Department of Defense
Fiscal Year (FY) 2017 President's Budget Submission

February 2016

Navy

Justification Book Volume 2 of 5

Research, Development, Test & Evaluation, Navy

Budget Activity 4

The estimated cost for this report for the Department of the Navy (DON) is $74,689.

The estimated total cost for supporting the DON budget justification material is approximately $1,834,000 for the 2016 fiscal year. This includes $75,200 in supplies and $1,758,800 in labor.

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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, $17,354,624,000, to remain available for obligation until September 30, 2017.

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Department of Defense
FY 2017 President's Budget
Exhibit R-1 FY 2017 President's Budget
Total Obligational Authority
(Dollars in Thousands)

14 Jan 2016

Appropriation	FY 2015 (Base & OCO)	FY 2016 Base Enacted	FY 2016 OCO Enacted	FY 2016 Total Enacted	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Research, Development, Test & Eval, Navy	16,067,423	18,111,247	35,747	18,146,994	17,276,301	78,323	17,354,624
Total Research, Development, Test & Evaluation	16,067,423	18,111,247	35,747	18,146,994	17,276,301	78,323	17,354,624

R-1C1: FY 2017 President's Budget (Published Version of PB Position), as of January 14, 2016 at 09:41:42

Department of Defense
FY 2017 President's Budget
Exhibit R-1 FY 2017 President's Budget
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(Dollars in Thousands)

14 Jan 2016

Summary Recap of Budget Activities	FY 2015 (Base & OCO)	FY 2016 Base Enacted	FY 2016 OCO Enacted	FY 2016 Total Enacted	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Basic Research	634,410	671,875		671,875	542,970		542,970
Applied Research	855,861	965,872		965,872	861,151		861,151
Advanced Technology Development	625,631	696,226		696,226	736,988		736,988
Advanced Component Development & Prototypes	4,357,168	5,022,272		5,022,272	4,662,867	41,897	4,704,764
System Development & Demonstration	5,119,875	6,274,796		6,274,796	6,025,655		6,025,655
Management Support	1,278,299	918,223		918,223	853,736		853,736
Operational Systems Development	3,196,179	3,561,983	35,747	3,597,730	3,592,934	36,426	3,629,360
Total Research, Development, Test & Evaluation	16,067,423	18,111,247	35,747	18,146,994	17,276,301	78,323	17,354,624
Summary Recap of FYDP Programs							
Strategic Forces	140,959	164,143		164,143	196,948		196,948
General Purpose Forces	1,292,908	1,326,178		1,326,178	1,447,043		1,447,043
Intelligence and Communications	754,576	719,253		719,253	713,042		713,042
Research and Development	12,620,194	14,380,627		14,380,627	13,638,282	41,897	13,680,179
Central Supply and Maintenance	60,896	28,506		28,506	52,526		52,526
Administration and Associated Activities	137	355		355			
Classified Programs	1,197,753	1,492,185	35,747	1,527,932	1,228,460	36,426	1,264,886
Total Research, Development, Test & Evaluation	16,067,423	18,111,247	35,747	18,146,994	17,276,301	78,323	17,354,624

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Management Support	1,278,299	918,223		918,223	853,736		853,736
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General Purpose Forces	1,292,908	1,326,178		1,326,178	1,447,043		1,447,043
Intelligence and Communications	754,576	719,253		719,253	713,042		713,042
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Department of the Navy
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Appropriation: 1319N Research, Development, Test & Eval, Navy

Line No	Program Element Number	Item	Act	FY 2015 (Base & OCO)	FY 2016 Base Enacted	FY 2016 OCO Enacted	FY 2016 Total Enacted	FY 2017 Base	FY 2017 OCO	FY 2017 Total	Sec
1	0601103N	University Research Initiatives	01	129,331	146,196		146,196	101,714		101,714	U
2	0601152N	In-House Laboratory Independent Research	01	18,997	19,126		19,126	18,508		18,508	U
3	0601153N	Defense Research Sciences	01	486,082	506,553		506,553	422,748		422,748	U
	Basic Research			634,410	671,875		671,875	542,970		542,970	
4	0602114N	Power Projection Applied Research	02	94,944	87,223		87,223	41,371		41,371	U
5	0602123N	Force Protection Applied Research	02	159,556	178,616		178,616	158,745		158,745	U
6	0602131M	Marine Corps Landing Force Technology	02	44,629	51,643		51,643	51,590		51,590	U
7	0602235N	Common Picture Applied Research	02	44,874	42,538		42,538	41,185		41,185	U
8	0602236N	Warfighter Sustainment Applied Research	02	46,202	45,047		45,047	45,467		45,467	U
9	0602271N	Electromagnetic Systems Applied Research	02	102,750	114,644		114,644	118,941		118,941	U
10	0602435N	Ocean Warfighting Environment Applied Research	02	62,643	72,252		72,252	42,618		42,618	U
11	0602651M	Joint Non-Lethal Weapons Applied Research	02	5,728	6,114		6,114	6,327		6,327	U
12	0602747N	Undersea Warfare Applied Research	02	88,204	150,839		150,839	126,313		126,313	U
13	0602750N	Future Naval Capabilities Applied Research	02	171,992	179,538		179,538	165,103		165,103	U
14	0602782N	Mine and Expeditionary Warfare Applied Research	02	34,339	37,418		37,418	33,916		33,916	U
15	0602898N	Science and Technology Management - ONR Headquarters	02					29,575		29,575	U
	Applied Research			855,861	965,872		965,872	861,151		861,151	

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Line No	Program Element Number	Item	Act	FY 2015 (Base & OCO)	FY 2016 Base Enacted	FY 2016 OCO Enacted	FY 2016 Total Enacted	FY 2017 Base	FY 2017 OCO	FY 2017 Total	Sec
16	0603114N	Power Projection Advanced Technology	03	36,651	36,971		36,971	96,406		96,406	U
17	0603123N	Force Protection Advanced Technology	03	25,148	38,044		38,044	48,438		48,438	U
18	0603271N	Electromagnetic Systems Advanced Technology	03	62,860	34,856		34,856	26,421		26,421	U
19	0603640M	USMC Advanced Technology Demonstration (ATD)	03	125,696	131,490		131,490	140,416		140,416	U
20	0603651M	Joint Non-Lethal Weapons Technology Development	03	11,163	12,745		12,745	13,117		13,117	U
21	0603673N	Future Naval Capabilities Advanced Technology Development	03	257,806	265,562		265,562	249,092		249,092	U
22	0603680N	Manufacturing Technology Program	03		57,074		57,074	56,712		56,712	U
23	0603729N	Warfighter Protection Advanced Technology	03	39,374	36,299		36,299	4,789		4,789	U
24	0603747N	Undersea Warfare Advanced Technology	03	9,639	13,748		13,748	25,880		25,880	U
25	0603758N	Navy Warfighting Experiments and Demonstrations	03	55,363	65,946		65,946	60,550		60,550	U
26	0603782N	Mine and Expeditionary Warfare Advanced Technology	03	1,931	3,491		3,491	15,167		15,167	U
		Advanced Technology Development		625,631	696,226		696,226	736,988		736,988	
27	0603207N	Air/Ocean Tactical Applications	04	39,669	37,832		37,832	48,536		48,536	U
28	0603216N	Aviation Survivability	04	4,280	10,904		10,904	5,239		5,239	U
29	0603237N	Deployable Joint Command and Control	04	2,991	3,086		3,086				U
30	0603251N	Aircraft Systems	04	14,270	26,643		26,643	1,519		1,519	U
31	0603254N	ASW Systems Development	04	7,602	5,551		5,551	7,041		7,041	U

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32	0603261N	Tactical Airborne Reconnaissance	04	5,870	3,080		3,080	3,274		3,274	U
33	0603382N	Advanced Combat Systems Technology	04	1,582	1,631		1,631	57,034		57,034	U
34	0603502N	Surface and Shallow Water Mine Countermeasures	04	83,793	90,472		90,472	165,775		165,775	U
35	0603506N	Surface Ship Torpedo Defense	04	56,802	71,300		71,300	87,066		87,066	U
36	0603512N	Carrier Systems Development	04	5,954	8,348		8,348	7,605		7,605	U
37	0603525N	PILOT FISH	04	140,841	122,939		122,939	132,068		132,068	U
38	0603527N	RETRACT LARCH	04	29,725	28,803		28,803	14,546	3,907	18,453	U
39	0603536N	RETRACT JUNIPER	04	79,059	112,604		112,604	115,435		115,435	U
40	0603542N	Radiological Control	04	667	710		710	702		702	U
41	0603553N	Surface ASW	04	1,020	1,096		1,096	1,081		1,081	U
42	0603561N	Advanced Submarine System Development	04	65,913	85,834		85,834	100,565		100,565	U
43	0603562N	Submarine Tactical Warfare Systems	04	7,986	10,371		10,371	8,782		8,782	U
44	0603563N	Ship Concept Advanced Design	04	17,831	10,459		10,459	14,590		14,590	U
45	0603564N	Ship Preliminary Design & Feasibility Studies	04	8,007	3,332		3,332	15,805		15,805	U
46	0603570N	Advanced Nuclear Power Systems	04	499,961	482,040		482,040	453,313		453,313	U
47	0603573N	Advanced Surface Machinery Systems	04	20,357	24,143		24,143	36,655		36,655	U
48	0603576N	CHALK EAGLE	04	529,885	511,651		511,651	367,016		367,016	U
49	0603581N	Littoral Combat Ship (LCS)	04	80,199	91,416		91,416	51,630		51,630	U
50	0603582N	Combat System Integration	04	20,741	32,561		32,561	23,530		23,530	U
51	0603595N	Ohio Replacement	04	833,274	971,393		971,393	700,811		700,811	U

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52	0603596N	LCS Mission Modules	04	172,602	203,143		203,143	160,058		160,058	U
53	0603597N	Automated Test and Analysis	04	7,816	23,000		23,000				U
54	0603599N	Frigate Development	04		30,000		30,000	84,900		84,900	U
55	0603609N	Conventional Munitions	04	7,603	7,678		7,678	8,342		8,342	U
56	0603611M	Marine Corps Assault Vehicles	04	101,175	212,173		212,173	158,682		158,682	U
57	0603635M	Marine Corps Ground Combat/Support System	04	1,241	378		378	1,303		1,303	U
58	0603654N	Joint Service Explosive Ordnance Development	04	22,274	15,329		15,329	46,911		46,911	U
59	0603658N	Cooperative Engagement	04	41,158	73,786		73,786				U
60	0603713N	Ocean Engineering Technology Development	04	6,127	4,520		4,520	4,556		4,556	U
61	0603721N	Environmental Protection	04	13,200	19,289		19,289	20,343		20,343	U
62	0603724N	Navy Energy Program	04	62,412	56,391		56,391	52,479		52,479	U
63	0603725N	Facilities Improvement	04	2,588	3,726		3,726	5,458		5,458	U
64	0603734N	CHALK CORAL	04	162,900	174,771		174,771	245,860		245,860	U
65	0603739N	Navy Logistic Productivity	04	3,355	3,866		3,866	3,089		3,089	U
66	0603746N	RETRACT MAPLE	04	346,830	359,856		359,856	323,526		323,526	U
67	0603748N	LINK PLUMERIA	04	260,179	237,376		237,376	318,497		318,497	U
68	0603751N	RETRACT ELM	04	32,889	37,700		37,700	52,834		52,834	U
69	0603764N	LINK EVERGREEN	04	44,894	47,312		47,312	48,116		48,116	U
70	0603787N	Special Processes	04	24,336	17,392		17,392	13,619		13,619	U
71	0603790N	NATO Research and Development	04	8,659	8,320		8,320	9,867		9,867	U

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72	0603795N	Land Attack Technology	04	310	887		887	6,015		6,015	U
73	0603851M	Joint Non-Lethal Weapons Testing	04	32,955	29,444		29,444	27,904		27,904	U
74	0603860N	Joint Precision Approach and Landing Systems - Dem/Val	04	41,644	81,466		81,466	104,144		104,144	U
75	0603925N	Directed Energy and Electric Weapon Systems	04	54,154	41,730		41,730	32,700		32,700	U
76	0604112N	Gerald R. Ford Class Nuclear Aircraft Carrier (CVN 78 - 80)	04	46,308	98,105		98,105	70,528		70,528	U
77	0604122N	Remote Minehunting System (RMS)	04	20,534	17,589		17,589	3,001		3,001	U
78	0604272N	Tactical Air Directional Infrared Countermeasures (TADIRCM)	04	5,677	18,969		18,969	34,920	37,990	72,910	U
79	0604279N	ASE Self-Protection Optimization	04	5,121	7,874		7,874				U
80	0604292N	MH-XX	04	3,007	4,516		4,516	1,620		1,620	U
81	0604454N	LX (R)	04	32,522	75,486		75,486	6,354		6,354	U
82	0604536N	Advanced Undersea Prototyping	04					78,589		78,589	U
83	0604653N	Joint Counter Radio Controlled IED Electronic Warfare (JCREW)	04	14,987	3,790		3,790				U
84	0604659N	Precision Strike Weapons Development Program	04		9,595		9,595	9,910		9,910	U
85	0604707N	Space and Electronic Warfare (SEW) Architecture/Engineering Support	04	21,916	20,203		20,203	23,971		23,971	U
86	0604786N	Offensive Anti-Surface Warfare Weapon Development	04	181,719	285,849		285,849	252,409		252,409	U
87	0605812M	Joint Light Tactical Vehicle (JLTV) Engineering and Manufacturing Development Ph	04	8,970	32,149		32,149	23,197		23,197	U

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88	0303354N	ASW Systems Development - MIP	04	6,495	9,835		9,835	9,110		9,110	U
89	0304270N	Electronic Warfare Development - MIP	04	332	580		580	437		437	U
		Advanced Component Development & Prototypes		4,357,168	5,022,272		5,022,272	4,662,867	41,897	4,704,764	
90	0603208N	Training System Aircraft	05	13,115	17,989		17,989	19,938		19,938	U
91	0604212N	Other Helo Development	05	34,436	11,101		11,101	6,268		6,268	U
92	0604214N	AV-8B Aircraft - Eng Dev	05	24,558	27,668		27,668	33,664		33,664	U
93	0604215N	Standards Development	05	52,842	53,049		53,049	1,300		1,300	U
94	0604216N	Multi-Mission Helicopter Upgrade Development	05	11,159	18,858		18,858	5,275		5,275	U
95	0604218N	Air/Ocean Equipment Engineering	05	2,126	4,515		4,515	3,875		3,875	U
96	0604221N	P-3 Modernization Program	05	698	1,514		1,514	1,909		1,909	U
97	0604230N	Warfare Support System	05	9,050	5,875		5,875	13,237		13,237	U
98	0604231N	Tactical Command System	05	52,287	73,533		73,533	36,323		36,323	U
99	0604234N	Advanced Hawkeye	05	171,189	217,645		217,645	363,792		363,792	U
100	0604245N	H-1 Upgrades	05	43,469	27,235		27,235	27,441		27,441	U
101	0604261N	Acoustic Search Sensors	05	24,395	31,235		31,235	34,525		34,525	U
102	0604262N	V-22A	05	50,188	76,483		76,483	174,423		174,423	U
103	0604264N	Air Crew Systems Development	05	14,503	12,665		12,665	13,577		13,577	U
104	0604269N	EA-18	05	18,653	46,921		46,921	116,761		116,761	U
105	0604270N	Electronic Warfare Development	05	27,250	20,113		20,113	48,766		48,766	U
106	0604273N	Executive Helo Development	05	356,567	507,093		507,093	338,357		338,357	U
107	0604274N	Next Generation Jammer (NGJ)	05	224,578	387,770		387,770	577,822		577,822	U

