799	Dec 2010	0.000		5.799	13.010	18.809	18.809
		Subtotal	0.000	9.588		33.033		0.000		33.033	53.510	96.131	78.045

Remarks

Support ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Integrated Logistics Support	WR	NAWCAD Pax River, MD	0.000	0.357	Dec 2009	0.364	Dec 2010	0.000		0.364	8.573	9.294	Continuing
		Subtotal	0.000	0.357		0.364		0.000		0.364	8.573	9.294	

Remarks

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603860N: *JT Precision Approach & Ldg Sys*	PROJECT 3228: *JPALS 1B*

Test and Evaluation ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation	WR	NAWCAD Pax River, MD	0.000	0.652	Dec 2009	3.748	Dec 2010	0.000		3.748	33.815	38.215	Continuing
		Subtotal	0.000	0.652		3.748		0.000		3.748	33.815	38.215	

Remarks

Management Services ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Government Engineering Support	WR	NAWCAD Pax River, MD	0.000	0.357	Dec 2009	0.841	Dec 2010	0.000		0.841	10.057	11.255	Continuing
		Subtotal	0.000	0.357		0.841		0.000		0.841	10.057	11.255	

Remarks

	Total Prior Years Cost	FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	10.954		37.986		0.000		37.986	105.955	154.895	78.045

Remarks

Exhibit R-4, **RDT&E Schedule Profile:** PB 2011 Navy		**DATE:** February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603860N: *JT Precision Approach & Ldg Sys*	**PROJECT** 3228: *JPALS 1B*

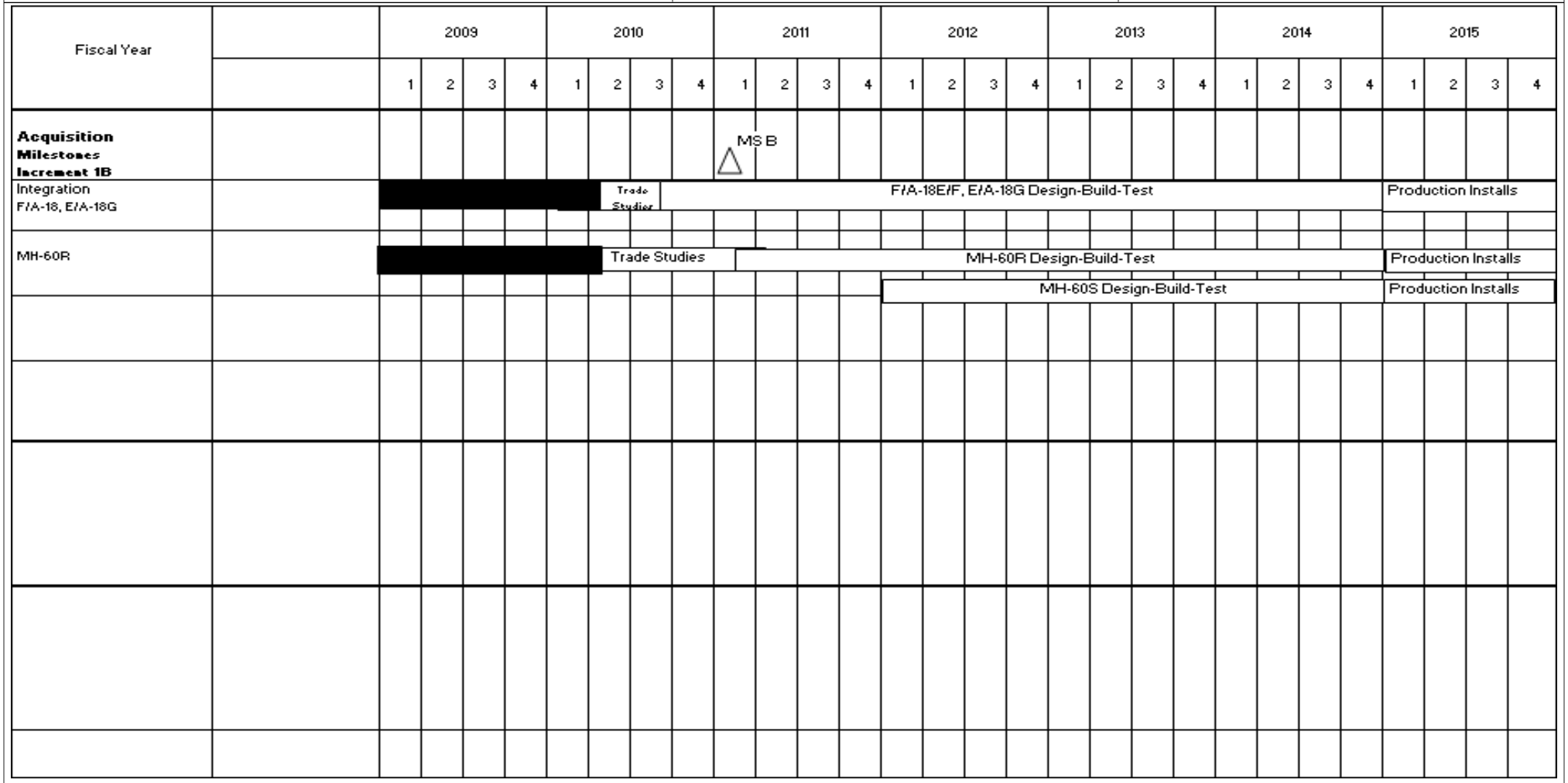

Exhibit R-4A, RDT&E Schedule Details: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603860N: *JT Precision Approach & Ldg Sys*	**PROJECT** 3228: *JPALS 1B*

Schedule Details

	Start		End	
Event	**Quarter**	**Year**	**Quarter**	**Year**
Trade Studies F/A-18, F/A-18G	1	2009	3	2010
Trade Studies MH-60 R	1	2009	1	2011
Milestone B	1	2011	1	2011
F/A-18 E/F, EA-18 Design, build, test	3	2010	4	2014
MH-60S Design, build, test	1	2012	4	2014
MH-60R Design, build, test	1	2011	4	2014
Start Production Installation F/A-18, F/A-18G,MH-60 R/S	1	2015	4	2015

Exhibit R-2, RDT&E Budget Item Justification: PB 2011 Navy											DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*				R-1 ITEM NOMENCLATURE PE 0603879N: *Single Int Air Picture (SIAP) Sys Eng*							
COST ($ in Millions)	**FY 2009 Actual**	**FY 2010 Estimate**	**FY 2011 Base Estimate**	**FY 2011 OCO Estimate**	**FY 2011 Total Estimate**	**FY 2012 Estimate**	**FY 2013 Estimate**	**FY 2014 Estimate**	**FY 2015 Estimate**	**Cost To Complete**	**Total Cost**
Total Program Element	40.587	52.497	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	362.275
3031: *Single Integrated Air Picture Sys Eng*	40.587	52.497	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	362.275

A. Mission Description and Budget Item Justification

At the direction of the Office of the Secretary of Defense and working in conjunction with the Joint Program Executive Office (JPEO) SIAP and Army Integrated Air and Missile Defense (IAMD) Program, the Navy mission is to support the design, development, testing and fielding of a SIAP capability which satisfies requirements mandated by the Global
Information Grid (GIG), Theater Air and Missile Defense (TAMD) and Combat Identification (CID) Mission Area Initial Capabilities Documents (MA-ICD). The Undersecretary of Defense Acquisition Memorandum of 3 May 06 validated the requirement for a SIAP capability and concurs with the Navy-designated Pathfinder programs identified for SIAP implementation. VCNO for Resources, Requirements, and Assessments (N8) SIAP implementation guidance of 14 March 06 defines requirements to the Navy to implement the SIAP. On 24 September 2007, the Joint Requirements Oversight Council (JROC) approved the Capability Development Document (CDD) establishing official requirements for the SIAP program.

The SIAP capability will provide the Navy warfighter with the ability to better understand the joint battlespace and employ weapons to the full extent of their designed capabilities. The SIAP will support the spectrum of offensive and defensive operations by US, allied, and coalition partners in the airspace within a theater of operations (e.g., attack operations, suppression of enemy air defenses, air and missile defense, intelligence preparation of the battlefield). The SIAP is accomplished through a combination of materiel and nonmaterial improvements. This effort through the application of disciplined System Engineering processes, policies, products and services will enable delivery of an integrated, interoperable, reliable, and maintainable Joint SIAP capability in Navy warfare systems/platforms, in the support of Joint and Navy Mission Capabilities.

SIAP capability is being introduced through a series of improvements, targeted at eliminating specific interoperability issues, and providing Command, Control, Communications, Computers, & Intelligence (C4I) enhancements. The engineering specifications and requirements developed by the engineering efforts will be incorporated into successive versions. The delivered capability will be used to develop the successive versions of the platform specific applications to be implemented in Navy combat systems requiring the Joint SIAP capability. The IABM will also be used as a standard against which to assess performance of the Navy combat systems in terms of Joint Force interoperability. The Navy is investing in the Open Architecture (OA) construct for many reasons, one of which is to create the combat system computing architecture which will permit the most rapid and least expensive implementation of the SIAP capability and other Joint applications. To that end, this effort also provides some resources to the OA system engineering process.

Exhibit R-2, RDT&E Budget Item Justification: PB 2011 Navy	DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603879N: *Single Int Air Picture (SIAP) Sys Eng*

Implementation of a SIAP capability in the Navy combat systems, will reduce risk of fratricide to US/coalition forces caused by incorrect correlation and ID association and enable warfighters to exploit the full kinematic range of their weapons through better Joint Force integration. This PE provides the resources for the Navy Programs of Record for integration of the Joint SIAP solution, and funding for the implementation of the SIAP capability into the Aegis combat system leveraging the Guided Missile Destroyer (DDG) Modernization Program.

B. Program Change Summary ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
Previous President's Budget	41.568	52.716	0.000	0.000	0.000
Current President's Budget	40.587	52.497	0.000	0.000	0.000
Total Adjustments	-0.981	-0.219	0.000	0.000	0.000
• Congressional General Reductions		-0.219			
• Congressional Directed Reductions		0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds		0.000			
• Congressional Directed Transfers		0.000			
• Reprogrammings	0.000	0.000			
• SBIR/STTR Transfer	-0.981	0.000			
• Program Adjustments	0.000	0.000	0.000	0.000	0.000

Change Summary Explanation

Technical: Not applicable.

Schedule: Not applicable.

FY11 from previous President's Budget is shown as zero because no FY11-15 data was presented in President's Budget 2010.

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603879N: *Single Int Air Picture (SIAP) Sys Eng*	PROJECT 3031: *Single Integrated Air Picture Sys Eng*	

COST ($ in Millions)	FY 2009 Actual	FY 2010 Estimate	FY 2011 Base Estimate	FY 2011 OCO Estimate	FY 2011 Total Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
3031: *Single Integrated Air Picture Sys Eng*	40.587	52.497	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	362.275
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0		

A. Mission Description and Budget Item Justification

At the direction of the Office of the Secretary of Defense and working in conjunction with the SIAP Joint Program Office (JPO), the Navy mission is to support the design, development, testing and fielding of a SIAP capability which satisfies requirements mandated by the Global Information Grid (GIG), Theater Air and Missile Defense (TAMD) and Combat Identification (CID) Mission Area Initial Capabilities Documents (MA-ICD). The Undersecretary of Defense Acquisition Memorandum of 3 May 06 validated the requirement for a SIAP capability and concurs with the Navy-designated Pathfinder programs identified for SIAP implementation. VCNO for Resources, Requirements, and Assessments (N8) SIAP implementation guidance of 14 March 06 directs the Navy to implement the SIAP program product, Integrated Architecture Behavior Model (IABM), in the following Navy pathfinder programs: Aegis Cruisers and Destroyers, Hawkeye Aircraft (E-2), and Ship Self Defense System (SSDS) platforms. On 24 September 2007, the Joint Requirements Oversight Council (JROC) approved the Capability Development Document (CDD) establishing official requirements for the SIAP program.

The SIAP capability will provide the Navy warfighter with the ability to better understand the joint battlespace and employ weapons to the full extent of their designed capabilities. The SIAP will support the spectrum of offensive and defensive operations by US, allied, and coalition partners in the airspace within a theater of operations (e.g., attack operations, suppression of enemy air defenses, air and missile defense, intelligence preparation of the battlefield). The SIAP is accomplished through a combination of materiel and nonmaterial improvements. This effort through the application of disciplined System Engineering processes, policies, products and services will enable delivery of an integrated, interoperable, reliable, and maintainable Joint SIAP capability in Navy warfare systems/platforms, in the support of Joint and Navy Mission Capabilities.

SIAP capability is being introduced through a series of improvements called Capability Drops, targeted at eliminating specific interoperability issues, providing Command, Control, Communications, Computers, & Intelligence (C4I) enhancements, and delivering an executable integrated architecture. The engineering specifications and requirements developed by the engineering efforts will be incorporated into the successive versions of the Joint IABM in a spiral development improvement process. The delivered IABM will be used to develop the successive versions of the platform specific applications to be implemented in Navy combat systems requiring the Joint SIAP capability. The IABM will also be used as a standard against which to assess performance of the Navy combat systems in terms of Joint Force interoperability. The Navy is investing in the Open Architecture (OA) construct for many reasons, one of which is to create the combat system computing

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603879N: *Single Int Air Picture (SIAP) Sys Eng*	PROJECT 3031: *Single Integrated Air Picture Sys Eng*

architecture which will permit the most rapid and least expensive implementation of the IABM and other Joint applications. To that end, this effort also provides some resources to the OA system engineering process.

Implementation of a platform specific application in the Navy Pathfinder combat systems (E-2, Aegis, and SSDS), will reduce risk of fratricide to US/coalition forces caused by incorrect correlation and ID association and enable warfighters to exploit the full kinematic range of their weapons through better Joint Force integration. This PE provides the resources for the Navy system engineering support to the Joint effort to develop SIAP capability, system engineering support to Navy Pathfinder Programs of Record (E-2, Aegis, SSDS) for integration of the Joint SIAP solution, and funding for the implementation of the IABM into the Aegis combat system leveraging the Guided Missile Destroyer (DDG) Modernization program.

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
SIAP ENGINEERING REQUIREMENTS AND ARCHITECTURE ALIGNMENT	1.868	1.516	0.000	0.000	0.000
FY 2009 Accomplishments: FY09: Continue to refine the systems requirements baseline for the additional capabilities in IABM CD-1 Follow-On (FO) for fielding the IABM into the Navy Pathfinder combat systems (Aegis, E-2, and SSDS). Update and finalize CD-1 FO interface specifications in support of adaptation and interface development for the IABM and Navy Pathfinder systems. Support system development and the System Engineering Review Process for additional IABM CD-1 FO capabilities. Develop pathfinder's adaptation layer phasing plans (phasing and mapping of the CD-1 FO Derived System Requirements) and complete associated Host Interface Description Documents. Support interface and architecture specifications in support of the IABM CD-1 FO Design Preliminary Design Review (PDR) and address revised functional alignment of Navy Pathfinder systems. *FY 2010 Plans:* FY10: Establish a Multi-Service System Engineering (MSSE) team to determine what near term improvements are feasible with the Navy and other Services current Programs of Record (PoRs). This effort will lead to determining what JTM functionality must be common, consistent, or interoperable. By working together in a Joint environment, the Services can determine which of these functionalities can be developed in a manner consistent with the PoR schedule requirements.					

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603879N: *Single Int Air Picture (SIAP) Sys Eng*	PROJECT 3031: *Single Integrated Air Picture Sys Eng*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
SIAP SYSTEM DEVELOPMENT	12.065	9.270	0.000	0.000	0.000

FY 2009 Accomplishments:

FY09: Support IABM CD-1 FO domain development in the areas of composite tracking capability and CEC interoperability (CEC Data Manager) and support the SIAP JPO Rapid Capability Insertion Process (RCIP) in examining Science and Technology (S&T) insertion efforts such as Distributed Multiple-Sensor Integration, Distributed Multiple-Hypothesis Tracking, Air Tasking Order / Airspace Control Order (ATO/ACO) Associator, and Automated Battle Management Aids (Distributed Weapons Coordination (DWC)). Migrate the developed prototype level interfaces and Adaptation Layers (AL) towards production level in parallel with CD-1 FO development (Time Boxes) to enable integration into Aegis and E-2 Hawkeye 2000 for SIAP Initial Operating Capability (IOC). Continue CD-1 FO prototype Adaptation Layer and interface development for Sensors (SPY OA, UPX 29, SPQ 9B, APS 145, and OL-483/AP) and TDLs (JTAL). Convert, adapt, and integrate IABM CD-1 into platform specific implementations in Aegis and E-2 Hawkeye 2000 programs to enable Navy platform Test and Evaluation (T&E) events (E-2 and Aegis Integration Testing) as well as Joint T&E events (JCHE-5).

FY 2010 Plans:

FY10: In a joint environment, under the direction of the JPEO SIAP, the Navy will collaborate in the development of a Joint Track Management (JTM) Capability towardsaccommodating the SIAP CDD. JTM capability will use existing technologies combined with current systems to provide an enhanced capability for the warfighter in the area of Joint Integrated Air and Missile Defense. The Navy will work collaboratively with the JPEO and Army to achieve incremental development of a JTM capability to support the warfighter. In order to support Joint Interoperability at the JTM capability level, Navy will initially focus efforts on pre-existing Tactical Data Link (TDL) - Cooperative Engagement Capability (CEC) fixes (ie - Fleet System Engineering Council (FSEC) fixes) to existing baselines. This is a required step towards meeting SIAP CDD requirements via the JTM capability. Initial efforts will address interoperability issues associated with the Fleet's inability to command and control forces and conduct defense of the force. The following prioritized list of issues to correct this shortfall will be addressed with this effort:

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603879N: *Single Int Air Picture (SIAP) Sys Eng*	**PROJECT** 3031: *Single Integrated Air Picture Sys Eng*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
- CEPN/LTN Mismatch - High/Low IU and LTN Processing - Link Track Correlation - TDL Filtering Limits - ID Management - IFF Mode 5					
SIAP TEST PLANNING AND EXECUTION *FY 2009 Accomplishments:* FY09: Perform, element, platform, and System of System level testing to include: - Update SIAP CD-1 and CD-1 FO Test and Evaluation (T&E) documentation in support of the SIAP Acquisition Milestones. - Continue development of T&E Metrics and Data Set - Plan and execute Engineering Assessments of the IABM to support fielding of the IABM CD-1 Follow-On. - Support CD-1 Operational Assessment - Assist with JTIC conformance testing - Develop plan for conducting CEC Backward Compatibility test using near-target AMOD and E-2 hardware configurations - Complete T&E planning and conduct execution of Navy SIAP IV&V and Navy participation in Joint Combined Hardware-in-the-loop Evaluation (JCHE-5) events.	5.729	0.000	0.000	0.000	0.000
SIAP INTEGRATION COORDINATION & PLANNING *FY 2009 Accomplishments:* FY09: For yearly SIAP DAB milestones, update documentation for Capability Development Document (CDD), Acquisition Program Baseline (APB), Program Protection Plan (PPP), Information Support Plan (ISP) and update Cost Analysis Requirements Document (CARD), Program Life Cycle Cost Estimate	1.673	1.481	0.000	0.000	0.000

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603879N: *Single Int Air Picture (SIAP) Sys Eng*	PROJECT 3031: *Single Integrated Air Picture Sys Eng*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
(PLCCE), Independent Cost Estimate (ICE), Systems Engineering Plan (SEP), and Acquisition Strategy (AS). Conduct planning for risk mitigation and configuration management activities. Monitor and support execution of the Navy SIAP Implementation Plan (IP). *FY 2010 Plans:* FY10: Produce and update documentation consistent with Milestone requirements that the Joint Track Manager development requires.					
DDG MOD PLATFORM SPECIFIC MODEL *FY 2009 Accomplishments:* FY09: Specific FY09 activity includes: Aegis SIAP Requirements and Architecture: Establish an allocated Baseline that includes JTM alignment by PDR. Define common data model and coordinated interfaces for the enterprise track server and the common track manager components for surface Navy combat systems, including component framework Application Programmer Interfaces (APIs), host services APIs, track server APIs from a client perspective, Sensor Adaptation Layer component IDDs, and system track management APIs for the host to use. Develop and/or review requirements and design products and contribute to coordinated Navy comments on SIAP JPO baseline products and other SIAP PDR artifacts, as well as the JAWG JTM SV-4. JCHE-5: Develop a prototype SPY adaptation layer to support JCHE-5 that interfaces with the SPY OA Radar control program and the IABM. Deliver associated SPY SAL B-5 level requirements. Coordinate with NSWC/DD for upgrades to the ASATS simulation to model the SPY OA radar variant planned for AMOD in preparation for JCHE-5. Complete integration of the SPY, SPQ 9B, and UPX-29 adaptation layers with the IABM CD-1 in preparation for JCHE-5. *FY 2010 Plans:* FY10: Perform the development and integration tasks required to support the Navy in the development and integration of the two common Track Manager components, System Track Manager (STM) and Track Server (TS) into AMOD ACB 12. The two components are being developed by a third party	19.050	40.230	0.000	0.000	0.000

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603879N: *Single Int Air Picture (SIAP) Sys Eng*	PROJECT 3031: *Single Integrated Air Picture Sys Eng*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
Systems Integrator / Design Agent (SI/DA). Under this effort, work with the SI/DA to integrate and jointly test the two components being developed in support of the ACB 12 Program. The technical focus of this effort is to conduct the required system engineering and associated development using the Aegis AMOD ACB 12 architecture as a base foundation and to implement Track Management architecture and interface changes in accordance with the Component Architecture SV-4.					
DAWDF *FY 2009 Accomplishments:* Acquisition Workforce	0.202	0.000	0.000	0.000	0.000
Accomplishments/Planned Programs Subtotals	40.587	52.497	0.000	0.000	0.000

C. Other Program Funding Summary ($ in Millions)

N/A

D. Acquisition Strategy

The Navy is committed to implementing the SIAP capability into Navy platforms as functionality matures and system programmatic considerations (funding and schedules) permit. Individual Programs of Record implementation will allow identification and resolution of key technical, operational and programmatic issues, and provide lessons learned for
future integration into Navy systems which have approved SIAP requirements. Implementation in Aegis, E-2, and SSDS platforms will occur per the Office of the Chief of Naval Operations (OPNAV) N8 SIAP Requirements letter and during scheduled software upgrades, to the extent feasible. This implementation of the capability into Navy platforms will
occur upon demonstration of certain critical factors and assumptions.

E. Performance Metrics

Milestone Reviews

Exhibit R-2, RDT&E Budget Item Justification: PB 2011 Navy										DATE: February 2010	
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*				R-1 ITEM NOMENCLATURE PE 0603889N: *Counterdrug RDT&E Projects*							
COST ($ in Millions)	**FY 2009 Actual**	**FY 2010 Estimate**	**FY 2011 Base Estimate**	**FY 2011 OCO Estimate**	**FY 2011 Total Estimate**	**FY 2012 Estimate**	**FY 2013 Estimate**	**FY 2014 Estimate**	**FY 2015 Estimate**	**Cost To Complete**	**Total Cost**
Total Program Element	62.439	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	390.306
2219: *Counterdrug RDTE Support*	61.641	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	372.755
9999: *Congressional Adds*	0.798	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	17.551

A. Mission Description and Budget Item Justification

The Counterdrug RDTE Projects Program mission is to develop and deploy technology that disrupts, deters, and denies the flow of drugs, people, information, money and weapons related to narcoterrorism.

The Research of Frequency Selective Surfaces and Thermal Signatures project is a Congressional plus up. Micro antenna-array technology will be developed to enhance, camouflage, or conceal the infrared (IR) signatures of controlled assets. The overall project objective is to investigate the utility of frequency selective surfaces (FSS) and thin-film materials as tags that can be viewed using airborne or national sensors. Arrays of infrared micro antennas will be applied to the exterior surface of a controlled item to alter the object's emission in the portion of the IR band commonly used by thermal imagers. The micro antenna array will be tailored to control the emitted infrared spectral pattern in order to disguise, conceal, or tag the asset of interest. The tag could also be remotely monitored using available thermal imaging technology. Key features include the ability to discriminate friend-from-foe and the tailoring of the thermal profile to enhance long-distance stand-off monitoring. The Volume Point Sensors project is a Congressional plus up. It is to demonstrate, based on recent research, that the existing or legacy electrical power lines can be used to charge and maintain all plug-in Chemical Biological Nuclear (CBN) point sensors as well as send sensor data and communications to in-line hubs, with out multiplexing coding and switching infrastructure cost. This system will provide the Ability to detect counter drug ops and transmit information over power lines and power grids.

Exhibit R-2, RDT&E Budget Item Justification: PB 2011 Navy	DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603889N: *Counterdrug RDT&E Projects*

B. Program Change Summary ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
Previous President's Budget	0.000	0.000	0.000	0.000	0.000
Current President's Budget	62.439	0.000	0.000	0.000	0.000
Total Adjustments	62.439	0.000	0.000	0.000	0.000
• Congressional General Reductions		0.000			
• Congressional Directed Reductions		0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds		0.000			
• Congressional Directed Transfers		0.000			
• Reprogrammings	63.771	0.000			
• SBIR/STTR Transfer	-1.332	0.000			

Congressional Add Details ($ in Millions, and Includes General Reductions)

	FY 2009	FY 2010
Project: 9999: *Congressional Adds*		
Congressional Add: *Over-the-Horizon Vessel Tracking*	0.798	0.000
Congressional Add Subtotals for Project: 9999	0.798	0.000
Congressional Add Totals for all Projects	0.798	0.000

Change Summary Explanation

Technical: Not applicable.

Schedule: Not applicable.

FY11 from previous President's Budget is shown as zero because no FY11-15 data was presented in President's Budget 2010.

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603889N: *Counterdrug RDT&E Projects*	PROJECT 2219: *Counterdrug RDTE Support*	

COST ($ in Millions)	FY 2009 Actual	FY 2010 Estimate	FY 2011 Base Estimate	FY 2011 OCO Estimate	FY 2011 Total Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
2219: *Counterdrug RDTE Support*	61.641	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	372.755
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0		

A. Mission Description and Budget Item Justification

The Counterdrug RDT&E mission is to develop and deploy technology that disrupts, deters, and denies the flow of drugs, people, information, money and weapons related to narcoterrorism.

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
Counterdrug RDTE Support	61.641	0.000	0.000	0.000	0.000
FY 2009 Accomplishments: Conducted studies, analyses and experimentation.					
Accomplishments/Planned Programs Subtotals	61.641	0.000	0.000	0.000	0.000

C. Other Program Funding Summary ($ in Millions)

N/A

D. Acquisition Strategy

Competitive procurement through RDT&E Indefinite Delivery, Indefinite Quantity (IDIQ) Contract

E. Performance Metrics

The CNTPO program goal is to identify and respond to R&D requirements that support ongoing counter narcoterrorism missions being conducted by the Department of Defense, other Federal agencies, partner nations and State and local authorities. CNTPO will conduct studies, analyses and experimentation in both laboratory and non-laboratory environments to support the DoD strategy for disrupting, deterring, and denying the flow of drugs, people, information, money and weapons related to illegal drug trafficking and narcoterrorism.

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603889N: *Counterdrug RDT&E Projects*	PROJECT 9999: *Congressional Adds*	

COST ($ in Millions)	FY 2009 Actual	FY 2010 Estimate	FY 2011 Base Estimate	FY 2011 OCO Estimate	FY 2011 Total Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
9999: *Congressional Adds*	0.798	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	17.551
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0		

A. Mission Description and Budget Item Justification

Congressional Add

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010
Congressional Add: Over-the-Horizon Vessel Tracking *FY 2009 Accomplishments:* Over-the-Horizon Vessel Tracking	0.798	0.000
Congressional Adds Subtotals	0.798	0.000

C. Other Program Funding Summary ($ in Millions)

N/A

D. Acquisition Strategy

N/A

E. Performance Metrics

Congressional Add

Exhibit R-2, RDT&E Budget Item Justification: PB 2011 Navy	DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603925N: *Directed Energy and Electric Weapon System*

COST ($ in Millions)	FY 2009 Actual	FY 2010 Estimate	FY 2011 Base Estimate	FY 2011 OCO Estimate	FY 2011 Total Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
Total Program Element	4.548	19.223	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	71.775
9823: *Lasers for Navy applicat*	0.000	4.982	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	4.982
9999: *Congressional Adds*	4.548	14.241	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	66.793

A. Mission Description and Budget Item Justification

In accordance with NAVSEA Notice 5400, Ser 09B/240, Subj: ESTABLISHMENT OF THE NAVY DIRECTED ENERGY (DE) WEAPONS PROGRAM OFFICE (PMS 405), dated 4 Jan 02 and NAVSEA 5400.101, Ser SEA 06/058, Subj: DIRECTED ENERGY AND ELECTRIC WEAPONS PROGRAM OFFICE (PMS 405) CHARTER, dated 21 Jul 04 - COMNAVSEASYSCOM (PMS 405) was assigned as the single Point of Contact for matters related to Directed Energy and Electric Weapon Systems development and acquisition initiation for the Navy and for those matters being coordinated with other Federal agencies and military services. The Naval Directed Energy and Electric Weapon Systems Program Office's (PMS 405) mission is to transition technology from the laboratory to prototype/advanced development/test for operational development and use. This will change the way the Navy fights in the 21st century by providing the war fighter with additional tools to fight today's and tomorrow's wars. This requires the effective management of Technology Development (BA-4) initiatives into System Development and Demonstration. PMS 405 will manage development of Directed Energy and Electric Weapon Systems onboard future naval surface ships that incorporate: Weapons Grade High Energy Lasers, Free Electron Lasers (Megawatt class), Electromagnetic Rail Gun (EMRG) Weapon Systems, High Power Microwave Weapon/Sensor Systems, and other systems/ capabilities.