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Line No	Program Element Number	Item	Act	FY 2015 (Base & OCO)	FY 2016 Base Enacted	FY 2016 OCO Enacted	FY 2016 Total Enacted	FY 2017 Base	FY 2017 OCO	FY 2017 Total	Sec
108	0604280N	Joint Tactical Radio System - Navy (JTRS-Navy)	05	6,725	24,985		24,985	2,365		2,365	U
109	0604282N	Next Generation Jammer (NGJ) Increment II	05		13,000		13,000	52,065		52,065	U
110	0604307N	Surface Combatant Combat System Engineering	05	178,430	386,576		386,576	282,764		282,764	U
111	0604311N	LPD-17 Class Systems Integration	05	363	747		747	580		580	U
112	0604329N	Small Diameter Bomb (SDB)	05	53,950	57,144		57,144	97,622		97,622	U
113	0604366N	Standard Missile Improvements	05	50,241	115,644		115,644	120,561		120,561	U
114	0604373N	Airborne MCM	05	37,831	9,647		9,647	45,622		45,622	U
115	0604376M	Marine Air Ground Task Force (MAGTF) Electronic Warfare (EW) for Aviation	05	9,219	2,778		2,778				U
116	0604378N	Naval Integrated Fire Control - Counter Air Systems Engineering	05	14,903	23,695		23,695	25,750		25,750	U
117	0604404N	Unmanned Carrier Launched Airborne Surveillance and Strike (UCLASS) System	05	382,542	434,699		434,699				U
118	0604501N	Advanced Above Water Sensors	05	19,320	43,914		43,914	85,868		85,868	U
119	0604503N	SSN-688 and Trident Modernization	05	70,053	109,893		109,893	117,476		117,476	U
120	0604504N	Air Control	05	28,669	57,928		57,928	47,404		47,404	U
121	0604512N	Shipboard Aviation Systems	05	120,062	120,217		120,217	112,158		112,158	U
122	0604518N	Combat Information Center Conversion	05					6,283		6,283	U
123	0604522N	Air and Missile Defense Radar (AMDR) System	05	126,525	232,677		232,677	144,395		144,395	U
124	0604558N	New Design SSN	05	85,787	157,056		157,056	113,013		113,013	U

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

Line No	Program Element Number	Item	Act	FY 2015 (Base & OCO)	FY 2016 Base Enacted	FY 2016 OCO Enacted	FY 2016 Total Enacted	FY 2017 Base	FY 2017 OCO	FY 2017 Total	Sec
125	0604562N	Submarine Tactical Warfare System	05	37,768	52,713		52,713	43,160		43,160	U
126	0604567N	Ship Contract Design/ Live Fire T&E	05	39,459	38,925		38,925	65,002		65,002	U
127	0604574N	Navy Tactical Computer Resources	05	3,884	4,096		4,096	3,098		3,098	U
128	0604580N	Virginia Payload Module (VPM)	05	106,223	167,719		167,719	97,920		97,920	U
129	0604601N	Mine Development	05	10,962	15,122		15,122	10,490		10,490	U
130	0604610N	Lightweight Torpedo Development	05	39,664	43,738		43,738	20,178		20,178	U
131	0604654N	Joint Service Explosive Ordnance Development	05	8,978	8,123		8,123	7,369		7,369	U
132	0604703N	Personnel, Training, Simulation, and Human Factors	05	5,925	7,686		7,686	4,995		4,995	U
133	0604727N	Joint Standoff Weapon Systems	05	4,389	405		405	412		412	U
134	0604755N	Ship Self Defense (Detect & Control)	05	64,704	145,336		145,336	134,619		134,619	U
135	0604756N	Ship Self Defense (Engage: Hard Kill)	05	94,534	86,811		86,811	114,475		114,475	U
136	0604757N	Ship Self Defense (Engage: Soft Kill/EW)	05	107,319	105,416		105,416	114,211		114,211	U
137	0604761N	Intelligence Engineering	05	200	2,053		2,053	11,029		11,029	U
138	0604771N	Medical Development	05	26,589	25,291		25,291	9,220		9,220	U
139	0604777N	Navigation/ID System	05	28,952	32,456		32,456	42,723		42,723	U
140	0604800M	Joint Strike Fighter (JSF) - EMD	05	487,940	537,901		537,901	531,426		531,426	U
141	0604800N	Joint Strike Fighter (JSF) - EMD	05	486,978	504,736		504,736	528,716		528,716	U
142	0604810M	Joint Strike Fighter Follow On Development - Marine Corps	05	10,086	20,798		20,798	74,227		74,227	U

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

Line No	Program Element Number	Item	Act	FY 2015 (Base & OCO)	FY 2016 Base Enacted	FY 2016 OCO Enacted	FY 2016 Total Enacted	FY 2017 Base	FY 2017 OCO	FY 2017 Total	Sec
143	0604810N	Joint Strike Fighter Follow On Development - Navy	05	10,302	21,200		21,200	63,387		63,387	U
144	0605013M	Information Technology Development	05	2,670	4,824		4,824	4,856		4,856	U
145	0605013N	Information Technology Development	05	55,106	85,816		85,816	97,066		97,066	U
146	0605024N	Anti-Tamper Technology Support	05					2,500		2,500	U
147	0605212N	CH-53K RDTE	05	538,192	592,317		592,317	404,810		404,810	U
148	0605215N	Mission Planning	05					33,570		33,570	U
149	0605217N	Common Avionics	05					51,599		51,599	U
150	0605220N	Ship to Shore Connector (SSC)	05	41,616	7,778		7,778	11,088		11,088	U
151	0605327N	T-AO (X)	05					1,095		1,095	U
152	0605414N	Carrier Based Aerial Refueling System (CBARS)	05					89,000		89,000	U
153	0605450N	Joint Air-to-Ground Missile (JAGM)	05	6,104	25,898		25,898	17,880		17,880	U
154	0605500N	Multi-mission Maritime Aircraft (MMA)	05	297,380	156,293		156,293	59,126		59,126	U
155	0605504N	Multi-Mission Maritime (MMA) Increment III	05		91,616		91,616	182,220		182,220	U
156	0204202N	DDG-1000	05	196,987	103,179		103,179	45,642		45,642	U
157	0303167N	Pre-Auction Spectrum Relocation Fund	05	1,569							U
158	0303267N	Auctioned Spectrum Relocation Fund	05	4,569							U
159	0304231N	Tactical Command System - MIP	05	1,011	998		998	676		676	U
160	0304785N	Tactical Cryptologic Systems	05	10,157	17,785		17,785	36,747		36,747	U
161	0305124N	Special Applications Program	05	73,975	35,905		35,905	35,002		35,002	U

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

Line No	Program Element Number	Item	Act	FY 2015 (Base & OCO)	FY 2016 Base Enacted	FY 2016 OCO Enacted	FY 2016 Total Enacted	FY 2017 Base	FY 2017 OCO	FY 2017 Total	Sec
162	0306250M	Cyber Operations Technology Development	05					4,942		4,942	U
		System Development & Demonstration		5,119,875	6,274,796		6,274,796	6,025,655		6,025,655	
163	0604256N	Threat Simulator Development	06	40,178	30,769		30,769	16,633		16,633	U
164	0604258N	Target Systems Development	06	66,251	71,152		71,152	36,662		36,662	U
165	0604759N	Major T&E Investment	06	121,108	61,234		61,234	42,109		42,109	U
166	0605126N	Joint Theater Air and Missile Defense Organization	06	4,800	6,995		6,995	2,998		2,998	U
167	0605152N	Studies and Analysis Support - Navy	06	3,412	4,011		4,011	3,931		3,931	U
168	0605154N	Center for Naval Analyses	06	43,054	47,071		47,071	46,634		46,634	U
169	0605285N	Next Generation Fighter	06	4,794	5,000		5,000	1,200		1,200	U
170	0605502N	Small Business Innovative Research	06	325,429							U
171	0605804N	Technical Information Services	06	1,290	925		925	903		903	U
172	0605853N	Management, Technical & International Support	06	83,789	83,024		83,024	87,077		87,077	U
173	0605856N	Strategic Technical Support	06	2,500	3,258		3,258	3,597		3,597	U
174	0605861N	RDT&E Science and Technology Management	06	72,943	76,948		76,948	62,811		62,811	U
175	0605863N	RDT&E Ship and Aircraft Support	06	127,634	132,122		132,122	106,093		106,093	U
176	0605864N	Test and Evaluation Support	06	335,791	351,912		351,912	349,146		349,146	U
177	0605865N	Operational Test and Evaluation Capability	06	16,423	17,985		17,985	18,160		18,160	U
178	0605866N	Navy Space and Electronic Warfare (SEW) Support	06	2,992	5,316		5,316	9,658		9,658	U

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179	0605867N	SEW Surveillance/Reconnaissance Support	06	8,325	6,519		6,519	6,500		6,500	U
180	0605873M	Marine Corps Program Wide Support	06	17,449	13,627		13,627	22,247		22,247	U
181	0605898N	Management HQ - R&D	06					16,254		16,254	U
182	0606355N	Warfare Innovation Management	06					21,123		21,123	U
183	0909980N	Judgment Fund Reimbursement	06		353		353				U
184	0909999N	Financing for Cancelled Account Adjustments	06	137	2		2				U
		Management Support		1,278,299	918,223		918,223	853,736		853,736	
186	0604402N	Unmanned Combat Air Vehicle (UCAV) Advanced Component and Prototype Development	07	35,309							U
187	0605525N	Carrier Onboard Delivery (COD) Follow On	07	8,873							U
188	0607658N	Cooperative Engagement Capability (CEC)	07					84,501		84,501	U
189	0607700N	Deployable Joint Command and Control	07					2,970		2,970	U
190	0101221N	Strategic Sub & Weapons System Support	07	93,912	96,404		96,404	136,556		136,556	U
191	0101224N	SSBN Security Technology Program	07	29,146	46,481		46,481	33,845		33,845	U
192	0101226N	Submarine Acoustic Warfare Development	07	4,366	4,700		4,700	9,329		9,329	U
193	0101402N	Navy Strategic Communications	07	13,535	16,558		16,558	17,218		17,218	U
194	0203761N	Rapid Technology Transition (RTT)	07	8,323	8,632		8,632				U
195	0204136N	F/A-18 Squadrons	07	84,976	135,755		135,755	189,125		189,125	U

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

Line No	Program Element Number	Item	Act	FY 2015 (Base & OCO)	FY 2016 Base Enacted	FY 2016 OCO Enacted	FY 2016 Total Enacted	FY 2017 Base	FY 2017 OCO	FY 2017 Total	Sec
196	0204163N	Fleet Telecommunications (Tactical)	07	26,333	41,538		41,538	48,225		48,225	U
197	0204228N	Surface Support	07	3,000	36,045		36,045	21,156		21,156	U
198	0204229N	Tomahawk and Tomahawk Mission Planning Center (TMPC)	07	25,543	25,227		25,227	71,355		71,355	U
199	0204311N	Integrated Surveillance System	07	72,315	49,587		49,587	58,542		58,542	U
200	0204413N	Amphibious Tactical Support Units (Displacement Craft)	07	5,522	11,335		11,335	13,929		13,929	U
201	0204460M	Ground/Air Task Oriented Radar (G/ ATOR)	07	90,577	65,598		65,598	83,538		83,538	U
202	0204571N	Consolidated Training Systems Development	07	38,359	34,325		34,325	38,593		38,593	U
203	0204574N	Cryptologic Direct Support	07	1,627	1,915		1,915	1,122		1,122	U
204	0204575N	Electronic Warfare (EW) Readiness Support	07	15,993	46,403		46,403	99,998		99,998	U
205	0205601N	HARM Improvement	07	17,377	23,708		23,708	48,635		48,635	U
206	0205604N	Tactical Data Links	07	135,582	142,361		142,361	124,785		124,785	U
207	0205620N	Surface ASW Combat System Integration	07	25,567	24,435		24,435	24,583		24,583	U
208	0205632N	MK-48 ADCAP	07	25,920	47,703		47,703	39,134		39,134	U
209	0205633N	Aviation Improvements	07	83,083	106,255		106,255	120,861		120,861	U
210	0205675N	Operational Nuclear Power Systems	07	104,023	101,323		101,323	101,786		101,786	U
211	0206313M	Marine Corps Communications Systems	07	82,576	77,909		77,909	82,159		82,159	U
212	0206335M	Common Aviation Command and Control System (CAC2S)	07	31,568	13,431		13,431	11,850		11,850	U

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

Line No	Program Element Number	Item	Act	FY 2015 (Base & OCO)	FY 2016 Base Enacted	FY 2016 OCO Enacted	FY 2016 Total Enacted	FY 2017 Base	FY 2017 OCO	FY 2017 Total	Sec
213	0206623M	Marine Corps Ground Combat/ Supporting Arms Systems	07	49,173	48,590		48,590	47,877		47,877	U
214	0206624M	Marine Corps Combat Services Support	07	18,185	19,955		19,955	13,194		13,194	U
215	0206625M	USMC Intelligence/Electronic Warfare Systems (MIP)	07	16,178	12,671		12,671	17,171		17,171	U
216	0206629M	Amphibious Assault Vehicle	07	87,940	45,110		45,110	38,020		38,020	U
217	0207161N	Tactical AIM Missiles	07	36,361	71,016		71,016	56,285		56,285	U
218	0207163N	Advanced Medium Range Air-to-Air Missile (AMRAAM)	07	9,820	32,172		32,172	40,350		40,350	U
219	0219902M	Global Combat Support System - Marine Corps (GCSS-MC)	07					9,128		9,128	U
223	0303109N	Satellite Communications (SPACE)	07	34,716	47,312		47,312	37,372		37,372	U
224	0303138N	Consolidated Afloat Network Enterprise Services (CANES)	07	24,137	21,667		21,667	23,541		23,541	U
225	0303140N	Information Systems Security Program	07	22,655	28,081		28,081	38,510		38,510	U
227	0305160N	Navy Meteorological and Ocean Sensors-Space (METOC)	07	356	599		599				U
228	0305192N	Military Intelligence Program (MIP) Activities	07	6,166	6,207		6,207	6,019		6,019	U
229	0305204N	Tactical Unmanned Aerial Vehicles	07	8,505	8,550		8,550	8,436		8,436	U
230	0305205N	UAS Integration and Interoperability	07		41,831		41,831	36,509		36,509	U
231	0305208M	Distributed Common Ground/Surface Systems	07	10,916	1,105		1,105	2,100		2,100	U
232	0305208N	Distributed Common Ground/Surface Systems	07	18,146	23,149		23,149	44,571		44,571	U
233	0305220N	MQ-4C Triton	07	419,242	227,118		227,118	111,729		111,729	U

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

Line No	Program Element Number	Item	Act	FY 2015 (Base & OCO)	FY 2016 Base Enacted	FY 2016 OCO Enacted	FY 2016 Total Enacted	FY 2017 Base	FY 2017 OCO	FY 2017 Total	Sec
234	0305231N	MQ-8 UAV	07	43,294	52,770		52,770	26,518		26,518	U
235	0305232M	RQ-11 UAV	07	682	635		635	418		418	U
236	0305233N	RQ-7 UAV	07	851	688		688	716		716	U
237	0305234N	Small (Level 0) Tactical UAS (STUASL0)	07	4,813	4,647		4,647	5,071		5,071	U
238	0305239M	RQ-21A	07	7,782	6,251		6,251	9,497		9,497	U
239	0305241N	Multi-Intelligence Sensor Development	07	17,751	39,645		39,645	77,965		77,965	U
240	0305242M	Unmanned Aerial Systems (UAS) Payloads (MIP)	07	1,900	9,246		9,246	11,181		11,181	U
241	0305421N	RQ-4 Modernization	07	30,000	129,892		129,892	181,266		181,266	U
242	0308601N	Modeling and Simulation Support	07	4,556	4,757		4,757	4,709		4,709	U
243	0702207N	Depot Maintenance (Non-IF)	07	20,678	24,185		24,185	49,322		49,322	U
244	0708011N	Industrial Preparedness	07	36,031							U
245	0708730N	Maritime Technology (MARITECH)	07	4,187	4,321		4,321	3,204		3,204	U
9999	9999999999	Classified Programs		1,197,753	1,492,185	35,747	1,527,932	1,228,460	36,426	1,264,886	U
		Operational Systems Development		3,196,179	3,561,983		3,597,730	3,592,934		3,629,360	
Total Research, Development, Test & Eval, Navy				16,067,423	18,111,247		18,146,994	17,276,301	78,323	17,354,624	

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Exhibit R-2, RDT&E Budget Item Justification: PB 2017 Navy											Date: February 2016	
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 4: *Advanced Component Development & Prototypes (ACD&P)*					R-1 Program Element (Number/Name) PE 0603207N *I Air/Ocean Tactical Applications*							
COST ($ in Millions)	**Prior Years**	**FY 2015**	**FY 2016**	**FY 2017 Base**	**FY 2017 OCO**	**FY 2017 Total**	**FY 2018**	**FY 2019**	**FY 2020**	**FY 2021**	**Cost To Complete**	**Total Cost**
Total Program Element	507.074	39.670	37.832	48.536	-	48.536	49.686	49.734	45.864	46.818	Continuing	Continuing
2341: *METOC Data Acquisition*	161.559	2.487	3.763	4.437	-	4.437	5.467	5.316	5.341	5.447	Continuing	Continuing
2342: *METOC Data Assimilation and Mod*	202.060	12.890	16.360	20.165	-	20.165	21.497	22.369	22.721	23.198	Continuing	Continuing
2343: *Tactical METOC Applications*	135.448	8.942	9.260	13.473	-	13.473	15.437	15.261	15.443	15.765	Continuing	Continuing
2344.: *Precise Time and Astrometry*	6.825	8.217	4.977	5.636	-	5.636	5.229	4.745	0.313	0.319	Continuing	Continuing
2363.: *Remote Sensing Capability Development*	0.000	4.949	2.479	3.855	-	3.855	1.023	0.988	0.970	0.991	Continuing	Continuing
3207: *Fleet Synthetic Training*	1.182	2.185	0.993	0.970	-	0.970	1.033	1.055	1.076	1.098	Continuing	Continuing

A. Mission Description and Budget Item Justification

The Air Ocean Tactical Applications (AOTA) Program Element is aligned with the Navy's maritime strategy to enhance the future mission capabilities of the Navy-Marine Corps Meteorological and Oceanographic (METOC) Team supporting naval warfighters worldwide. New state-of-the art government and commercial technologies are identified, transitioned, demonstrated and then integrated into Combat Systems and programs of record to provide capabilities that provide real-time and near-real-time 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 and predicting 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. Model data, products and services can be used by forward-deployed personnel or in a reach-back mode to optimize sensor placement and force allocation decisions. Global Geospatial Information and Services efforts within this program address the bathymetric 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. This program element develops technological upgrades for the U.S. Naval Observatory's Master Clock system to meet requirements of Department of Defense 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.