In FY 09, $1,755K was provided under Project Unit (PU) 9D61A for the Directed Energy Initiative (DEI) to support acceleration of development and testing of the Laser Weapon System (LaWS); $1,596K was provided under PU 9D62A for Guillotine (G) efforts to support the acceleration of development and testing of a non-lethal, non-attributable system designed to offer non-kinetic offensive Information Operations (IO) solutions; and $1,197K was provided under PU 9D63A for Multi Function Laser System (MFLS) efforts to support the development of the Visual Interruption System (VIS) capability to be integrated into the Laser Weapon System (LaWS).

In FY 10, $4,982K was provided under Project Unit 9823 to support Pacific Sail Proof of Concept prototype system development and demonstration. Congressional funding was provided for the following projects: $1,494K was provided under Project Unit (PU) 10C132 to support technology development for Counter-Narcotics efforts as part of Global Law Enforcement; $1,593K was provided under PU 10C133 to support Joint Technology Insertion and Accelerated System Integration Capability for Electronic Warfare; $1,195K was provided under PU 10C134 to support Maritime Directed Energy Test Center (MDETC) efforts; $9,959K was provided under PU 9823A to support Laser Weapon System (LaWS) technology development and test efforts in support of the Advanced Development Model (ADM) effort.

Exhibit R-2, RDT&E Budget Item Justification: PB 2011 Navy	DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603925N: *Directed Energy and Electric Weapon System*

B. Program Change Summary ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
Previous President's Budget	4.548	5.003	0.000	0.000	0.000
Current President's Budget	4.548	19.223	0.000	0.000	0.000
Total Adjustments	0.000	14.220	0.000	0.000	0.000
• Congressional General Reductions		-0.080			
• Congressional Directed Reductions		0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds		14.300			
• Congressional Directed Transfers		0.000			
• Reprogrammings	0.000	0.000			
• SBIR/STTR Transfer	0.000	0.000			
• Program Adjustments	0.000	0.000	0.000	0.000	0.000

Congressional Add Details ($ in Millions, and Includes General Reductions)	FY 2009	FY 2010
Project: 9999: *Congressional Adds*		
Congressional Add: *Global Law Enforcement Support for Counter-Narcotics*	0.000	1.494
Congressional Add: *Joint Tech Insertion and Accelerated System Integration Capability for Electroni*	0.000	1.593
Congressional Add: *Maritime Directed Energy Test and Evaluation Center*	0.000	1.195
Congressional Add: *LASERS FOR NAVY APPLICATIONS*	0.000	9.959
Congressional Add: *Directed Energy Initiative*	1.755	0.000
Congressional Add: *Guillotine*	1.596	0.000
Congressional Add: *Multi-Function Laser System*	1.197	0.000
Congressional Add Subtotals for Project: 9999	4.548	14.241
Congressional Add Totals for all Projects	4.548	14.241

Exhibit R-2, RDT&E Budget Item Justification: PB 2011 Navy	DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603925N: *Directed Energy and Electric Weapon System*

Change Summary Explanation

Technical: Not applicable.

Schedule: Not applicable.

FY11 from previous President's Budget is shown as zero because no FY11-15 data was presented in President's Budget 2010.

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603925N: *Directed Energy and Electric Weapon System*	PROJECT 9823: *Lasers for Navy applicat*	

COST ($ in Millions)	FY 2009 Actual	FY 2010 Estimate	FY 2011 Base Estimate	FY 2011 OCO Estimate	FY 2011 Total Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
9823: *Lasers for Navy applicat*	0.000	4.982	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	4.982
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0		

A. Mission Description and Budget Item Justification

The Pacific Sail effort utilizes Lasers for Navy Applications to develop a gyro-stabilized, multi-mission, optical system as a "Proof of Concept" capability for at-sea evaluation in support of tactical ship defense requirements.

Funding was established in FY 2010 under this project unit to support prototype laser system development and system concept demonstration onboard a surface platform. This at-sea test and analysis will demonstrate operational effectiveness in support of Information Operations (IO), short-range ship defense/force protection, tracking and imaging, combat identification, and threat assessment.

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
Lasers for Navy Applications	0.000	4.982	0.000	0.000	0.000
The Pacific Sail effort utilizes Lasers for Navy Applications to develop a gyro-stabilized, multi-mission, optical system as a "Proof of Concept" capability for at-sea evaluation in support of tactical ship defense requirements. *FY 2010 Plans:* Funding was established in FY 2010 under this project unit to support laser prototype system development and system concept demonstration onboard a surface platform. This at-sea test and analysis will demonstrate operational effectiveness in support of Information Operations, short-range ship defense/force protection, long-range tracking and imaging, combat identification, and threat assessment.					
Accomplishments/Planned Programs Subtotals	0.000	4.982	0.000	0.000	0.000

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603925N: *Directed Energy and Electric Weapon System*	PROJECT 9823: *Lasers for Navy applicat*

C. Other Program Funding Summary ($ in Millions)

N/A

D. Acquisition Strategy

Government Field Activities: Technology development and demonstration/test of capabilities for designated Directed Energy and Electric Weapon System components, subsystems, system(s). Program Office approved design, development, and demonstration/test efforts.

Non-Government Activities: Technology development and demonstration/test of capabilities for designated Directed Energy and Electric Weapon System components, subsystems, system(s). Program Office approved design, development, and demonstration/test efforts.

E. Performance Metrics

Quarterly Program Reviews

Exhibit R-4, RDT&E Schedule Profile: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603925N: *Directed Energy and Electric Weapon System*	PROJECT 9823: *Lasers for Navy applicat*

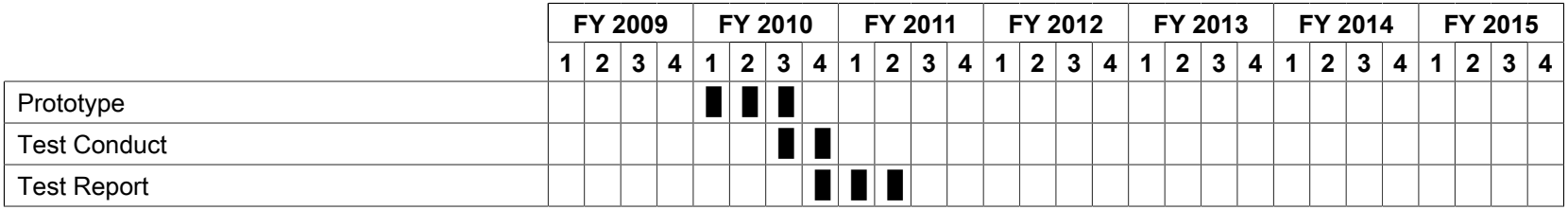

Exhibit R-4A, RDT&E Schedule Details: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603925N: *Directed Energy and Electric Weapon System*	**PROJECT** 9823: *Lasers for Navy applicat*

Schedule Details

	Start		End	
Event	**Quarter**	**Year**	**Quarter**	**Year**
Prototype	1	2010	3	2010
Test Conduct	3	2010	4	2010
Test Report	4	2010	2	2011

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603925N: *Directed Energy and Electric Weapon System*	PROJECT 9999: *Congressional Adds*	

COST ($ in Millions)	FY 2009 Actual	FY 2010 Estimate	FY 2011 Base Estimate	FY 2011 OCO Estimate	FY 2011 Total Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
9999: *Congressional Adds*	4.548	14.241	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	66.793
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0		

A. Mission Description and Budget Item Justification

10C132 - Global Law Enforcement Support for Counter-Narcotics - Funding was provided to support the development and deployment of wireless intercept technology to aid in counter-narcotics operations in foreign countries.

10C133 - Joint Technology Insertion and Accelerated System Integration Capability for Electronic Warfare (EW) - Funding was provided for the development of an Electronic Warfare (EW) Capabilities Analysis Tool that can conduct 'capability versus threat' analyses using multiple, networked, Joint/Coalition EW Threat Databases.

10C134 - Maritime Directed Energy Test Center (MDETC) - Funding was provided for maritime-based Directed Energy (DE) testing and facility utilization at Pacific Missile Range Facility in Hawaii. Laser propagation test conduct and analysis, facility requirements/utilization planning and agreements, and addressing of environmental considerations associated with DE testing are integral to the overall operational DE test strategy for the Surface Navy.

9823A - Lasers for Navy Applications (Laser Weapon System) - Funding was provided to support the acceleration of technology development and testing of the Laser Weapon System (LaWS), to provide for Navy-funded development, production, and fielding in the near future. FY 10 funding supports the acceleration of LaWS engineering and development of the Advanced Development Model (ADM) to include: operational and employment concept requirements/definition; ADM test planning, coordination, and conduct; mechanical design of system components; LaWS-specific software development; CIWS integration; ship integration including space, weight, power, and cooling.

9D61A - Directed Energy Initiative (DEI) - Funding was provided to support the acceleration of development and testing of the Laser Weapon System (LaWS). FY 09 funding supported the acceleration of the development and testing of the Laser Weapon System (LaWS) engineering to include: investigation of Beam Director architecture options, range testing documentation, and development of a mature system design to mount a six beam laser Beam Director on the Close In Weapon System (CIWS); to assist in the establishment of initial program concepts, perform system engineering to develop performance specifications and perform research and development tests and simulations to investigate solutions to problems, assess alternative technical approaches to identify the best programmatic approach and evaluate design achievements to encompass all facets of this project. This prototype DE engagement element of the MK15 CIWS provides multi-mission "zero time of flight" defensive capability to counter limited asymmetric threats (Unmanned Aerial Vehicles (UAVs), jet skis, boats, threat Electro Optic/Infra Red (EO/IR) sensors, rockets, artillery, mortars, etc.) beyond existing CIWS hard kill ranges. The prototype laser weapon components will augment the existing CIWS in order to extend the

effective range, provide enhanced lethality against certain target sets, and increase the weapon system's ability to counter a greater quantity (deep magazine) and spectrum of threats.

9D62A - Guillotine (G) - Funding was provided to support the acceleration of development and testing of a non-lethal, non-attributable system designed to offer non-kinetic offensive IO solutions. FY 09 funding supported Guillotine development engineering to include: test platform modification, test target preparation, threat evaluation, modeling & simulation, testing, and analysis; technology evaluation to assist in the establishment of initial program concepts, perform system engineering to develop performance specifications and perform research development tests and simulations to investigate solutions to problems, assess alternative technical approaches to identify the best programmatic approach and evaluate design achievements to encompass all facets of this project.

9D63A - Multi Function Laser System (MFLS) - Funding was provided for Multi-Function Laser System (MFLS) efforts to support the development of the Visual Interruption System (VIS) capability to be integrated into the Laser Weapon System (LaWS). FY 09 funding supported the development of the Visual Interruption System (VIS) capability to be integrated into the Laser Weapon System (LaWS) as part of the LaWS engagement element, to the Mk 15 CIWS that provides the non-lethal ability to confuse and deter attack; technology evaluation to assist in the establishment of initial program concepts, perform system engineering to develop performance specifications and perform research development tests and simulations to investigate solutions to problems, assess alternative technical approaches to identify the best programmatic approach and evaluate design achievements to encompass all facets of this project. This all weather capability application includes: swarming boat defense; harbor defense; perimeter defense; Force Protection. The prototype VIS components will augment the enhanced non-lethal options to the on-site Commander for Anti-terrorism / Force Protection (AT/FP) that determines hostile intent and denies personnel access under restrictive rules of engagement.

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010
Congressional Add: Global Law Enforcement Support for Counter-Narcotics *FY 2010 Plans:* 10C132 - Global Law Enforcement Support for Counter-Narcotics: Funding was provided to support the development and deployment of wireless intercept technology to aid in counter-narcotics operations in foreign countries.	0.000	1.494
Congressional Add: Joint Tech Insertion and Accelerated System Integration Capability for Electroni	0.000	1.593

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603925N: *Directed Energy and Electric Weapon System*	**PROJECT** 9999: *Congressional Adds*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010
FY 2010 Plans: 10C133 - Joint Technology Insertion and Accelerated System Integration Capability for Electronic Warfare: Funding was provided for the development of an Electronic Warfare (EW) Capabilities Analysis Tool that can conduct 'capability versus threat' analyses using multiple, networked, Joint/ Coalition EW Threat Databases.		
Congressional Add: Maritime Directed Energy Test and Evaluation Center *FY 2010 Plans:* 10C134 - Maritime Directed Energy Test Center (MDETC): Funding was provided for maritime-based Directed Energy (DE) testing and facility utilization at Pacific Missile Range Facility in Hawaii. Laser propagation test conduct and analysis, facility requirements/utilization planning and agreements, and addressing of environmental considerations associated with DE testing are integral to the overall operational DE test strategy for the Surface Navy.	0.000	1.195
Congressional Add: LASERS FOR NAVY APPLICATIONS *FY 2010 Plans:* 9823A - Lasers for Navy Applications (Laser Weapon System): Funding was provided to support the acceleration of technology development and testing of the Laser Weapon System (LaWS), to provide for Navy-funded development, production, and fielding in the near future. FY 10 funding supports the acceleration of LaWS engineering and development of the Advanced Development Model (ADM) to include: operational and employment concept requirements/definition; ADM test planning, coordination, and conduct; mechanical design of system components; LaWS-specific software development; CIWS integration; ship integration including space, weight, power, and cooling.	0.000	9.959
Congressional Add: Directed Energy Initiative	1.755	0.000

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603925N: *Directed Energy and Electric Weapon System*	PROJECT 9999: *Congressional Adds*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010
FY 2009 Accomplishments: Funding was provided to support the acceleration of development and testing of the Laser Weapon System (LaWS). FY 09 funding supported the acceleration of the development and testing of the Laser Weapon System (LaWS) engineering to include: investigation of Beam Director architecture options, range testing documentation, and development of a mature system design to mount a six beam laser Beam Director on the Close In Weapon System (CIWS); to assist in the establishment of initial program concepts, perform system engineering to develop performance specifications and perform research and development tests and simulations to investigate solutions to problems, assess alternative technical approaches to identify the best programmatic approach and evaluate design achievements to encompass all facets of this project. This prototype DE engagement element of the Mk15 CIWS provides multi-mission "zero time of flight" defensive capability to counter limited asymmetric threats (Unmanned Aerial Vehicles (UAVs), jet skis, boats, threat Electro Optic/Infra Red (EO/IR) sensors, rockets, artillery, mortars, etc.) beyond existing CIWS hard kill ranges. The prototype laser weapon components will augment the existing CIWS in order to extend the effective range, provide enhanced lethality against certain target sets, and increase the weapon system's ability to counter a greater quantity (deep magazine) and spectrum of threats.		
Congressional Add: Guillotine *FY 2009 Accomplishments:* Funding was provided to support the acceleration of development and testing of a non-lethal, non-attributable system designed to offer non-kinetic offensive IO solutions. FY 09 funding supported Guillotine development engineering to include: test platform modification, test target preparation, threat evaluation, modeling & simulation, testing, and analysis; technology evaluation to assist in the establishment of initial program concepts, perform system engineering to develop performance specifications and perform research development tests and simulations to investigate solutions to problems, assess alternative technical approaches to identify the best programmatic approach and evaluate design achievements to encompass all facets of this project.	1.596	0.000

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603925N: *Directed Energy and Electric Weapon System*	**PROJECT** 9999: *Congressional Adds*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010
Congressional Add: Multi-Function Laser System *FY 2009 Accomplishments:* Funding was provided for Multi-Function Laser System (MFLS) efforts to support the development of the Visual Interruption System (VIS) capability to be integrated into the Laser Weapon System (LaWS). FY 09 funding supported the development of the Visual Interruption System (VIS) capability to be integrated into the Laser Weapon System (LaWS) as part of the LaWS engagement element, to the Mk 15 CIWS that provides the non-lethal ability to confuse and deter attack; technology evaluation to assist in the establishment of initial program concepts, perform system engineering to develop performance specifications and perform research development tests and simulations to investigate solutions to problems, assess alternative technical approaches to identify the best programmatic approach and evaluate design achievements to encompass all facets of this project. This all weather capability application includes: swarming boat defense; harbor defense; perimeter defense; Force Protection. The prototype VIS components will augment the enhanced non-lethal options to the on-site Commander for Anti-terrorism / Force Protection (AT/FP) that determines hostile intent and denies personnel access under restrictive rules of engagement.	1.197	0.000
Congressional Adds Subtotals	4.548	14.241

C. Other Program Funding Summary ($ in Millions)

N/A

D. Acquisition Strategy

Not Applicable.

E. Performance Metrics

congressional adds.

Exhibit R-4, RDT&E Schedule Profile: PB 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603925N: *Directed Energy and Electric Weapon System*	PROJECT 9999: *Congressional Adds*	

	FY 2009				FY 2010				FY 2011				FY 2012				FY 2013				FY 2014				FY 2015			
	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
10C132 Preliminary Design Review (PDR)						■																						
10C132 Critical Design Review (CDR)							■																					
10C132 Prototype System Development								■	■																			
10C132 Field Evaluation									■	■																		
10C133 Preliminary Design Review (PDR)						■																						
10C133 Critical Design Review (CDR)							■																					
10C133 Prototype System Development								■	■	■																		
10C134 Preliminary Test Plan						■																						
10C134 Final Test Plan							■																					
10C134 Test Conduct								■																				
10C134 Test Analysis									■	■																		
10C134 Final Report										■																		
9823A Preliminary Design Review (PDR) Components/Integration						■	■																					
9823A Component Testing						■	■	■																				
9823A Critical Design Review (CDR) Components/Integration							■	■																				
9823A Prototype Components Procured								■	■																			
9823A System Testing										■																		

Exhibit R-4A, RDT&E Schedule Details: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603925N: *Directed Energy and Electric Weapon System*	**PROJECT** 9999: *Congressional Adds*

Schedule Details

	Start		End	
Event	**Quarter**	**Year**	**Quarter**	**Year**
10C132 Preliminary Design Review (PDR)	2	2010	2	2010
10C132 Critical Design Review (CDR)	3	2010	3	2010
10C132 Prototype System Development	4	2010	1	2011
10C132 Field Evaluation	1	2011	2	2011
10C133 Preliminary Design Review (PDR)	2	2010	2	2010
10C133 Critical Design Review (CDR)	3	2010	3	2010
10C133 Prototype System Development	4	2010	2	2011
10C134 Preliminary Test Plan	2	2010	2	2010
10C134 Final Test Plan	3	2010	3	2010
10C134 Test Conduct	4	2010	4	2010
10C134 Test Analysis	1	2011	2	2011
10C134 Final Report	2	2011	2	2011
9823A Preliminary Design Review (PDR) Components/Integration	2	2010	3	2010
9823A Component Testing	2	2010	4	2010
9823A Critical Design Review (CDR) Components/Integration	3	2010	4	2010
9823A Prototype Components Procured	4	2010	1	2011
9823A System Testing	2	2011	2	2011

Exhibit R-2, RDT&E Budget Item Justification: PB 2011 Navy										DATE: February 2010	
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*				R-1 ITEM NOMENCLATURE PE 0604272N: *Tact Air Dir Infrared CM (TADIRCM)*							
COST ($ in Millions)	**FY 2009 Actual**	**FY 2010 Estimate**	**FY 2011 Base Estimate**	**FY 2011 OCO Estimate**	**FY 2011 Total Estimate**	**FY 2012 Estimate**	**FY 2013 Estimate**	**FY 2014 Estimate**	**FY 2015 Estimate**	**Cost To Complete**	**Total Cost**
Total Program Element	42.832	50.484	51.693	0.000	51.693	48.614	42.829	42.126	43.063	Continuing	Continuing
3040: *TADIRCM*	35.342	50.484	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	154.739
3166: *CH-53 DIRCM TAP*	3.900	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	99.147
3302: *JATAS*	0.000	0.000	51.693	0.000	51.693	48.614	38.123	12.043	0.379	Continuing	Continuing
3304: *CIRCM*	0.000	0.000	0.000	0.000	0.000	0.000	4.706	30.083	42.684	Continuing	Continuing
9999: *Congressional Adds*	3.590	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	8.989

Note

Joint and Allied Threat Awareness System (JATAS) work performed in this program element under project unit (PU) 3040 is moved to an individual PU 3302 for efforts beginning in FY11.

New PU 3304 Common Infrared Countermeasures (CIRCM)is is a new start for the Navy with efforts to begin in FY13.

A. Mission Description and Budget Item Justification

This element includes development of electronic warfare systems for the United States Navy (USN) and United States Marine Corps (USMC) assault and strike aircraft. This includes the development and testing of advanced Infrared Countermeasures (IRCM) systems for emerging threats and emergency contingencies. Realignment of project units from Tactical Aircraft Directed Infrared Countermeasure (TADIRCM) to Joint and Allied Threat Awareness System (JATAS) begins in FY11.

This program element includes $0.285 million for the Defense Acquisition Workforce Development Fund (DAWDF).

Exhibit R-2, RDT&E Budget Item Justification: PB 2011 Navy	DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0604272N: *Tact Air Dir Infrared CM (TADIRCM)*

B. Program Change Summary ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
Previous President's Budget	66.568	63.702	0.000	0.000	0.000
Current President's Budget	42.832	50.484	51.693	0.000	51.693
Total Adjustments	-23.736	-13.218	51.693	0.000	51.693
• Congressional General Reductions		-0.210			
• Congressional Directed Reductions		-13.000			
• Congressional Rescissions	0.000	-0.008			
• Congressional Adds		0.000			
• Congressional Directed Transfers		0.000			
• Reprogrammings	-21.839	0.000			
• SBIR/STTR Transfer	-1.897	0.000			
• Program Adjustments	0.000	0.000	51.693	0.000	51.693

Congressional Add Details ($ in Millions, and Includes General Reductions)	FY 2009	FY 2010
Project: 9999: *Congressional Adds*		
Congressional Add: *ASSAULT DIRECTED INFRARED COUNTERMEASURES*	1.994	0.000
Congressional Add: *Compact Ultra-Fast Laser System Development*	1.596	0.000
Congressional Add Subtotals for Project: 9999	3.590	0.000
Congressional Add Totals for all Projects	3.590	0.000

Change Summary Explanation

Technical: The acquisition strategy has been revised to field an advanced IRCM capability for assault aircraft. An evolutionary acquisition approach will be implemented in fielding this capability. The capability will be fielded in two increments, with the first increment being an advanced Missile Warning System (MWS) capability. This capability has been designated as JATAS. The second increment Assault DIRCM designated by the Army as the Common Infrared Countermeasure (CIRCM) has a Milestone B decision planned in FY10.

Schedule: The schedule for Tactical Aircraft Directed Infrared Countermeasure (TADIRCM) has changed due to new guidance from OPNAV. An Analysis of Alternatives (AoA) was conducted by N88 to assess the need for an advanced Infrared Countermeasure (IRCM) capability for assault and strike aircraft against

Exhibit R-2, RDT&E Budget Item Justification: PB 2011 Navy	DATE: February 2010
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surface to air threats. Conclusions from the AoA determined there was an immediate need for an advanced IRCM capability for assault (rotary wing) aircraft, however, additional analysis was needed to evaluate strike aircraft IRCM requirements. The AoA conclusion was that advanced Missile Warning Technology was sufficiently mature to proceed into an Engineering Manufacturing Development (EMD) program. However, the Assault Directed Infrared countermeasure (DIRCM) technology for small to medium USN/USMC assault aircraft required maturity of several technologies prior to EMD. TADIRCM will now be executed via two separate programs. Subsequent to the AoA, an Under Secretary of Defense for Acquisition, Logistics and Technology USD (AT&L) directed Joint Analysis Team (JAT) was formed to analyze Aircraft Survivability Equipment (ASE) across all the services. As a result of the JAT's recommended roadmap for ASE, an Acquisition Decision Memorandum (ADM) by the USD (AT&L) on 15 April 09 directed the Navy to conduct a competitive prototyping technology development (TD) phase prior to EMD. In addition to designating the Army as the lead service for developing a DIRCM capability for assault aircraft, a Joint and Allied Threat Awareness System (JATAS) TD phase contract to conduct competitive prototyping prior to an EMD was awarded in FY09. The EMD contract award is planned for FY11 with an Initial Operational Capability (IOC) date of FY14 planned. Assault DIRCM, which has been designated by the Army as the Common Infrared Countermeasure (CIRCM) has a planned Milestone B of FY11.

FY11 from previous President's Budget is shown as zero because no FY11-15 data was presented in President's Budget 2010.

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy			DATE: February 2010
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COST ($ in Millions)	FY 2009 Actual	FY 2010 Estimate	FY 2011 Base Estimate	FY 2011 OCO Estimate	FY 2011 Total Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
3040: *TADIRCM*	35.342	50.484	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	154.739
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0		

A. Mission Description and Budget Item Justification

The Tactical Aircraft Directed Infrared Countermeasures (TADIRCM) system provides the war fighter with protection against surface and air-to-air missiles. This project looks at an advanced Infrared Countermeasure (IRCM) capability for USN/USMC rotary wing/tilt rotor assault aircraft against Infrared (IR) Man Portable Air Defense System (MANPADS) and Surface-to-Air (SAM) threats. This project is divided into two components: 1) An advanced missile warning threat detection capability Joint and Allied Threat Awareness System (JATAS) and 2) An advanced IR countermeasure capability Assault Directed Infrared Countermeasure (DIRCM). JATAS will be the front end of an integrated survivability suite. It will require integration with the APR-39 or follow-on Radar Warning Receiver/EW integration bus, the ALE-47 Countermeasures Dispensing System, and a number of joint and allied platforms. It will also provide advanced capabilities that require extensive testing & evaluation of IRCM techniques.

New PU 3302 (JATAS) Joint and Allied Threat Awareness System was established to begin in FY11. Prior year efforts (FY08-FY10) were funded via PU 3040 (TADIRCM).

This project unit includes $0.285 million for the Defense Acquisition Workforce Development Fund (DAWDF).

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
TADIRCM JATAS Joint and Allied Threat Awareness System (JATAS) is required to provide assault aircraft with a reliable surface-to-air IR missile/Hostile Fire Indication (HFI) threat detection system.	32.857	30.219	0.000	0.000	0.000

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
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B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
FY 2009 Accomplishments: Completed a demonstration of the ability of advanced missile warning technology to detect hostile fire threats (i.e. rocket propelled grenade and small arms, etc.). Collected hostile fire data and generated a hostile fire data base that will be used to support the JATAS test and evaluation efforts. *FY 2010 Plans:* Plan to fund engineering and program management efforts to support the JATAS TD phase contract award. Plan to incrementally fund the JATAS TD contract and continue development of HFI algorithms.					
TADIRCM Assault Assault Directed Infrared Countermeasure (DIRCM) system will counter current and future Infrared (IR) threats. *FY 2009 Accomplishments:* Funded efforts to support trade studies and analysis for assault DIRCM. *FY 2010 Plans:* Plan to fund engineering and program management efforts to support the US Army's Common Infrared Countermeasure (CIRCM) Milestone B and contract award in FY2010. Conduct an early operational assessment flight test demonstration of a light weight DIRCM capability on an assault aircraft.	1.000	19.265	0.000	0.000	0.000
JATAS and CIRCM Pre-MS B, Risk Reduction, EMD Effort The Army was designated as the lead service for developing a DIRCM capability for assault aircraft. Risk reduction efforts for JATAS and CIRCM programs.	1.200	1.000	0.000	0.000	0.000

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
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B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
FY 2009 Accomplishments: Funded efforts to support engineering, program management, and risk reduction efforts for the JATAS and CIRCM programs. This includes requirement development and efforts for a JATAS Engineering and Manufacturing Development (EMD) contract. *FY 2010 Plans:* Funding the development of applicable modeling and simulation for both programs. Risk reduction efforts in the area of HFI for JATAS and risk reduction/technology development efforts to reduce the size and weight an Assault DIRCM Pointer Tracker System.					
DAWDF Realignment *FY 2009 Accomplishments:* DAWDF realignment	0.285	0.000	0.000	0.000	0.000
Accomplishments/Planned Programs Subtotals	35.342	50.484	0.000	0.000	0.000

C. Other Program Funding Summary ($ in Millions)

N/A

D. Acquisition Strategy

OPNAV (N88) completed an Analysis of Alternatives (AoA) in March 2007 to address the need for an Assault Directed Infrared Countermeasure (DIRCM) capability for assault (rotary wing) platforms. Based on the results of the AoA, an evolutionary acquisition strategy will be used to develop an advanced Infrared Countermeasure (IRCM) capability for USN/USMC rotary wing and tilt rotor assault aircraft. This acquisition approach will consist of two program increments 1) the development, test, and fielding of a Missile Warning capability to detect surface-to-air and air-to-air Infrared (IR) threats and 2) an Assault DIRCM system to counter current and future IR threats. The DIRCM sends directed laser energy to defeat the incoming IR threat when it is detected by the missile warning system. This approach will accelerate fielding of the missile warning capability while allowing Assault DIRCM technology to mature. Assault DIRCM technology maturation is required to support the size and weight constraints of USN/USMC assault platforms. The first increment of Assault DIRCM is the missile warning component designated by N88 as the Joint and Allied Threat Awareness System (JATAS). A JATAS Technology Development (TD) phase contract was awarded in FY09 and an Engineering Manufacturing

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
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Development (EMD) contract award is planned for FY11. JATAS Initial Operational Capability (IOC) is planned for FY14. The Army was designated as the lead service for developing a DIRCM capability for assault aircraft. Assault DIRCM designated by the Army as the Common Infrared Countermeasure (CIRCM), has a planned Milestone B of FY10.

E. Performance Metrics

Comptetive TD contract award (2 contractors) in Sept 2009. Incremental funding for FY10 to both contractors. Down select to one contractor in FY11 for EMD contract award.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy			DATE: February 2010
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Product Development ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Primary Hdw Development JATAS	C/CPIF	LM, ATK LM, ATK	34.430	22.600	Feb 2010	0.000		0.000		0.000	0.000	57.030	49.822
Aircraft Integration JATAS I	WR	Various Various	0.180	0.000		0.000		0.000		0.000	0.000	0.180	Continuing
Aircraft Integration JATAS II	SS/CPIF	DCMA, LM Owego, NY	2.615	0.000		0.000		0.000		0.000	0.000	2.615	2.615
Aircraft Integration JATAS III	C/CPIF	Various Various	4.238	5.723	Mar 2010	0.000		0.000		0.000	0.000	9.961	9.961
Modeling/Simulation JATAS	WR	Various Various	2.550	0.400	Dec 2009	0.000		0.000		0.000	0.000	2.950	Continuing
Systems Engineering JATAS I	C/CPFF	TEKLA Woodbridge, VA	2.896	0.000		0.000		0.000		0.000	0.000	2.896	2.896
Systems Engineering JATAS II	C/CPFF	Various Various	0.330	0.000		0.000		0.000		0.000	0.000	0.330	0.330
Sys Eng Govt JATAS I	WR	Various Various	4.625	1.952	Dec 2009	0.000		0.000		0.000	0.000	6.577	Continuing
Sys Eng Govt JATAS II	WR	NRL Washington, DC	2.443	0.000		0.000		0.000		0.000	0.000	2.443	Continuing
Sys Eng CONG HPFL	WR	NSWC Crane, IN	0.288	0.000		0.000		0.000		0.000	0.000	0.288	Continuing
Sys Eng CONG Assault	WR	NSWC Crane, IN	3.648	0.000		0.000		0.000		0.000	0.000	3.648	Continuing
Prototype Dev JATAS	MIPR	Ft Monmouth Ft Monmouth, NJ	0.800	0.000		0.000		0.000		0.000	0.000	0.800	Continuing
	C/CPIF	TBD	0.000	4.770	Mar 2010	0.000		0.000		0.000	0.000	4.770	4.770

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy		DATE: February 2010
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Product Development ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Primary Hdw Dev Assault		TBD											
Aircraft Integration Assault	C/CPIF	TBD TBD	0.000	2.375	Mar 2010	0.000		0.000		0.000	0.000	2.375	2.375
Modeling/Simulation Assault	WR	Various Various	0.000	0.300	Dec 2009	0.000		0.000		0.000	0.000	0.300	Continuing
Systems Eng Govt Assault	WR	Various Various	0.000	1.025	Dec 2009	0.000		0.000		0.000	0.000	1.025	Continuing
		Subtotal	59.043	39.145		0.000		0.000		0.000	0.000	98.188	72.769

Remarks

Support ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Dev Support JATAS	WR	Various Various	3.900	0.000		0.000		0.000		0.000	0.000	3.900	Continuing
Configuration Mgmt JATAS	WR	Various Various	0.000	0.100	Dec 2009	0.000		0.000		0.000	0.000	0.100	Continuing
Integrated Logistics JATAS I	WR	Various Various	0.962	0.636	Dec 2009	0.000		0.000		0.000	0.000	1.598	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy		DATE: February 2010
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Support ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Integrated Logistics JATAS II	C/CPFF	TSD Orlando	0.012	0.000	Jun 2010	0.000		0.000		0.000	0.000	0.012	0.012
Software Dev JATAS	WR	NAWCAD Pt Mugu	0.751	0.400	Dec 2009	0.000		0.000		0.000	0.000	1.151	Continuing
Studies & Analyses Gov JATAS	WR	Various Various	6.240	0.000		0.000		0.000		0.000	0.000	6.240	Continuing
S & A NonFFRDC JATAS	C/CPFF	Bell Boeing Bell Boeing, TX	1.344	0.000		0.000		0.000		0.000	0.000	1.344	1.344
Technical Data JATAS	WR	NRL Washington, DC	1.450	0.000		0.000		0.000		0.000	0.000	1.450	Continuing
S & A CONG HPFL GOV	WR	NSWC Crane, IN	0.140	0.000		0.000		0.000		0.000	0.000	0.140	Continuing
S & A CONG HPFL	C/CPFF	Amsec Amsec, VA	1.000	0.000		0.000		0.000		0.000	0.000	1.000	1.000
Software Dev Assault	WR	Various Various	0.000	0.300	Dec 2009	0.000		0.000		0.000	0.000	0.300	Continuing
Integrated Logistics Assault	WR	Various Various	0.000	1.525	Dec 2009	0.000		0.000		0.000	0.000	1.525	Continuing
Configuration Mgmt Assault	WR	Various Various	0.000	0.100	Dec 2009	0.000		0.000		0.000	0.000	0.100	Continuing
		Subtotal	15.799	3.061		0.000		0.000		0.000	0.000	18.860	2.356

Remarks

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy			DATE: February 2010
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Test and Evaluation ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Developmental T & E JATAS	WR	NRL Washington, DC	1.132	0.136	Dec 2009	0.000		0.000		0.000	0.000	1.268	Continuing
Operational T & E JATAS	WR	Various Various	0.577	0.400	Jan 2010	0.000		0.000		0.000	0.000	0.977	Continuing
ENG and Evaluation JATAS	C/CPFF	Various Various	4.892	0.000		0.000		0.000		0.000	0.000	4.892	4.892
ENG and Eval Govt JATAS	WR	Various Various	4.466	0.630	Dec 2009	0.000		0.000		0.000	0.000	5.096	Continuing
Live Fire Support JATAS	WR	Various Various	0.990	0.200	Feb 2010	0.000		0.000		0.000	0.000	1.190	Continuing
Technical Maturation JATAS I	WR	NAWCAD Pax River, MD	2.655	0.000		0.000		0.000		0.000	0.000	2.655	Continuing
Technical Maturation JATAS II	MIPR	DTIS Fort Belvoir	0.280	0.000		0.000		0.000		0.000	0.000	0.280	Continuing
Developmental T&E MH60S JATAS	WR	NAWCAD Pax River, MD	0.236	0.000		0.000		0.000		0.000	0.000	0.236	Continuing
Test Assets JATAS	WR	NAWCWD China Lake	3.600	0.820	Jan 2010	0.000		0.000		0.000	0.000	4.420	Continuing
ENG and Eval Govt Assault	WR	Various Various	0.000	0.202	Dec 2009	0.000		0.000		0.000	0.000	0.202	Continuing
Developmental T&E Assault	WR	NRL Washington, DC	0.000	0.000		0.000		0.000		0.000	0.000	0.000	Continuing
Test Assets Assault	WR	Various Various	0.000	0.851	Jan 2010	0.000		0.000		0.000	0.000	0.851	Continuing
		Subtotal	18.828	3.239		0.000		0.000		0.000	0.000	22.067	4.892

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy			DATE: February 2010
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Test and Evaluation ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract

Remarks

Management Services ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Contractor Eng Supt JATAS	C/CPFF	Various Various	4.219	0.600	Dec 2009	0.000		0.000		0.000	0.000	4.819	4.819
Govt Eng Supt JATAS	WR	Various Various	3.209	0.430	Dec 2009	0.000		0.000		0.000	0.000	3.639	Continuing
Program Mgmt Supt JATAS	C/CPFF	Various Various	2.756	0.750	Dec 2009	0.000		0.000		0.000	0.000	3.506	3.506
Travel JATAS	WR	NAVAIR Various	0.768	0.000		0.000		0.000		0.000	0.000	0.768	Continuing
Transportation JATAS	MIPR	DIA Redstone, AL	0.015	0.000		0.000		0.000		0.000	0.000	0.015	Continuing
Direct Support Costs JATAS	WR	Various Various	0.458	0.000		0.000		0.000		0.000	0.000	0.458	Continuing
Cost Analysis Supt JATAS	WR	NAWCAD Pax River, MD	1.005	0.300	Dec 2009	0.000		0.000		0.000	0.000	1.305	Continuing
Contracting Procure Fee JATAS	WR	NAWCAD Pax River, MD	0.048	0.000		0.000		0.000		0.000	0.000	0.048	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0604272N: *Tact Air Dir Infrared CM (TADIRCM)*	PROJECT 3040: *TADIRCM*	

Management Services ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Acquisition Program Office JATAS	WR	NAWCAD Pax River, MD	0.185	0.000		0.000		0.000		0.000	0.000	0.185	Continuing
Eng & Eval CONG HPFL Gov	WR	NSWC Crane, IN	0.095	0.000		0.000		0.000		0.000	0.000	0.095	Continuing
Eng & Eval CONG ASSAULT	MIPR	Fort Monmouth, NJ Fort Monmouth, NJ	0.326	0.000		0.000		0.000		0.000	0.000	0.326	Continuing
DAWDF Realignment	Various/ Various	FMB FMB	0.285	0.000		0.000		0.000		0.000	0.000	0.285	Continuing
Travel CONG HPFL	WR	NSWC Crane, IN	0.020	0.000		0.000		0.000		0.000	0.000	0.020	Continuing
NAWCAD Pax Support JATAS	WR	NAWCAD Pax River, MD	1.006	0.620	Dec 2009	0.000		0.000		0.000	0.000	1.626	Continuing
Contractor Eng Supt Assault	C/CPFF	Various Various	0.000	0.600	Dec 2009	0.000		0.000		0.000	0.000	0.600	0.600
Govt Eng Supt Assault	WR	Various Various	0.000	0.430	Dec 2009	0.000		0.000		0.000	0.000	0.430	Continuing
Cost Analysis Support Assault	WR	NAWCAD Pax River, MD	0.000	0.389	Dec 2009	0.000		0.000		0.000	0.000	0.389	Continuing
NAWCAD Pax Support Assault	WR	NAWCAD Pax River, MD	0.000	0.620	Dec 2009	0.000		0.000		0.000	0.000	0.620	Continuing
Program Mgmt Supt Assault	C/CPFF	Various Various	0.000	0.300	Dec 2009	0.000		0.000		0.000	0.000	0.300	0.300
		Subtotal	14.395	5.039		0.000		0.000		0.000	0.000	19.434	9.225

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0604272N: *Tact Air Dir Infrared CM (TADIRCM)*	PROJECT 3040: *TADIRCM*

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	FY 2010 Cost	FY 2010 Award Date	FY 2011 Base Cost	FY 2011 Base Award Date	FY 2011 OCO Cost	FY 2011 OCO Award Date	FY 2011 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Remarks													

	Total Prior Years Cost	FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	108.065	50.484		0.000		0.000		0.000	0.000	158.549	89.242

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0604272N: *Tact Air Dir Infrared CM (TADIRCM)*	**PROJECT** 3040: *TADIRCM*

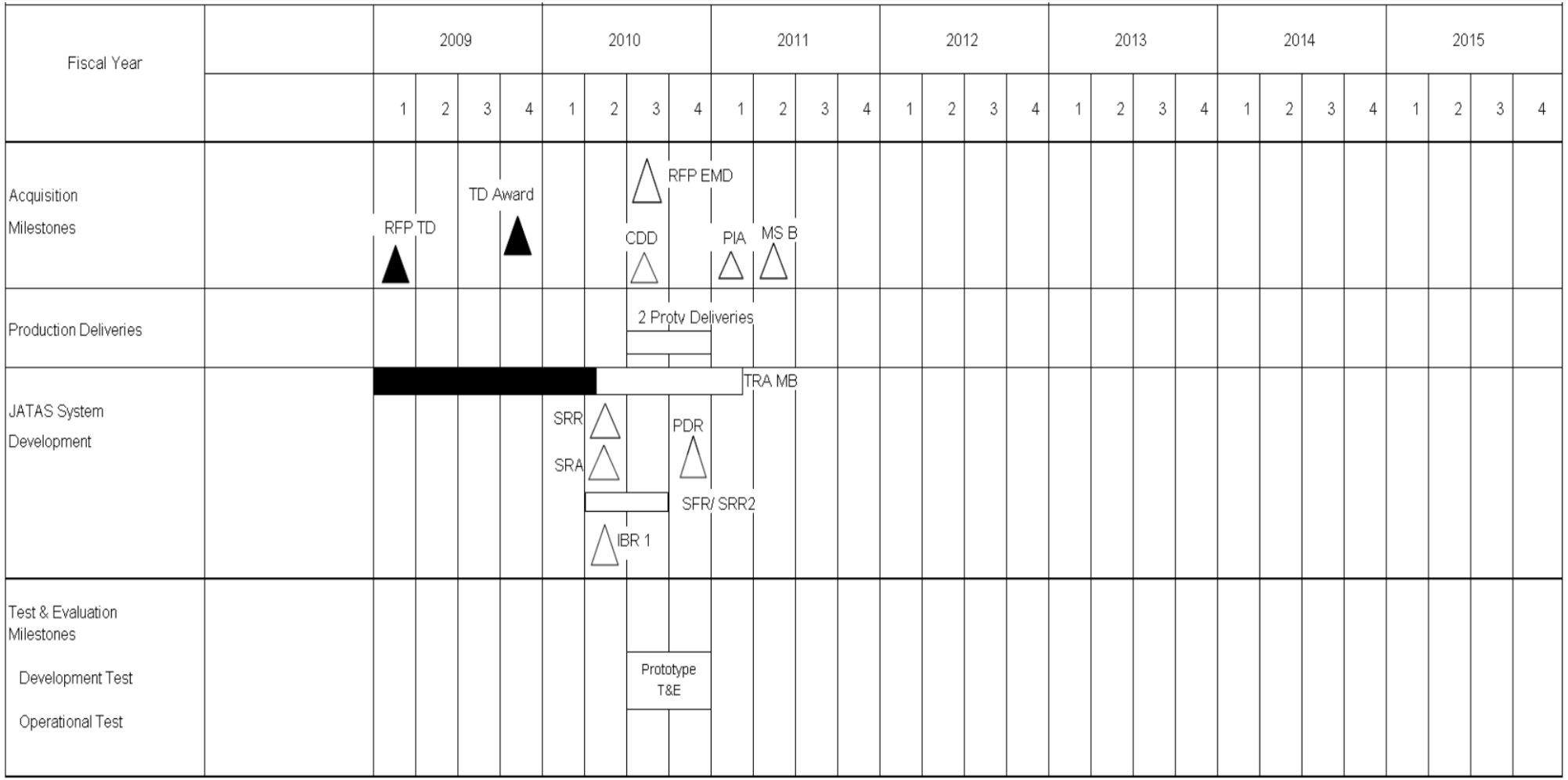

Exhibit R-4A, RDT&E Schedule Details: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0604272N: *Tact Air Dir Infrared CM (TADIRCM)*	**PROJECT** 3040: *TADIRCM*

Schedule Details

	Start		End	
Event	**Quarter**	**Year**	**Quarter**	**Year**
Technology Readiness Assessment for Milestone B (TRA MB)	1	2009	1	2011
Request for Proposal for Technology Demo (RFP for TD)	1	2009	1	2009
Technology Demonstration Award	4	2009	4	2009
System Requirements Review 1 (SRR)	2	2010	2	2010
Schedule Risk Assessment (SRA)	2	2010	2	2010
System Functional Review/System Requirements Review 2 (SFR/SRR)	2	2010	3	2010
Integrated Baseline Review 1 (IBR)	2	2010	2	2010
Prototype Delivery (2)	3	2010	4	2010
Request for Proposal for EM Development and Demonstration (RFP for EMDD)	3	2010	3	2010
Capabilities Development Document (CDD)	3	2010	3	2010
Prototyping Test and Evaluation (T&E)	3	2010	4	2010
Preliminary Design Review (PDR)	4	2010	4	2010
Platform Integration Award (PA)	1	2011	1	2011
Milestone B	2	2011	2	2011

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0604272N: *Tact Air Dir Infrared CM (TADIRCM)*	PROJECT 3166: *CH-53 DIRCM TAP*	

COST ($ in Millions)	FY 2009 Actual	FY 2010 Estimate	FY 2011 Base Estimate	FY 2011 OCO Estimate	FY 2011 Total Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
3166: *CH-53 DIRCM TAP*	3.900	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	99.147
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0		

Note

This funding was used to complete an FY 2007 Supplemetal requirement.

A. Mission Description and Budget Item Justification

This supplemental helps to accelerate the fielding of an advanced InfraRed Countermeasure (IRCM) capability for United States Navy (USN)/ United States Marine Corps (USMC) rotary wing platforms. This capability will significantly increase platform survivability against Man Portable Air Defense (MANPADs) and is required to defeat advanced threats expected to be encountered in the Global War on Terrorism (GWOT) theaters. Without this capability USN / USMC rotary wing platform will be limited in their ability to engage/complete mission in support of GWOT. This effort will entail the qualification and tests required to field an advanced IRCM capability on the CH-53E, in addition to the nonrecurring engineering costs necessary to address the limitation of the current Assault Support Equipment (ASE) Missile Warning Sensor (MWS) capability on forward deployed USN / USMC rotary wing platforms.

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
CH-53 DIRCM TAP	3.900	0.000	0.000	0.000	0.000
FY 2009 Accomplishments: This funding completed the qualification tests required to field an advanced IRCM capability on the CH-53E and the non recurring engineering costs necessary to address limitations of the current ASE MWS capability on forward deployed USN / USMC rotary wing platforms. The advanced IRCM capability requires system integration and engineering manufacturing development to existing hardware and software configuration of the CH-53 platform. Ancillary hardware development is required to support optimal utilization of IRCM detecting, tracking and targeting of the sensors and					

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0604272N: *Tact Air Dir Infrared CM (TADIRCM)*	PROJECT 3166: *CH-53 DIRCM TAP*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
lasers. Modeling and simulation will support development of software and operability testing. The MWS will be integrated on multiple forward deployed USN / USMC rotary wing platforms.					
Accomplishments/Planned Programs Subtotals	3.900	0.000	0.000	0.000	0.000

C. Other Program Funding Summary ($ in Millions)

N/A

D. Acquisition Strategy

Initial Qualification of the CH-53 DIRCM capability for operational use occurred in FY 2006 and FY 2007. Contract execution of this effort began in the 3rd quarter of FY 2007 to procure initial DIRCM test assets. Upon completion of validation the CH-53 DIRCM, the system will be identified suitable and effective for operational use.

E. Performance Metrics

Complete.

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0604272N: *Tact Air Dir Infrared CM (TADIRCM)*	PROJECT 3302: *JATAS*	

COST ($ in Millions)	FY 2009 Actual	FY 2010 Estimate	FY 2011 Base Estimate	FY 2011 OCO Estimate	FY 2011 Total Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
3302: *JATAS*	0.000	0.000	51.693	0.000	51.693	48.614	38.123	12.043	0.379	Continuing	Continuing
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0		

A. Mission Description and Budget Item Justification

The Joint and Allied Threat Awareness System (JATAS) is required to provide assault aircraft with a reliable surface-to-air IR missile/Hostile Fire Indication (HFI) threat detection system. This capability must provide accurate and timely warning in all flight regimes, ambient light conditions, clutter backgrounds and weather conditions. It must be capable of providing countermeasure cueing to flares and/or a Directional Infra-red Countermeasures (DIRCM). JATAS will enable assault Aircraft Survivability Equipment (ASE) to detect and provide countermeasure cueing to current and emerging threats. Lead Department of the Navy platform for this capability is the MV-22. Project was previously funded by the Tactical Aircraft Directed Infrared Countermeasure (TADIRCM) project unit.

New PU 3302 (JATAS) Joint and Allied Threat Awareness System was established to begin in FY11. Prior year efforts (FY08-FY10) were funded via PU 3040 (TADIRCM).

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
JATAS Technology Demonstration	0.000	0.000	4.534	0.000	4.534
Provide Technology Development phase support for Joint and Allied Threat Awareness System (JATAS). Program will provide assault aircraft with a reliable surface-to-air IR missile/Hostile Fire Indication (HFI) threat detection system. *FY 2011 Base Plans:* FY 11 Base: Complete the execution of the JATAS Technology Development phase efforts including the down select to the Engineering Manufacturing Development (EMD) vendor.					
JATAS Engineering Manufacturing Development	0.000	0.000	35.116	0.000	35.116

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0604272N: *Tact Air Dir Infrared CM (TADIRCM)*	**PROJECT** 3302: *JATAS*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
Provide Engineering and Manufacturing Development (EMD) phase support for JATAS. Program will provide assault aircraft with a reliable surface-to-air IR missile/HFI threat detection system. *FY 2011 Base Plans:* Execution of the EMD contract award to begin development of JATAS. Tasks to be completed include Integrated Baseline Review (IBR) and Critical Design Review (CDR).					
JATAS Integration Provide required platform integration support for JATAS. *FY 2011 Base Plans:* Continuation of aircraft integration efforts with the JATAS lead platform. Plan to complete A-kit Preliminary Design Review (PDR) second quarter of FY11.	0.000	0.000	12.043	0.000	12.043
Accomplishments/Planned Programs Subtotals	0.000	0.000	51.693	0.000	51.693

C. Other Program Funding Summary ($ in Millions)

N/A

D. Acquisition Strategy

OPNAV (N88) completed an Analysis of Alternatives (AoA) in March 2007 to address the need for an Assault Directed Infrared Countermeasure (DIRCM) capability for assault (rotary wing) platforms. Based on the results of the AoA, an evolutionary acquisition strategy will be used to develop an advanced Infrared Countermeasure (IRCM) capability for USN/USMC rotary wing and tilt rotor assault aircraft. This acquisition approach will consist of two program increments 1) the development, test, and fielding of a Missile Warning capability to detect surface-to-air and air-to-air Infrared (IR) threats and 2) an Assault DIRCM system to counter current and future IR threats. The DIRCM sends directed laser energy to the incoming IR threat once detected by the missile warning system. This approach will accelerate fielding of the missile warning capability while allowing Assault DIRCM technology to mature. Assault DIRCM technology maturation is required to support the size and weight constraints of USN/USMC assault platforms. The first increment of Assault DIRCM is the missile warning component designated by N88 as the Joint and Allied Threat

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0604272N: *Tact Air Dir Infrared CM (TADIRCM)*	**PROJECT** 3302: *JATAS*

Awareness System (JATAS). A JATAS Technology Development (TD) phase contract was awarded in FY09 and an Engineering Manufacturing Development (EMD) contract award is planned for FY11. JATAS Initial Operational Capability (IOC) is planned for FY14.

E. Performance Metrics

Award of JATAS EMD contract in FY11.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0604272N: *Tact Air Dir Infrared CM (TADIRCM)*	PROJECT 3302: *JATAS*

Product Development ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Primary Hdw Dev JATAS I	C/CPIF	TD TBD	0.000	0.000		8.534	Dec 2010	0.000		8.534	0.000	8.534	8.534
Primary Hdw Dev JATAS II	C/CPIF	EMD TBD	0.000	0.000		20.751	Mar 2011	0.000		20.751	56.250	77.001	77.001
Aircraft Integration JATAS I	WR	Various Various	0.000	0.000		0.000		0.000		0.000	1.200	1.200	Continuing
Aircraft Integration JATAS II	C/CPIF	Various Various	0.000	0.000		6.700	Dec 2010	0.000		6.700	9.200	15.900	15.900
Modeling/Simulation JATAS	WR	Various Various	0.000	0.000		0.800	Dec 2010	0.000		0.800	1.500	2.300	Continuing
Sys Eng Govt JATAS	WR	Various Various	0.000	0.000		1.195	Dec 2010	0.000		1.195	2.425	3.620	Continuing
		Subtotal	0.000	0.000		37.980		0.000		37.980	70.575	108.555	101.435

Remarks

Support ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Configuration Mgmt JATAS	WR	Various Various	0.000	0.000		0.200	Dec 2010	0.000		0.200	0.250	0.450	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0604272N: *Tact Air Dir Infrared CM (TADIRCM)*	PROJECT 3302: *JATAS*

Support ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Integrated Logistics JATAS I	WR	Various Various	0.000	0.000		1.600	Dec 2010	0.000		1.600	3.270	4.870	Continuing
Integrated Logistics JATAS II	C/CPFF	TSD Orlando	0.000	0.000		0.525	Jun 2011	0.000		0.525	0.600	1.125	1.125
Sw Dev JATAS	WR	NAWCWD Point Mugu	0.000	0.000		0.750	Dec 2010	0.000		0.750	1.200	1.950	Continuing
S & A NonFFRDC JATAS	Various/ Various	Various Various	0.000	0.000		0.000		0.000		0.000	2.000	2.000	Continuing
		Subtotal	0.000	0.000		3.075		0.000		3.075	7.320	10.395	1.125

Remarks

Test and Evaluation ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Developmental T&E JATAS	WR	NRL Washington, DC	0.000	0.000		1.110	Dec 2010	0.000		1.110	1.400	2.510	Continuing
Operational T&E JATAS	WR	Various Various	0.000	0.000		0.400	Jan 2011	0.000		0.400	4.200	4.600	Continuing
ENG & Eval JATAS	C/CPFF	TBD Not Specified	0.000	0.000		0.000		0.000		0.000	1.500	1.500	1.500

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0604272N: *Tact Air Dir Infrared CM (TADIRCM)*	PROJECT 3302: *JATAS*	

Test and Evaluation ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
ENG & Eval Govt JATAS	WR	Various Various	0.000	0.000		1.030	Jan 2011	0.000		1.030	2.860	3.890	Continuing
Live Fire Support JATAS	WR	Various Various	0.000	0.000		1.560	Feb 2011	0.000		1.560	1.130	2.690	Continuing
Test Assets JATAS	WR	NAWCWD China Lake	0.000	0.000		0.540	Jan 2011	0.000		0.540	1.250	1.790	Continuing
		Subtotal	0.000	0.000		4.640		0.000		4.640	12.340	16.980	1.500

Remarks

Management Services ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Contractor Eng Supt JATAS	C/CPFF	Various Various	0.000	0.000		0.726	Dec 2010	0.000		0.726	2.200	2.926	2.926
Govt Eng Supt JATAS	WR	Various Various	0.000	0.000		1.252	Dec 2010	0.000		1.252	4.075	5.327	Continuing
Program Mgmt Supt JATAS	C/CPFF	Various Various	0.000	0.000		0.750	Dec 2010	0.000		0.750	0.900	1.650	1.650
Travel JATAS	WR	NAVAIR Various	0.000	0.000		0.200		0.000		0.200	0.600	0.800	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy		DATE: February 2010
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Management Services ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Direct Support Costs JATAS	WR	Various Various	0.000	0.000		1.150	Dec 2010	0.000		1.150	1.950	3.100	Continuing
Cost Analysis Supt JATAS	WR	NAWCAD Pax River, MD	0.000	0.000		0.700	Dec 2010	0.000		0.700	2.700	3.400	Continuing
NAWCAD Pax Supt JATAS	WR	NAWCAD Pax River, MD	0.000	0.000		1.220	Dec 2010	0.000		1.220	3.845	5.065	Continuing
		Subtotal	0.000	0.000		5.998		0.000		5.998	16.270	22.268	4.576

Remarks

	Total Prior Years Cost	FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	0.000		51.693		0.000		51.693	106.505	158.198	108.636

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0604272N: *Tact Air Dir Infrared CM (TADIRCM)*	PROJECT 3302: *JATAS*