Exhibit R-2, RDT&E Budget Item Justification: PB 2017 Navy	Date: February 2016
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 0603207N *I Air/Ocean Tactical Applications*

Major emphasis areas include the Naval Integrated Tactical Environmental System Next Generation (NITES-Next) and the METOC Future Mission Capabilities (FMC), the METOC Space-Based Sensing Capabilities, the Precise Timing and Astrometry, the Fleet Synthetic Training, the Tactical Oceanographic Capabilities for Under Sea Warfare, the Earth System Prediction Capability projects, and the Remote Sensing Capability Development.

B. Program Change Summary ($ in Millions)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Previous President's Budget	40.429	41.832	50.430	-	50.430
Current President's Budget	39.670	37.832	48.536	-	48.536
Total Adjustments	-0.759	-4.000	-1.894	-	-1.894
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-4.000			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	0.284	0.000			
• SBIR/STTR Transfer	-1.044	0.000			
• Program Adjustments	0.000	0.000	1.800	-	1.800
• Rate/Misc Adjustments	0.001	0.000	-3.694	-	-3.694

Change Summary Explanation

Decrease in Air Ocean Tactical Applications (AOTA) by $2.1M as required for the Department of the Navy to comply with the Bipartisan Budget Act of 2015.

The FY 2016 funding request was reduced by $3.6 million to account for the availability of prior year execution balances.

Technical - Increase in funding in FY16 - FY19 for Precise Time and Astrometry (PTA) program efforts.

Schedule- 1) The schedule for PTA is updated to reflect the additional required research and upgrades.

2) The schedule for NITES-Next is updated to reflect a 12 month delay to Fleet Capability Release-3 (FCR-3) Build Decision.

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603207N / *Air/Ocean Tactical Applications*	Project (Number/Name) 2341 / *METOC Data Acquisition*	

COST ($ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
2341: *METOC Data Acquisition*	161.559	2.487	3.763	4.437	-	4.437	5.467	5.316	5.341	5.447	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

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 typically have dynamic and complex oceanographic and atmospheric conditions. The need to accurately characterize these conditions is more crucial than ever in planning and executing warfare operations and effectively allocating force weapon and sensor systems. 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 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 validates 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. Major emphasis areas include the METOC Future Mission Capabilities (FMC) and the Tactical Oceanographic Capabilities project.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Title: Meteorological and Oceanographic (METOC) Future Mission Capabilities (FMC)	2.188	3.463	4.230	0.000	4.230
Articles:	-	-	-	-	-
FY 2015 Accomplishments: Continued advanced component and prototype development efforts associated with acquiring environmental data and develop advanced techniques for data measurement and survey techniques that capture measurement uncertainties in order to provide warfare commanders with an accurate assessment of uncertainty in sensor performance prediction products and services. Continued to develop technologies that use tactical detection systems where applicable to characterize undersea and atmospheric environment in the battlespace. Developed					

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603207N / *Air/Ocean Tactical Applications*	**Project (Number/Name)** 2341 / *METOC Data Acquisition*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
and demonstrated in-situ sampling techniques to support adaptive and advance measurement technologies. Developed tools and techniques to support forecaster's processing, analysis and performance assessment processes. ***FY 2016 Plans:*** Continue advanced component and prototype development efforts associated with acquiring environmental data. Develop advanced techniques for data measurement and survey techniques that capture measurement uncertainties in order to provide warfare commanders with an accurate assessment of uncertainty in sensor performance prediction products and services. Continue to develop technologies to characterize undersea and atmospheric environment in the battlespace. Continue to develop and demonstrate in-situ sampling techniques to support adaptive and advance measurement technologies. Continue to develop tools and techniques to support forecaster's processing, analysis and performance assessment processes. Develop tools to assess reach-back and on scene data fusion to support improved METOC decision support infrastructure. ***FY 2017 Base Plans:*** Developed and demonstrated in-situ sampling techniques to support adaptive and advance measurement technologies. Developed techniques to improve delivery of GI&S within Navy METOC product production centers and throughout the fleet user base. Continue development of METOC systems engineering plans, requirements, standards, studies, and other documentation supporting integration of these products. Develop advanced techniques for data measurement and survey techniques that capture measurement uncertainties in order to provide warfare commanders with an accurate assessment of uncertainty in sensor performance prediction products and services. Develop tools to assess reach-back and on scene data fusion to support improved METOC decision support infrastructure. ***FY 2017 OCO Plans:*** N/A					
Title: Tactical Oceanography Capabilities (TOC) / Undersea Warfare (USW)	0.299	0.300	0.207	0.000	0.207
Articles:	-	-	-	-	-
FY 2015 Accomplishments: Continued to transition sonar through-the-sensor (TTS) collection methodologies, data assimilation, models, algorithms and databases used by the Naval Oceanographic Office (NAVO) to calculate accurate acoustic transition loss (TL) and characterize environmental parameters that affect TL into U.S. Navy anti-submarine warfare (ASW) tactical decision aids (TDAs). Continued to develop capabilities to rapidly calculate acoustic TL					

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603207N / *Air/Ocean Tactical Applications*	**Project (Number/Name)** 2341 / *METOC Data Acquisition*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
values within tactical timeframes to include environmental uncertainty quantification of those values for both active and passive sonar systems. ***FY 2016 Plans:*** Continue to transition models, algorithms and databases used to calculate accurate acoustic TL and characterize environmental parameters that affect TL into U.S. Navy ASW TDAs. Continue to develop capabilities to rapidly calculate acoustic TL values within tactical timeframes to include environmental uncertainty quantification of those values for both active and passive sonar systems with emphasis on developing an active radial province capability. ***FY 2017 Base Plans:*** Continue to transition models, algorithms and databases that calculate accurate acoustic transmission loss (TL) and characterize environmental parameters that affect TL. Developed TL calculation implementations to be used in the Navy's Anti-Submarine Warfare (ASW) Tactical Decision Aids (TDAs) and sonar trainers. Continued to develop capabilities to rapidly calculate acoustic TL values within tactical timeframes to include environmental uncertainty quantification of those values. Develop capabilities to rapidly calculate acoustic TL values within tactical timeframes to include environmental uncertainty quantification of those values for both active and passive sonar systems with emphasis on developing an active radial province capability. ***FY 2017 OCO Plans:*** N/A					
Accomplishments/Planned Programs Subtotals	2.487	3.763	4.437	0.000	4.437

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
• RDTEN/0604218N/2345: *FLEET METOC EQUIPMENT*	1.200	3.379	2.222	-	2.222	2.411	2.438	2.456	2.505	Continuing	Continuing
• RDTEN/0603207N/2342: *METOC DATA ASSIMILATION AND MOD*	4.891	8.168	0.000	-	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
• RDTEN/0604218N/2346: *METOC SENSOR ENGINEERING*	0.926	1.136	0.000	-	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing

Remarks

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603207N / *Air/Ocean Tactical Applications*	**Project (Number/Name)** 2341 / *METOC Data Acquisition*

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 Meteorological and Oceanographic (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 2017 Navy			Date: February 2016
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Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
METOC Future Mission Capabilities	WR	NRL : Washington, DC	73.390	1.669	Nov 2014	2.636	Nov 2015	3.406	Nov 2016	-		3.406	Continuing	Continuing	Continuing
METOC Future Mission Capabilities	WR	SSC PAC : California	22.033	0.300	Nov 2014	0.730	Nov 2015	0.000		-		0.000	Continuing	Continuing	Continuing
METOC Future Mission Capabilities	Various	Various : Various	45.516	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Tactical Oceanography Capabilities / Undersea Warfare (TOC USW)	Various	Various : Various	5.764	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Littoral Battlespace Sensing - Autonomous Undersea Vehicle	Various	Various : Various	8.422	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Tactical Oceanography Capabilities / Undersea Warfare (TOC USW)	WR	NSWC : Bethesda, MD	0.666	0.137	Dec 2014	0.185	Nov 2015	0.205	Nov 2016	-		0.205	Continuing	Continuing	Continuing
METOC Future Mission Capabilities	C/FP	APPLIED SCIENCE ASSOCIATED : RHODE ISLAND	0.000	0.000		0.000		0.226	Dec 2016	-		0.226	Continuing	Continuing	Continuing
METOC Future Mission Capabilities	C/FP	SAIC : Virginia	1.400	0.022	Jan 2015	0.059	Jan 2016	0.300	Dec 2016	-		0.300	Continuing	Continuing	Continuing
METOC Future Mission Capabilities	C/FP	CSC : Virginia	0.400	0.031	Jan 2015	0.000		0.300	Dec 2016	-		0.300	Continuing	Continuing	Continuing
METOC Future Mission Capabilities	C/CPFF	GDIT : Virginia	0.000	0.138	Mar 2015	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
		Subtotal	157.591	2.297		3.610		4.437		-		4.437	-	-	-

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
METOC Future Mission Capabilities	C/CPIF	Various : Various	2.672	0.000		0.000		0.000		-		0.000	0.000	2.672	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy			Date: February 2016
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Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Littoral Battlespace Sensing - Autonomous Undersea Vehicle	C/FP	SAIC : Virginia	0.600	0.000		0.000		0.000		-		0.000	0.000	0.600	-
Tactical Oceanography Capabilities / Undersea Warfare (TOC USW)	WR	SSC PAC : California	0.000	0.162	Nov 2014	0.115	Jan 2016	0.000		-		0.000	0.000	0.277	-
METOC Future Mission Capabilities	C/CPFF	PSS/BAH : California	0.000	0.028	Dec 2014	0.038	Dec 2015	0.000		-		0.000	0.000	0.066	-
		Subtotal	3.272	0.190		0.153		0.000		-		0.000	0.000	3.615	-

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
METOC Future Mission Capabilities	Various	Various : Various	0.200	0.000		0.000		0.000		-		0.000	0.000	0.200	-
		Subtotal	0.200	0.000		0.000		0.000		-		0.000	0.000	0.200	-

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Acquisition Workforce	Various	Not Specified : Not Specified	0.096	0.000		0.000		0.000		-		0.000	0.000	0.096	-
METOC Future Mission Capabilities Management Support	C/FP	BAH : Virginia	0.400	0.000		0.000		0.000		-		0.000	0.000	0.400	-
		Subtotal	0.496	0.000		0.000		0.000		-		0.000	0.000	0.496	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy			Date: February 2016
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	Prior Years	FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	161.559	2.487		3.763		4.437		-		4.437	-	-	-

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603207N / *Air/Ocean Tactical Applications*	**Project (Number/Name)** 2341 / *METOC Data Acquisition*

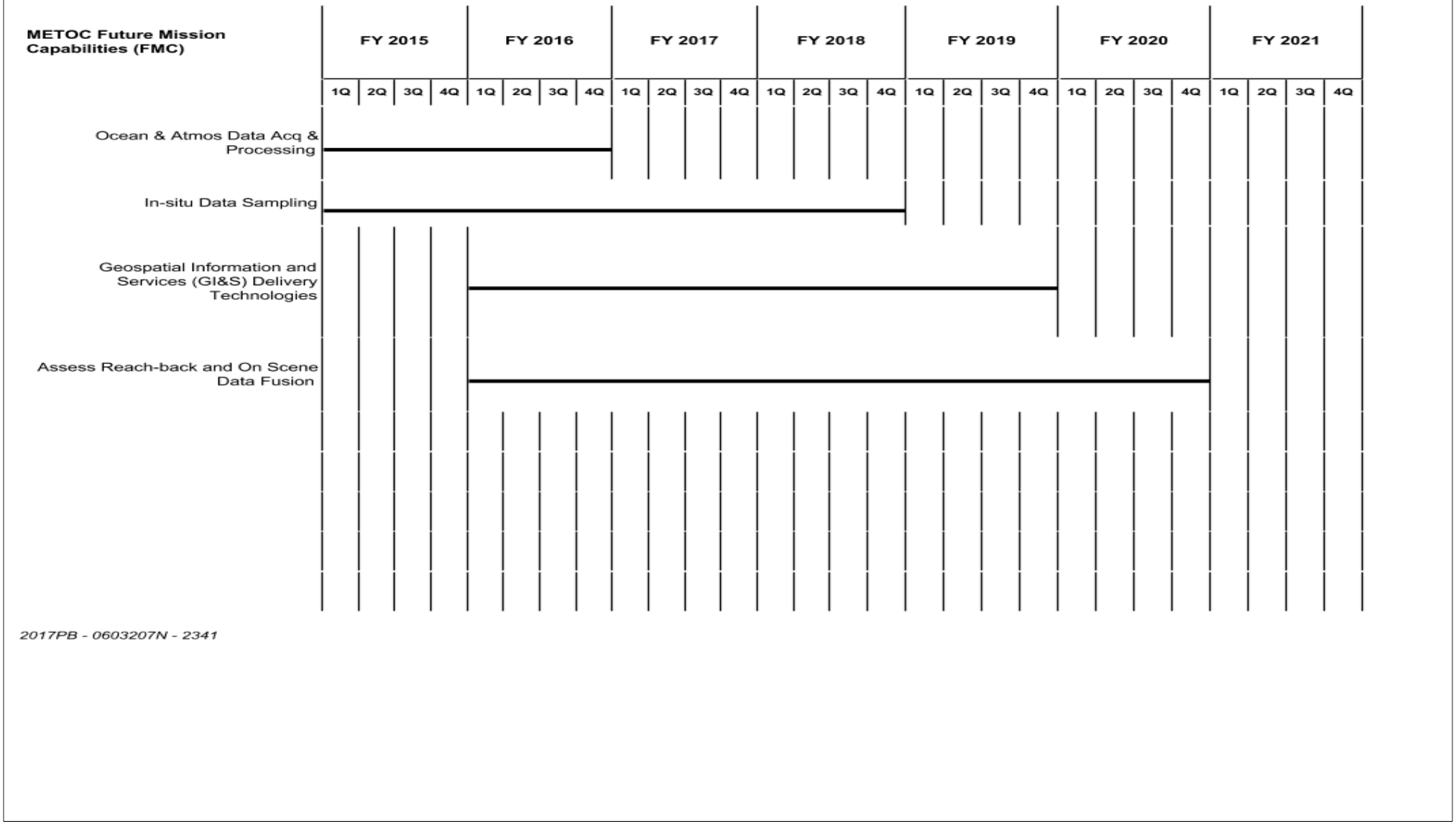

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Exhibit R-4A, RDT&E Schedule Details: PB 2017 Navy		Date: February 2016
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Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
METOC Future Mission Capabilities (FMC)				
Ocean & Atmos Data Acq & Processing:	1	2015	4	2016
In-situ Data Sampling:	1	2015	4	2018
Geospatial Information and Services (GI&S) Delivery Technologies:	1	2016	4	2019
Assess Reach-back and On Scene Data Fusion: Schedule Detail	1	2016	4	2020

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603207N / *Air/Ocean Tactical Applications*	Project (Number/Name) 2342 / *METOC Data Assimilation and Mod*	

COST ($ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
2342: *METOC Data Assimilation and Mod*	202.060	12.890	16.360	20.165	-	20.165	21.497	22.369	22.721	23.198	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