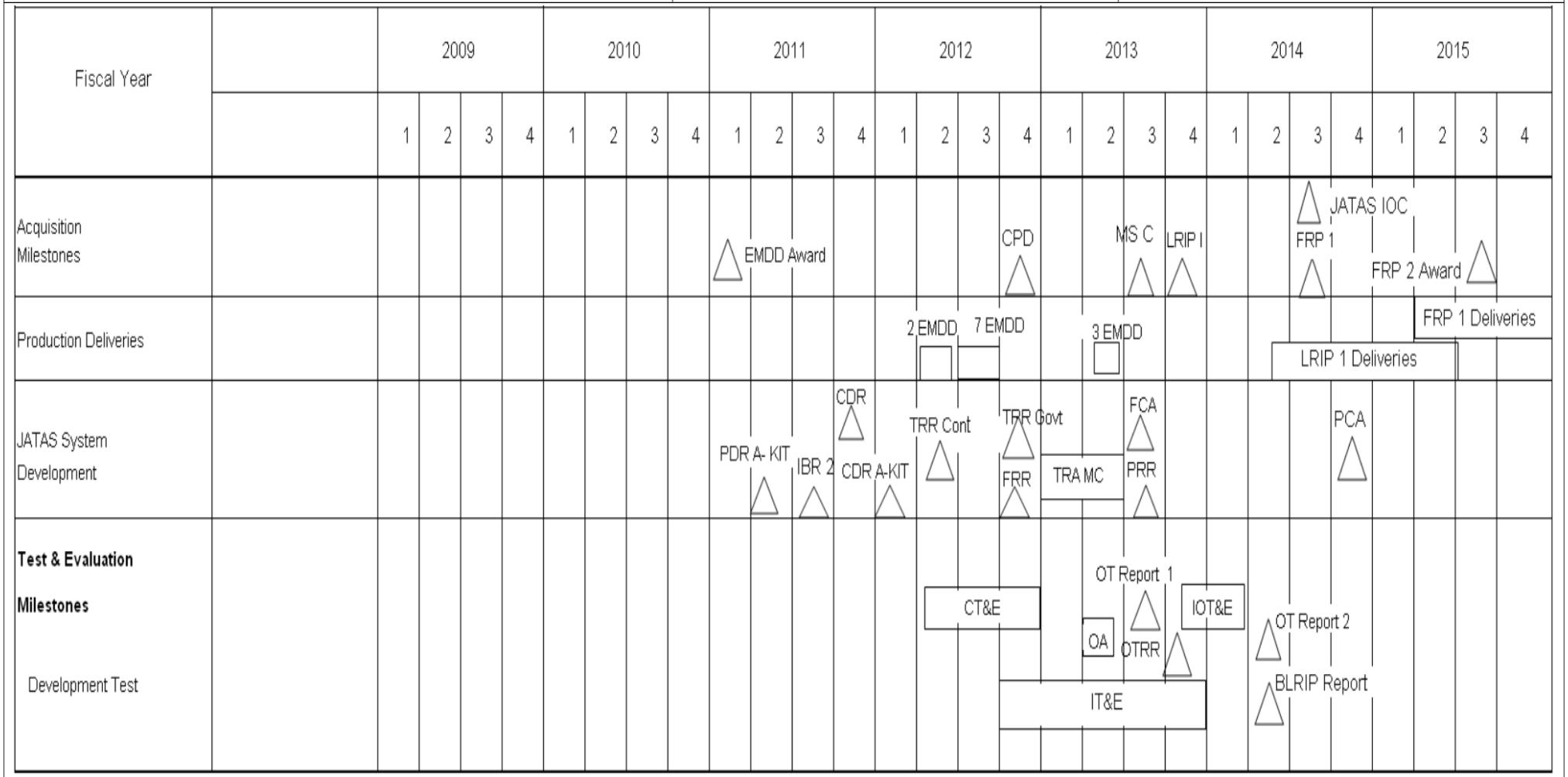

Exhibit R-4A, RDT&E Schedule Details: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0604272N: *Tact Air Dir Infrared CM (TADIRCM)*	**PROJECT** 3302: *JATAS*

Schedule Details

	Start		End	
Event	**Quarter**	**Year**	**Quarter**	**Year**
EM Development and Demonstration Award (EMDD)	1	2011	1	2011
Preliminary Design Review (PDR) - A-kit	2	2011	2	2011
Integrated Baseline Review 2 IBR	3	2011	3	2011
Critical Design Review (CDR)	4	2011	4	2011
Critical Design Review (CDR) - A-kit	1	2012	1	2012
EM Development and Demonstration (EMDD) Deliveries (2)	2	2012	2	2012
Test Readiness Review - Contractor (TRR Cont)	2	2012	2	2012
Contractor Test and Evaluation (CT+E)	2	2012	4	2012
EM Development and Demonstration (EMDD) Deliveries (7)	3	2012	3	2012
Capabilities Production Document (CPD)	4	2012	4	2012
Test Readiness Review - Government (TRR Govt)	4	2012	4	2012
Flight Readiness Review (FRR)	4	2012	4	2012
Initial Test and Evaluation (IT&E)	4	2012	4	2013
Technology Readiness Assessment for Milestone C (TRA MC)	1	2013	2	2013
EM Development and Demonstration (EMDD) Deliveries (3)	2	2013	2	2013
Operational Assessment (OA)	2	2013	2	2013
OT Report 1 (OT)	3	2013	3	2013
Functional Configuration Audit (FCA)	3	2013	3	2013

Exhibit R-4A, RDT&E Schedule Details: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0604272N: *Tact Air Dir Infrared CM (TADIRCM)*	PROJECT 3302: *JATAS*

	Start		End	
Event	Quarter	Year	Quarter	Year
Reproduction Readiness Review (PRR)	3	2013	3	2013
Milestone C	3	2013	3	2013
Operational Test Readiness Review (OTRR)	4	2013	4	2013
Low-Rate Initial Production (LRIP) I	4	2013	4	2013
Independent Operational Test and Evaluation (IOT&E)	4	2013	1	2014
OT Report 2 (OT)	2	2014	2	2014
Beyond Low-Rate Initial Production Report (BLRIP)	2	2014	2	2014
Low-Rate Initial Production Deliveries	2	2014	2	2015
Joint Allied Threat Awareness System (JATAS) Initial Operational Capability (IOC)	3	2014	3	2014
Full Rate Production (FRP) I Award	3	2014	3	2014
Physical Configuration Audit (PCA)	4	2014	4	2014
Full Rate Production (FRP) I Deliveries	2	2015	4	2015
Full Rate Production (FRP) 2 Award	3	2015	3	2015

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0604272N: *Tact Air Dir Infrared CM (TADIRCM)*	PROJECT 3304: *CIRCM*	

COST ($ in Millions)	FY 2009 Actual	FY 2010 Estimate	FY 2011 Base Estimate	FY 2011 OCO Estimate	FY 2011 Total Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
3304: *CIRCM*	0.000	0.000	0.000	0.000	0.000	0.000	4.706	30.083	42.684	Continuing	Continuing
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0		

Note

New start in FY13.

A. Mission Description and Budget Item Justification

Planned new start for FY13.

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total	FY 2012	FY 2013	FY 2014	FY 2015	Cost To Complete	Total Cost
• APN/057600: *JATAS*	0.000	0.000	0.000	0.000	0.000	0.000	28.286	19.126	41.248	1,102.100	1,190.760

D. Acquisition Strategy

N/A

E. Performance Metrics

TBD.

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0604272N: *Tact Air Dir Infrared CM (TADIRCM)*	PROJECT 9999: *Congressional Adds*	

COST ($ in Millions)	FY 2009 Actual	FY 2010 Estimate	FY 2011 Base Estimate	FY 2011 OCO Estimate	FY 2011 Total Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
9999: *Congressional Adds*	3.590	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	8.989
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0		

A. Mission Description and Budget Item Justification

FY09 Assault Directed Infrared Countermeasure Congressional Add funding was authorized for risk reduction efforts to include the incorporation of laser warning and advanced infrared missile warning in a form factor consistent with current aircraft installation hardware and to demonstrate a reduced cost Infrared Countermeasure (IRCM) solution that addresses not only surface to air and air to air missile threats but also enhanced collision avoidance and protection against the downing of aircraft by small arms and rocket propelled grenade assaults.

FY09 Compact Ultra-Fast Laser System Development Congressional Add funding was authorized for risk reduction efforts to include development and testing of High Power Fiber Laser (HPFL) and Ultra-Short Pulse Lasers (USPL) for application to airborne self-protection against surface-to-air and air-to-air missile threats consistent with current aircraft installation and hardware.

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010
Congressional Add: ASSAULT DIRECTED INFRARED COUNTERMEASURES *FY 2009 Accomplishments:* Funding was utilized for risk reduction efforts to include the incorporation of laser warning and advanced infrared missile warning in a form consistent with current aircraft installation hardware and to demonstrate a reduced cost Infrared Countermeasure (IRCM) solution that addresses not only surface to air and air to air missile threats but also enhanced collision avoidance and protection against the downing of aircraft by small arms and rocket propelled grenade assaults.	1.994	0.000
Congressional Add: Compact Ultra-Fast Laser System Development	1.596	0.000

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0604272N: *Tact Air Dir Infrared CM (TADIRCM)*	**PROJECT** 9999: *Congressional Adds*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010
FY 2009 Accomplishments: Funding was utilized for risk reduction efforts to include development and testing of High Power Fiber Laser (HPFL) and Ultra-Short Pulse Lasers (USPL) for application to airborne self-protection against surface-to-air and air-to-air missile threats consistent with current aircraft installation and hardware.		
Congressional Adds Subtotals	3.590	0.000

C. Other Program Funding Summary ($ in Millions)

N/A

D. Acquisition Strategy

N/A

E. Performance Metrics

Congressional Adds.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2011 Navy	DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0604653N: *JT Cntr Radio Controlled IED Elec War (JCREW)*

COST ($ in Millions)	FY 2009 Actual	FY 2010 Estimate	FY 2011 Base Estimate	FY 2011 OCO Estimate	FY 2011 Total Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
Total Program Element	0.000	55.611	56.542	0.000	56.542	63.653	72.807	56.917	57.647	Continuing	Continuing
3177: *Joint Counter Radio-Controlled IED Elec Warfare*	0.000	55.611	56.542	0.000	56.542	63.653	72.807	56.917	57.647	Continuing	Continuing

A. Mission Description and Budget Item Justification

Provides for the research and development of EW systems, equipment, procedures, and tactical aids for all military services against the threat posed by Radio-Controlled Improvised Explosive Devices (RCIEDs) and to prevent initiation of RCIEDs across the spectrum of Joint military operations. The Navy has been designated as DOD Executive Agent and Single Manager for Military Ground-Based Counter Radio-Controlled Improvised Explosive Warfare (CREW) Technology by DOD Directive 5101.14 of 11 June 2007, requiring RDT&E to develop capabilities that meet global joint requirements. Utilize Joint requirements to provide a system of systems approach for a suite of equipment for mounted, dismounted, and fixed site operations; provide Joint CREW development of equipment, procedures, and tactical aids to make rapid improvements to performance, supportability and affordability, while maintaining pace with a migrating global threat. This program also includes development of Electromagnetic Environment (EME) data collection and analysis equipment that provides for the research, development and integration of realistic electromagnetic environments for primary use in the development, assessment, modeling, simulation, test and evaluation of CREW systems. Funding for this effort is required for Counter-IED initiatives being transferred from the Joint IED Defeat Organization (JIEDD0) in accordance with DEPSECDEF memo of 14 August 2007 and in accordance with DOD Directive 2000.19E.

*Prior to FY10, the Joint Counter Radio Controlled IED Electronic Warfare program was part of PE 0603654N.

Exhibit R-2, RDT&E Budget Item Justification: PB 2011 Navy	DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0604653N: *JT Cntr Radio Controlled IED Elec War (JCREW)*

B. Program Change Summary ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
Previous President's Budget	0.000	67.843	0.000	0.000	0.000
Current President's Budget	0.000	55.611	56.542	0.000	56.542
Total Adjustments	0.000	-12.232	56.542	0.000	56.542
• Congressional General Reductions		-0.232			
• Congressional Directed Reductions		-12.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds		0.000			
• Congressional Directed Transfers		0.000			
• Reprogrammings	0.000	0.000			
• SBIR/STTR Transfer	0.000	0.000			
• Program Adjustments	0.000	0.000	56.542	0.000	56.542
• Rate/Misc Adjustments	0.000	0.000	0.000	0.000	0.000

Change Summary Explanation

Technical: Not applicable.

Schedule: Not applicable.

FY11 from previous President's Budget is shown as zero because no FY11-15 data was presented in President's Budget 2010.

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0604653N: *JT Cntr Radio Controlled IED Elec War (JCREW)*	PROJECT 3177: *Joint Counter Radio-Controlled IED Elec Warfare*	

COST ($ in Millions)	FY 2009 Actual	FY 2010 Estimate	FY 2011 Base Estimate	FY 2011 OCO Estimate	FY 2011 Total Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
3177: *Joint Counter Radio-Controlled IED Elec Warfare*	0.000	55.611	56.542	0.000	56.542	63.653	72.807	56.917	57.647	Continuing	Continuing
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0		

A. Mission Description and Budget Item Justification

Provides for the research and development of EW systems, equipment, procedures, and tactical aids for all military services against the threat posed by Radio-Controlled Improvised Explosive Devices (RCIEDs) and to prevent initiation of RCIEDs across the spectrum of Joint military operations. The Navy has been designated as DOD Executive Agent and Single Manager for Military Ground-Based Counter Radio-Controlled Improvised Explosive Warfare (CREW) Technology by DOD Directive 5101.14 of 11 June 2007, requiring RDT&E to develop capabilities that meet global joint requirements. Utilize Joint requirements to provide a system of systems approach for a suite of equipment for mounted, dismounted, and fixed site operations; provide Joint CREW development of equipment, procedures, and tactical aids to make rapid improvements to performance, supportability and affordability, while maintaining pace with a migrating global threat. This program also includes development of Electromagnetic Environment (EME) data collection and analysis equipment that provides for the research, development and integration of realistic electromagnetic environments for primary use in the development, assessment, modeling, simulation, test and evaluation of CREW systems. Funding for this effort is required for Counter-IED initiatives being transferred from the Joint IED Defeat Organization (JIEDDO) in accordance with DEPSECDEF memo of 14 August 2007 and in accordance with DOD Directive 2000.19E.

*Prior to FY10, the Joint Counter Radio Controlled IED Electronic Warfare program was part of PE 0603654N.

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
Joint Counter Radio-Controlled IED Elec Warfare	0.000	55.611	56.542	0.000	56.542
Defines the effort required for the design, engineering, development, fabrication and test of contractor's development models for in-house verification and validation for governmental developmental testing for JCREW System of Systems (SoS) to include the System Development and Demonstration (SD&D) Phase. The JCREW SoS approach includes three distinct capabilities that shall be developed and will					

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0604653N: *JT Cntr Radio Controlled IED Elec War (JCREW)*	PROJECT 3177: *Joint Counter Radio-Controlled IED Elec Warfare*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
utilize common component, software, and hardware solutions for an open, flexible, and compatible system design approach that is modular. These capabilities are: mobile dismounted operations, mobile ground, and waterborne transport and combat systems (mounted) and semi-permanent geographical area (fixed) systems. All capabilities will have coalition sharing capabilities. Multiple awards will be made for all capabilities. *FY 2010 Plans:* Provides for development, testing, and evaluation of Joint CREW modeling and simulation efforts and upgrades to Joint CREW tactical decision aids. *FY 2011 Base Plans:* Provides for development, testing, and evaluation of Joint CREW modeling and simulation efforts and upgrades to Joint CREW tactical decision aids.					
Accomplishments/Planned Programs Subtotals	0.000	55.611	56.542	0.000	56.542

C. Other Program Funding Summary ($ in Millions)

N/A

D. Acquisition Strategy

Analysis of Alternatives (AOA) studies are always conducted prior to the initiation of new subprojects. The AOA addresses and emphasizes acquisition strategies of the most cost effective solution over subprojects' life-cycle. At significant decision points, the AOA will be re-validated or updated to reflect changes in technology and threat. The acquisition strategies observe the following hierarchy of alternatives: commercial item (including modification), non-developmental item (including modification), and lastly, developmental programs. Contracting for RDT&E, if required, is always competitive and when feasible, production options are included. Procurements across the services may be combined to gain quantity discounts.

E. Performance Metrics

Gate 6 Milestone B complete 10 Jul 2009; Contract for preliminary design review awarded 01 Oct 2009; Milestone C anticipated in Q4 FY11.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0604653N: *JT Cntr Radio Controlled IED Elec War (JCREW)*	PROJECT 3177: *Joint Counter Radio-Controlled IED Elec Warfare*

Product Development ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Primary Hardware Development	C/TBD	TBD TBD	0.000	7.540	May 2010	2.450	Nov 2010	0.000		2.450	0.000	9.990	Continuing
Software Development	C/TBD	TBD TBD	0.000	8.328	May 2010	7.650	Nov 2010	0.000		7.650	0.000	15.978	Continuing
Systems Engineering	C/TBD	Various Various	0.000	6.890	Jan 2010	6.410	Oct 2010	0.000		6.410	0.000	13.300	Continuing
ILS	C/TBD	Various Various	0.000	1.960	Jan 2010	2.450	Oct 2010	0.000		2.450	0.000	4.410	Continuing
System Integration	C/TBD	Various Various	0.000	2.700	Jan 2010	2.830	Oct 2010	0.000		2.830	0.000	5.530	Continuing
Loadset Development	C/TBD	Various Various	0.000	3.630	Jan 2010	5.520	Oct 2010	0.000		5.520	0.000	9.150	Continuing
		Subtotal	0.000	31.048		27.310		0.000		27.310	0.000	58.358	

Remarks

Support ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Support	C/TBD	Various Various	0.000	5.620	Jan 2010	2.090	Oct 2010	0.000		2.090	0.000	7.710	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0604653N: *JT Cntr Radio Controlled IED Elec War (JCREW)*	PROJECT 3177: *Joint Counter Radio-Controlled IED Elec Warfare*

Support ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Training Development	C/TBD	Various Various	0.000	0.880	Jan 2010	0.490	Oct 2010	0.000		0.490	0.000	1.370	Continuing
Integrated Logistics Support	C/TBD	Various Various	0.000	0.500	Jan 2010	0.500	Oct 2010	0.000		0.500	0.000	1.000	Continuing
Configuration Management	C/TBD	Various Various	0.000	0.980	Jan 2010	1.220	Oct 2010	0.000		1.220	0.000	2.200	Continuing
Technical Data	C/TBD	Various Various	0.000	0.000	Jan 2010	4.060	Oct 2010	0.000		4.060	0.000	4.060	Continuing
		Subtotal	0.000	7.980		8.360		0.000		8.360	0.000	16.340	

Remarks

Test and Evaluation ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Development Test & Evaluation	C/TBD	Various Various	0.000	9.230	Jan 2010	6.930	Oct 2010	0.000		6.930	0.000	16.160	Continuing
Operational Test & Evaluation	C/TBD	Various Various	0.000	1.890	Jan 2010	5.810	Oct 2010	0.000		5.810	0.000	7.700	Continuing
		Subtotal	0.000	11.120		12.740		0.000		12.740	0.000	23.860	

Remarks

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0604653N: *JT Cntr Radio Controlled IED Elec War (JCREW)*	PROJECT 3177: *Joint Counter Radio-Controlled IED Elec Warfare*

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	FY 2010 Cost	FY 2010 Award Date	FY 2011 Base Cost	FY 2011 Base Award Date	FY 2011 OCO Cost	FY 2011 OCO Award Date	FY 2011 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Support	C/TBD	Various Various	0.000	4.830	Jan 2010	4.890		0.000		4.890	0.000	9.720	Continuing
Miscellaneous	C/TBD	Various Various	0.000	0.633	Jan 2010	3.242		0.000		3.242	0.000	3.875	Continuing
		Subtotal	0.000	5.463		8.132		0.000		8.132	0.000	13.595	

Remarks

	Total Prior Years Cost	FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	55.611		56.542		0.000		56.542	0.000	112.153	

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0604653N: *JT Cntr Radio Controlled IED Elec War (JCREW)*	**PROJECT** 3177: *Joint Counter Radio-Controlled IED Elec Warfare*

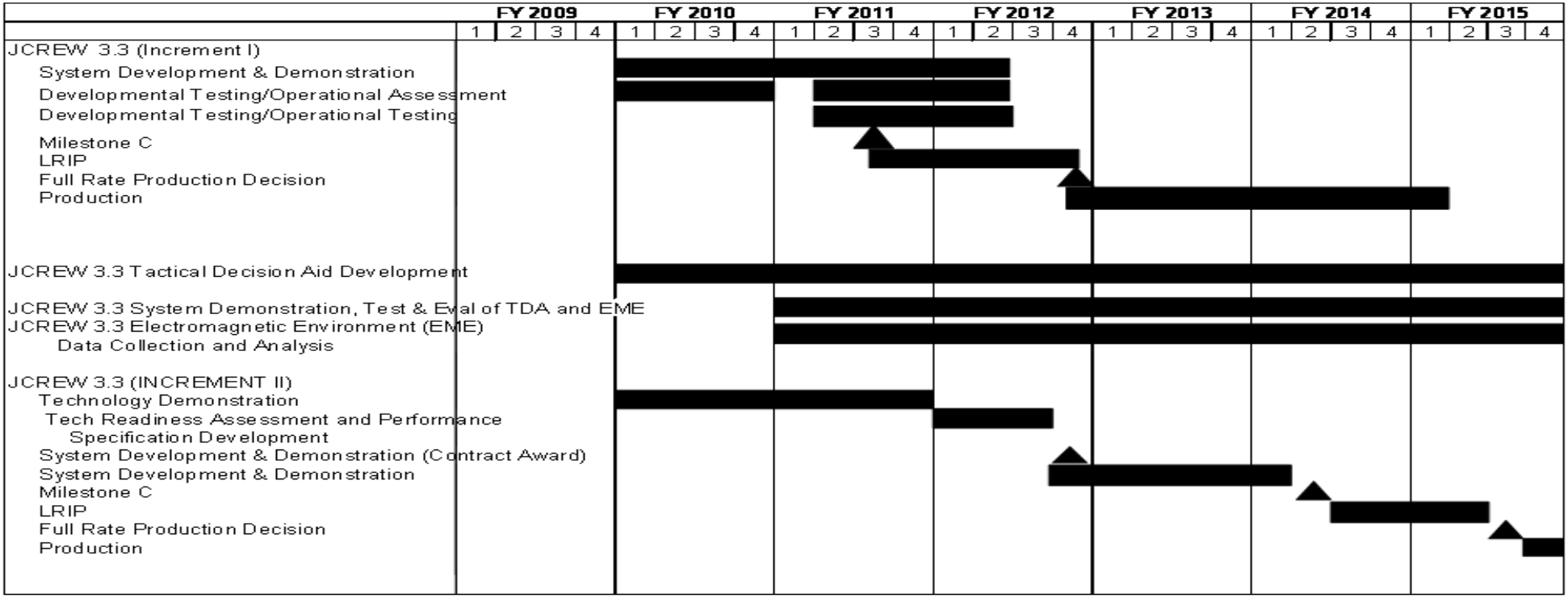


Exhibit R-4A, RDT&E Schedule Details: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0604653N: *JT Cntr Radio Controlled IED Elec War (JCREW)*	**PROJECT** 3177: *Joint Counter Radio-Controlled IED Elec Warfare*

Schedule Details

	Start		End	
Event	**Quarter**	**Year**	**Quarter**	**Year**
JCREW 3.3 (Increment I)	1	2009	1	2009
System Development & Demonstration (Increment I)	1	2010	2	2012
Developmental Testing/Operational Assessment	1	2010	2	2012
Developmental Testing/Operational Testing	2	2011	2	2012
Milestone C (Increment I)	3	2011	3	2011
LRIP (Increment I)	3	2011	4	2012
Full Rate Production Decision (Increment I)	4	2012	4	2012
Production (Increment I)	4	2012	1	2015
JCREW 3.3 Tactical Decision Aid Development	1	2010	4	2015
JCREW 3.3 System Demonstration, Test and Eval of TDA and EME	1	2011	4	2015
JCREW 3.3 Electromagnetic Environment (EME) Data Collection and Analysis	1	2011	4	2015
JCREW 3.3 (Increment II)	1	2009	1	2009
Technology Demonstration	1	2010	4	2011
Tech Readiness Assessment and Performance Specification Development	1	2012	3	2012
System Development & Demonstration (Contract Award)	4	2012	4	2012
System Development & Demonstration (Increment II)	4	2012	1	2014
Milestone C (Increment II)	2	2014	2	2014
LRIP (Increment II)	3	2014	2	2015

Exhibit R-4A, RDT&E Schedule Details: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0604653N: *JT Cntr Radio Controlled IED Elec War (JCREW)*	**PROJECT** 3177: *Joint Counter Radio-Controlled IED Elec Warfare*

	Start		End	
Event	**Quarter**	**Year**	**Quarter**	**Year**
Full Rate Production Decision (Increment II)	3	2015	3	2015
Production (Increment II)	4	2015	4	2015

Exhibit R-2, RDT&E Budget Item Justification: PB 2011 Navy	DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0604659N: *Precison Strike Weapons Development Program*

COST ($ in Millions)	FY 2009 Actual	FY 2010 Estimate	FY 2011 Base Estimate	FY 2011 OCO Estimate	FY 2011 Total Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
Total Program Element	0.000	40.757	25.121	0.000	25.121	28.791	12.441	0.000	0.000	0.000	107.110
3214: *Fuze Development Program*	0.000	28.392	25.121	0.000	25.121	28.791	12.441	0.000	0.000	0.000	94.745
3215: *Strike Weapons Technology Demonstrations*	0.000	12.365	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	12.365

Note

This PE begins in FY2010 and includes the new start effort FMU-164 Fuze under Project 3214. The Hard Target Void Sensing Fuze effort under Project 3214 is not a new start and was funded under PE 0604329N, Project 3072 Small Diameter Bomb II. Strike Weapons Technology Demonstration (SWTD) Project 3215 is not a new start and was formerly funded under PE 0604329N, Project 3072 Small Diameter Bomb II.

A. Mission Description and Budget Item Justification

The Precision Strike Weapons Development program provides for initial and continuing development of strike weapons consisting of armament, munitions, and weapon subsystems to allow for the horizontal integration among current and future weapon system capabilities. This program will also provide the Navy with the opportunity to improve upon the accuracy, lethality, interoperability, and overall effectiveness of current and future precision strike weapons.

B. Program Change Summary ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
Previous President's Budget	0.000	40.926	0.000	0.000	0.000
Current President's Budget	0.000	40.757	25.121	0.000	25.121
Total Adjustments	0.000	-0.169	25.121	0.000	25.121
• Congressional General Reductions		-0.169			
• Congressional Directed Reductions		0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds		0.000			
• Congressional Directed Transfers		0.000			
• Reprogrammings	0.000	0.000			
• SBIR/STTR Transfer	0.000	0.000			
• Program Adjustments	0.000	0.000	25.121	0.000	25.121

Exhibit R-2, RDT&E Budget Item Justification: PB 2011 Navy	DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0604659N: *Precison Strike Weapons Development Program*

Change Summary Explanation

Technical: Not applicable.

Schedule: The revised acquisition strategy (AS) was approved by PEO(U&W) on 16 DEC 2009. The impacts to the original AS schedule included the Material Development Decision to enter the Program into the Technology Development phase instead of at Milestone B as was the decision of the original AS. The change of the Program's initiation point moved the Milestone B decision from the first quarter of FY 10 to the first quarter of FY 13. The change also moved the planned contract award from the second quarter of FY 10 to the first quarter of FY 11.

The integration requirements including preparations for pilot/platform interface updates, JDAM Block 09 S/W update, GBU-24/FZU-48 flight certification, GBU-31/FZU-48 flight certification will start prior to contract award to provide risk reduction to the program. The BLU-109 Bomb (inerts) are required to support FMU-164 RDT&E requirements.

FY11 from previous President's Budget is shown as zero because no FY11-15 data was presented in President's Budget 2010.

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0604659N: *Precison Strike Weapons Development Program*	PROJECT 3214: *Fuze Development Program*	

COST ($ in Millions)	FY 2009 Actual	FY 2010 Estimate	FY 2011 Base Estimate	FY 2011 OCO Estimate	FY 2011 Total Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
3214: *Fuze Development Program*	0.000	28.392	25.121	0.000	25.121	28.791	12.441	0.000	0.000	0.000	94.745
Quantity of RDT&E Articles	0	0	517	0	517	0	0	0	0		

A. Mission Description and Budget Item Justification

The Precision Strike Weapons Development program provides for initial and continuing development of strike weapons consisting of armament, munitions, and weapon subsystems to allow for the horizontal integration among current and future weapon system capabilities. This program will also provide the Navy with the opportunity to improve upon the accuracy, lethality, interoperability, and overall effectiveness of current and future precision strike weapons.

The current funding profile provides funding for the FMU-164/Bomb Fuze and the Hard Target Void Sensing Fuze (HTVSF) . The Engineering and Manufacturing Development (EMD) of the FMU-164/B Bomb Fuze is intended to upgrade and expand the capabilities of the Navy's bomb fuze inventory. The FMU-164/B Bomb Fuze provides the Warfighter with next-generation bomb fuze capability including a Serial Data Interface (SDI), which provides additional in-flight cockpit selectable fuze arm/functional delay times and provides increased reliability. The FMU-164/B is used to initiate General Purpose (GP), penetrator, Joint Direct Attack Munition (JDAM), and Laser Guided Bomb (LGB) weapons. The FMU-164/B will reduce the Navy fuze footprint by combining capabilities of the existing FMU-139C/B an FMU-143 fuze. The HTVSF meets a capability gap requirement for harder, deeper and more complex targets. The HTVSF will provide in-flight cockpit reprogramming with fuze time delay options and void sensing providing aircrew the ability to detonate penetrating bombs at various levels within multi-story complex target facilities. The HTVSF will be used only with BLU-109 JDAMs.

Note: First article quantity includes FMU-164/B (FY11-Quantity 512 & FY12-Quantity 1130) and Hard Target Void Sensing Fuze (FY11-Quantity 5 & FY 12- Quantity 40)

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
FMU-164/B Primary Hardware Development	0.000	24.892	17.051	0.000	17.051
The FMU-164/B funding develops the a bomb fuze to replace the FMU-139 and FMU-143 legacy bomb. The vendor's efforts include providing platform integration support.					

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0604659N: *Precison Strike Weapons Development Program*	PROJECT 3214: *Fuze Development Program*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
FY 2010 Plans: Commence FMU-164/B requirement development, logical analysis and System Engineering Technical Reviews (SETR) leading up to MS B approval, Preliminary Design Review (PDR). Commence aircraft integration and ancillary hardware development including H8E, H6.1, 25X and JDAM software updates. *FY 2011 Base Plans:* Commence FMU-164/B design confidence testing including explosive train reliability, insensitive munition, hazard classification, electro-magnetic environment, product oriented packaging and target penetration (sled) tests. These tests will be conducted to gather design information. RDT&E test units are consumed during testing by the contractor.					
FMU-164/B Design Qualification The FMU-164/B funding will be used to qualify Fuze to weapon and Fuze to aircraft interfaces. *FY 2011 Base Plans:* Continue FMU-164/B design development and testing of the electrical firing circuit and serial data interface. The cockpit selectability Key Performance Parameter (KPP) will be tested using Software - In-the-Loop (SIL) prototypes with F/A-18 Operational Flight Program (OFP) and JDAM tail kits.	0.000	0.000	2.570	0.000	2.570
Hard Target Void Sensing Fuze (HTVSF) Hardware Development The Hard Target Void Sensing Fuze hardware development funding will be used to qualify the fuze booster as part of the BLU-109 explosive train and begin F/A-18 EF software OFP development. *FY 2010 Plans:* Continue Hard Target Void Sensing Fuze hardware development, modeling & simulation and target construction. This phase includes initial F/A-18 EF OFP software development explosive train qualification test.	0.000	3.500	5.500	0.000	5.500

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0604659N: *Precison Strike Weapons Development Program*	PROJECT 3214: *Fuze Development Program*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
FY 2011 Base Plans: Funding is for F/A-18 OFP development, buy sled and flight test hardware and execute tests.					
Accomplishments/Planned Programs Subtotals	0.000	28.392	25.121	0.000	25.121

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total	FY 2012	FY 2013	FY 2014	FY 2015	Cost To Complete	Total Cost
• PAN&MC/014500: *General Purpose Bombs HTVSF/FMU-164*	0.000	0.000	0.000	0.000	0.000	0.000	2.000	4.300	4.300	526.448	537.048
• Proc/PE 020803: *USAF*	0.000	0.000	0.000	0.000	0.000	0.000	18.800	37.500	38.500	0.000	94.800
• RDTE/ PE 064602F: *(JCTD) Air Force*	0.000	10.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	10.000
• RDTE/ PE 064635F: *Air Force (SDD)*	0.000	18.800	33.400	0.000	33.400	27.900	5.400	0.000	0.000	0.000	85.500

D. Acquisition Strategy

The FMU-164/B will provide a capability upgrade to the existing FMU-139 and FMU-143 Bomb Fuzes. The capability upgrades include in-flight cockpit selectability via a Serial Data Interface and increased reliability. The FMU-164/B will also be Insensitive Munition compliant. Program plan consists of Engineering & Manufacturing Development (EMD) in FY13 followed by Low Rate Initial Production (LRIP) in FY16 and Full Rate Production (FRP) in FY17.

The Hard Target Void Sensing Fuze Joint Capabilities Technology Demonstration (JCTD) is considered a risk reduction effort and was funded in PE0604329N, PU 3072, Small Diameter Bomb II. The JCTD supports 2 competitively selected sources for development and testing of initial prototyping. Following the JCTD, a down select to a single source will occur and enter into a EMD effort followed by LRIP in FY13 and FRP in FY14.

E. Performance Metrics

Successfully complete milestones: Enter MS B (EMD), System Functional Review (SFR), Preliminary Design Review (PDR), and Critical Design Review (CDR).

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0604659N: *Precison Strike Weapons Development Program*	PROJECT 3214: *Fuze Development Program*

Product Development ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Primary Hardware Development1	C/CPIF	TBD TBD	0.000	3.500	Apr 2010	1.200	Feb 2011	0.000		1.200	0.000	4.700	4.700
Primary Hardware Development2	C/CPIF	TBD TBD	0.000	0.000		13.636	Feb 2011	0.000		13.636	89.152	102.788	102.788
		Subtotal	0.000	3.500		14.836		0.000		14.836	89.152	107.488	107.488

Remarks

Changes are based on updated FMU-164 schedule change

Support ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Software Development	WR	NAWC WD China Lake	0.000	2.514	Feb 2010	3.800	Dec 2010	0.000		3.800	5.152	11.466	Continuing
Software Development	MIPR	Air Force Eglin AFB FL	0.000	0.500	Feb 2010	0.000		0.000		0.000	0.000	0.500	Continuing
Integrated Logistic Support	WR	Various Various	0.000	0.000		0.100		0.000		0.100	0.400	0.500	Continuing
Configuration Management	WR	Various Various	0.000	1.882	Feb 2010	1.300	Nov 2010	0.000		1.300	1.050	4.232	Continuing
		Subtotal	0.000	4.896		5.200		0.000		5.200	6.602	16.698	

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0604659N: *Precison Strike Weapons Development Program*	PROJECT 3214: *Fuze Development Program*

Support ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract

Remarks

Changes are based on updated FMU-164 schedule change

Test and Evaluation ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Development Flight Certification	WR	NAWC AD Patuxent River, MD	0.000	6.500	Apr 2010	1.225	Dec 2010	0.000		1.225	0.300	8.025	Continuing
Operational Test & Evaluation	WR	NAWC WD China Lake	0.000	0.000		0.000		0.000		0.000	0.900	0.900	Continuing
Test Assets	MIPR	JMC Moline, IL	0.000	5.934	Mar 2010	0.000		0.000		0.000	0.000	5.934	Continuing
Test Assets	C/CPIF	Boeing St.Louis MO	0.000	1.500	Apr 2010	0.000		0.000		0.000	0.318	1.818	1.818
		Subtotal	0.000	13.934		1.225		0.000		1.225	1.518	16.677	1.818

Remarks

Changes are based on updated FMU-164 schedule change and BLU-109 Bomb (inerts) required to support FMU-164 RDT&E requirements.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0604659N: *Precison Strike Weapons Development Program*	PROJECT 3214: *Fuze Development Program*

Management Services ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Government Engineering Support	WR	NAWC AD Patuxent River, MD	0.000	3.100	Mar 2010	1.100	Nov 2010	0.000		1.100	0.861	5.061	Continuing
Government Engineering Support	WR	NAWC WD China Lake, CA	0.000	2.382	Feb 2010	1.900	Nov 2010	0.000		1.900	3.305	7.587	Continuing
Program Management Support	C/FP	Various Various	0.000	0.500	Feb 2010	0.700	Dec 2010	0.000		0.700	1.200	2.400	2.400
Travel	Allot	NAWC AD Patuxent River, MD	0.000	0.080	Feb 2010	0.160	Oct 2010	0.000		0.160	0.100	0.340	Continuing
		Subtotal	0.000	6.062		3.860		0.000		3.860	5.466	15.388	2.400

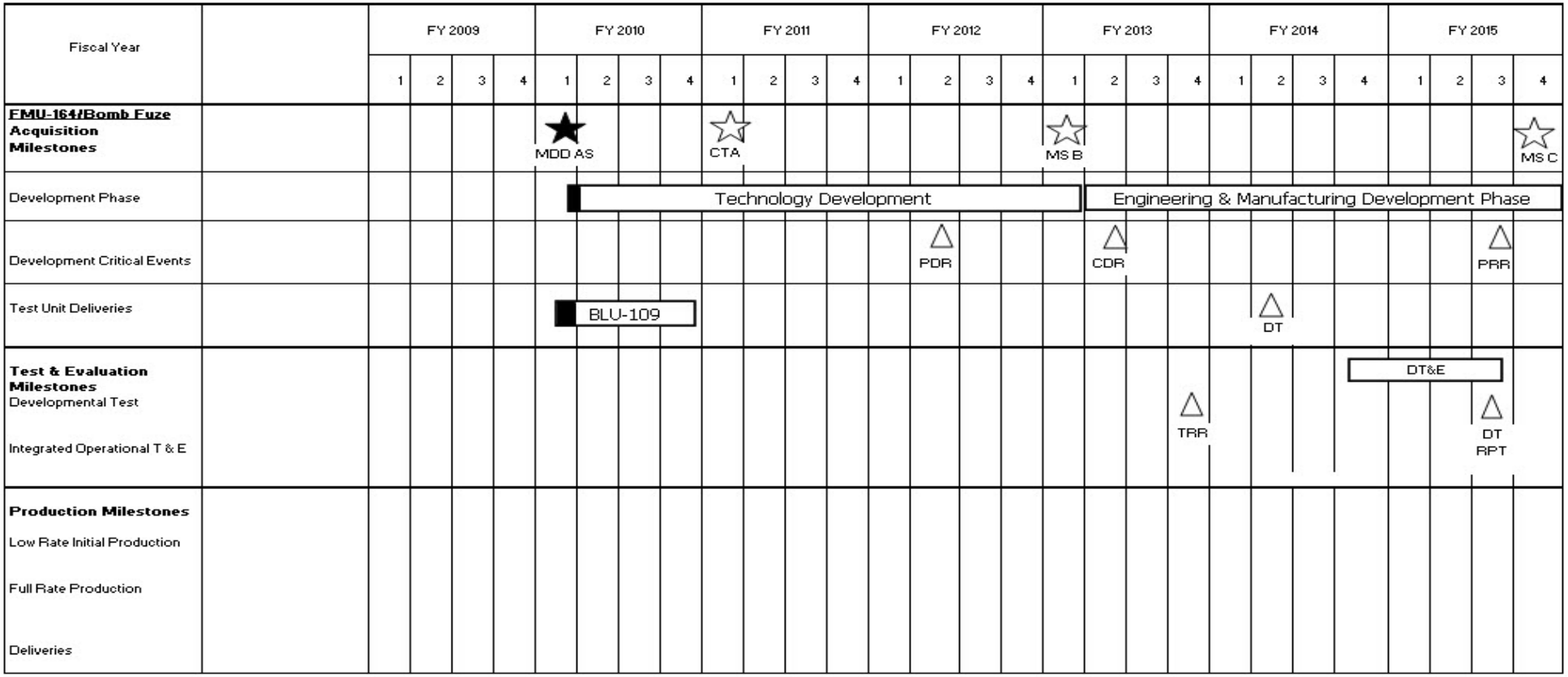
Remarks

Changes are based on updated FMU-164 schedule change

	Total Prior Years Cost	FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	28.392		25.121		0.000		25.121	102.738	156.251	111.706

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0604659N: *Precison Strike Weapons Development Program*	**PROJECT** 3214: *Fuze Development Program*



* LRIP 1st Q FY17
* FRPD 1st Q FY17
* IOC 2nd Q FY17

Exhibit R-4, RDT&E Schedule Profile: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0604659N: *Precison Strike Weapons Development Program*	PROJECT 3214: *Fuze Development Program*

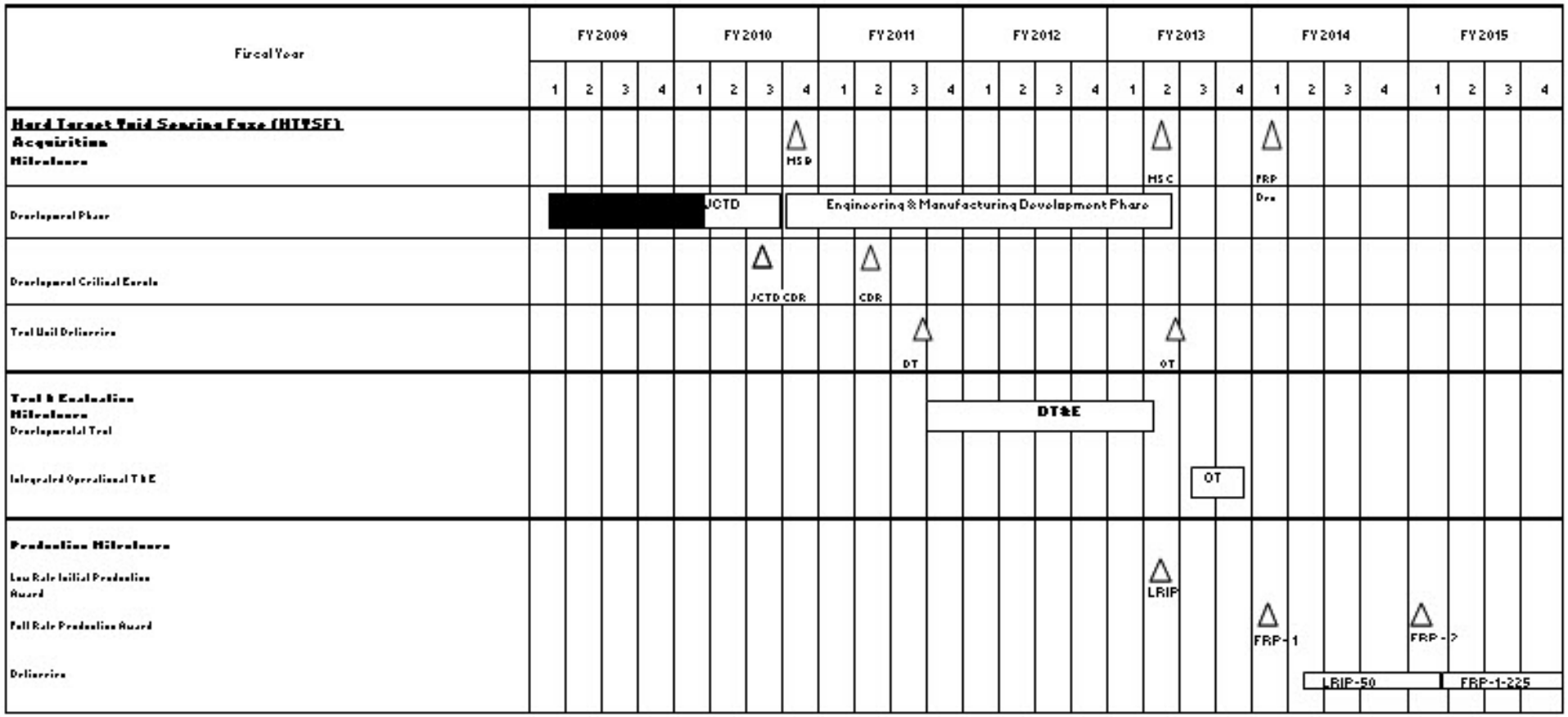


Exhibit R-4A, RDT&E Schedule Details: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0604659N: *Precison Strike Weapons Development Program*	**PROJECT** 3214: *Fuze Development Program*

Schedule Details

	Start		End	
Event	**Quarter**	**Year**	**Quarter**	**Year**
Hard Target Void Sensing Fuze (HTVSF)	1	2010	4	2015
-- Joint Capability Technology Demonstration (JCTD)	1	2009	3	2010
-- JCTD CDR	3	2010	3	2010
-- Milestone B (MS B)	4	2010	4	2010
-- Engineering, Manufacturing, and Development Phase (EM&D)	4	2010	2	2013
-- Critical Design Review (CDR)	2	2011	2	2011
-- Test Unit Deliveries DT	3	2011	3	2011
-- Developmental Test and Evaluation (DT&E)	4	2011	2	2013
-- Milestone C (MS C)	2	2013	2	2013
-- Test Unit Deliveries OT	2	2013	2	2013
-- Low-Rate Initial Production (LRIP)	2	2013	2	2013
-- Operational Test (OT)	3	2013	4	2013
-- Full Rate Production (FRP)	1	2014	1	2014
-- Full Rate Production (FRP-1)	1	2014	1	2014
-- Full Rate Production (FRP-2)	1	2015	1	2015
-- LRIP Delivery	2	2014	1	2015
-- FRP-1 Delivery	1	2015	4	2015
FMU-164/Bomb Fuze	1	2010	4	2015

Exhibit R-4A, RDT&E Schedule Details: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0604659N: *Precison Strike Weapons Development Program*	PROJECT 3214: *Fuze Development Program*

	Start		End	
Event	Quarter	Year	Quarter	Year
-- FMU-164 Materiel Development Decision (MDD)	1	2010	1	2010
-- FMU-164 Technology Development Contract Award (CTA)	1	2011	1	2011
-- FMU-164 BLU-109 Test Unit Deliveries	1	2010	4	2010
-- FMU-164 Preliminary Design Review (PDR)	2	2012	2	2012
-- FMU-164 Milestone B (MS B)	1	2013	1	2013
-- FMU-164 Engineering, Manufacturing, and Development Phase (EM&D)	2	2013	4	2015
-- FMU-164 Critical Design Review (CDR)	2	2013	2	2013
-- FMU-164 Technical Readiness Review (TRR)	4	2013	4	2013
-- FMU-164 Developmental Test	2	2014	2	2014
-- FMU-164 Development Test Evaluation (DT&E)	4	2014	3	2015
-- FMU-164 Developmental Test Report	3	2015	3	2015
-- FMU-164 Preproduction Readiness Review (PRR)	3	2015	3	2015
-- FMU-164 Milestone C (MS C)	4	2015	4	2015

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0604659N: *Precison Strike Weapons Development Program*	PROJECT 3215: *Strike Weapons Technology Demonstrations*	

COST ($ in Millions)	FY 2009 Actual	FY 2010 Estimate	FY 2011 Base Estimate	FY 2011 OCO Estimate	FY 2011 Total Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
3215: *Strike Weapons Technology Demonstrations*	0.000	12.365	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	12.365
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0		

A. Mission Description and Budget Item Justification

The overall intent of the Strike Weapons Technology Demonstrations (SWTD) is to demonstrate, operationally assess, rapidly deploy, and transition capability solutions and innovative concepts to address the joint, coalition and interagency operational gaps and shortfalls. The Combatant Commands drive SWTDs through their stated operational priorities and needs, which are applied to an agile acquisition process that yields results years ahead of traditional material development cycles.

The SWTD will demonstrate robust, end-to-end kill chains to engage enemy surface combatants. Intelligence Surveillance and Reconnaissance (ISR) platforms will include the USAF E-8 Joint Surveillance Targeting Attack Radar System (JSTARS) and the USN P-3 Littoral Surveillance Radar System (LSRS). The launch platform will be the F/A-18E/F Super Hornet. Weapons will include the AGM-154C Joint Stand-off Weapon (JSOW-C-1), and the AGM-84K Stand-off Land Attack Missile-Expanded Response (SLAM-ER). In the case of the SLAM-ER, the FA-18 will translate ISR Link-16 targeting information and transmit that information to the SLAM-ER with J3.3/J3.5 messages via the AWW-13 pod. The focus will be on in-flight targeting messages going directly from the ISR platforms to the weapons themselves.

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
Strike Weapons Technology Demonstrations	0.000	12.365	0.000	0.000	0.000
FY 2010 Plans: FY10-The SWTD will exploit the success of the Weapons Data Link Network (WDLN) Advanced Concept Technology Demonstration (ACTD) and its networking protocols by integrating the WDLN messages into Intelligence Surveillance and Reconnaissance platforms in accordance with MIL-STD-6016C; the launch platform and weapons will integrate the messages as part of their programs of record. Platform modifications will be centered around the integration of the WDLN messages (hereafter referred to as the Net-Enabled Weapon (NEW) messages) into aircraft mission computers					

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0604659N: *Precison Strike Weapons Development Program*	PROJECT 3215: *Strike Weapons Technology Demonstrations*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
to transmit and receive joint targeting data. Weapon modifications (outside of JSuW SWTD funding but included as part of the capability) include the avionics changes necessary to transmit and receive the WDLN message set to enable targeting of surface ships.					
Accomplishments/Planned Programs Subtotals	0.000	12.365	0.000	0.000	0.000

C. Other Program Funding Summary ($ in Millions)

N/A

D. Acquisition Strategy

The contracting strategy for JSuW SWTD is planned to be sole source for the duration of the demonstration. Cost type contracts will be utilized with Raytheon for Littoral Surveillance Radar System, and Northrop Grumman for Joint Surveillance Targeting Attack Radar System (JSTARS). In addition, funds will be provided to the current Programs of Record contracts for JSOW (Raytheon, Tucson Arizona), and F/A-18E/F (Boeing, St. Louis, Missouri).

E. Performance Metrics

The Joint Surface Warfare (JSuW) Joint capability technology demonsration (JCTD) will exploit the success of the Weapons Data Link Network (WDLN) Advanced Concept Technology Demonstration (ACTD) and its networking protocols by integrating the J-11 messages set via Joint Surveillance Targeting Attack Radar System (JSTARS) and the USN P-3 Littoral Surveillance Radar System (LSRS)into Intelligence Surveillance and Reconnaissance platforms.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0604659N: *Precison Strike Weapons Development Program*	PROJECT 3215: *Strike Weapons Technology Demonstrations*

Product Development ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Primary Hardware Development	SS/CPFF	Raytheon Dallas, TX	0.000	1.759	Feb 2010	0.000		0.000		0.000	0.000	1.759	Continuing
Primary Hardware Development	SS/CPFF	Northrup Grumman Melbourne, FL	0.000	1.646	Feb 2010	0.000		0.000		0.000	0.000	1.646	Continuing
Primary Hardware Development	WR	CINCPACFLT Hawaii	0.000	0.345	Dec 2009	0.000		0.000		0.000	0.000	0.345	Continuing
		Subtotal	0.000	3.750		0.000		0.000		0.000	0.000	3.750	

Remarks

FY10 0.345 Funding will be sent Direct Cite to CINCPACFLT,Hawaii.

Support ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Software Development	SS/CPFF	Raytheon Tucson, AZ	0.000	0.303	Dec 2009	0.000		0.000		0.000	0.000	0.303	Continuing
		Subtotal	0.000	0.303		0.000		0.000		0.000	0.000	0.303	

Remarks

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0604659N: *Precison Strike Weapons Development Program*	PROJECT 3215: *Strike Weapons Technology Demonstrations*

Test and Evaluation ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation	WR	NAWCWD China Lake, CA	0.000	6.022	Nov 2009	0.000		0.000		0.000	0.000	6.022	Continuing
Developmental Test & Evaluation	WR	COMOPTEVFOR Norfolk, VA	0.000	0.435	Nov 2009	0.000		0.000		0.000	0.000	0.435	Continuing
		Subtotal	0.000	6.457		0.000		0.000		0.000	0.000	6.457	

Remarks

Management Services ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Contractor Engineering Support	WR	NAVSEA Washington, DC	0.000	0.225	Nov 2009	0.000		0.000		0.000	0.000	0.225	Continuing
Government Engineering Support	WR	NAWCWD China Lake, CA	0.000	1.150	Jan 2010	0.000		0.000		0.000	0.000	1.150	Continuing
Government Engineering Support	WR	NAWCAD Patuxent River, MD	0.000	0.470	Nov 2009	0.000		0.000		0.000	0.000	0.470	Continuing
Government Engineering Support	MIPR	Air Force ACC Eglin AFB, FL	0.000	0.010	Nov 2009	0.000		0.000		0.000	0.000	0.010	Continuing
		Subtotal	0.000	1.855		0.000		0.000		0.000	0.000	1.855	

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0604659N: *Precison Strike Weapons Development Program*	PROJECT 3215: *Strike Weapons Technology Demonstrations*

Management Services ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Remarks													

	Total Prior Years Cost	FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	12.365		0.000		0.000		0.000	0.000	12.365	

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0604659N: *Precison Strike Weapons Development Program*	**PROJECT** 3215: *Strike Weapons Technology Demonstrations*

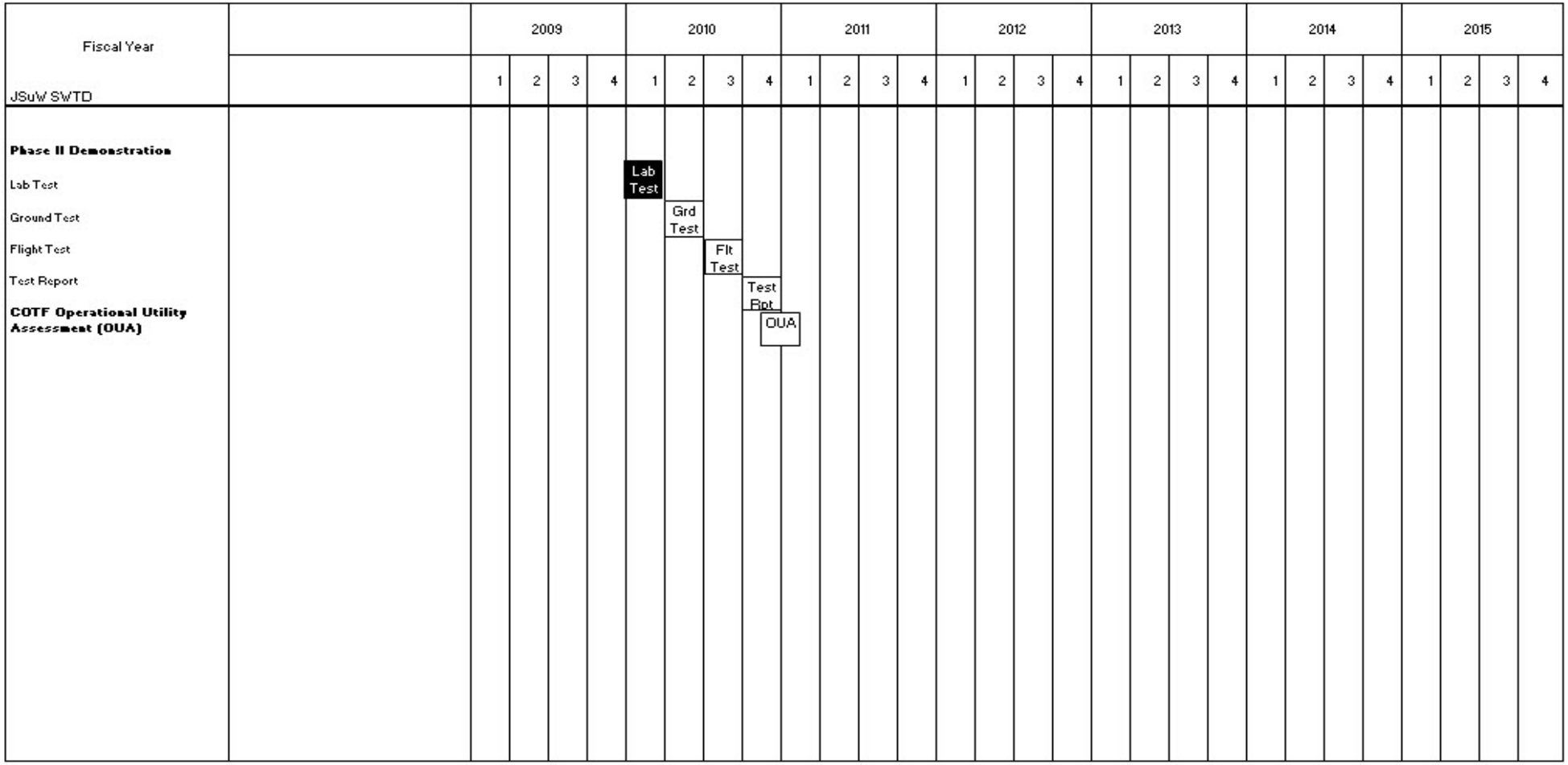


Exhibit R-4A, RDT&E Schedule Details: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0604659N: *Precison Strike Weapons Development Program*	**PROJECT** 3215: *Strike Weapons Technology Demonstrations*

Schedule Details

	Start		End	
Event	**Quarter**	**Year**	**Quarter**	**Year**
Lab Test	1	2010	1	2010
Ground Test	2	2010	2	2010
Flight Test	3	2010	3	2010
Test Report	4	2010	4	2010
COTF Operational Utility Assessment (OUA)	4	2010	1	2011

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Exhibit R-2, RDT&E Budget Item Justification: PB 2011 Navy										DATE: February 2010	
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*				R-1 ITEM NOMENCLATURE PE 0604707N: *SEW Architecture/Eng Support*							
COST ($ in Millions)	**FY 2009 Actual**	**FY 2010 Estimate**	**FY 2011 Base Estimate**	**FY 2011 OCO Estimate**	**FY 2011 Total Estimate**	**FY 2012 Estimate**	**FY 2013 Estimate**	**FY 2014 Estimate**	**FY 2015 Estimate**	**Cost To Complete**	**Total Cost**
Total Program Element	46.251	40.328	34.793	0.000	34.793	43.166	43.123	45.037	48.924	Continuing	Continuing
0798: *OTH Targeting*	1.405	0.919	0.853	0.000	0.853	1.005	1.006	0.997	1.017	Continuing	Continuing
2144: *Space & Elec Warfare Engineering*	13.810	11.032	10.059	0.000	10.059	11.556	11.400	12.445	11.649	Continuing	Continuing
2357: *Maritime Battle Center*	30.238	28.377	23.881	0.000	23.881	30.605	30.717	31.595	36.258	Continuing	Continuing
9999: *Congressional Adds*	0.798	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.798

A. Mission Description and Budget Item Justification

This Program Element (PE) contains three projects: Maritime Battle Center (MBC), Over-the-Horizon Targeting (OTH-T), and Space and Electronic Warfare (SEW) Engineering. The MBC project (2357) focuses on fleet experimentation in order to eliminate warfighting gaps and validate Navy Concept of Operations (CONOPS) and doctrine. The MBC also manages the Sea Trial program of fleet experimentation that is administered by the Sea Trial Executive Steering Group (STESG). Both MBC and Sea Trial integrate emergent concepts and technologies through experiments, analysis, modeling and simulation to support warfighting capability development. Sea Trial experimentation is dedicated to providing solutions to near term (within the Fiscal Year Defense Plan) warfighting gaps through focused operational agent (Commander Second Fleet, Commander Third Fleet and Commander Naval Network Warfare Command) led experimentation. The flag level Sea Trial Executive Steering Group prioritizes proposed Sea Trial experiments annually. The MBC will also serve as the Navy representative to the Joint Battle Center and the battle labs of other services.