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 software associated with atmospheric and oceanographic data assimilation forecast models and database management systems 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 software models, which focus on ocean thermal structure and circulation, and surf and tide prediction; 3) software 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) future METOC and environmental satellite data readiness and risk reduction preparations to develop hardware and software that will allow ground stations to receive, ingest and exploit satellite data including payload sensor data from the National Polar Orbiting Operational Environmental Satellite System (NPOESS) Preparatory Project (NPP), the European Organization for the Exploitation of Meteorological Satellites (EUMETSAT) Polar Systems' Meteorological Operational satellites A & B (METOP-A & B), Joint Polar Satellite System (JPSS), and Defense Meteorological Satellite Program (DMSP). This software allows for the integration and tactical application of significant oceanographic and atmospheric data derived from satellite-borne sensors. Satellite and unmanned sensor data, combined with manned platform data are foundational to a robust numerical weather and oceanographic modeling capability that predicts battlespace conditions impacting fleet and adversary weapon and sensor performance. Included are software 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. Major emphasis areas include the METOC Future Mission Capabilities (FMC), the METOC Space-Based Sensing Capabilities, and the Tactical Oceanographic Capabilities / Under Sea Warfare projects (TOC/USW).Recent focuses have included continued advanced software 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 software), the continued development of advanced oceanographic and atmospheric prediction systems software and architectures to

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
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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 software technologies for tactical radars, remote sensing and undersea sensor systems. Continue research and development of data processing and data assimilation algorithms for the Joint Polar Satellite System-1 (JPSS-1), Free-Flyer, GOES-S, EarthCARE, and OceanSat launch. Continue to Develop Meteorological and Oceanographic (METOC) Decision Support & Prediction Tools to improve Electromagnetic and Electro-optical (EM/EO) system performance. Funding from Project Element 0305160N, Line Item 0524 has been realigned to the 2342 Line Item: Meteorology and Oceanography (METOC) Space-Based Sensing Capabilities project provides for Navy participation in the Defense Meteorological Satellite Program (DMSP) Special Sensor Microwave/Imager and Special Sensor Microwave Imager Sounder calibration/validation efforts in support of the fleet operational requirements. The passive microwave instrument carried on DMSP provides global oceanic and atmospheric data of direct operational relevance, including sea surface wind speed, sea ice, and precipitation. The METOC Space-Based Sensing Capabilities project ensures the naval service's operational requirements are satisfied primarily through demonstration of technologies for inclusion on operational constellations such as DMSP, the Joint Polar Satellite System (JPSS) and the National Oceanic and Atmospheric Administration's Geostationary Operational Environmental Satellites (GOES). These efforts fulfill naval service unique requirements that are not funded within the DMSP, JPSS or GOES programs, and are in accordance with current inter-agency agreements. The TREES Speed to Fleet project is an advanced electromagnetic propagation model for Electronic Warfare. The Navy Earth System Prediction Capability (ESPC) program, will provide a more accurate, longer range, global ocean and atmospheric forecast system for decision support to DoD Maritime Operations through the development of an integrated, coupled atmosphere, ocean, sea ice, land and near-space prediction system with improved deterministic and probabilistic skill over the current operational modeling suite. It will result in increased accuracy for lead times of 1-30 days as well as a new capability for accurate forecasts in the Arctic at all lead times. Additionally it will seek to develop more computationally efficient environmental prediction for emerging architectures and provide Navy R&D support to the National ESPC.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Title: Meteorological and Oceanographic (METOC) Future Mission Capabilities (FMC)	2.475	3.872	4.408	0.000	4.408
Articles:	-	-	-	-	-
FY 2015 Accomplishments: Continued to development of advanced METOC prediction systems and architectures to provide improved forecasts and estimates of product accuracies. Continued the development of improved data fusion and assimilation techniques, data quality control technologies and accelerate the automation of prediction processes using data from tactical sensors, remote sensing and undersea sensor systems. Continued to develop METOC and GI&S fusion algorithms and demonstration of capabilities. Developed METOC Decision Support & Prediction Tools to improve Electromagnetic and Electro-optical (EM/EO) systems performance.					
FY 2016 Plans: Continue development of advanced METOC prediction systems and architectures to provide improved forecasts and estimates of product accuracies. Continue development of improved data fusion and assimilation techniques, data quality control technologies and accelerate the automation of prediction processes using data from tactical sensors, remote sensing and undersea sensor systems. Continue to develop METOC fusion algorithms and demonstrate capabilities. Continue to develop METOC Decision Support & Prediction Tools to					

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603207N / *Air/Ocean Tactical Applications*	**Project (Number/Name)** 2342 / *METOC Data Assimilation and Mod*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
improve EM/EO system performance. Accelerate the development of the higher resolution global and small scale ocean forecasting systems with 4 dimensional variational data assimilation. Develop and demonstrate a tropospheric environmental modeling capability to support long range EM propagation (in FY17 this effort moved to R2A Chief of Naval Operations Speed to Fleet Initiative). ***FY 2017 Base Plans:*** Development of advanced METOC prediction systems and architectures to provide improved forecasts and estimates of product accuracies. Continue development of improved data fusion and assimilation techniques, data quality control technologies and accelerate the automation of prediction processes using data from tactical sensors, remote sensing and undersea sensor systems. Develop METOC and GI&S fusion algorithms and demonstrate capabilities. Develop METOC Decision Support & Prediction Tools to improve Electromagnetic and Electro-optical (EM/EO) systems performance. Accelerate the development of the higher resolution global and small scale ocean forecasting systems with four-dimensional variation (4DVAR) data assimilation. ***FY 2017 OCO Plans:*** N/A					
Title: Meteorological and Oceanographic (METOC) Space-Based Sensing Capabilities	0.642	2.278	3.544	0.000	3.544
Articles:	-	-	-	-	-
FY 2015 Accomplishments: Prepared to ingest data from earth observing satellite systems, specifically Sentinel launches. Began research and development of data processing and data assimilation algorithms for the Geostationary Operational Environmental Satellite R-Series (GOES-R) launch. ***FY 2016 Plans:*** Preparation to ingest data from earth observing satellite systems, Geostationary Operational Environmental Satellite R-Series (GOES-R), and Global Change Observation Mission (GCOM) W-2 sensors. Begin research and development of data processing and data assimilation algorithms for the Joint Polar Satellite System-1 (JPSS-1), GOES-S, Earthcare, and OceanSat-3 launches scheduled in FY2017. ***FY 2017 Base Plans:*** Continue performance assessment on National Polar-orbiting Operational Environmental Satellite System Preparatory Project (NPP) and Defense Meteorological Satellite Program (DMSP) satellite sensor suites. Furthering assessment of planned Joint Polar Satellite System (JPSS) sensors and assessment of other national, commercial, and foreign earth observing satellite system's sensor data for use in Navy Atmospheric					

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
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B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
and Oceanographic Prediction Models. Develop performance assessment of planned national earth observing satellite system's sensor data Sentinel 3a and 3b launch for use in Navy Atmospheric and Oceanographic Prediction Models. Develop assessment of planned environmental satellite sensor launches such as Geostationary Operational Environmental Satellite R-Series (GOES-R) and Global Change Observation Mission (GCOM) W-2 scheduled in FY16. ***FY 2017 OCO Plans:*** N/A					
Title: Tactical Oceanographic Capabilities (TOC) / Undersea Warfare (USW)	1.774	2.018	2.393	0.000	2.393
Articles:	-	-	-	-	-
FY 2015 Accomplishments: Continued to develop the underlying acoustic and environmental software components of Navy decision tools that assist Undersea Warfare (USW) warfighters to optimally deploy assets equipped with acoustic sensors and to take advantage of prevailing environmental conditions. VerifyVerified, validated and transitioned this software technology through the Oceanographic and Atmospheric Master Library (OAML). Continued population/upgrade of oceanographic, acoustic and geoacoustic databases in Combatant Commanders' (COCOM) areas of interest. Continued developing Maritime Patrol Aircraft and submarine-based TTS technologies to collect and transmit environmental data for use by NAVOCEANO to predict ASW sensor performance. Transitioned software algorithms that capture and communicate variability and uncertainty contained in the output of underlying model and data base components of ASW TDAs. Continued to develop and transition the environmental software components of MIW TDAs in use by the U.S. Navy's MIW Forces and Naval NOe personnel supporting them. Provided technical support to the NAVOCEANO in updating geoacoustic bottom loss & scatter data bases for sonar performance predictions. Continued to design and develop a geospatially-enabled global ocean observing system database through the Ocean Observing System (OOS) designed to characterize national and international ocean observatories locations, sensor grid capabilities and mitigations to address potential U.S. submarine security vulnerabilities. Conducted additional proof-of-concept at-sea demonstration of emerging Unmanned Undersea Vehicle (UUV) and Unmanned Surface Vehicle (USV) technologies designed to collect environmental data based on feedback received on FY14 at-sea demonstration results. ***FY 2016 Plans:*** Continue to develop the underlying acoustic and environmental software components of Navy decision tools that assist Undersea Warfare (USW) warfighters to optimally deploy assets equipped with acoustic sensors and to take advantage of prevailing environmental conditions. Verify, validate and transition this software					

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B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
technology through the Oceanographic and Atmospheric Master Library (OAML). Continue population/upgrade of oceanographic, acoustic and geoacoustic databases in COCOM areas of interest. Complete development of Maritime Patrol & Reconnaissance Aircraft (MPRA) and submarine-based Through-the-Sensor (TTS) technologies to collect and transmit environmental data for use by Naval Oceanographic Office (NAVOCEANO) to predict Anti-Submarine Warfare (ASW) sensor performance. Transition, to include Reachback Cells (RBCs), software algorithms that capture and communicate variability and uncertainty contained in the output of underlying model and data base components of ASW Tactical Decision Aids (TDAs). Restart efforts to increase access speed of acoustic surface scattering and loss modules for ASW applications. Continue to develop and transition the environmental software components of Mine Warfare (MIW) TDAs in use by the U.S. Navy's MIW Forces and Naval Oceanography enterprise (NOe) personnel supporting them. Complete development and transition of a global observing database designed through the Ocean Observing System to characterize national and international ocean observatory locations, sensor grid capabilities and mitigations to address potential U.S. submarine security vulnerabilities.					
FY 2017 Base Plans: - Furthering to develop the underlying acoustic and environmental software components of Navy decision tools that assist Undersea Warfare (USW) warfighters to optimally deploy assets equipped with acoustic sensors and to take advantage of prevailing environmental conditions. Verified, validated and transitioned this software technology through the Oceanographic and Atmospheric Master Library (OAML). - Furthering to refine and validate USW-related performance surface and decision support software applications for use afloat and at ASW RBCs to determine appropriate tactical Courses of Action (COAs) in ASW. - Furthering population/upgrade of oceanographic, acoustic and geo-acoustic databases in COCOM areas of interest. Began developing Maritime Patrol & Reconnaissance Aircraft (MPRA) and submarine-based Through-the-Sensor (TTS) technologies to collect and transmit environmental data for use by Naval Oceanographic Office (NAVOCEANO) to predict Anti- Submarine Warfare (ASW) sensor performance. - Transition software algorithms that capture and communicate variability and uncertainty contained in the output of underlying model and database components of ASW Tactical Decision Aids (TDAs). - Expand capabilities and increased access speed of acoustic surface scattering and loss modules. - Furthering development of software-based methodologies that characterize and forecast bio-acoustic volume attenuation and scatter functions as observed by the Navy's active hull-mounted sonar systems. - Furthering to develop and transition the environmental software components of Mine Warfare (MIW) TDAs in use by the U.S. Navy's MIW Forces and Naval Oceanography enterprise (NOe) personnel supporting them. Provided technical support to the NAVOCEANO in updating geo-acoustic bottom loss & scatter data bases for					

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B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
sonar performance predictions. Began to design, develop, demonstrate and transition a geospatially-enabled global ocean observing system database through the Ocean Observing System (OOS) designed to characterize national and international ocean observatories locations, sensor grid capabilities and mitigations to address potential U.S. submarine security vulnerabilities. - Conduct proof-of-concept at-sea demonstrations of emerging Unmanned Undersea Vehicle (UUV) and Unmanned Surface Vehicle (USV) technologies designed to collect environmental data. - Restart efforts to increase access speed of acoustic surface scattering and loss modules for ASW applications. Continue to develop and transition the environmental software components of Mine Warfare (MIW) TDAs in use by the U.S. Navy's MIW Forces and Naval Oceanography enterprise (NOe) personnel supporting them. Conduct additional proof-of-concept at-sea demonstrations of emerging Unmanned Undersea Vehicle (UUV) and Unmanned Surface Vehicle (USV) technologies designed to collect environmental data based on feedback received on FY14 at-sea demonstration results. ***FY 2017 OCO Plans:*** N/A					
Title: Chief of Naval Operations Speed to Fleet Initiative	0.000	0.000	1.058	0.000	1.058
Articles:	-	-	-	-	-
Description: This Speed to Fleet effort will develop a parameterization for the Advanced Propagation Model (APM) electromagnetic energy propagation model to improve modeling of the long range radar performance. This is a two year effort that will demonstrate the effectiveness of the parameterization and deliver the upgrade to the APM developers for inclusion into future releases of APM to fleet programs. This effort was previously funded in R2A Meteorological and Oceanographic (METOC) Future Mission Capabilities (FMC). ***FY 2015 Accomplishments:*** N/A ***FY 2016 Plans:*** N/A ***FY 2017 Base Plans:*** Initiate two-year effort to quickly transition new Advanced Propagation Model (APM) capability to the U.S. Fleet. ***FY 2017 OCO Plans:***					

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B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
N/A					
Title: Earth System Prediction Capability (ESPC)	7.999	8.192	8.762	0.000	8.762
Articles:	-	-	-	-	-

Description: Funding increased from FY 2016 to FY 2017 due to an increased effort to develop an extended range, probabilistic ensemble from the deterministic prototype system completed in 2016. This increase will be applied to an ensemble by design effort that is needed to extend decision support guidance to longer lead times required for transit route optimization, global military logistics, and exercise and contingency operational planning and response.

FY 2015 Accomplishments:
- Continued to develop a greatly more efficient computational architecture to allow for real-time operational prediction.
- Continued science workshops and benchmark testing.
- Continued efforts towards advanced skillful environmental forecasts and decision guidance (relative to averaged climatology) to improve from the operational capability, currently 7-10 days, to 30 days and longer.
- Continued the Navy component to the National R&D initiative for Environmental Prediction across the major U.S. National Operational Prediction Centers at Navy, NOAA, NASA, and DOE.
- Completed a National common environmental computing architecture to improve cross-Agency collaboration.
- Completed common environmental model architecture and standards and prediction demonstration plans.
- Initiated improved scalability and computational performance of a fully coupled global atmosphere / wave / ocean / land / ice prediction system providing daily predictions out to 10 days and weekly predictions out to 30 days.
- Initiated improved DoD decision support for 30-180 Day lead times.

FY 2016 Plans:
- Continue all efforts from FY2015, less those noted as complete.
- Continue science workshops and benchmark testing.
- Continue efforts towards advanced skillful environmental forecasts and decision guidance (relative to averaged climatology) to improve from the operational capability, currently 7-10 days, to 30 days and longer.
- Continue the Navy component to the National R&D initiative for Environmental Prediction across the major U.S. National
Operational Prediction Centers at Navy, NOAA, NASA, NSF and DOE.