The OTH-T and SEW Engineering projects (0798 and 2144 respectively) are systems engineering non-acquisition programs to develop, test, implement technical authority, and validate naval Command, Control, Communications, Computers, Intelligence, Surveillance, and Reconnaissance (C4ISR) architectures to support naval missions in the Joint and Coalition Theater. The mission of these projects are carried out by multiple tasks that are used to ensure naval C4ISR Command and Control Warfare (C2W) components of SEW are effectively integrated into service-oriented architecture delivering net centric warfare capability. Additionally, these projects ensure that (1) the composite operational capabilities of SEW systems (not the individual component systems) conform to the naval C4ISR architecture and enhance warfighting capability as related to the objectives of National Defense Strategy, evolving joint visions and direction, such as net centric capability, and are guided by warfighter requirements; (2) that SEW systems and systems integration efforts involve leading-edge technology transfer of information processing technologies primarily through integration of government and commercial off-the-shelf (GOTS/COTS) products to enhance the Navy's operational capability, interoperability, warfighter effectiveness, flexible reconfiguration, as well as reduce costs; and (3) that SEW systems integration efforts promote the delivery of FORCEnet and the Navy's contribution to the Global Information Grid (GIG).

Exhibit R-2, RDT&E Budget Item Justification: PB 2011 Navy	DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0604707N: *SEW Architecture/Eng Support*

The SEW Engineering project (2144) also includes efforts supporting the Maritime Domain Awareness (MDA) program. MDA is the effective understanding of anything associated with the global maritime domain that could impact the security, safety, economy, or environment of the United States.

Due to the number of efforts in this PE, the programs described are representative of the work included in this PE.

B. Program Change Summary ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
Previous President's Budget	48.116	42.533	0.000	0.000	0.000
Current President's Budget	46.251	40.328	34.793	0.000	34.793
Total Adjustments	-1.865	-2.205	34.793	0.000	34.793
• Congressional General Reductions		-0.168			
• Congressional Directed Reductions		-2.000			
• Congressional Rescissions	0.000	-0.037			
• Congressional Adds		0.000			
• Congressional Directed Transfers		0.000			
• Reprogrammings	-0.946	0.000			
• SBIR/STTR Transfer	-0.919	0.000			
• Program Adjustments	0.000	0.000	34.793	0.000	34.793

Congressional Add Details ($ in Millions, and Includes General Reductions)	FY 2009	FY 2010
Project: 9999: *Congressional Adds*		
Congressional Add: *Cross-Domain Network Access System*	0.798	0.000
Congressional Add Subtotals for Project: 9999	0.798	0.000
Congressional Add Totals for all Projects	0.798	0.000

Change Summary Explanation

Technical: Not applicable.

Schedule: Not applicable.

Exhibit R-2, RDT&E Budget Item Justification: PB 2011 Navy	DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0604707N: *SEW Architecture/Eng Support*

FY11 from previous President's Budget is shown as zero because no FY11-15 data was presented in President's Budget 2010.

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0604707N: *SEW Architecture/Eng Support*	PROJECT 0798: *OTH Targeting*	

COST ($ in Millions)	FY 2009 Actual	FY 2010 Estimate	FY 2011 Base Estimate	FY 2011 OCO Estimate	FY 2011 Total Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
0798: *OTH Targeting*	1.405	0.919	0.853	0.000	0.853	1.005	1.006	0.997	1.017	Continuing	Continuing
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0		

A. Mission Description and Budget Item Justification

The Allied Interoperability program determines allied and coalition C4 maritime operational gaps, to identify Doctrine, Organization, Training, Material, Leadership, Personnel and Facilities (DOTMLPF) solutions with the potential to fill those gaps, and to assess these solutions and associated concepts of operation in laboratory and at-sea environments. The OTH-T/Allied Interoperability program provides a virtual, global systems integration and test facility for Command, Control, Communications, Computers, Intelligence, Surveillance and Reconnaissance (C4ISR) technology that supports the collection, transmission, correlation, and display of track data into common operational and tactical pictures in support of warfighting requirements. The common view of the battle space applies across the spectrum of warfare missions. However, technology and doctrine has changed radically. The first objective of the OTH-T/Allied Interoperability program is to transition the joint and Navy architectures and systems to state-of-the-art Commercial off the Shelf (COTS) and Government off the Shelf (GOTS) products that support network centric warfare. The second objective is to support development, integration, and joint interoperability of all National Security System (NSS), information technology, and C4I systems into cohesive war fighting capabilities. This support includes providing technical expertise afloat and ashore via a cadre of highly trained fleet dystems engineers in order to integrate, validate, and evaluate new OTH-T/Allied Interoperability capabilities during major fleet exercises and demonstrations. The OTH-T/Allied Interoperability program includes joint and coalition integration and testing in support of these war fighting capabilities, including interoperability testing of C4ISR equipments. Coalition and joint interoperability is critical for future maritime operations, especially with the Navy initiatives to expand Internet Protocol (IP) networking throughout the fleet via Consolidated Afloat Networks and Enterprise Services, Next Generation Networks and with the Global Information Grid. Currently, IP connectivity with coalition forces is limited, requiring extensive backhaul through ashore infrastructure. Higher bandwidth solutions suitable for use over tactical networks require development and assessment for emerging coalition and joint interoperability requirements, such as Naval Tactical Networking and Maritime Domain Awareness. Increases in data throughput are required for the effective exchange of rich data sets and services via service oriented architectures within the limitations of high frequency, ultra-high frequency and other portions of the radio frequency spectrum, coupled with appropriate information asssurance and computer network defense mechanisms. Development and assessment of potential solutions will integrate improved transmission control protocol/IP capabilities with the Advanced Digital Network Systems and existing international standards (e.g., NATO Standardization Agreement 5066). The continued development and refinement of advanced tactical networking technologies and protocols, as well as automatic link establishment standards, will provide for a significant improvement in data sharing within, and between, coalition maritime elements.

B. Accomplishments/Planned Program ($ in Millions)

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0604707N: *SEW Architecture/Eng Support*	PROJECT 0798: *OTH Targeting*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
ACQUISITION WORKFORCE FUND	0.009	0.000	0.000	0.000	0.000
FY 2009 Accomplishments: N/A					
ADVANCED RELAY CAPABILITIES	0.000	0.000	0.853	0.000	0.853
Prior to FY 2011, R-2a activity "ADVANCED RELAY CAPABILITIES" was divided between Advanced Relay/Wireless/Antenna Technologies and Subnet Relay. With Subnet Relay now a program of record, initiatives to improve the system and its operational use in the coalition context have started to mirror or become a subset of the FY 2010 Advanced Relay/Wireless/Antenna Technologies effort. Subnet Relay and Advanced Relay initiatives need to address multi-bearer routing, High Assurance Internet Protocol Encryption (HAIPE) and Service Oriented Architectures in a similar and integrated manner. For FY 2011 and out, these two efforts have been merged into one integrated program entitled ADVANCED RELAY CAPABILITIES.					
FY 2011 Base Plans: Continue the development and refinement of advanced relay capabilities that support Coalition Naval Tactical Networking (CNTN). Solutions will address advanced relay technologies, coalition routing architectures (with an emphasis on cipher text or "black core" routing), application architectures/ configurations and Information Assurance/Computer Network Defense (IA/CND) solutions that maximize network efficiency using multiple, dissimilar bearers in the CNTN environment on CENTRIXS. Integrate these advanced solutions with HAIPE devices and Service Oriented Architectures (SOA) in a coalition networking environment. Continue to progress the standardization of Subnet Relay into North Atlantic Treaty Organization Standardization Agreements (STANAGs) 4691 (Subnet Relay) and 5066 Edition 3 (HFIP/UHFIP multi hop). Continue to refine broadband solutions, such as wide-band ultrahigh frequency (UHF) and Spatially Aware Wireless Networking (SPAWN), which enhance throughput and promote allied interoperability. Assess the ability of these solutions to support Service Oriented Architectures. Exploit venues of opportunity, such as Trident Warrior, to					

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0604707N: *SEW Architecture/Eng Support*	PROJECT 0798: *OTH Targeting*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
evaluate and validate the individual technologies as well as integrated solutions through testing, trials and demonstrations.					
ADVANCED RELAY/WIRELESS/ANTENNA TECHNOLOGIES The decrease in FY 2011 is due to this activity being realigned to "Advanced Relay Capabilities." *FY 2009 Accomplishments:* Designed, fabricated and tested Generation 5 Spatially Aware Wireless Network (SPAWN) antennas in integrated form with wireless network equipment. Performed an Over-the-Horizon (OTH) field demonstration of SPAWN in Trident Warrior 2009. *FY 2010 Plans:* - Design, fabricate and test Generation 6 SPAWN antennas in an integrated form with wireless network equipment. Perform an OTH field demonstration of SPAWN in Trident Warrior or similar venue to include airborne relay platforms for a demonstration of high bandwidth Naval Tactical Networking. The demonstration will also include the integration of advanced relay technology with mobile ad hoc network (MANET) controllers and High Assurance Internet Protocol Encryption (HAIPE) devices on CENTRIXS. - Develop advanced routing, application and Information Assurance/Computer Network Defense (IA/CND) architectures and solutions for the coalition Naval Tactical Networking (NTN) environment that maximize network efficiency using multiple, dissimilar bearers.	0.652	0.718	0.000	0.000	0.000
SUBNET RELAY The decrease in FY 2011 is due to this activity being realigned to "Advanced Relay Capabilities."	0.152	0.201	0.000	0.000	0.000

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0604707N: *SEW Architecture/Eng Support*	PROJECT 0798: *OTH Targeting*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
FY 2009 Accomplishments: - Continued to refine Subnet Relay allied interoperability. Venues of opportunity will be exploited to validate and evaluate developed portions of Subnet Relay configurations through testing, trials, and demonstrations. - Completed field demonstration of Subnet Relay airborne deployment. *FY 2010 Plans:* As a part of the refinement of Subnet Relay allied interoperability, develop interoperable wide-band ultrahigh frequency solutions to enhance throughput and progress the standardization of Subnet Relay into a NATO Standardization Agreement. Exploit venues of opportunity to evaluate and validate developed portions of Wide-Band Subnet Relay configurations through testing, trials and demonstrations.					
INTEROPERABILITY VALIDATION *FY 2009 Accomplishments:* Continued to use the Reconfigurable Land Based Test Sites (RLBTS) and Over-the-Horizon Targeting (OTH-T) resources to validate Global Information Grid (GIG) technologies prior to shipboard installation, supported ten Net Ready-Key Performance Parameters (NR-KPP) Migration Plan Developments and four joint interoperability C4ISR certifications to ensure interoperability requirements between sensors, weapon systems and information systems were met.	0.101	0.000	0.000	0.000	0.000
SYSTEMS INTEGRATION & INTEROPERABILITY TESTING *FY 2009 Accomplishments:* Continued to conduct and participate in five overall joint and Navy integration and interoperability tests; facilitated two planning reviews for joint test and evaluations; participated in Joint Users Interoperability Communications Exercise, Joint Distributed Engineering Plant, and other joint test events.	0.272	0.000	0.000	0.000	0.000
TESTING OTH-T SYSTEMS	0.219	0.000	0.000	0.000	0.000

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0604707N: *SEW Architecture/Eng Support*	PROJECT 0798: *OTH Targeting*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
The decrease in FY 2010 and out is due to the effort concluding in FY 2009. *FY 2009 Accomplishments:* Continued to conduct six developmental, integration, and certification tests of OTH-T and combat systems with tactical data exchanged over Common Operational Picture Common Synchronization Tools networks and other networks; three integration test events for Joint Command and Control, Combat Decision Systems, and collaboration technologies within the Global Information Grid. Tested to also address issues of fleet essential capabilities and emerging mission essential needs both for new, legacy, and technology refreshed systems. This included developmental testing between foint C2 systems and combat systems.					
Accomplishments/Planned Programs Subtotals	1.405	0.919	0.853	0.000	0.853

C. Other Program Funding Summary ($ in Millions)

N/A

D. Acquisition Strategy

N/A

E. Performance Metrics

ADVANCED RELAY CAPABILITIES: In FY10 and FY11, the Allied Interoperability program will employ laboratory testing and at-sea demonstrations to assess specific technologies, operational concepts, and integrated Doctrine, Organization, Training, Material, Leadership, Personnel and Facilities (DOTMLPF) solutions pertaining to Coalition Naval Tactical Networking, Service Oriented Architectures, and Maritime Domain Awareness. These assessments will report on identified capability gaps, link capability gaps to technology/DOTMLPF gaps, identify technologies and DOTMLPF solutions considered ready for deployment and transition to a Program of Record to enhance Fleet war fighting capability and enhance allied and coalition interoperability.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0604707N: *SEW Architecture/Eng Support*	PROJECT 0798: *OTH Targeting*

Test and Evaluation ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Advanced Relay Capabilities	Various/ Various	Various Various	11.210	0.919	Nov 2009	0.853	Jan 2011	0.000		0.853	0.000	12.982	Continuing
Interoperability Requirements	Various/ Various	Various Various	3.266	0.000		0.000		0.000		0.000	0.000	3.266	Continuing
T & E Tools Development	Various/ Various	Various Various	0.429	0.000		0.000		0.000		0.000	0.000	0.429	Continuing
Systems Int. & Interop. Testing (LBTN)	Various/ Various	Various Various	3.862	0.000		0.000		0.000		0.000	0.000	3.862	Continuing
Interoperability Validation	Various/ Various	Various Various	2.748	0.000		0.000		0.000		0.000	0.000	2.748	Continuing
Joint Interoperability	Various/ Various	Various Various	1.174	0.000		0.000		0.000		0.000	0.000	1.174	Continuing
Testing OTH-T Systems	Various/ Various	Various Various	3.069	0.000		0.000		0.000		0.000	0.000	3.069	Continuing
		Subtotal	25.758	0.919		0.853		0.000		0.853	0.000	27.530	

Remarks

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0604707N: *SEW Architecture/Eng Support*	PROJECT 0798: *OTH Targeting*

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	FY 2010 Cost	FY 2010 Award Date	FY 2011 Base Cost	FY 2011 Base Award Date	FY 2011 OCO Cost	FY 2011 OCO Award Date	FY 2011 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Contractor Engineering Support	Various/ Various	Various Various	0.000	0.000		0.000		0.000		0.000	0.000	0.000	Continuing
Program Management Support	Various/ Various	Various Various	1.468	0.000		0.000		0.000		0.000	0.000	1.468	Continuing
ACQ Workforce Fund	Various/ Various	Various Various	0.009	0.000		0.000		0.000		0.000	0.000	0.009	Continuing
		Subtotal	1.477	0.000		0.000		0.000		0.000	0.000	1.477	

Remarks

	Total Prior Years Cost	FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	27.235	0.919		0.853		0.000		0.853	0.000	29.007	

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0604707N: *SEW Architecture/Eng Support*	PROJECT 0798: *OTH Targeting*

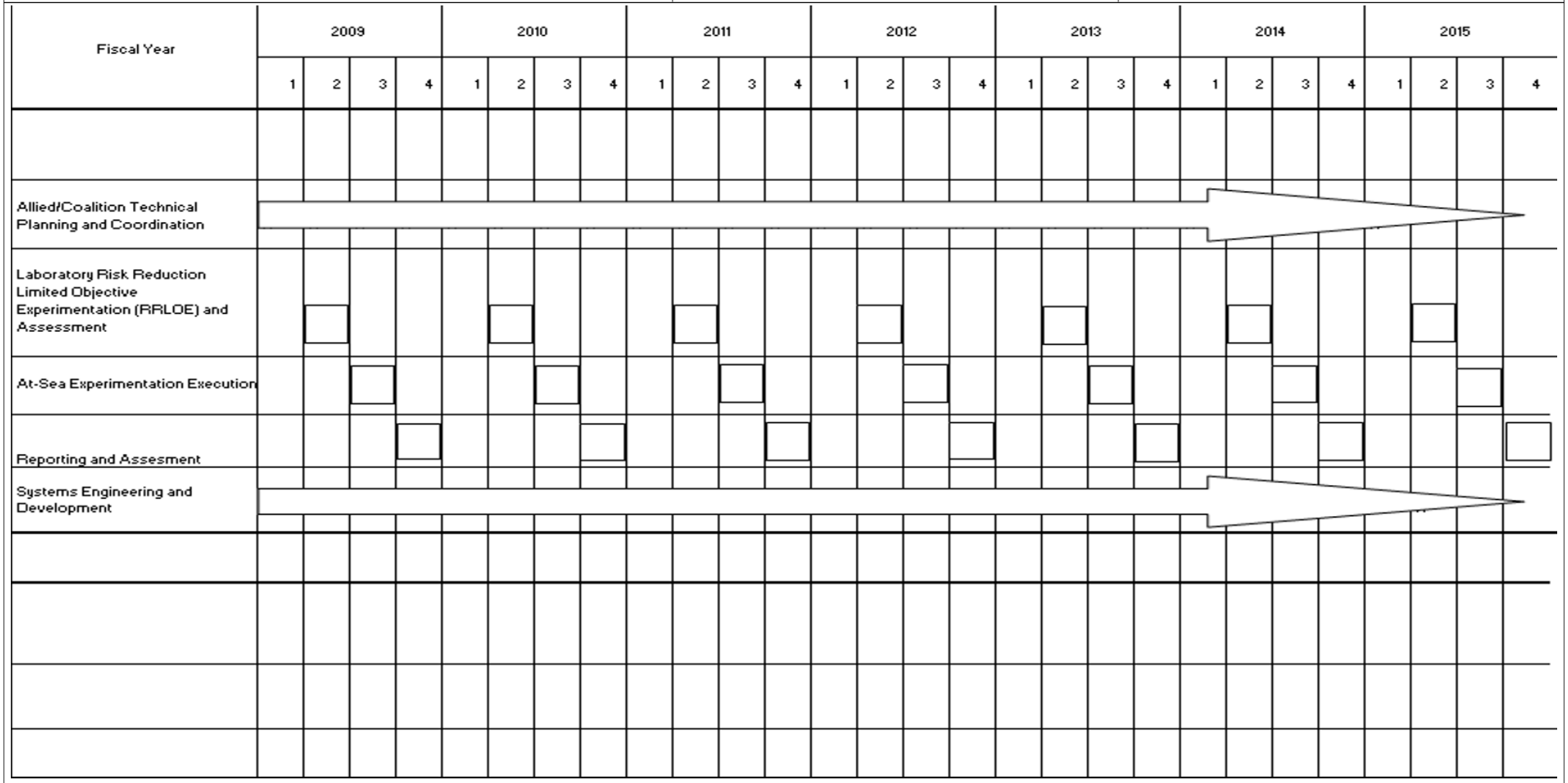

Exhibit R-4A, RDT&E Schedule Details: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0604707N: *SEW Architecture/Eng Support*	**PROJECT** 0798: *OTH Targeting*

Schedule Details

	Start		End	
Event	**Quarter**	**Year**	**Quarter**	**Year**
Allied/Coalition Technical Planning and Coordination	1	2009	4	2015
Laboratory Risk Reduction Limited Objective Experimentation (RRLOE) and Assessment	2	2009	2	2015
At-Sea Experimentation Execution	3	2009	3	2015
Reporting and Assesment	4	2009	4	2015
Systems Engineering and Development	1	2009	4	2015

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0604707N: *SEW Architecture/Eng Support*	PROJECT 2144: *Space & Elec Warfare Engineering*	

COST ($ in Millions)	FY 2009 Actual	FY 2010 Estimate	FY 2011 Base Estimate	FY 2011 OCO Estimate	FY 2011 Total Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
2144: *Space & Elec Warfare Engineering*	13.810	11.032	10.059	0.000	10.059	11.556	11.400	12.445	11.649	Continuing	Continuing
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0		

A. Mission Description and Budget Item Justification

OPNAVINST 3050.23 defines the policy to fuse validated/approved Command, Control, Communications, Computers, Intelligence, Surveillance, and Reconnaissance (C4ISR) architectures and interoperability requirements with Joint requirements, milestones and program decisions. C4ISR integrated architectures/requirements are the underpinnings for all C4ISR mission areas and capabilities and, as such, requirements and acquisition processes have been reengineered to use these Integrated Architectures for decisional purposes and strategic planning. Furthermore, Office of the Secretary of Defense (OSD) has defined key programs/efforts Global Information Grid (GIG) Baseline Extension (BE), Joint Tactical Radio System (JTRS), Network Centric Enterprise Services (NCES), Information Assurance (IA) and standards that will drive and change the Navy's C4ISR integrated architectures and associated business processes for requirements, budgets and acquisition. To that end, the SEW provides two main functions: 1) Development of C4ISR Integrated Architecture Products and 2) Supporting C4ISR Systems Engineering processes and standards. The integrated architecture products are used to support the Navy's C4ISR budget process by providing the critical core architecture and enabling capabilities to the Warfighter. The C4ISR systems engineering processes and standards provide the construct for distributed C2 interoperability requirements analyses to identify capability shortfalls/gaps and for systems engineering to compare/test alternatives in a joint end-to-end environment while identifying associated Navy wide C4ISR implications. Processes include developing and applying criteria for use in Systems Engineering Technical Reviews mandated by Assistant Secretary of the Navy for Research, Development and Acquisition (ASN RDA) and providing technical input to governance bodies such as the FORCEnet Coordination Council and the Information Technology Management Council. This includes Human Systems Integration (HSI) to provide a mission-centered orientation to ensure effective operational employment of fielded capability. As joint concepts and OSD driving efforts/programs are matured/defined the Navy's C4ISR integrated architectures are refined and the supporting C4ISR Systems Engineering processes and standards work to engineer and enact C4ISR implementations Navy wide across all C4ISR mission areas.

Products provided:
1) C4ISR Integrated Architectures
- Integrated Architectures and Standards - Architecture Views (Operational Views, Service Views, Technical Views, System Views)
- Migration Roadmaps to the target Architectures
- Architecture technical authority, studies, interpretation assistance, and white papers

2) Supporting C4ISR Systems Engineering processes

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0604707N: *SEW Architecture/Eng Support*	PROJECT 2144: *Space & Elec Warfare Engineering*

- Distributed C2 Interoperability Requirement Analysis - Gaps Analysis, Overlap Analysis, System Priority Lists, C4ISR Metrics and Models, Analysis of Alternatives, Requirements Database, Assessment Repository, Resource Implications Studies, Baseline Performance Models, Mission Task Analysis, Human Systems Integration (HSI) assessments.
- End-to-End Systems Engineering and Integrated Design - Operational feasibility studies, technical feasibility studies, technical roadmap engineering validations, Architectures and Assessment traceability matrices.
- Joint and Coalition interoperability trials - Joint End-to-End prototyping trials, and Joint/Coalition interoperability demonstrations, Interoperability assessments and metrics, and Interoperability studies via the Coalition Warrior Interoperability Demonstration (CWID). USN provides funding to the general CWID operating budget and participates by operating a US Navy demonstration site.

3) Compliance and alignment reports with Navy Enterprise Architecture/Data Strategy and Assistant Secretary of the Navy for Research, Development and Acquisition (ASN RDA) system engineering policies generated during Systems Engineering Technical Reviews.

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
C4ISR ARCHITECTURE AND STANDARDS	0.155	0.000	0.000	0.000	0.000
The decrease in FY 2010 and out is due to this effort being combined with C4ISR Systems Engineering. *FY 2009 Accomplishments:* - Conducted spiral development of the FORCEnet Integration Architecture including Operational, System, Service and Technical Views. - Conducted technical analysis to review Joint Capabilities Integration and Development System documentations. - Implemented technical authority for architecture and standards.					
C4ISR SYSTEMS ENGINEERING	0.000	5.229	4.400	0.000	4.400
FY 2009 and prior, funding for this effort was budgeted in PE 0604231N, Tactical Command System, Project 9123 (FORCEnet). In addition, sub projects C4ISR Architecture and Standards, Distributed C2 Interoperability Requirements Analysis, and End-To-End System Engineering and Integrated Design are combined under C4ISR Systems Engineering in FY 2010 and out.					

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0604707N: *SEW Architecture/Eng Support*	PROJECT 2144: *Space & Elec Warfare Engineering*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
FY 2010 Plans: - Navy C4ISR Transformation/Strategic Planning within Navy/Joint/Department of Defense (DoD) Framework: Assesses existing and emerging capabilities, develops and evaluates Navy-wide policies, plans, requirements, and compliance; develops integration and investment strategies; and accelerates innovation, testing, assessment and fielding of material and non-material solutions for enhanced operational capability, joint/allied/coalition interoperability and application/enforcement of enterprise requirements/architectures/standards toward greater Net-Centric Operations/Warfare (NCO/W) capability. - Implementing and validating FORCEnet requirements: Perform systems engineering technical reviews utilizing validated assessment tools, system engineering methodologies and Compliance Action Lists to ensure standard engineering processes (e.g., information assurance, data strategy, architecture, modeling, service oriented architecture development) are being developed and utilized to ensure FORCEnet compliance. *FY 2011 Base Plans:* - Navy C4ISR Transformation/Strategic Planning within Navy/Joint/Department of Defense (DoD) Framework: Assesses existing and emerging capabilities, develops and evaluates Navy-wide policies, plans, requirements, and compliance; develops integration and investment strategies; and accelerates innovation, testing, assessment and fielding of material and non-material solutions for enhanced operational capability, Joint/Allied/Coalition interoperability and application/enforcement of enterprise requirements/architectures/standards toward greater NCO/W capability. - Implementing and validating FORCEnet requirements: Perform systems engineering technical reviews utilizing validated assessment tools, system engineering methodologies and Compliance Action Lists to ensure standard engineering processes (e.g., information assurance, data strategy, architecture, modeling, SOA development) are being developed and utilized to ensure FORCEnet compliance.					
COALITION WARRIOR INTEROPERABILITY DEMONSTRATION (CWID)	1.916	1.290	1.700	0.000	1.700

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0604707N: *SEW Architecture/Eng Support*	PROJECT 2144: *Space & Elec Warfare Engineering*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
FY 2009 Accomplishments: - Executed Coalition Forces Maritime Component Commander role in conjunction with NORTHCOM. - Executed over coalition-secret networks with joint and coalition partners. Integrated warfighter subject matter experts (SMEs) from New Zealand, Germany, and the U.S. Navy. In addition, executed the Homeland Defense (HLD)/Homeland Security (HLS) Coalition Warrior Interoperability Demonstration (CWID) site in conjunction with Academia (San Diego State University) and multiple federal (FBI, DEA, DHS) and state and local agencies (local law enforcement, city government, business and community leaders, non-governmental organizations (NGOs), parks service, first responders, faith leaders, etc.). Inter-governmental agency interoperability remained a cornerstone of the CWID charter. - Directed, executed, and hosted both CWID 09 venues/sites at NORTHCOM and San Diego State University (integrating their Department of Homeland Security Graduate Study and Research Programs). - Evaluated over 20 key technologies for Interoperability, Security, and Warfighter Utility at the Navy-directed sites alone, with over 220 (two to five times the amount of other service sites) decision makers (flag, SES, industry) and other stakeholders from U.S. and joint military, academia, and civil sectors participating in the experiment. *FY 2010 Plans:* - CWID will de-scope its current joint and navy effort to focus exclusively on joint capability gaps. As directed by the CWID Joint Management Office (JMO), funding will be provided to the various joint organizations for execution of the joint portions of the CWID effort. - The Navy site will evaluate known Navy capability gaps and will perform demonstration management, planning, installation/de-installation, security certification and accreditation, infrastructure (networks, crypto, laboratories, etc.), data collection and analysis, final report, and documentation.					