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B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
- Continue improved scalability and computational performance of a fully coupled global atmosphere / wave / ocean / land / sea ice prediction system providing daily predictions out to 16 days and weekly predictions out to 30-90 days. - Continue improved DoD decision support for 30-180 Day lead times. - Complete development of a greatly more efficient computational architecture to allow for real-time operational prediction. - Initiate high resolution and high fidelity Regional Arctic Prediction System development for improved decision support to maritime operations for 0-7 days as well as monthly and seasonal outlooks. - Initiate improvements to automated ship routing guidance for safety and energy efficiency at 0-7 day lead times. ***FY 2017 Base Plans:*** - Continue all efforts from FY2016, less those noted as complete. - Continue science workshops and benchmark testing. - Continue efforts towards advanced skillful environmental forecasts and decision guidance (relative to averaged climatology) to improve from the operational capability, currently 7-10 days, to 45 days and longer. - Continue to develop the Navy component to the National R&D initiative for Environmental Prediction across the major U.S. National Operational Prediction Centers at Navy, NOAA, NASA, NSF and DOE. - Continue improved scalability and computational performance of a fully coupled global atmosphere / wave / ocean / land /sea ice prediction system providing daily predictions out to 16 days and weekly predictions out to 30-90 days. - Continue improved DoD decision support for 30-180 Day lead times. - Continue high resolution and high fidelity Regional Arctic Prediction System development for improved decision support to maritime operations for 0-7 days as well as monthly and seasonal outlooks. - Complete initial prototype system, with data cycling and post-model processing for pre-operations evaluation. - Initiate an Ensemble by design coupled global ocean-atmospheric system for probabilities and risk assessments at longer lead times based on the Navy ESPC deterministic architecture. - Initiate advanced improvements to automated ship routing guidance for safety and energy efficiency from a 7 day maximum to a 14 day maximum lead time. ***FY 2017 OCO Plans:*** N/A					
Accomplishments/Planned Programs Subtotals	12.890	16.360	20.165	0.000	20.165

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C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
• RDTEN/0604218N/2345: *FLEET METOC EQUIPMENT*	1.200	3.379	0.354	-	0.354	0.491	0.480	0.458	0.467	Continuing	Continuing
• RDTEN/0603207N/2341: *METOC DATA ACQUISITION*	2.487	3.763	0.000	-	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
• RDTEN/0604218N/2346: *METOC SENSOR ENGINEERING*	0.926	1.136	0.000	-	0.000	0.000	9.933	0.000	0.000	Continuing	Continuing
• RDTEN/0305160N/0524: *NAVY METOC SUPPORT (SPACE)*	0.356	0.599	0.000	-	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing

Remarks

D. Acquisition Strategy

Acquisition, management and contracting strategies to support the Meteorological & Oceanography (METOC) Data Assimilation Project which is a multi-faceted program which includes: 1) development, demonstration and validation of software associated with atmospheric and oceanographic data assimilation forecast models and database management systems for use in both mainframe and tactical scale computers; 2) other software models, which focus on ocean thermal structure and circulation, and surf and tide prediction; 3) software 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. Acquisition, management and contracting strategies to support the Navy Earth System Prediction Capability Project, a multi-faceted program which includes: 1) development, demonstration and validation of atmospheric, sea ice and oceanographic data assimilation techniques, forecast models, database management systems, and associated software for use in teraflop to petaflop scale computers; 2) other models, which focus on decision products and quantifying thresholds, forecast uncertainty, and risk for Navy and DoD resource and mission planning using non-Navy models as input; 3) techniques to improve computational and data dissemination efficiency for environmental information dominance. Space based Meteorology and Oceanography (METOC) requirements: particular sensors or data sources with unique naval service mission needs are targeted to accelerate acquisition or ensure threshold accomplishment of Joint or converged national program plans. The Joint Polar Satellite System (JPSS) program will collect global microwave radiometry and sounding data to produce microwave imagery and other meteorological and oceanographic data. Conical Microwave Imager Sounder (CMIS) can be viewed as the follow-on instrument to the Special Sensor Microwave (SSM) instruments Navy developed for the Defense Meteorological Satellite Program. These CMIS sensors will be acquired as part of the JPSS architecture which supports these Navy requirements in the future. Maintenance of rigorous sensor calibration and data validation for operational SSM instruments continues along with algorithm development in support of fleet applications. The Advanced Altimeter technologies will improve radar altimeter resolution and aerial coverage to support Navy requirements for sea surface topography measurement in the littorals.

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.

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Tasks are directed toward advanced software 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. Goal (ESPC): Develop a more accurate global ocean, atmosphere, wave and sea ice forecast system with longer skillful forecast times from weeks to seasons through integrating and coupling atmosphere, ocean, ice, land and near-space forecast models into a seamless deterministic and ensemble prediction system that significantly improves skill over the current modeling suite. Additionally develop a common modeling architecture to improve cross-Agency collaboration, and greatly more efficient environmental modeling and computational architectures to allow for real-time operational prediction at skill levels comparable to any international peer competitor for 0-30 day global operational planning.
Metrics: Long term trends show a globally averaged gain of skill of 1 day per decade of RDT&E investment, i.e. today's 5-day forecast is as accurate as the 3-day forecast available in the early 1990's. This program will implement new technological approaches to improve 7-14 day predictions to the level of current 5-7 day forecasts and will seek to provide quantifiable skill above long term seasonal averages for 14-90 day lead times for mission planning.

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Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
METOC Future Mission Capabilities	WR	NRL : Washington DC	119.107	2.298	Nov 2014	2.926	Nov 2015	3.626	Nov 2016	-		3.626	Continuing	Continuing	Continuing
METOC Future Mission Capabilities	Various	Various : Various	46.068	0.000		0.000		0.000		-		0.000	0.000	46.068	-
METOC Space-Based Sensing Capabilities	WR	NRL : Washington, DC	11.627	0.642	Nov 2014	2.278	Nov 2015	2.545	Nov 2016	-		2.545	Continuing	Continuing	Continuing
Tactical Oceanography Capabilities / Undersea Warfare	WR	NRL : Washington, DC	7.288	0.529	Nov 2014	0.523	Nov 2015	1.140	Nov 2016	-		1.140	Continuing	Continuing	Continuing
Tactical Oceanography Capabilities / Undersea Warfare	C/FP	University of Texas : TX	0.800	0.208	Apr 2015	0.155	Apr 2016	0.000		-		0.000	0.000	1.163	-
Tactical Oceanography Capabilities / Undersea Warfare	WR	NSWC Carderock : West Bethesda, MD	1.635	0.005	Nov 2014	0.000		0.450	Nov 2016	-		0.450	Continuing	Continuing	Continuing
Tactical Oceanography Capabilities / Undersea Warfare	WR	NAVOCEANO : Mississippi	0.549	0.000		0.000		0.000		-		0.000	0.000	0.549	-
Tactical Oceanography Capabilities / Undersea Warfare	C/FP	University of Washington : Seattle, WA	0.630	0.050	Dec 2014	0.050	Dec 2015	0.120	Dec 2016	-		0.120	Continuing	Continuing	Continuing
Tactical Oceanography Capabilities / Undersea Warfare	C/FP	Johns Hopkins University : MD	0.310	0.000		0.030	Dec 2015	0.091	Dec 2016	-		0.091	Continuing	Continuing	Continuing
Tactical Oceanography Capabilities / Undersea Warfare	C/FP	SAIC/QNA : Various	1.490	0.115	Jan 2015	0.000		0.354	Nov 2016	-		0.354	Continuing	Continuing	Continuing
METOC Future Mission Capabilities	C/FP	SAIC/QNA : Various	1.575	0.149	Feb 2015	0.758	Jan 2016	0.614	Dec 2016	-		0.614	Continuing	Continuing	Continuing
Tactical Oceanography Capabilities / Undersea Warfare	C/FP	Penn Sate University : Pennsylvania	0.000	0.050	Dec 2014	0.075	Dec 2015	0.000		-		0.000	0.000	0.125	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy		Date: February 2016
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Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Tactical Oceanography Capabilities / Undersea Warfare	WR	SSC LANT : North Charleston	0.000	0.025	Nov 2014	0.025	Nov 2015	0.000		-		0.000	0.000	0.050	-
Tactical Oceanography Capabilities / Undersea Warfare	C/FP	SPA : Virginia	0.000	0.175	Dec 2014	0.200	Dec 2015	0.000		-		0.000	0.000	0.375	-
METOC SUPPORT SPACE-SOFTWARE DEVELOPMENT	WR	NRL : WASHINGTON DC	0.000	0.000		0.000		0.515	Nov 2016	-		0.515	Continuing	Continuing	Continuing
Tactical Oceanography Capabilities / Undersea Warfare	C/FP	METRON : Virginia	0.000	0.000		0.385	Dec 2015	0.000		-		0.000	0.000	0.385	-
Tactical Oceanography Capabilities / Undersea Warfare	C/FP	Vencore : Virginia	0.000	0.000		0.239	Nov 2015	0.000		-		0.000	0.000	0.239	-
Earth Systems Prediction Capability (ONR)	WR	NRL : Washington DC	5.883	5.000	Oct 2014	5.000	Oct 2015	7.431	Nov 2016	-		7.431	Continuing	Continuing	Continuing
ESPC	Various	Various : Various	1.365	1.949	Oct 2014	2.692	Oct 2015	1.661	Nov 2016	-		1.661	Continuing	Continuing	Continuing
CHIEF OF NAVAL OPERATIONS SPEED TO FLEET INITIATIVE	WR	NRL : WASHINGTON DC	0.000	0.000		0.000		0.850	Nov 2016	-		0.850	1.130	1.980	-
		Subtotal	198.327	11.195		15.336		19.397		-		19.397	-	-	-

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
METOC Future Mission Capabilities	Various	Various : Various	0.795	0.000		0.000		0.000		-		0.000	0.000	0.795	-
Littoral Battlespace Sensing - Autonomous Undersea Vehicle	C/FP	SAIC : Virginia	0.473	0.000		0.000		0.000		-		0.000	0.000	0.473	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy			Date: February 2016
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Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Tactical Oceanography Capabilities / Undersea Warfare	C/FP	SAIC : Virginia	0.000	0.461	Feb 2015	0.173	Feb 2016	0.000		-		0.000	0.000	0.634	-
METOC Future Mission Capabilities	C/FP	SAIC : VIRGINIA	0.000	0.000		0.000		0.115	Nov 2016	-		0.115	Continuing	Continuing	Continuing
METOC SUPPORT SPACE-PROGRAM SUPPORT	WR	SSC PACIFIC : SAN DIEGO, CA	0.000	0.000		0.000		0.090	Nov 2016	-		0.090	Continuing	Continuing	Continuing
Program Support and Subject Matter Expertise	Various	UW-APL : Seattle, WA	0.200	1.050	Oct 2014	0.500	Oct 2015	0.000		-		0.000	0.000	1.750	-
		Subtotal	1.468	1.511		0.673		0.205		-		0.205	-	-	-

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Acquisition Workforce	Various	Various : Various	0.090	0.000		0.000		0.000		-		0.000	0.000	0.090	-
METOC Space-Based Sensing Capabilities	Various	Various : Various	1.350	0.000		0.000		0.000		-		0.000	0.000	1.350	-
Tactical Oceanography Capabilities / Undersea Warfare	WR	SSC PAC : San Diego, CA	0.825	0.156	Nov 2014	0.163	Nov 2015	0.171	Nov 2016	-		0.171	Continuing	Continuing	Continuing
METOC Future Mission Capabilities	C/FP	PSS/BAH : San Diego, CA	0.000	0.028	Dec 2014	0.188	Dec 2015	0.000		-		0.000	0.000	0.216	-
METOC Space-Based Sensing Capabilities	C/FP	BAH : VIRGINIA	0.000	0.000		0.000		0.142	Nov 2016	-		0.142	Continuing	Continuing	Continuing
METOC Space-Based Sensing Capabilities	WR	SSC PAC : SAN DIEGO, CA	0.000	0.000		0.000		0.213	Nov 2016	-		0.213	Continuing	Continuing	Continuing
METOC Acquisition Management	C/CPFF	PSS/BAH : SAN DIEGO, CA	0.000	0.000		0.000		0.037	Nov 2016	-		0.037	Continuing	Continuing	Continuing
		Subtotal	2.265	0.184		0.351		0.563		-		0.563	-	-	-

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	Prior Years	FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	202.060	12.890		16.360		20.165		-		20.165	-	-	-

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2017 Navy		Date: February 2016
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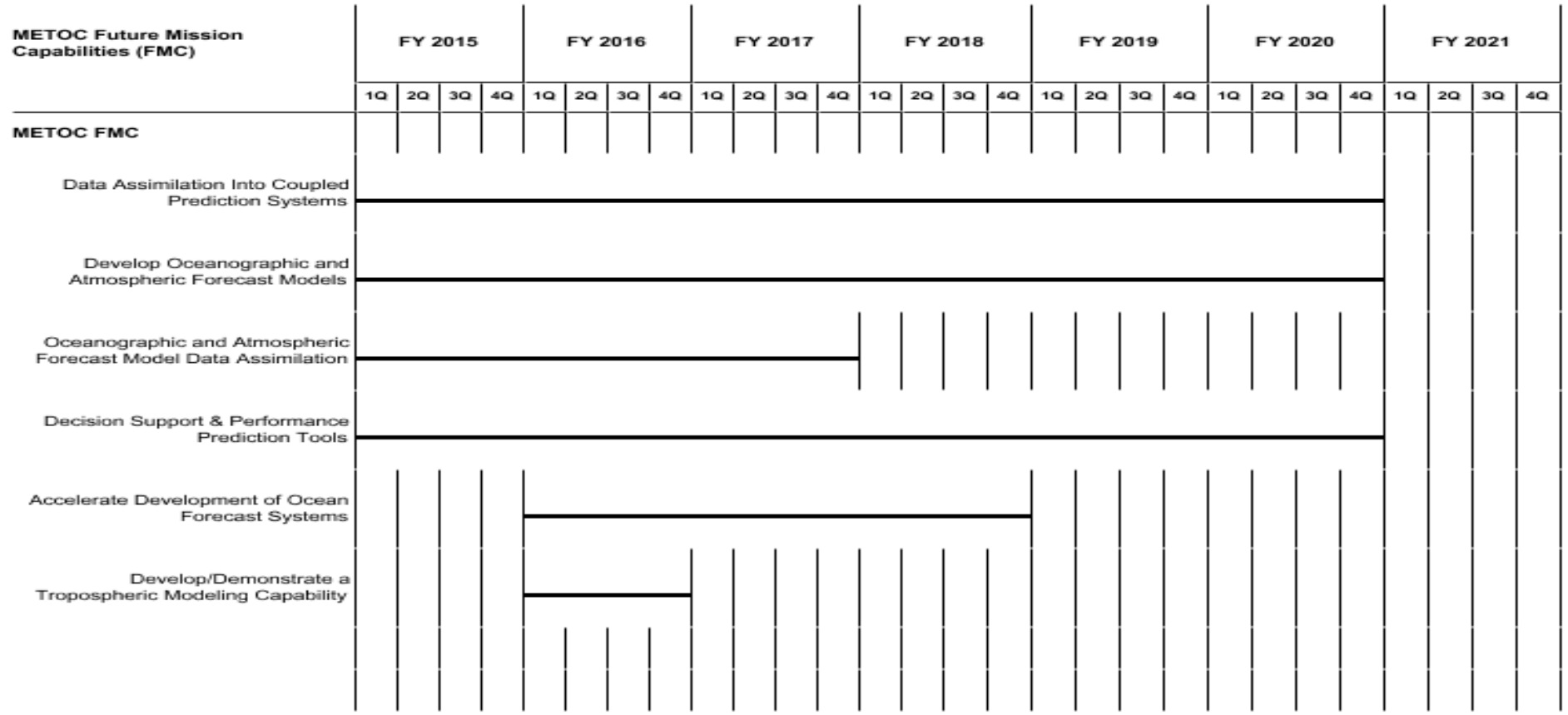

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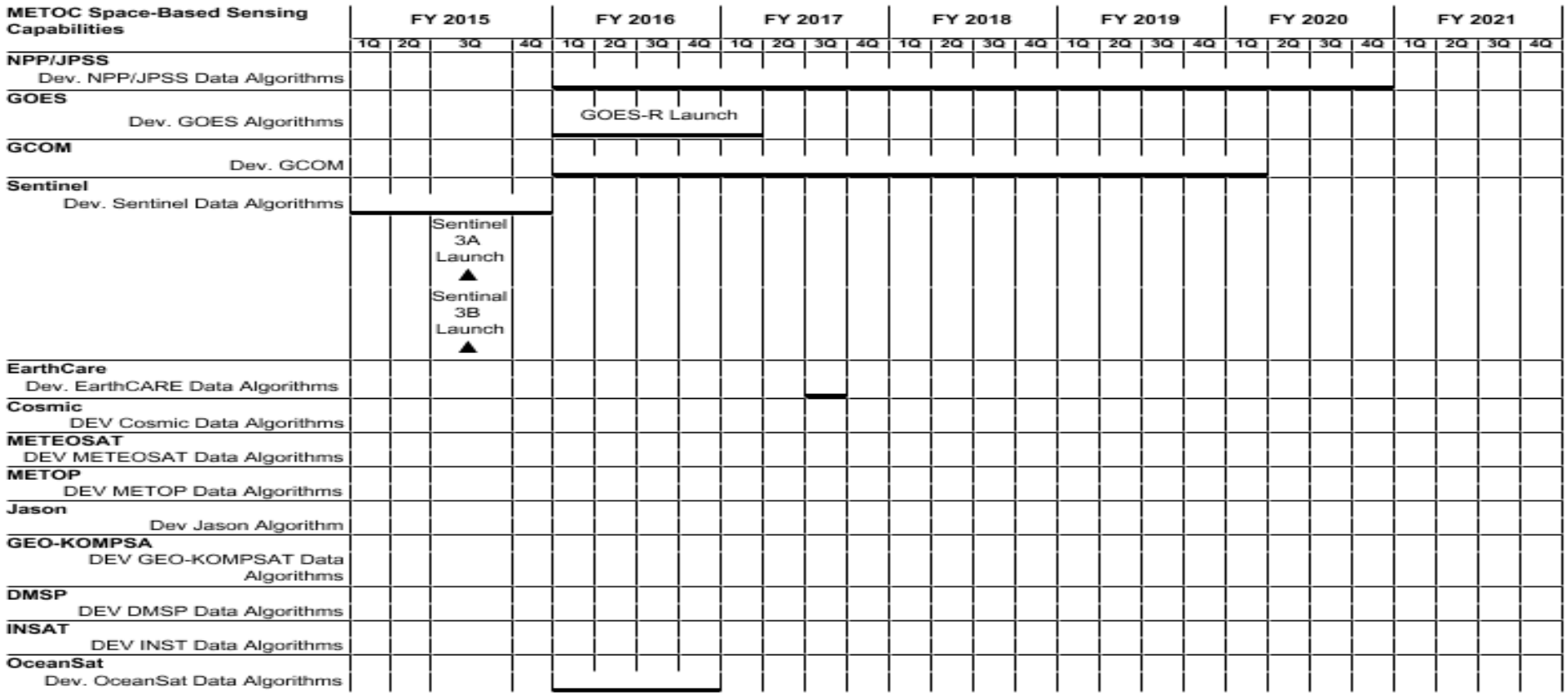

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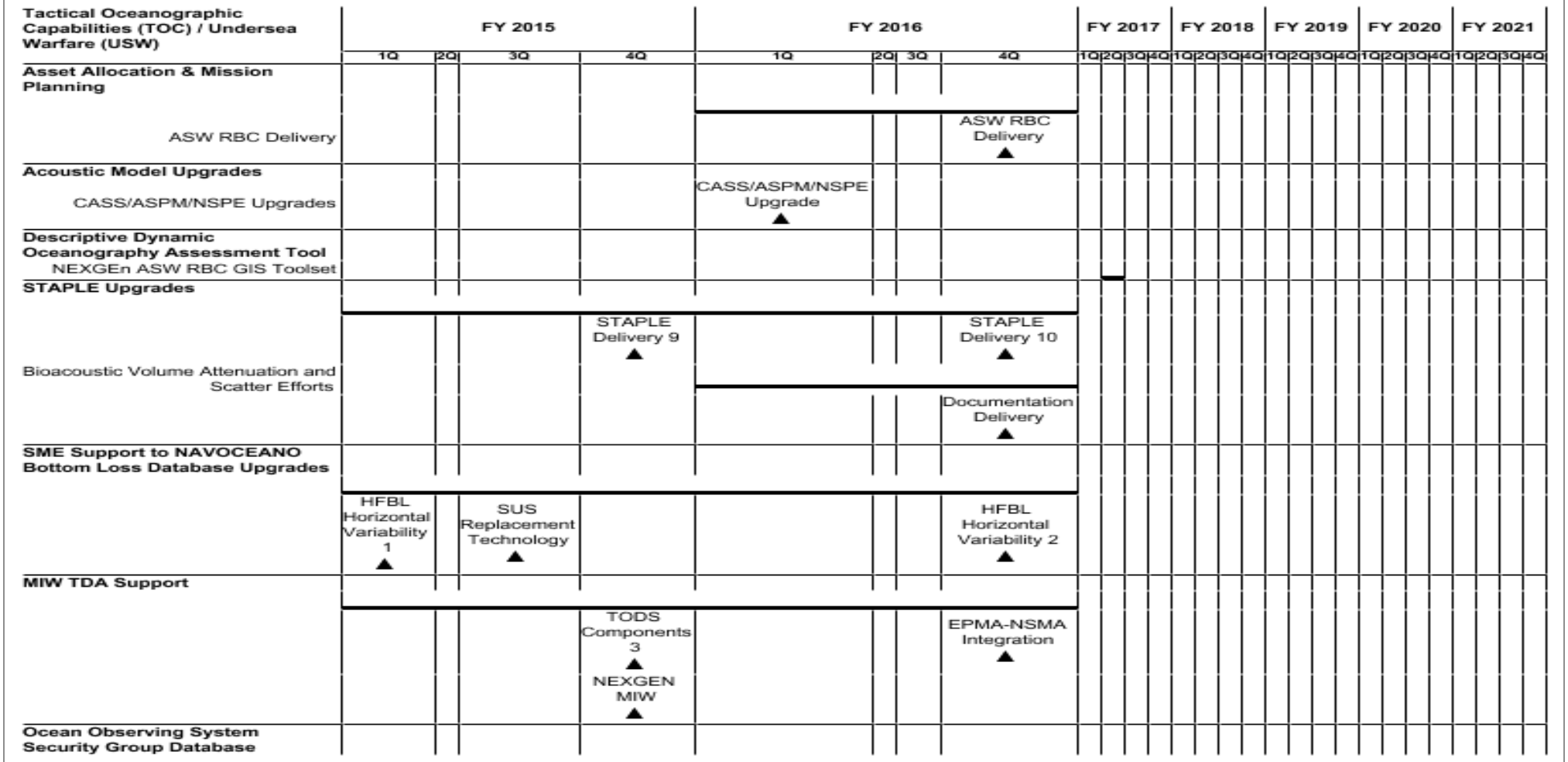

Exhibit R-4, RDT&E Schedule Profile: PB 2017 Navy		Date: February 2016
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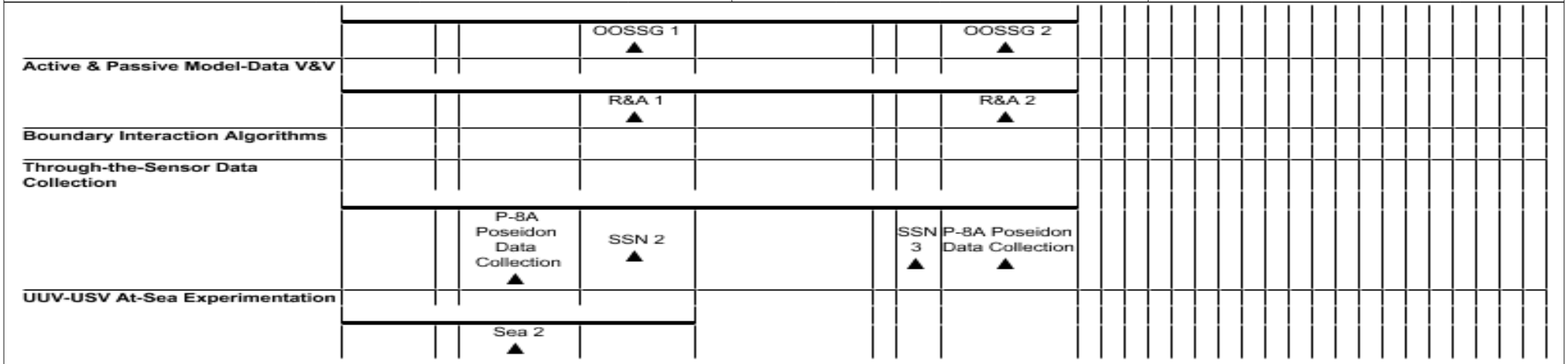
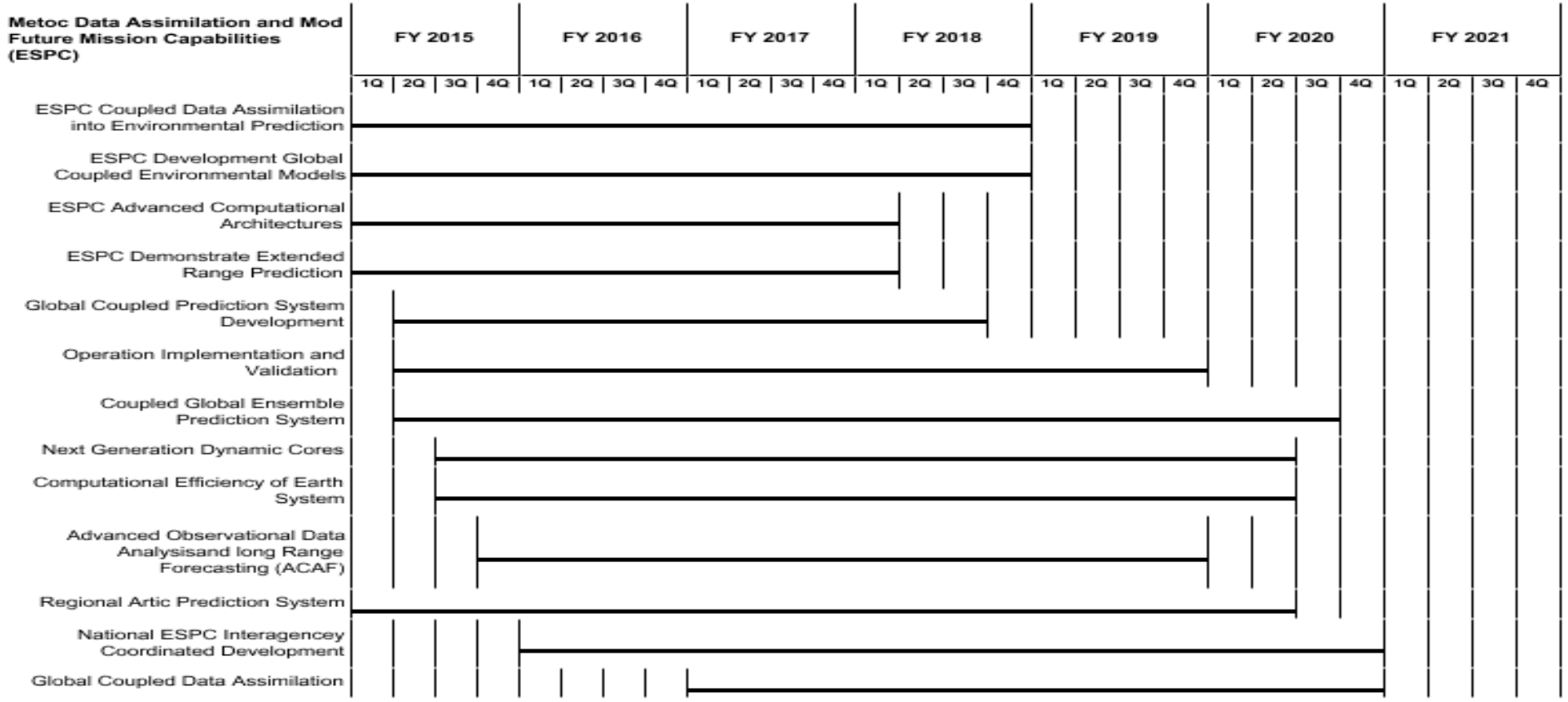


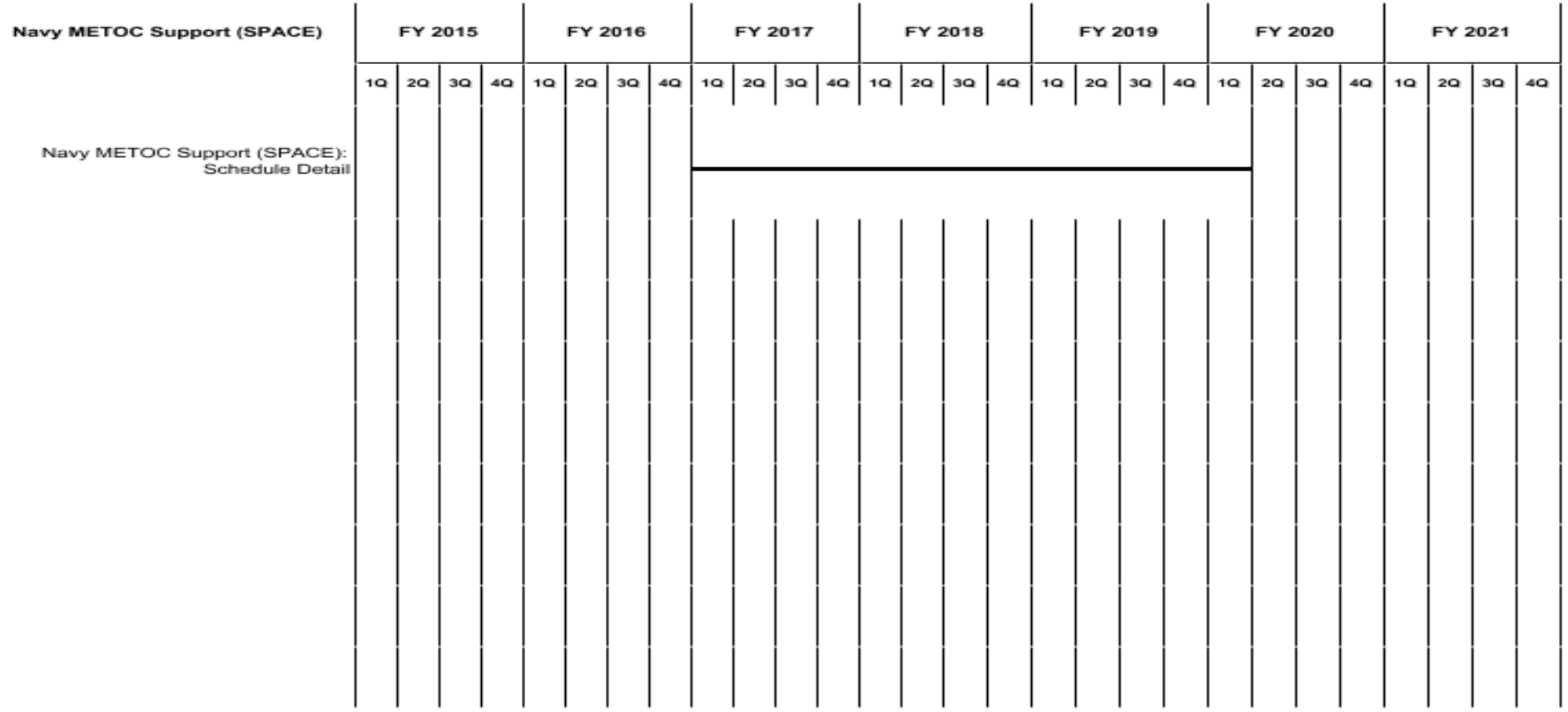
2017OSD - 0603207N - 2342

Exhibit R-4, RDT&E Schedule Profile: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603207N / *Air/Ocean Tactical Applications*	**Project (Number/Name)** 2342 / *METOC Data Assimilation and Mod*



2017OSD - 0603207N - 2342

Exhibit R-4, RDT&E Schedule Profile: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603207N / *Air/Ocean Tactical Applications*	**Project (Number/Name)** 2342 / *METOC Data Assimilation and Mod*



2017OSD - 0603207N - 2342

Exhibit R-4A, RDT&E Schedule Details: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603207N / *Air/Ocean Tactical Applications*	**Project (Number/Name)** 2342 / *METOC Data Assimilation and Mod*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
METOC Future Mission Capabilities (FMC)				
METOC FMC: Data Assimilation Into Coupled Prediction Systems:	1	2015	4	2020
METOC FMC: Develop Oceanographic and Atmospheric Forecast Models:	1	2015	4	2020
METOC FMC: Oceanographic and Atmospheric Forecast Model Data Assimilation:	1	2015	4	2017
METOC FMC: Decision Support & Performance Prediction Tools:	1	2015	4	2020
METOC FMC: Accelerate Development of Ocean Forecast Systems:	1	2016	4	2018
METOC FMC: Develop/Demonstrate a Tropospheric Modeling Capability:	1	2016	4	2016
METOC Space-Based Sensing Capabilities				
NPP/JPSS: Dev. NPP/JPSS Data Algorithms: FY16-FY20	1	2016	4	2020
NPP/JPSS: Dev. NPP/JPSS Data Algorithms: JPSS-1 Launch	3	2017	3	2017
GOES: Dev. GOES Algorithms: GOES-R Launch	1	2016	1	2017
GOES: Dev. GOES Algorithms: GOES-S Launch	2	2017	2	2017
GOES: Dev. GOES Algorithms: GOES-T Launch	2	2019	2	2019
GCOM: Dev. GCOM: FY16-FY20	1	2016	1	2020
GCOM: Dev. GCOM: GCOM-W2 Launch	3	2016	3	2016
GCOM: Dev. GCOM: GCOM-W3 Launch	3	2020	3	2020
Sentinel: Dev. Sentinel Data Algorithms:	1	2015	4	2015
Sentinel: Dev. Sentinel Data Algorithms: Sentinel 3A Launch	3	2015	3	2015
Sentinel: Dev. Sentinel Data Algorithms: Sentinal 3B Launch	3	2015	3	2015
EarthCare: Dev. EarthCARE Data Algorithms: EarthCARE Launch	3	2017	3	2017
EarthCare: Dev. EarthCARE Data Algorithms: Schedule Detail	1	2016	4	2020
Cosmic: DEV Cosmic Data Algorithms: Schedule Detail	1	2016	4	2020