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0604707N: *SEW Architecture/Eng Support*	PROJECT 2144: *Space & Elec Warfare Engineering*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
FY 2011 Base Plans: - CWID will demonstrate state-of-the-industry technologies in an operationally relevant lab based environment to inform DoD Command, Control, Communications, Computers, Intelligence, Surveillance, and Reconnaissance (C4ISR) design efforts.					
DISTRIBUTED C2 INTEROPERABILITY REQUIREMENTS ANALYSIS The decrease in FY 2010 and out is due to this effort being combined with C4ISR Systems Engineering. *FY 2009 Accomplishments:* - 2020-2026 Model C4ISR architectures for 3 Major Combat Operations / Mission areas supported of force level assessments for 5 Navy analytic issues / Capability Based Assessments (CBA). Supported NCW Level 3 block builds. FORCEnet Capability List (FCL) efforts continued to develop a web-based software system required to implement the FCL. It provided the direct correlation of joint interoperable capabilities to activities, functions, and systems mapped to Mission Essential Tasks (METs). It provided linkages to the metrics assessing value of systems relevance to joint interoperable capability, functions, and associated tasks and activities. FY 2009 OCO: - Not applicable	1.051	0.000	0.000	0.000	0.000
END-TO-END SYSTEM ENGINEERING AND INTEGRATED DESIGN The decrease in FY 2010 and out is due to this effort being combined with C4ISR Systems Engineering. *FY 2009 Accomplishments:* - Continued to provide systems engineering support to apply end-to-end integrated architectures across the Naval Enterprise.	0.155	0.000	0.000	0.000	0.000

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0604707N: *SEW Architecture/Eng Support*	PROJECT 2144: *Space & Elec Warfare Engineering*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
- Continued to provide training for Team SPAWAR personnel on how to meet interoperability certification requirements. - Continued to work with ASN RDA on implementation of the Integration & Interoperability Management Plan (I&IMP). - Implemented the CTE CONOPS/effort with emphasis on linking Team SPAWAR labs and facilities to Naval Enterprise labs and facilities. - Supported Team SPAWAR PMs in development and implementation of Joint Capabilities Integration and Development System (JCIDS) documents, ISPs and NR-KPPs through the Systems Engineering Technical Review (SETR) process.					
JOINT RAPID ARCHITECTURE EXPERIMENTATION (JRAE) The decrease in FY 2010 and out is due to the effort concluding in FY 2009. *FY 2009 Accomplishments:* - JRAE's focus is on experimenting with near term, end-to-end material solutions that the Services plan to field in the next one to four years and ensuring the end-to-end architectures are interoperable. Built on successes from JRAE 07 (NCES ABAC) and JRAE 08 (Cryptographic Binding of Metadata) to demonstrate a layered Information Assurance (IA) solution with Maritime Domain Awareness Continental U.S. (MDA CONUS) Port and Coastal Surveillance Systems (P&CS). This experiment leverages National Security Agency (NSA) expertise and support to deliver cutting edge Multi-Level Security Service Oriented Architecture (MLS SOA) solutions that can be utilized to address wide ranging warfighter and civil capability gaps. Successfully demonstrated operational capability for a civil user of MDA CONUS Port and Coastal data (United States Coast Guard Operations Center and Port of San Diego Law Enforcement Operations Center) to access only that information they are allowed to see based upon their security clearance. Provides for trusted user changes (the affiliation of the track to Friendly [Blue Force]) and assured system tagging (changed data disappears from the civil authority display). JRAE, via this	0.290	0.000	0.000	0.000	0.000

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0604707N: *SEW Architecture/Eng Support*	PROJECT 2144: *Space & Elec Warfare Engineering*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
experiment, demonstrated cutting edge Multi Level Security (MLS) capability with an operational system used by military and civil agencies in a Service Oriented Architecture (SOA) environment.					
MARITIME DOMAIN AWARENESS (MDA) The decrease in FY 2010 and out is due to the effort being realigned to program element 0604231N, project 2351. *FY 2009 Accomplishments:* Provided systems engineering support for the MDA acceleration initiative to include: - Architecture: Interim Authority to Operate (IATO) for Comprehensive Maritime Awareness (CMA), Google and Extended-Maritime Intercept Operations (EMIO) Afloat Database Server (EADS) - Capability demonstrations: Coalition Warrior Interoperability Demonstration (CWID), Joint Rapid Architecture Experimentation (JRAE), Joint Capabilities Technology Demonstration (JCTD), Advanced Concept Technology Demonstration (ACTD) - Completed the extended fielding of prototypes: Naval Forces Europe (NAVEUR), Pacific Fleet (PACFLT), Maritime Intelligence Fusion Center, Pacific (MFICPAC), Maritime Intelligence Fusion Center, Atlantic (MFICLANT), Navy, Central Command (NAVCENT), Office of Naval Intelligence (ONI), and Joint Interagency Task Force-South (JIATF-S). - Provided Acquisition Workforce support.	6.861	0.000	0.000	0.000	0.000
SYSTEMS ENGINEERING AND INTEGRATION REVITALIZATION *FY 2009 Accomplishments:* - Developed and improved systems engineering models, tools, and databases to improve the quality of C4ISR products. - Developed the Systems Engineering Technical Review database. - Initiated the systems engineering plan e-Builder. - Initiated the measurement repository and analysis database.	0.927	1.264	1.108	0.000	1.108

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0604707N: *SEW Architecture/Eng Support*	PROJECT 2144: *Space & Elec Warfare Engineering*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
FY 2009 OCO: - Not applicable *FY 2010 Plans:* - Certify competency standards for systems engineering qualification. - Deliver an assessment of systems engineering capability and recommend improvements. - Increase access to systems engineering training resources. *FY 2011 Base Plans:* - Implement system engineering capability recommendations. - Provide increased access to systems engineering training resources.					
SYSTEMS ENGINEERING STANDARDS AND PROCESSES *FY 2009 Accomplishments:* - Combined existing stovepiped data systems into integrated operational pictures across programs of record. - Developed prototypes and excursions of emerging C4ISR systems for use in potential product enhancements. - Enabled excursions from existing ISR systems to use existing sensors to solve non-traditional problems. - Integrated existing technologies in novel ways to substantially increase systems capabilities at low risk. - Reduced network bandwidth overhead and inefficiencies. *FY 2010 Plans:* - Develop processes, model, and collect data to link probability of program success to systems engineering performance. - Improve process for using modeling and simulation in Systems Engineering Technical Review.	2.384	3.249	2.851	0.000	2.851

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0604707N: *SEW Architecture/Eng Support*	PROJECT 2144: *Space & Elec Warfare Engineering*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
- Improve linkage between requirements analysis and enterprise architecture products. *FY 2011 Base Plans:* - Define the interfaces between program office systems engineering and enterprise systems engineering and optimize the total value of systems engineering in product delivery. - Develop processes to inject systems engineering discipline into the acquisition cycle earlier. - Incorporate lessons learned from recent and emerging program issues.					
ACQUISITION WORKFORCE FUND *FY 2009 Accomplishments:* FY 2009: Funded DoD Acquisition Workforce Fund.	0.071	0.000	0.000	0.000	0.000
Accomplishments/Planned Programs Subtotals	13.810	11.032	10.059	0.000	10.059

C. Other Program Funding Summary ($ in Millions)

N/A

D. Acquisition Strategy

N/A

E. Performance Metrics

In FY10 and FY11, the SEW engineering program will employ rigorous and consistent system engineering planning practices to develop architecture-based, model-validated solutions, plans, and recommendations for enterprise-wide network reconciliation, common platform networks, and standardized operation center configuration.

COALITION WARRIOR INTEROPERABILITY DEMONSTRATION (CWID) Performance Metrics: Three key metrics: (1) Interoperability and compliance with Naval, Joint, Coalition and other Non-Governmental Organization (NGO) architectures, systems and equipment; (2) Compliance with Defense Information Services Agency (DISA), National Security Agency (NSA), and other Joint and Coalition Information Assurance and Security standards; and (3) Warfighter utility assessment across the joint and coalition spectrum. Specific metrics validate performance of individual technologies participating in CWID.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0604707N: *SEW Architecture/Eng Support*	PROJECT 2144: *Space & Elec Warfare Engineering*

Support ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Development Support	Various/ Various	Various Various	4.554	0.000		0.000		0.000		0.000	0.000	4.554	Continuing
SEW/C4I Technology Integration	Various/ Various	Various Various	12.985	0.000		0.000		0.000		0.000	0.000	12.985	Continuing
MDA Prototype SE Support	Various/ Various	Various Various	17.376	0.000		0.000		0.000		0.000	0.000	17.376	Continuing
Systems Engineering & Integreation Revitalization	Various/ Various	Various Various	0.927	1.264	Feb 2010	1.108	Feb 2011	0.000		1.108	Continuing	Continuing	Continuing
Systems engineering Standards & Processes	Various/ Various	Various Various	2.384	3.249	Feb 2010	2.851	Feb 2011	0.000		2.851	Continuing	Continuing	Continuing
Systems A&E and Validation	Various/ Various	Various Various	13.188	0.000		0.000		0.000		0.000	0.000	13.188	Continuing
Distributed C2 Interoperability Requirement analysis	Various/ Various	Various Various	16.583	0.000		0.000		0.000		0.000	0.000	16.583	Continuing
C4ISR Architecture and Standards	Various/ Various	Various Various	14.268	0.000		0.000		0.000		0.000	0.000	14.268	Continuing
End-to-End System Engineering and Integrated Design	Various/ Various	Various Various	10.994	0.000		0.000		0.000		0.000	0.000	10.994	Continuing
Info. Repository/Naval Architecture	Various/ Various	Various Various	4.000	0.000		0.000		0.000		0.000	0.000	4.000	Continuing
C4ISR Systems Engineering	Various/ Various	Various Various	0.000	5.229	Feb 2010	4.400	Feb 2011	0.000		4.400	Continuing	Continuing	Continuing
		Subtotal	97.259	9.742		8.359		0.000		8.359			

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0604707N: *SEW Architecture/Eng Support*	PROJECT 2144: *Space & Elec Warfare Engineering*

Support ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract

Remarks

Test and Evaluation ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
SEW Eng/CWID	Various/ Various	Various Various	28.881	1.290	Dec 2009	1.700	Dec 2010	0.000		1.700	Continuing	Continuing	Continuing
SEW Eng/JRAE	Various/ Various	Various Various	15.978	0.000		0.000		0.000		0.000	0.000	15.978	Continuing
		Subtotal	44.859	1.290		1.700		0.000		1.700			

Remarks

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0604707N: *SEW Architecture/Eng Support*	PROJECT 2144: *Space & Elec Warfare Engineering*

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	FY 2010 Cost	FY 2010 Award Date	FY 2011 Base Cost	FY 2011 Base Award Date	FY 2011 OCO Cost	FY 2011 OCO Award Date	FY 2011 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
ACQ Workforce Fund	Various/ Various	Various Various	0.071	0.000		0.000		0.000		0.000	0.000	0.071	Continuing
		Subtotal	0.071	0.000		0.000		0.000		0.000	0.000	0.071	

Remarks

	Total Prior Years Cost	FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	142.189	11.032		10.059		0.000		10.059			

Remarks

Exhibit R-4, **RDT&E Schedule Profile:** PB 2011 Navy			**DATE:** February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0604707N: *SEW Architecture/Eng Support*	**PROJECT** 2144: *Space & Elec Warfare Engineering*	

Fiscal Year					2009				2010				2011				2012				2013				2014				2015			
	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	1	2	3	4
CWID: Schedule as directed by the Joint Management Office (JMO) during execution year.																																

Exhibit R-4A, RDT&E Schedule Details: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0604707N: *SEW Architecture/Eng Support*	**PROJECT** 2144: *Space & Elec Warfare Engineering*

Schedule Details

	Start		End	
Event	**Quarter**	**Year**	**Quarter**	**Year**
CWID: Schedule as directed by the Joint Management Office (JMO) during execution year.	1	2009	4	2015

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0604707N: *SEW Architecture/Eng Support*	PROJECT 2357: *Maritime Battle Center*	

COST ($ in Millions)	FY 2009 Actual	FY 2010 Estimate	FY 2011 Base Estimate	FY 2011 OCO Estimate	FY 2011 Total Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
2357: *Maritime Battle Center*	30.238	28.377	23.881	0.000	23.881	30.605	30.717	31.595	36.258	Continuing	Continuing
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0		

A. Mission Description and Budget Item Justification

The mission of the Maritime Battle Center (MBC) is the development of new or improved warfighting capabilities through Sea Trial, the fleet's experimentation process. The MBC's program evaluates and validates emerging Navy concept of operations, doctrine and technologies through focused experimentation, rigorous analysis and assessment. Sea Trial experimentation, on the other hand, is dedicated to providing solutions to near term (within the Fiscal Year Defense Plan) war fighting gaps. The flag level Sea Trial Executive Steering Group (STESG prioritizes and approves the Sea Trial's annual execution plan.

The MBC acts as the executive agent to conduct and coordinate experiments that are focused on both technological and non-technological solutions to warfighting gaps across all naval warfare areas. The MBC is involved in all facets of experimentation including planning, systems engineering and integration, execution, data collection, analysis, and assessment for fleet experiments, limited objective experiments, limited technical experiments, wargames, seminars and workshops. The MBC supports the early and sustained involvement of Joint Warfighters in refining the technologies and the tactics, techniques, and procedures needed in the Joint fight.

This program historically does not meet established execution benchmarks. MBC experimentation differs from other Research, Development, Test and Evaluation (RDT&E) programs because it is based upon Fleet operational availability vice independently scheduled through warfighting labs. Because Fleet experimentation frequently must occur during the spring AND summer operational schedules, the overall RDT&E obligation/expenditure rates do not align with OSD practice. As a result, MBC's obligation rates do not begin to approach benchmark until the program nears the fiscal year's end while its expenditure rates generally do not approach benchmark until midway through the second year of its appropriation.

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
FBE ANALYSIS AND CORE SUPPORT	30.238	28.377	23.881	0.000	23.881
Because of the synergistic relationship between NWDC's Maritime Battle Center experimentation efforts and the Fleet's Sea Trial experimentation efforts, funding for both endeavors have been combined					

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B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
under one project, the Maritime Battle Center. The Sea Trial aspect of this project's mission is driven by the priorities of the designated Operational Agents, Commander Second Fleet for Sea Strike and Seabasing, Commander Third Fleet for Sea Shield, and Commander Naval Network Warfare Command for FORCEnet. The priorities of these Operational Agents are further prioritized and approved by the Sea Trial Executive Steering Group (STESG) in conjunction with Commander U.S. Fleet Forces. *FY 2009 Accomplishments:* - Continued participation in JFCOM experimentation continuum. - Continued Limited Objective Experiments. - Continued CONOPS Development Experiments. - Completed Submarine Automated Identification System Buoy experiment. - Completed the FY09 spiral of the multi-year series of Maritime Operations Center experiments. - Completed the FY09 spiral of the multi-year series of Intelligence, Surveillance and Reconnaissance (ISR) Support to the Maritime Operations Center experiments. - Completed the FY09 spiral of the multi-year series of Networking of Military Operations Center experiments. - Completed the FY09 spiral of the multi-year series of Network Operations, Information Operations and Space Support experiments. - Completed the FY09 spiral of the multi-year series of Information Assurance/Computer Network Defense experiments. - Completed the FY09 spiral of the multi-year series of Electronic Warfare Improvement experiments. - Completed the FY09 spiral of the multi-year series of Maritime Domain Awareness experiments. - Completed the FY09 spiral of the multi-year series of Coalition Networks experiments. - Completed the FY09 spiral of the multi-year series of Unclassified Common Operational Picture (COP) experiments. - Completed the FY09 spiral of the multi-year series of Bandwidth Optimization experiments. - Completed the FY09 spiral of the multi-year series of Network Instrumentation and Visualization experiments.					

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B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
- Completed the FY09 spiral of the multi-year series of Offensive Information Operations experiments. - Completed the FY09 spiral of the multi-year series of Cross Domain Solution experiments. - Completed the FY09 spiral of the multi-year series of Command and Control/Real-Time Collaboration experiments. - Cancelled the Surface Meteorological and Oceanographic experiment. - Cancelled the Global Ocean Forecasting experiment. - Cancelled the FY09 spiral of the multi-year series of Persistent Day/Night Tracking experiments. - Executed Sea Trial Experiments, War Games, and Seminars. - Initiated the Sonar/Radar Data Comparison experiment. - Initiated the Maritime Domain Awareness Analyst Tools experiment. - Initiated the Millimeter Wave Chaff experiment. - Initiated the Surface Action Group Modeling experiment. - Initiated the Harpoon Seeker Modeling in an Electronic Attack environment experiment. - Initiated the Fast Attack Craft/Fast Inshore Attack Craft experiment. - Initiated the first of the multi-year series of Littoral Force Protection experiments. - Initiated the final spiral of the multi-year series of Tactical Tomahawk 3rd Party Targeting experiments. - Initiated the FY09 spiral of the multi-year series of Surface Ship Periscope Detection experiments. - Initiated the FY09 spiral of the multi-year series of Submarine Unmanned Aerial System experiments. - Initiated the FY09 spiral of the multi-year series of Submarine Communications at Speed and Depth experiments. - Initiated the FY09 spiral of the multi-year series of Mine Countermeasures in Support of Homeland Defense experiments. - Initiated the FY09 spiral of the multi-year series of Littoral Combat Ship Mine Warfare Mission Modules experiments. - Initiated the FY09 spiral of the multi-year series of Naval Obscurant experiments. - Initiated the FY09 spiral of the multi-year series of SPIKE experiments. - Initiated and completed the FY09 spiral of the multi-year series of Remote Monitoring experiments.					

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
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B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
- Initiated and completed the FY09 spiral of the multi-year series of Extended Maritime Interception Operations experiments. - Initiated the Sonar Active Target Evaluation experiment. - Initiated the FY09 spiral of the multi-year series of Project Guillotine experiments. - Initiated the FY09 spiral of the multi-year series of Submarine/Unmanned Underwater Vehicle Communications experiments. Acquisition Workforce Fund - Funded DoD Acquisition Workforce Fund. *FY 2010 Plans:* Items listed below represent some of the experiments in the approved Execution Plan 10, but adjustments will be made during FY10 as high priority pop-ups are added and other experiments are cancelled or delayed for various reasons. - Continue all FY 2009 efforts less those noted as completed above. - Initiate and execute Sea Trial Experiments, War Games, and Seminars. - Initiate and complete the ASW Employment of Emerging Technology experiment. - Initiate and complete the FY10 spiral of the multi-year series of Computer Network Defense experiments. - Initiate and complete the FY10 spiral of the multi-year series of Electronic Warfare Improvement experiments. - Initiate and complete the FY10 spiral of the multi-year series of Persistent ISR (Intelligence, Surveillance and Reconnaissance) experiments. - Initiate and complete the FY10 spiral of the multi-year series of Globally Networked Maritime Operations Center experiments. - Initiate and complete the Palantir experiment.					

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
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B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
- Initiate and complete the FY10 spiral of the multi-year series of Operational Level Command and Control experiments. - Initiate and complete the CONOPS for Employment of Unmanned Surface Vessels for Force Protection experiment. - Initiate and complete the FY10 spiral of the multi-year series of Maritime Domain Awareness experiments. - Initiate and complete the FY10 spiral of the multi-year series of Long Range Anti-Ship Missile Weapon experiments. - Initiate and complete the Tactical Tomahawk/Network Enabled Weapon experiment. - Initiate and complete the FY10 spiral of the multi-year series of Naval Oceanography Mine Warfare Center Employment of Emerging Technology experiments. - Initiate and complete the FY10 spiral of the multi-year series of Fusion Correlation experiments. - Initiate and complete the ASW Distributed Force experiment. - Initiate and complete the Tactical Tomahawk Ship to Objective Maneuver Coordination experiment. - Initiate and complete the JFMCC-MEB Command and Control experiment. - Initiate and complete the Non-Lethal Weapons for Expeditionary Maritime Forces experiment. - Initiate and complete the FY10 spiral of the multi-year series of Coalition Information Sharing experiments. - Initiate and complete the Compact Low Frequency Active Off-Board Active Source Expendable experiment. - Initiate and complete the FY10 spiral of the multi-year series of Electric E-Fields experiments. - Initiate and complete the FY10 spiral of the Unmanned Surface Vehicle Decoys experiments. - Initiate and complete the ASW Non-Traditional Sensor experiment. - Initiate and complete the Maritime Force Application/Fires Computer Information Environment experiment. - Initiate and complete the FY10 spiral of the multi-year series of Navy Laser Weapons Systems experiments. - Initiate and complete the Carrier Strike Group/Surface Action Group Takedown experiment.					

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0604707N: *SEW Architecture/Eng Support*	PROJECT 2357: *Maritime Battle Center*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
- Initiate and complete the Seabasing Wargame. - Initiate and complete the FY10 spiral of the multi-year series of Data Throughput experiments. - Initiate and complete the FY10 spiral of the multi-year series of Tactical Communications experiments. - Initiate and complete the FY10 spiral of the multi-year series of Offensive Information Operations experiments. - Initiate and complete the FY10 spiral of the multi-year series of Network Management experiments. - Initiate and complete the FY10 spiral of the multi-year series of Real-Time Collaboration experiments. - Initiate and complete the FY10 spiral of the multi-year series of Submarine Launched Small Tactical Unmanned Aerial Systems experiments. - Initiate and complete the Lethal Weapons for Expeditionary Maritime Forces experiments. - Initiate and complete the FY10 spiral of the multi-year series of Satellite Communications experiments. - Initiate and complete the APS-145 Counter Deceptive Electronic Attack experiment. - Initiate and complete the Sealift 10 Navy Logistics Cell experiment. - Initiate and complete the FY10 spiral of the multi-year series of Information Assurance experiments. - Initiate and complete the Logistics Common Operating Picture experiment. - Initiate and complete the FY10 spiral of the multi-year series of Naval Obscurant System experiments. - Initiate and complete the Over the Horizon Detection of Naval Radar experiment. - Initiate and complete the FY10 spiral of the multi-year series of Cross Domain Solutions experiments. - Initiate and complete the Reconfigurable Autonomous Classification System experiment. *FY 2011 Base Plans:* - Continue all FY 2010 efforts less those noted as completed above. - Initiate and execute Sea Trial Experiments, War Games, and Seminars based on the Execution Plan 11, currently being developed.					
Accomplishments/Planned Programs Subtotals	30.238	28.377	23.881	0.000	23.881

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0604707N: *SEW Architecture/Eng Support*	**PROJECT** 2357: *Maritime Battle Center*

C. Other Program Funding Summary ($ in Millions)

N/A

D. Acquisition Strategy

N/A

E. Performance Metrics

Maritime Battle Center:

- Refine concepts and identify key performance levels necessary for implementation.
- Demonstrate feasibility and discriminate among competing concepts and implementation alternatives.
- Understand potential military effectiveness and risk.
- Evaluate how much of the new capability and attendant force structure is needed.
- Learn how to operate the new force and combine it with the legacy force.
- Develop recommended Doctrine, Organization, Training, Materiel, Leadership, and Personnel (DOTMLP) changes.
- Develop fleet warfighting requirements for submission to the OPNAV Navy Capabilities Development Process (NCDP) to inform Navy acquisition decisions.
- Integrate emergent concepts and technologies, leading to rapid introduction of needed warfighting capabilities in the fleet.
- Rapidly mature Sea Shield, Sea Strike, Sea Basing, and FORCEnet concepts, technologies, and doctrine.
- Focus on near, mid and long term warfighting challenges to realize increased warfighting effectiveness.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0604707N: *SEW Architecture/Eng Support*	PROJECT 2357: *Maritime Battle Center*	

Test and Evaluation ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
System Test and Evaluation	Various/ Various	Various Various	222.324	23.953		19.882		0.000		19.882	Continuing	Continuing	Continuing
		Subtotal	222.324	23.953		19.882		0.000		19.882			

Remarks

Management Services ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management	Various/ Various	Various Various	45.639	4.424		3.999		0.000		3.999	Continuing	Continuing	Continuing
ACQ Workforce Fund	Various/ Various	Various Various	0.148	0.000		0.000		0.000		0.000	0.000	0.148	Continuing
		Subtotal	45.787	4.424		3.999		0.000		3.999			

Remarks

	Total Prior Years Cost	FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	268.111	28.377		23.881		0.000		23.881			

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0604707N: *SEW Architecture/Eng Support*	PROJECT 2357: *Maritime Battle Center*	

	Total Prior Years Cost	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total	Cost To Complete	Total Cost	Target Value of Contract
Remarks								

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0604707N: *SEW Architecture/Eng Support*	PROJECT 9999: *Congressional Adds*	

COST ($ in Millions)	FY 2009 Actual	FY 2010 Estimate	FY 2011 Base Estimate	FY 2011 OCO Estimate	FY 2011 Total Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
9999: *Congressional Adds*	0.798	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.798
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0		

A. Mission Description and Budget Item Justification

Congressional Add

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010
Congressional Add: Cross-Domain Network Access System *FY 2009 Accomplishments:* Using an existing, government-accredited COTS product, developed a secure communications system that can be employed outside standard secure facilities in unclassified areas. The solution must run on standard ordinary hardware platforms, such as laptops, and have no residual evidence of secure communication activity. It must support conventional text and commonly used software applications such as office productivity applications. In its classified state, it must run on a trusted operating system and be accreditable by appropriate authorities resulting in an authority to operate (ATO) on military and intelligence networks.	0.798	0.000
Congressional Adds Subtotals	0.798	0.000

C. Other Program Funding Summary ($ in Millions)

N/A

D. Acquisition Strategy

Congressional Add

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0604707N: *SEW Architecture/Eng Support*	**PROJECT** 9999: *Congressional Adds*

E. Performance Metrics

Congressional Add

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Exhibit R-2, RDT&E Budget Item Justification: PB 2011 Navy	DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0303354N: *ASW Systems Development - MIP*

COST ($ in Millions)	FY 2009 Actual	FY 2010 Estimate	FY 2011 Base Estimate	FY 2011 OCO Estimate	FY 2011 Total Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
Total Program Element	0.000	0.000	2.161	0.000	2.161	1.172	1.285	1.338	1.387	Continuing	Continuing
0490: *Airborne Acoustic Intelligence (AAI)*	0.000	0.000	2.161	0.000	2.161	1.172	1.285	1.338	1.387	Continuing	Continuing

A. Mission Description and Budget Item Justification

In January 2008, OPNAV renamed project unit 0490 from Project Beartrap to Airborne Acoustic Intelligence (AAI). The mission of AAI (CNO Project K-0416) is to provide Sound Pressure Level (SPL) quality recordings of targets of interest and an associated new technology, rapid prototyping mechanism for the application of state-of-the-art collection sensors. The program will develop and rapidly deploy new technology concepts in hardware and software to effectively address emerging littoral threats and to improve the present Undersea Warfare capability in support of Sea Shield/Sea Trial Initiatives. AAI also provides a measurement analysis capability to reconstruct, analyze, and develop active and target strength measurement validation. The AAI data collection program provides passive and active acoustic and non-acoustic data essential for the design and development of environmental models, sensors, weapons, software algorithms, and tactical decision aids. AAI employs developmental and prototypical hardware installed in uniquely configured ASW aircraft to collect data of interest, and specially configured ground support facilities to conduct reconstruction and analysis of this data. AAI includes calibrated recording systems, advanced detection and tracking systems, special sensors, advanced processing systems and techniques and specially derived operational tactics.