Exhibit R-4A, RDT&E Schedule Details: PB 2017 Navy		Date: February 2016
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	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Cosmic: DEV Cosmic Data Algorithms: Cosmic-2 Launch	3	2018	3	2018
METEOSAT: DEV METEOSAT Data Algorithms: MTG-I1 Launch	3	2020	3	2020
METEOSAT: DEV METEOSAT Data Algorithms: FY16-FY20	1	2017	4	2020
METOP: DEV METOP Data Algorithms: FY16-FY20	1	2017	4	2020
METOP: DEV METOP Data Algorithms: METOP-C Launch	3	2018	3	2018
Jason: Dev Jason Algorithm: FY16-FY20	1	2016	4	2020
Jason: Dev Jason Algorithm: JASON-CS A Launch	1	2018	1	2018
GEO-KOMPSA: DEV GEO-KOMPSAT Data Algorithms: GEO-KOMPSAT 2A Launch	1	2018	1	2018
GEO-KOMPSA: DEV GEO-KOMPSAT Data Algorithms: GEO-KOMPSAT 2B Launch	4	2018	4	2018
GEO-KOMPSA: DEV GEO-KOMPSAT Data Algorithms: Schedule Detail	1	2017	4	2020
DMSP: DEV DMSP Data Algorithms: FY16-FY20	1	2017	4	2020
DMSP: DEV DMSP Data Algorithms: DMSP-20 Launch	1	2020	1	2020
INSAT: DEV INST Data Algorithms: Schedule Detail	1	2017	1	2017
OceanSat: Dev. OceanSat Data Algorithms:	1	2016	4	2016
OceanSat: Dev. OceanSat Data Algorithms: OceanSat 3 Launch	3	2017	3	2017
Tactical Oceanographic Capabilities (TOC) / Undersea Warfare (USW)				
Asset Allocation & Mission Planning:	1	2016	4	2016
Asset Allocation & Mission Planning: ASW RBC Delivery: ASW RBC Delivery	4	2016	4	2016
Asset Allocation & Mission Planning: ASW RBC Delivery: ASW RBC Delivery 2	4	2017	4	2017
Asset Allocation & Mission Planning: ASW RBC Delivery: ASW RBC Delivery 3	4	2018	4	2018
Acoustic Model Upgrades: CASS/ASPM/NSPE Upgrades: CASS/ASPM/NSPE Upgrades	1	2016	1	2016
Acoustic Model Upgrades: CASS/ASPM/NSPE Upgrades: CASS/ASPM/NSPE Upgrade 3	4	2017	4	2017
Acoustic Model Upgrades: CASS/ASPM/NSPE Upgrades: CASS/ASPM/NSPE Upgrade 4	4	2018	4	2018

Exhibit R-4A, RDT&E Schedule Details: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603207N / *Air/Ocean Tactical Applications*	**Project (Number/Name)** 2342 / *METOC Data Assimilation and Mod*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Acoustic Model Upgrades: CASS/ASPM/NSPE Upgrades: CASS/ASPM/NSPE Upgrade 5	4	2019	4	2019
Acoustic Model Upgrades: CASS/ASPM/NSPE Upgrades: CASS/ASPM/NSPE Upgrade 6	4	2020	4	2020
Descriptive Dynamic Oceanography Assessment Tool: NEXGEn ASW RBC GIS Toolset: NEXGEN ASW RBC GIS TOOLSET 1	2	2017	2	2017
Descriptive Dynamic Oceanography Assessment Tool: NEXGEn ASW RBC GIS Toolset: NEXGEN ASW RBC GIS TOOLSET 2	4	2018	4	2018
Descriptive Dynamic Oceanography Assessment Tool: NEXGEn ASW RBC GIS Toolset: NEXGEN ASW RBC GIS TOOLSET 3	4	2020	4	2020
STAPLE Upgrades:	1	2015	4	2016
STAPLE Upgrades: STAPLE Delivery 9	4	2015	4	2015
STAPLE Upgrades: STAPLE Delivery 10	4	2016	4	2016
STAPLE Upgrades: STAPLE Delivery 11	4	2017	4	2017
STAPLE Upgrades: STAPLE Delivery 12	4	2018	4	2018
STAPLE Upgrades: STAPLE Delivery 13	4	2019	4	2019
STAPLE Upgrades: STAPLE Delivery 14	4	2020	4	2020
STAPLE Upgrades: Bioacoustic Volume Attenuation and Scatter Efforts:	1	2016	4	2016
STAPLE Upgrades: Bioacoustic Volume Attenuation and Scatter Efforts: Documentation Delivery	4	2016	4	2016
SME Support to NAVOCEANO Bottom Loss Database Upgrades:	1	2015	4	2016
SME Support to NAVOCEANO Bottom Loss Database Upgrades: HFBL Horizontal Variability 1	1	2015	1	2015
SME Support to NAVOCEANO Bottom Loss Database Upgrades: HFBL Horizontal Variability 2	4	2016	4	2016
SME Support to NAVOCEANO Bottom Loss Database Upgrades: SUS Replacement Technology	3	2015	3	2015

Exhibit R-4A, RDT&E Schedule Details: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603207N / *Air/Ocean Tactical Applications*	**Project (Number/Name)** 2342 / *METOC Data Assimilation and Mod*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
MIW TDA Support:	1	2015	4	2016
MIW TDA Support: EPMA-NSMA Integration	4	2016	4	2016
MIW TDA Support: TODS Components	4	2015	4	2015
MIW TDA Support: NEXGEN MIW Environmental Application	4	2015	4	2015
MIW TDA Support: EPMA-NSMA Integration 2	4	2018	4	2018
MIW TDA Support: EPMA-NSMA Integration 3	4	2019	4	2019
Ocean Observing System Security Group Database:	1	2015	4	2016
Ocean Observing System Security Group Database: OOSSG Database Delivery #1	4	2015	4	2015
Ocean Observing System Security Group Database: OOSSG Database Delivery #2	4	2016	4	2016
Active & Passive Model-Data V&V:	1	2015	4	2016
Active & Passive Model-Data V&V: Active ASW R&A 1	4	2015	4	2015
Active & Passive Model-Data V&V: Active ASW R&A 2	4	2016	4	2016
Active & Passive Model-Data V&V: Active ASW R&A 4	4	2017	4	2017
Active & Passive Model-Data V&V: Active ASW R&A 5	4	2018	4	2018
Active & Passive Model-Data V&V: Active ASW R&A 6	4	2019	4	2019
Active & Passive Model-Data V&V: Active ASW R&A 7	4	2020	4	2020
Boundary Interaction Algorithms: TOTLOSS/SCATTER Algorithm Delivery 3	4	2018	4	2018
Through-the-Sensor Data Collection:	1	2015	4	2016
Through-the-Sensor Data Collection: P-8A Poseidon Data Collection 2	3	2015	3	2015
Through-the-Sensor Data Collection: P-8A Poseidon Data Collection 3	4	2016	4	2016
Through-the-Sensor Data Collection: SSN Data Collection 2	4	2015	4	2015
Through-the-Sensor Data Collection: SSN Data Collection 3	3	2016	3	2016
Through-the-Sensor Data Collection: SSN Data Collection 4	4	2017	4	2017
Through-the-Sensor Data Collection: SSN Data Collection 5	4	2018	4	2018
Through-the-Sensor Data Collection: SSN Data Collection 6	4	2019	4	2019

Exhibit R-4A, RDT&E Schedule Details: PB 2017 Navy		Date: February 2016
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	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Through-the-Sensor Data Collection: SSN Data Collection 7	4	2020	4	2020
UUV-USV At-Sea Experimentation:	1	2015	4	2015
UUV-USV At-Sea Experimentation: Sea Test 2	3	2015	3	2015
UUV-USV At-Sea Experimentation: Sea Test 3	4	2017	4	2017
Metoc Data Assimilation and Mod Future Mission Capabilities (ESPC)				
ESPC Coupled Data Assimilation into Environmental Prediction:	1	2015	4	2018
ESPC Development Global Coupled Environmental Models:	1	2015	4	2018
ESPC Advanced Computational Architectures: Schedule Detail	1	2015	1	2018
ESPC Demonstrate Extended Range Prediction: Schedule Detail	1	2015	1	2018
Global Coupled Prediction System Development: Schedule Detail	2	2015	3	2018
Operation Implementation and Validation: Schedule Detail	2	2015	4	2019
Coupled Global Ensemble Prediction System: Schedule Detail	2	2015	3	2020
Next Generation Dynamic Cores: Schedule Detail	3	2015	2	2020
Computational Efficiency of Earth System: Schedule Detail	3	2015	2	2020
Advanced Observational Data Analysisand long Range Forecasting (ACAF): Schedule Detail	4	2015	4	2019
Regional Artic Prediction System: Schedule Detail	1	2015	2	2020
National ESPC Interagencey Coordinated Development: Schedule Detail	1	2016	4	2020
Global Coupled Data Assimilation: Schedule Detail	1	2017	4	2020
Navy METOC Support (SPACE)				
Navy METOC Support (SPACE): Schedule Detail: Schedule Detail	1	2017	1	2020

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603207N / *Air/Ocean Tactical Applications*	Project (Number/Name) 2343 / *Tactical METOC Applications*	

COST ($ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
2343: *Tactical METOC Applications*	135.448	8.942	9.260	13.473	-	13.473	15.437	15.261	15.443	15.765	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Tactical Meteorology and Oceanography (METOC) Applications Project provides cyber secure operational effects decision aid capabilities for Navy and Marine Corps warfighters in the context of Joint Operations in a net-centric environment. This project funds the agile software development of the Naval Integrated Tactical Environmental System Next Generation (NITES-Next) program of record. NITES-Next program identifies and transitions state-of-the-art decision support software technologies from the governments and commercial iIndustry's technology base, and then demonstrates and validates these capabilities before fielding. These software decision support tools provide platform, sensor, communications, and weapon systems performance assessments for warfighters in terms of their littoral and deep-strike battlespace environments. These assessments allow mission planners and warfighters, from Unit to Theater level, to optimize their sensor employment on airborne, surface, and subsurface platforms in support of Naval Composite Warfare mission areas including Undersea Warfare (USW), Anti-Submarine Warfare (ASW), Mine Warfare (MIW), Amphibious Warfare (AMW), Anti-Surface Warfare (ASUW), Anti-Air Warfare (AAW), Strike Warfare (STW), Expeditionary Warfare (EXW), Electronic Warfare (EW), Information Operations (IO), Intelligence Operations (INT), Non-Combat Operations (NCO), Command, Control, Communication (CCC), and Naval Special Warfare (NSW). Performance assessments leading to improvements in operational and tactical control are conducted through a two-tiered approach: 1) 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 weapons and sensor systems will perform. Performance results are displayed in tabular and graphic formats integrated into net-centric visualization tools for use by mission planners, and combat/weapon system operators to develop localization plans, USW/AAW/ASUW screens, STW profiles, 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 cyber secure 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.

FY 2017 request provides for NITES-Next to finalize the acquisition documentation, award a task order, begin the development efforts and plan for test events for Fleet Capability Release (FCR-3). NITES-Next will begin planning the initial FCR-4 development efforts and contract actions.

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603207N / *Air/Ocean Tactical Applications*	**Project (Number/Name)** 2343 / *Tactical METOC Applications*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Title: Naval Integrated Tactical Environmental System Next Generation (NITES-Next)	8.942	9.260	13.473	0.000	13.473
Articles:	-	-	-	-	-

FY 2015 Accomplishments:
Conducted Operational Test Readiness Review (OTRR) with the System Engineering Technical Review (SETR) board, and the Milestone Decision Authority (MDA). Conducted Initial Operational Test and Evaluation (IOT&E) in support of FCR-1 Fielding Decision (FD). Complete Independent Logistics Assessment (ILA) for FCR-1. Obtained Authority to Operate (ATO) for FCR-1. Conducted FCR-1 FD with the MDA and achieved Initial Operational Capability (IOC). Conducted the SETR Build Technical Review (BTR) in support of FCR-2. Conducted the Build Decision (BD) for FCR-2. Continued developing, integrating, and testing FCR-2 software. Began documentation, and preparation (including Requirements Definition Package (RDP), Technology Readiness Assessment (TRA) Addendum 2, Cost Analysis Requirements Description (CARD), Acquisition Strategy (AS), and Acquisition Program Baseline (APB)) for FCR-3. Began planning for contract actions in support of FCR-3. Continued planning contract in support of FCR-3. Planned for SIT and, SQT, UA, and DT&E for FCR-2.

FY 2016 Plans:
NITES-Next will conduct the SIT#1, SIT #2, SQT, UA, and DT&E for FCR-2. Participate in the Consolidated Afloat Network and Enterprise Services (CANES) Application Integration (AI) SIT event. The program will update the Navy Training System Plan (NTSP) and ILA for FCR-2. NITES-Next will continue development, integration, and test for FCR-2 software with follow-on contract. The program will conduct and seek a FCR-2 FD with the MDA. Receive the ATO for FCR-2. The program will plan the FCR-3 development activities. NITES-Next will conduct the Fielding Technical Review (FTR) for FCR-2. Plan and prepare for integration into the Navy Tactical Cloud Reference Implementation (NTCRI).

FY 2017 Base Plans:
NITES-Next will incorporate new, robust Department of Defense (DoD)/Department of Navy (DoN) cybersecurity standards in the design of FCR-3 software and finalize the documentation (including RDP, TRA Addendum 2, CARD, Program Life Cycle Cost Estimate (PLCCE), AS, and APB) for the FCR-3 BD. NITES-Next will award a task order for the development of FCR-3. NITES-Next will prepare for FCR-3 BTR, prepare for FCR-3 BD, and begin to develop FCR-3 software that is anti-tamper proof and releasable to our allies to enhance our interoperability with their information warfare systems. NITES-Next will plan for SIT, SQT, UA, and DT&E for

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
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B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
FCR-3. Continue integration into the Navy Tactical Cloud Reference Implementation (NTCRI). The program will plan the initial FCR-4 development activities and begin planning for contract actions in support of FCR-4. ***FY 2017 OCO Plans:*** N/A					
Accomplishments/Planned Programs Subtotals	8.942	9.260	13.473	0.000	13.473

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

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

E. Performance Metrics

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

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

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy		Date: February 2016
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Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
NITES/NITES-Next	Various	Various : Various	111.017	0.000		0.000		0.000		-		0.000	0.000	111.017	-
NITES-Next	WR	SSC Pacific : San Diego, CA	12.209	3.818	Jan 2015	1.381	Dec 2015	4.533	Nov 2016	-		4.533	Continuing	Continuing	Continuing
NITES-Next	C/FP	SAIC : Virginia	3.986	1.445	Jan 2015	2.046	Dec 2015	2.472	Dec 2016	-		2.472	Continuing	Continuing	Continuing
NITES-Next	WR	SSC Atlantic : South Carolina	0.200	0.000		0.009	Oct 2015	0.007	Oct 2016	-		0.007	0.000	0.216	-
NITES-Next/ SW	C/FP	GDIT : Virginia	3.000	1.120	Apr 2015	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
NITES-Next	WR	SSC Pac : San Diego, CA	0.000	0.000		2.481	Feb 2016	0.000		-		0.000	Continuing	Continuing	Continuing
NITES-Next / Eng	C/IDIQ	Unknown : Unknown	0.000	0.000		1.500	Mar 2016	0.000		-		0.000	0.000	1.500	-
NITES-Next / Engineering	C/IDIQ	Unknown : Unknown	0.000	0.000		0.150	Jul 2016	4.500	Jan 2017	-		4.500	0.000	4.650	-
NITES-Next/SW	C/IDIQ	Unknown : Unknown	0.000	0.000		0.000		0.000		-		0.000	0.000	0.000	-
NITES-Next	C/BA	PS&E : Washington	0.000	0.207	Jan 2015	0.000		0.000		-		0.000	0.000	0.207	-
NITES-Next	C/BA	COTF : Virginia	0.000	0.121	Nov 2014	0.000		0.000		-		0.000	0.000	0.121	-
		Subtotal	130.412	6.711		7.567		11.512		-		11.512	-	-	-