Funding was moved in FY11 thru FY15 from PE 0603254N to this new PE 0303354N and is a Military Intelligence Program.

Exhibit R-2, RDT&E Budget Item Justification: PB 2011 Navy	DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0303354N: *ASW Systems Development - MIP*

B. Program Change Summary ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
Previous President's Budget	0.000	0.000	0.000	0.000	0.000
Current President's Budget	0.000	0.000	2.161	0.000	2.161
Total Adjustments	0.000	0.000	2.161	0.000	2.161
• Congressional General Reductions		0.000			
• Congressional Directed Reductions		0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds		0.000			
• Congressional Directed Transfers		0.000			
• Reprogrammings	0.000	0.000			
• SBIR/STTR Transfer	0.000	0.000			
• Program Adjustments	0.000	0.000	2.161	0.000	2.161

Change Summary Explanation

Technical: 0490. Defined Active Measurement Validation as a separate cost category for improved programmatic tracking. Active Measurement Validation is an output product of the Active Target Strength (T.S.) project.

Schedule: Not applicable.

FY11 from previous President's Budget is shown as zero because no FY11-15 data was presented in President's Budget 2010.

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0303354N: *ASW Systems Development - MIP*	PROJECT 0490: *Airborne Acoustic Intelligence (AAI)*	

COST ($ in Millions)	FY 2009 Actual	FY 2010 Estimate	FY 2011 Base Estimate	FY 2011 OCO Estimate	FY 2011 Total Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
0490: *Airborne Acoustic Intelligence (AAI)*	0.000	0.000	2.161	0.000	2.161	1.172	1.285	1.338	1.387	Continuing	Continuing
Quantity of RDT&E Articles	0	0	1	0	1	0	0	0	0		

A. Mission Description and Budget Item Justification

The mission of Airborne Acoustic Intelligence (AAI) (CNO Project K-0416) is to provide SPL quality recordings of targets of interest and an associated new technology, rapid prototyping mechanism for the application of state-of-the-art collection sensors. The program will develop and rapidly deploy new technology concepts in hardware and software to effectively address emerging littoral threats and to improve the present Undersea Warfare capability in support of Sea Shield/Sea Trial Initiatives. AAI also provides a measurement analysis capability to reconstruct, analyze and develop active target strength measurement validation. The AAI data collection program provides passive and active acoustic and non-acoustic data essential for the design and development of environmental models, sensors, weapons, software algorithms, and tactical decision aids. AAI employs developmental and prototypical hardware installed in uniquely configured ASW aircraft to collect data of interest, and specially configured ground support facilities to conduct reconstruction and analysis of this data. AAI includes calibrated recording systems, advanced detection and tracking systems, special sensors, advanced processing systems and techniques and specially derived operational tactics. The 1 RDT&E article consist of a Sound Pressure Level (SPL) collection suite.

Funding was moved in FY11 thru FY15 from PE 0603254N to this new PE 0303354N and is considered a Military Intelligence Program.

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
Systems Engineering / Aircraft Mods Active Acoustic Program	0.000	0.000	1.011	0.000	1.011
FY 2011 Base Plans: Engineering to support SPL Recording. Post mission processor upgrade and engineering to support aircraft calibration unit enhancements for active target strength. Engineering development of Target Strength processing continues.					
Data Collection and Analysis	0.000	0.000	0.750	0.000	0.750

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0303354N: *ASW Systems Development - MIP*	PROJECT 0490: *Airborne Acoustic Intelligence (AAI)*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
FY 2011 Base Plans: Data collection support at Operational Wings. Ongoing collection of high interest acoustic and non-acoustic data in support of Measurement/Measuring and Signature Intelligence (MASINT)/Office of Naval Intelligence (ONI) threat assessment requirements. Reduction, Analysis and Fleet Rapid Feedback. Conduct airborne special operations support. Essential performance modeling and evaluation for advanced technology sensor systems design and Fleet tactics development.					
Active Measurement Validation	0.000	0.000	0.400	0.000	0.400
FY 2011 Base Plans: Active Measurement Validation of targets of interest. Provides the acoustic analysis of echo characterization (which includes: signal excess (SE) measurements, peak frequency (PF), trend analysis and pulse duration measurements) and target strength.					
Accomplishments/Planned Programs Subtotals	0.000	0.000	2.161	0.000	2.161

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total	FY 2012	FY 2013	FY 2014	FY 2015	Cost To Complete	Total Cost
• 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	0.000

D. Acquisition Strategy

Airborne Acoustic Intelligence (AAI) is a CNO Special Project. The included technology developments are primarily in-house with contractor participation through existing vehicles.

E. Performance Metrics

MIP Program.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0303354N: *ASW Systems Development - MIP*	PROJECT 0490: *Airborne Acoustic Intelligence (AAI)*

Product Development ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Active Measurement Validation	WR	NAWCAD PATUXENT RIVER, MD	0.000	0.000		0.400	Oct 2010	0.000		0.400	0.000	0.400	Continuing
Ancillary Hdw Development	WR	NAWCAD PATUXENT RIVER, MD	0.000	0.000		0.750	Oct 2010	0.000		0.750	1.752	2.502	Continuing
Systems Eng	WR	NAWCAD PATUXENT RIVER, MD	0.000	0.000		0.111	Oct 2010	0.000		0.111	4.427	4.538	Continuing
		Subtotal	0.000	0.000		1.261		0.000		1.261	6.179	7.440	

Remarks

Management Services ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
MGT & PROF SPT SVCS (NON-FFRDC)	Various/ Various	VARIOUS VARIOUS	0.000	0.000		0.900	Dec 2010	0.000		0.900	3.600	4.500	4.500
		Subtotal	0.000	0.000		0.900		0.000		0.900	3.600	4.500	4.500

Remarks

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0303354N: *ASW Systems Development - MIP*	PROJECT 0490: *Airborne Acoustic Intelligence (AAI)*	

	Total Prior Years Cost	FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	0.000		2.161		0.000		2.161	9.779	11.940	4.500

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0303354N: *ASW Systems Development - MIP*	PROJECT 0490: *Airborne Acoustic Intelligence (AAI)*

Fiscal Year	2010				2011				2012				2013				2014				2015			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Acquisition Milestones																								
Systems Engineering P-3 Avionics Suite							1				1				1									
Tactical Acoustic Processor (TAPS)																								
T.S. Processor Development/Prototype											1				1				1				1	
Test & Evaluation Milestones																								
Production Milestones																								
Product Development																								
Data Collection/Analysis																								
Deliveries																								
P-3 Avionics							1				1				1									
T.S. Processor											1				1				1				1	

Exhibit R-4A, RDT&E Schedule Details: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0303354N: *ASW Systems Development - MIP*	**PROJECT** 0490: *Airborne Acoustic Intelligence (AAI)*

Schedule Details

	Start		End	
Event	**Quarter**	**Year**	**Quarter**	**Year**
Sys Eng Avionics Suite	1	2011	4	2015
Sys Eng Tactical Acoustic Processor (TAPS)	1	2011	4	2015
Target Strength Processor Dev't/Prototype	1	2011	4	2015
Data Collection and Analysis	1	2011	4	2015
Deliveries	3	2011	3	2015

Exhibit R-2, RDT&E Budget Item Justification: PB 2011 Navy	DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0303562N: *Submarine Tactical Warfare Systems - MIP*

COST ($ in Millions)	FY 2009 Actual	FY 2010 Estimate	FY 2011 Base Estimate	FY 2011 OCO Estimate	FY 2011 Total Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
Total Program Element	0.000	0.000	4.253	0.000	4.253	4.334	4.404	4.503	4.595	Continuing	Continuing
0770: *Adv Sub Supp Equip Prog*	0.000	0.000	4.253	0.000	4.253	4.334	4.404	4.503	4.595	Continuing	Continuing

A. Mission Description and Budget Item Justification

The Submarine Tactical Warfare Systems program element is comprised of the Advanced Submarine Support Equipment Program (ASSEP) and the Submarine Special Operations Support Program. The objective is to improve submarine operational effectiveness through the development and implementation of advanced Research and Development (R&D). In order to provide improved operational effectiveness, research and development efforts are focused on Advanced Imaging Developments and Advanced Electronic Warfare Support (ES) Developments. A continuing need exists to improve these capabilities in view of the advancements in potential imaging counter detection, the need to support specialized missions and the increasingly dense and sophisticated electronic environment caused by the proliferation of complex radar, communications, and navigation equipment of potential adversaries. Ongoing developments in 360 degree imaging systems technologies are supporting these needs.

B. Program Change Summary ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
Previous President's Budget	0.000	0.000	0.000	0.000	0.000
Current President's Budget	0.000	0.000	4.253	0.000	4.253
Total Adjustments	0.000	0.000	4.253	0.000	4.253
• Congressional General Reductions		0.000			
• Congressional Directed Reductions		0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds		0.000			
• Congressional Directed Transfers		0.000			
• Reprogrammings	0.000	0.000			
• SBIR/STTR Transfer	0.000	0.000			
• Program Adjustments	0.000	0.000	4.253	0.000	4.253

Change Summary Explanation

Technical: Not. applicable.

Exhibit R-2, RDT&E Budget Item Justification: PB 2011 Navy	DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0303562N: *Submarine Tactical Warfare Systems - MIP*

Schedule: Not applicable.

FY11 from previous President's Budget is shown as zero because no FY11-15 data was presented in President's Budget 2010.

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0303562N: *Submarine Tactical Warfare Systems - MIP*	PROJECT 0770: *Adv Sub Supp Equip Prog*	

COST ($ in Millions)	FY 2009 Actual	FY 2010 Estimate	FY 2011 Base Estimate	FY 2011 OCO Estimate	FY 2011 Total Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
0770: *Adv Sub Supp Equip Prog*	0.000	0.000	4.253	0.000	4.253	4.334	4.404	4.503	4.595	Continuing	Continuing
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0		

A. Mission Description and Budget Item Justification

A continuing need exists to improve Imaging and Electronic Warfare Support (ES) capabilities in view of the advancements in potential imaging counter detection, the need to support specialized missions and the increasingly dense electromagnetic environment caused by the proliferation of complex radar, communications, and navigation equipment of potential adversaries. Improvements are necessary for submarine ES and imaging to be operationally effective in the following mission areas: Joint Littoral Warfare, Joint Surveillance, Space and Electronic Warfare, Intelligence Collection, Maritime Protection and Joint Strike. The program is divided into two project categories: Advanced Imaging Project Development and Advanced Electronic Warfare Support Project Development. Both of these categories will allow for the evaluation of the vulnerability of submarine masts, periscopes and sensors to visual, radar, and infrared detection and evaluation of state of the art technology to implement periscope/mast engineering improvements to reduce counter detection threats, the pursuit of technologies (such as PATRIOT LPI radar range finding and 360 degree imaging systems) to develop submarine unique improvements to mast, periscope, and ES electromagnetic and electro-optic sensors based on emerging technologies available from DOD Exploratory Development Programs, industry Independent Research and Development, academia and other sources. Feasibility demonstration models (FDMs) are developed, evaluated, and validated in the lab and through at-sea.

The Advanced Imaging Project Development Projects Include the development of: 360 Degree Imaging - Far Term Advanced System, 360 Degree Imaging - Near Term System, 360 Degree Submarine Panoramic Infra-Red (SPIR) Imaging System, 360 Degree Affordable Modular Panoramic Periscope (AMPP), Low Cost Expendable Sensor (LCES), Advanced Head Window Water Shedding, Electro-Optic Diploops, and a Low Cost, Multi-Spectral, Grade A Head Window. The Advanced Electronic Warfare Support (ES) Development Projects include the development of: PATRIOT Phase B - Low Probability of Intercept (LPI) Radar, LPI Direction Finding (DF), Distant ES Support and Remote Log-In, Specific Emitter Identification (SEI) Improvements, ES Vulnerability Tool, Integrated ES and ECS Radio Frequency Distribution Unit (RFDU), Multi-function Modular Mast (MMM) Payloads, Mast Signature Reduction, PATRIOT Non-Scanning LPI Radar.

All programs funded in this project are non-acquisition category programs. Program plans and priorities are established by N87. The test articles identified consist of critical components that will be fully developed during engineering development into Engineering Development Models (EDMs). ASSEP Programs will eventually be broken down into initial and developmental research, for both Imaging and Electronic Warfare.

The ASSEP Program will become a Military Intelligence Program beginning Fiscal Year 2011 under a new Program Element 0303562N.

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0303562N: *Submarine Tactical Warfare Systems - MIP*	**PROJECT** 0770: *Adv Sub Supp Equip Prog*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
Advanced Imaging Project Development	0.000	0.000	2.552	0.000	2.552
FY 2011 Base Plans: 360 Degree Imaging (JPL) - Far Term Advanced System 360 Degree Imaging (ONR T18)- Near Term System 360 Degree Submarine Panoramic Mid-Wave Infra-Red (MWIR) Imaging System 360 Degree Affordable Modular Panoramic Periscope (AMPP) Advanced Head Window Water Shedding Low Cost, Multi-Spectral Grade A Head Window					
Advanced Electronic Warefare Support (ES) Project Development	0.000	0.000	1.701	0.000	1.701
FY 2011 Base Plans: PATRIOT Phase B - Low Probability of Intercept (LPI) Radar Capability Insertions (CI) LPI Direction Finding (DF) Distant ES Support and Remote Log-In Specific Emitter Identification (SEI) Improvements ES Vulnerability Tool Integrated ES and ECS Radio Frequency Distribution Unit (RFDU) Multi-function Modular Mast (MMM) Payloads Mast Signature Reduction PATRIOT Non-Scanning LPI Radar					
Accomplishments/Planned Programs Subtotals	0.000	0.000	4.253	0.000	4.253

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0303562N: *Submarine Tactical Warfare Systems - MIP*	**PROJECT** 0770: *Adv Sub Supp Equip Prog*

C. Other Program Funding Summary ($ in Millions)

N/A

D. Acquisition Strategy

This project optimizes technology insertion using a build-test-build approach to support ES and imaging operational needs. Operational needs have been based on the tactical requirements identified in CNO letters, Serial N77/3U629212, dated 04 Sep 03, Serial N77/3U629205, dated 01 Apr 03, and Serial N77/1U651534, dated 30 Oct 01, COMSUBLANT/COMSUBPACCommand Capability Issues (CCIs), Virginia Class SSN Operational Requirements Document objectives, a review, assessment and prioritization of Sensor and Processor efforts and SSN force level projections for SSN688/688I, SSN21, and SSN 774 classes through FY2011. Project efforts develop submarine unique improvements to mast, periscope, and ES electromagnetic and electro-optic sensors based on emerging technologies that are available from DOD Exploratory Development Programs, industry Independent Research and Development, and other sources. Feasibility Demonstration Models (FDMs) will be developed to provide a realistic method of evaluating the improvements, including deployment on submarines for testing.

E. Performance Metrics

The RDD program goal is to respond to urgent operational needs within 30 days and provide for rapid development and fielding of prototype solutions within 270 days.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0303562N: *Submarine Tactical Warfare Systems - MIP*	PROJECT 0770: *Adv Sub Supp Equip Prog*

Product Development ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Primary Hardware Development	SS/CPIF	JPL Pasadena, CA	0.000	0.000		1.504	Oct 2010	0.000		1.504	Continuing	Continuing	Continuing
Systems Engineering	WR	NUWC, Newport, RI	0.000	0.000		2.474	Oct 2010	0.000		2.474	Continuing	Continuing	Continuing
		Subtotal	0.000	0.000		3.978		0.000		3.978			

Remarks

Support ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Engineering Technical Services	C/CPAF	AT&T GSI Vienna, VA	0.000	0.000		0.240	Feb 2011	0.000		0.240	Continuing	Continuing	Continuing
		Subtotal	0.000	0.000		0.240		0.000		0.240			

Remarks

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0303562N: *Submarine Tactical Warfare Systems - MIP*	PROJECT 0770: *Adv Sub Supp Equip Prog*

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	FY 2010 Cost	FY 2010 Award Date	FY 2011 Base Cost	FY 2011 Base Award Date	FY 2011 OCO Cost	FY 2011 OCO Award Date	FY 2011 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Travel	WR	Various Not Specified	0.000	0.000		0.035		0.000		0.035	Continuing	Continuing	Continuing
		Subtotal	0.000	0.000		0.035		0.000		0.035			

Remarks

	Total Prior Years Cost	FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	0.000		4.253		0.000		4.253			

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0303562N: *Submarine Tactical Warfare Systems - MIP*	PROJECT 0770: *Adv Sub Supp Equip Prog*

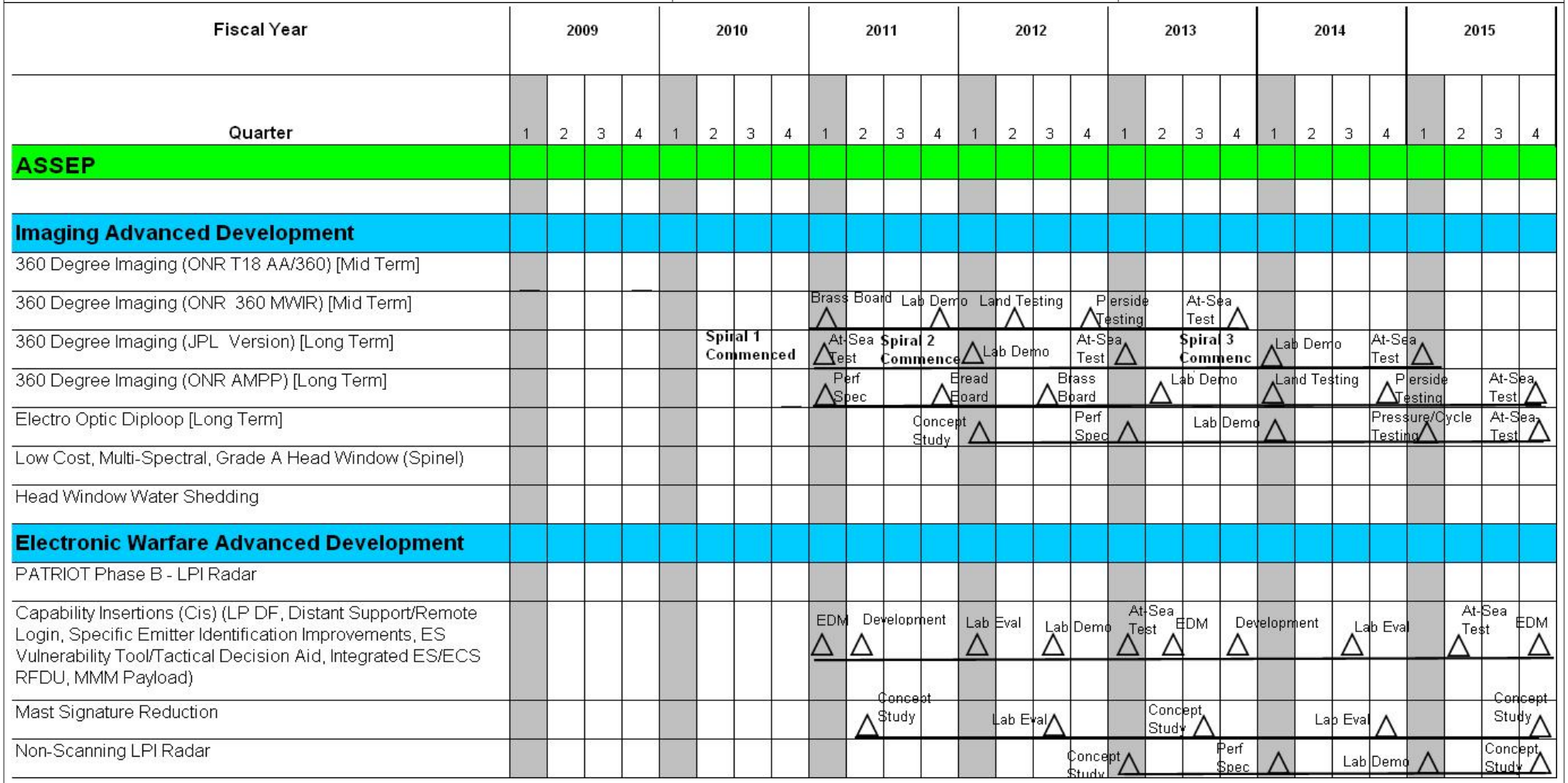

Exhibit R-4A, RDT&E Schedule Details: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0303562N: *Submarine Tactical Warfare Systems - MIP*	**PROJECT** 0770: *Adv Sub Supp Equip Prog*

Schedule Details

	Start		End	
Event	**Quarter**	**Year**	**Quarter**	**Year**
360 Degree Imaging (ONR) - MWIR - (Brass Board)	1	2011	1	2011
360 Degree Imaging (ONR) - MWIR - (Lab Demo)	4	2011	4	2011
360 Degree Imaging (ONR) - MWIR - (Land Testing)	2	2012	2	2012
360 Degree Imaging (ONR) - MWIR - (Pierside Testing)	4	2012	4	2012
360 Degree Imaging (ONR) - MWIR - (At-Sea Testing)	4	2013	4	2013
360 Degree Imaging (JPL) - (At-Sea Test)	1	2011	1	2015
360 Degree Imaging (JPL) - (Lab Demo)	1	2012	1	2014
360 Degree Imaging (ONR) - AMPP - (Perf Spec)	1	2011	1	2011
360 Degree Imaging (ONR) - AMPP - (Bread Board)	4	2011	4	2011
360 Degree Imaging (ONR) - AMPP - (Brass Board)	3	2012	3	2012
360 Degree Imaging (ONR) - AMPP - (Lab Demo)	2	2013	2	2013
360 Degree Imaging (ONR) - AMPP- (Land Testing)	1	2014	1	2014
360 Degree Imaging (ONR) - AMPP- (Pierside Testing)	4	2014	4	2014
360 Degree Imaging (ONR) - AMPP- (At-Sea Testing)	4	2015	4	2015
Capability Insertions (CI) - (EDM)	1	2011	4	2015
Capability Insertions (CI) - (Development)	2	2011	4	2013
Capability Insertions (CI) - (Lab Eval)	1	2012	3	2014
Capability Insertions (CI) - (Lab Demo)	3	2012	3	2012

Exhibit R-4A, RDT&E Schedule Details: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0303562N: *Submarine Tactical Warfare Systems - MIP*	**PROJECT** 0770: *Adv Sub Supp Equip Prog*

	Start		End	
Event	**Quarter**	**Year**	**Quarter**	**Year**
Capability Insertions (CI) - (At-Sea Testing)	1	2013	2	2015
Mast Signature Reduction - (Concept Study)	2	2011	4	2015
Mast Signature Reduction - (Lab Eval)	3	2012	4	2014
PATRIOT Non-Scanning LPI Radar - (Concept Study)	1	2013	4	2015
PATRIOT Non-Scanning LPI Radar - (Perf Spec)	1	2014	1	2014
PATRIOT Non-Scanning LPI Radar - (Lab Demo)	1	2015	1	2015
Electro Optic Diploop - (Concept Study)	1	2012	1	2012
Electro Optic Diploop - (Perf Spec)	1	2013	1	2013
Electro Optic Diploop - (Lab Demo)	1	2014	1	2014
Electro Optic Diploop - (Pressure/Cycle Testing)	1	2015	1	2015
Electro Optic Diploop - (At-Sea Testing)	4	2015	4	2015

Exhibit R-2, RDT&E Budget Item Justification: PB 2011 Navy	DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0304270N: *Electronic Warfare Development - MIP*

COST ($ in Millions)	FY 2009 Actual	FY 2010 Estimate	FY 2011 Base Estimate	FY 2011 OCO Estimate	FY 2011 Total Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
Total Program Element	0.000	0.000	0.663	0.000	0.663	0.666	0.687	0.703	0.716	Continuing	Continuing
2260: *Specific Emitter ID*	0.000	0.000	0.663	0.000	0.663	0.666	0.687	0.703	0.716	Continuing	Continuing

Note

New MIP PE formerly funded in 0604270N.

A. Mission Description and Budget Item Justification

The efforts described in this Program Element (PE) are based on investment directions as defined in the Naval S&T Strategic Plan approved by the S&T Corporate Board (Feb 2009).

This project supports systems development and collection of Specific Emitter Identification (SEI) information from National Technical Means (NTM) to track commercial ships over 200 gross registered tons world-wide. Research and development will cover improvements and enhancements to Electronic Intelligence technology. This will include improved/next generation SEI technology for miniaturization and automation of hardware, national collection systems, signal processing and analysis, and de-interleaving of signals. Propagation in a multi-path signal environment will also be assessed. All work on this project will be undertaken in pursuit of goals stated by the Office of Naval Intelligence and the National Security Agency in support of the Worldwide Ship Tracking Program.

This effort was previously funded in PE 0604270N and is moved to this new PE 0304270N for FY11 onward. This PE is a Military Intelligence Program.

Exhibit R-2, RDT&E Budget Item Justification: PB 2011 Navy	DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0304270N: *Electronic Warfare Development - MIP*

B. Program Change Summary ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
Previous President's Budget	0.000	0.000	0.000	0.000	0.000
Current President's Budget	0.000	0.000	0.663	0.000	0.663
Total Adjustments	0.000	0.000	0.663	0.000	0.663
• Congressional General Reductions		0.000			
• Congressional Directed Reductions		0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds		0.000			
• Congressional Directed Transfers		0.000			
• Reprogrammings	0.000	0.000			
• SBIR/STTR Transfer	0.000	0.000			
• Program Adjustments	0.000	0.000	0.663	0.000	0.663

Change Summary Explanation

Technical: Not applicable.

Schedule: Not applicable.

FY11 from previous President's Budget is shown as zero because no FY11-15 data was presented in President's Budget 2010.

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0304270N: *Electronic Warfare Development - MIP*	PROJECT 2260: *Specific Emitter ID*	

COST ($ in Millions)	FY 2009 Actual	FY 2010 Estimate	FY 2011 Base Estimate	FY 2011 OCO Estimate	FY 2011 Total Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
2260: *Specific Emitter ID*	0.000	0.000	0.663	0.000	0.663	0.666	0.687	0.703	0.716	Continuing	Continuing
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0		

A. Mission Description and Budget Item Justification

This project supports systems development and collection of Specific Emitter Identification (SEI) information from National Technical Means (NTM) to track commercial ships over 200 gross registered tons world-wide. Research and development will cover improvements and enhancements to Electronic Intelligence technology. This will include improved/next generation SEI technology for miniaturization and automation of hardware, national collection systems, signal processing and analysis, and de-interleaving of signals. Propagation in a multi-path signal environment will also be assessed. All work on this project will be undertaken in pursuit of goals stated by the Office of Naval
Intelligence and the National Security Agency in support of the Worldwide Ship Tracking Program.

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
SENSOR FUSION	0.000	0.000	0.199	0.000	0.199
This effort supports systems development and information fusion of improved SEI technology for automation of hardware, national collection systems, signal processing and analysis, and de-interleaving of signals. *FY 2011 Base Plans:* Transistioned from PE 0604270N/Specific Emitter ID) - Continued task to fuse additional sources of data with SEI data for automation of hardware, national collection systems, signal processing and analysis, and de-interleaving of signals. Work toward increasing sensor fusion, collection and reporting automation helped reduce staffing and support remote access and control capability.					
SYSTEM AUTOMATION	0.000	0.000	0.234	0.000	0.234

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0304270N: *Electronic Warfare Development - MIP*	PROJECT 2260: *Specific Emitter ID*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
This effort supports development of an autonomous surveillance system capable of providing emitter signal information to a central location. *FY 2011 Base Plans:* (Transitioned from PE 0604270N/Specific Emitter ID) - Continued task to develop an unmanned, autonomous, remote collection and surveillance system. - Continued task to automate fusion of other sensor information with SEI data collection.					
TECHNOLOGY REFRESH & COMMUNICATION ENHANCEMENT This effort improves SEI system performance, real-time communication and tactical use of SEI which will be expanded with next generation SEI technology. *FY 2011 Base Plans:* (Transitioned from PE 0604270N/Specific Emitter ID) - Continued task to incorporate other SEI algorithms into deployed processing software. - Continued task on integrating advanced SEI hardware with WINSEI software to support improved SEI system performance and capabilities for tactical and technical use, and which can be expanded with next generation SEI algorithms. - Continued task to incorporate further message reporting formats for dissemination of SEI data and improve SEI interoperability. - Continued task to expand collection capability to support additional radar types.	0.000	0.000	0.230	0.000	0.230
Accomplishments/Planned Programs Subtotals	0.000	0.000	0.663	0.000	0.663

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0304270N: *Electronic Warfare Development - MIP*	**PROJECT** 2260: *Specific Emitter ID*

C. Other Program Funding Summary ($ in Millions)

N/A

D. Acquisition Strategy

N/A

E. Performance Metrics

MIP Program.

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