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Support Cost	C/CPIF	IPD : Various	0.595	0.000		0.000		0.000		-		0.000	0.000	0.595	-
NITES-Next	C/FP	SAIC : Virginia	2.735	1.530	Jan 2015	0.984	Dec 2015	1.191	Nov 2016	-		1.191	Continuing	Continuing	Continuing
NITES-Next	C/FP	NAVAIR : Maryland	0.125	0.000		0.000		0.000		-		0.000	0.000	0.125	-
		Subtotal	3.455	1.530		0.984		1.191		-		1.191	-	-	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy			Date: February 2016
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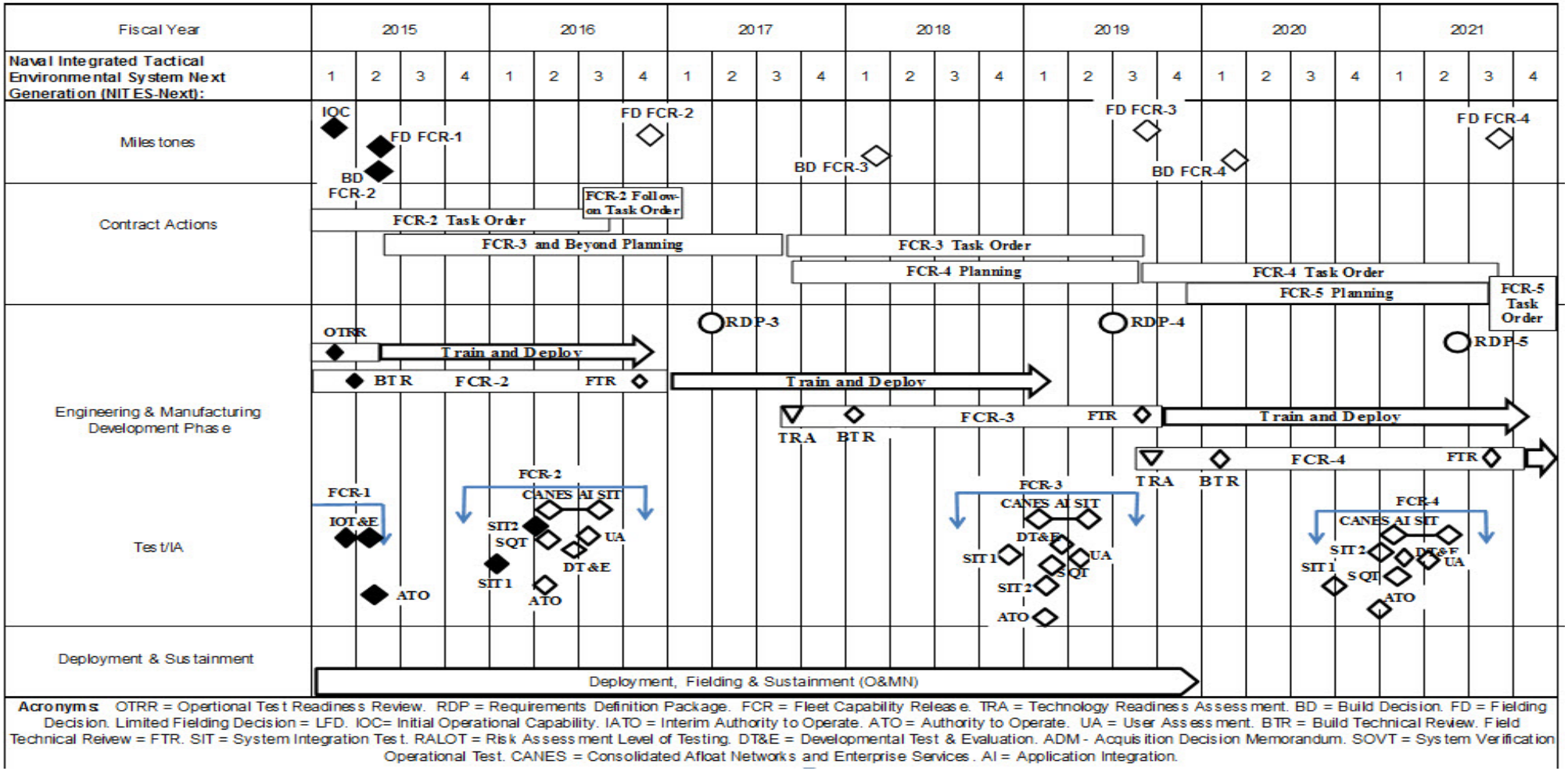
Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Acquisition Workforce	Various	Various : Various	0.031	0.000		0.000		0.000		-		0.000	0.000	0.031	-
NITES-Next	WR	SSC Pacific : San Diego, CA	0.600	0.200	Nov 2014	0.365	Dec 2015	0.293	Nov 2016	-		0.293	Continuing	Continuing	Continuing
NITES-Next	C/FP	BAH : San Diego, CA	0.950	0.501	Nov 2014	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
NITES-Next	TBD	Unknown : Unknown	0.000	0.000		0.344	Dec 2015	0.477	Dec 2016	-		0.477	0.000	0.821	-
		Subtotal	1.581	0.701		0.709		0.770		-		0.770	-	-	-

	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	135.448	8.942		9.260		13.473		-		13.473	-	-	-

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603207N / *Air/Ocean Tactical Applications*	**Project (Number/Name)** 2343 / *Tactical METOC Applications*



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

Exhibit R-4A, RDT&E Schedule Details: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603207N / *Air/Ocean Tactical Applications*	**Project (Number/Name)** 2343 / *Tactical METOC Applications*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Naval Integrated Tactical Environmental System Next Generation (NITES-Next)				
Milestones: Build Decision Fleet Capability Release - 2	2	2015	2	2015
Milestones: Initial Operational Capability	1	2015	1	2015
Milestones: Fielding Decision Fleet Capability Release - 1	2	2015	2	2015
Milestones: Build Decision Fleet Capability Release - 3	1	2018	1	2018
Milestones: Fielding Decision Fleet Capability Release - 2	4	2016	4	2016
Milestones: Build Decision Fleet Capability Release - 4	1	2020	1	2020
Milestones: Fielding Decision Fleet Capability Release - 3	3	2019	3	2019
Milestones: Fielding Decision Fleet Capability Release - 4	3	2021	3	2021
Contract Actions: FCR-2 Task Order	1	2015	3	2016
Contract Actions: FCR-3 Task Order	3	2017	3	2019
Contract Actions: FCR-3-Beyond Planning	2	2015	3	2017
Contract Actions: FCR-4 Task Order	3	2019	3	2021
Contract Actions: FCR-4 Planning	3	2017	3	2019
Contract Actions: FCR-5 Planning	4	2019	3	2021
Contract Actions: FCR-5 Task Order	3	2021	4	2021
Engineering & Manufacturing Development Phase: Fleet Capability Release - 1 / Train and Deploy	1	2015	4	2016
Engineering & Manufacturing Development Phase: Fleet Capability Release - 2 / Train Deploy	1	2015	1	2019
Engineering & Manufacturing Development Phase: Fleet Capability Release - 3 / Train Deploy	3	2017	4	2021

Exhibit R-4A, RDT&E Schedule Details: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603207N / *Air/Ocean Tactical Applications*	**Project (Number/Name)** 2343 / *Tactical METOC Applications*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Engineering & Manufacturing Development Phase: Fleet Capability Release - 4 / Train and Deploy	3	2019	4	2021
Engineering & Manufacturing Development Phase: Requirements Definition Package - 3	2	2017	2	2017
Engineering & Manufacturing Development Phase: Requirements Definition Package - 4	3	2019	3	2019
Engineering & Manufacturing Development Phase: Requirements Definition Package - 5	2	2021	2	2021
Engineering & Manufacturing Development Phase: Build Technical Review FCR-2	1	2015	1	2015
Engineering & Manufacturing Development Phase: Build Technical Review FCR-3	1	2018	1	2018
Engineering & Manufacturing Development Phase: Build Technical Review FCR-4	1	2020	1	2020
Engineering & Manufacturing Development Phase: Technology Readiness Assessment - 3	3	2017	3	2017
Engineering & Manufacturing Development Phase: Technology Readiness Assessment - 4	3	2019	3	2019
Engineering & Manufacturing Development Phase: Field Technical Review FCR-2	4	2016	4	2016
Engineering & Manufacturing Development Phase: Field Technical Review FCR-3	3	2019	3	2019
Engineering & Manufacturing Development Phase: Field Technical Review FCR-4	3	2021	3	2021
Engineering & Manufacturing Development Phase: Operational Test Readiness Review FCR-1	1	2015	1	2015
Test/IA: Fleet Capability Release - 1	1	2015	2	2015
Test/IA: Fleet Capability Release - 2	4	2015	4	2016
Test/IA: Fleet Capability Release - 3	3	2018	3	2019
Test/IA: Fleet Capability Release - 4	3	2020	3	2021
Test/IA: System Integration Test - 1 (FCR-2)	1	2016	1	2016
Test/IA: System Integration Test - 2 (FCR-2)	2	2016	2	2016
Test/IA: System Integration Test - 1 (FCR-3)	4	2018	4	2018

Exhibit R-4A, RDT&E Schedule Details: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603207N / *Air/Ocean Tactical Applications*	**Project (Number/Name)** 2343 / *Tactical METOC Applications*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Test/IA: System Integration Test - 2 (FCR-3)	1	2019	1	2019
Test/IA: System Integration Test - 1 (FCR-4)	3	2020	3	2020
Test/IA: System Integration Test - 2 (FCR4)	1	2021	1	2021
Test/IA: Initial Operational Test and Evaluation 1	1	2015	1	2015
Test/IA: Initial Operational Test and Evaluation 2	2	2015	2	2015
Test/IA: Authority to Operate FCR-1	2	2015	2	2015
Test/IA: Authority to Operate FCR-2	2	2016	2	2016
Test/IA: Authority to Operate FCR-3	1	2019	1	2019
Test/IA: Authority to Operate FCR-4	1	2021	1	2021
Test/IA: System Qualification Test FCR-2	2	2016	2	2016
Test/IA: System Qualification Test FCR-3	1	2019	1	2019
Test/IA: System Qualification Test FCR-4	1	2021	1	2021
Test/IA: Developmental Test Fleet Capability Release - FCR-2	2	2016	2	2016
Test/IA: Developmental Test Fleet Capability Release - FCR-3	1	2019	1	2019
Test/IA: Developmental Test Fleet Capability Release - FCR-4	1	2021	1	2021
Test/IA: User Assessment FCR-2	3	2016	3	2016
Test/IA: User Assessment FCR-3	2	2019	2	2019
Test/IA: User Assessment FCR-4	2	2021	2	2021
Test/IA: CANES AI SIT FCR-2	2	2016	3	2016
Test/IA: CANES AI SIT FCR-3	1	2019	2	2019
Test/IA: CANES AI SIT FCR-4	1	2021	2	2021
Test/IA: Deployment and Sustainment: Deployment, fielding and Sustainment (OMN)	1	2015	4	2019

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603207N / *Air/Ocean Tactical Applications*	Project (Number/Name) 2344. / *Precise Time and Astrometry*	

COST ($ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
2344.: *Precise Time and Astrometry*	6.825	8.217	4.977	5.636	-	5.636	5.229	4.745	0.313	0.319	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Precise Timing and Astrometry (PTA) project funds research and development of improvements for the U.S. Master Clock (MC) System, the DoD Time Transfer capability, the Earth Orientation System, and the Astrometric Observation System. The MC System and Time Transfer provides precise time for use in modern military and National Technical Means (NTM) navigation, guidance, positioning, and tracking systems. The Earth Orientation System provides precise Earth Orientation Parameters for use by the DoD and the national civilian infrastructure to establish the specific orientation of the Earth and to provide input to the terrestrial reference frame. The Astrometric Observation System provides the basic data needed to generate the celestial reference frame which is the standard for calibrating all inertial navigation systems, satellite orbits, and earth rotation determinations. Improvement to the MC System, Time Transfer, Earth Orientation, and Astrometric Observation Systems are needed to ensure that new and upgraded DoD and NTM capabilities meet their performance requirements. By DoD Directive (CJCSI 6130.01D, encl J, of 13 Apr 2007), the U.S. Naval Observatory (USNO), Washington, D.C., is responsible for coordinating Precise Time and Time Interval (PTTI) requirements and for maintaining a PTTI reference standard (astronomical and atomic) for use by all DoD, Federal agencies, and related scientific laboratories. The Navy is also responsible for providing astronomical data for military and NTM navigation, positioning, and guidance capabilities that are space-based.

The PTA research and development efforts are focused on several areas relating to timing and time transfer: (1) Development of Rubidium Fountain Atomic Clocks and development of improved GPS Timing Receivers in order to meet the precise timing requirements for the GPS III system; (2) Research & development of the capability of distributing timing signals via Optical fiber lines, as an alternative and backup to GPS time distribution; and (3) Research & development into Optical Clock technology, which is expected to be required for future DoD systems. The PTA research and development effort is also focused on the following areas related to Earth Orientation Parameter (EOP) determination: (1) Upgrade of the Very Long Baseline Interferometry (VBLI) data acquisition system / radio telescope at Kokee Park HI; (2) Development of a Software (SW) Correlator for processing of VLBI data, necessary for the generation of Earth Orientation Parameter (EOP) data; (3) Development of the capability for electronic transmission of the VLBI data from remote VLBI sites to the USNO correlator. The new SW Correlator and the eVLBI infrastructure upgrades are necessary in order to support daily updates of EOP data required by GPS III; (4) Development of an automated end-to-end EOP processing system, which combines input from multiple data sets (e.g. VLBI data, GPS orbit data, and laser ranging data, etc.). This process is currently very labor intensive and costly. Automation is necessary to meet future DoD and GPS requirements; and (5) Modifications to the EOP system for compatibility with the new international standard -'VLBI2010'. Starting in FY15, the PTA research and development for astrometry will focus on improvements to the USNO Navy Precision Optical Interferometer (NPOI) at Flagstaff, AZ. It is necessary for maintenance of the Celestial Reference Frame (CRF). Four 1.8m telescopes will be added to the array in order to extend and expand the number of stars in the catalog to fainter stars of 9th magnitude.

The Critical Time Dissemination (CTD) aspect of the PTA program develops enhanced methods of distributing and verifying precise time back to the Master Clock, UTC (USNO). The development aspect of this project has four parts: (1) Development of a mobile time link; (2) Refinement of and modernization of the Hydrogen Maser and

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603207N / *Air/Ocean Tactical Applications*	**Project (Number/Name)** 2344. / *Precise Time and Astrometry*

Auxilary Offset Generator (AOG); (3) Customize a timing system to develop a Site Verification System; and (4) Produce a fiber link system to transfer the Master Clock down long-haul fiber.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Title: Precise Timing and Astronomy	8.217	4.977	5.636	0.000	5.636
Articles:	-	-	-	-	-
Description: Description: Research and development of improvements for the U.S. Master Clock (MC) System, the DoD Time Transfer capability, the Earth Orientation System, and the Astrometric Observation System.					
FY 2015 Accomplishments: *Final Operating Capability (FOC) for Rb Fountains at USNO Alternate Master Clock facility *Continue Optical Fiber timing link activities *Continue Critical Time Dissemination Activities *PDR for Earth Orientation Parameter (EOP) Automation *Install Kokee Park radio telescope *Begin Navy Precision Optical Interferometer (NPOI)/1.8m construction activities (relocate roads, install concrete piers, fabricate & install domes, electrical services)					
FY 2016 Plans: *Demo Optical Fiber timing link in fiber network *Lab demonstration of optical clock prototype *Continue Critical Time Dissemination Activities *Continue work on EOP automation *IOC for Kokee Park radio telescope * Continue NPOI/1.8m construction activities (relocate roads, install concrete piers, fabricate & install domes, electrical services)					
FY 2017 Base Plans: *Optical clock prototype Improvements *Continue Critical Time Dissemination Activities *Continue work on EOP automation *Increased NPOI enhancements *Create a control system and procure the adaptive optics *IOC for Kokee Park radio telescope					

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
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B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
*Continue NPOI/1.8m construction activities (relocate roads, install concrete piers, fabricate & install domes, electrical services) ***FY 2017 OCO Plans:*** N/A					
Accomplishments/Planned Programs Subtotals	8.217	4.977	5.636	0.000	5.636

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

The included technology developments are primarily in-house with selected contractor participation. However, the Kokee Park, HI, radio telescope upgrade and the SW Correlator (OPN-funded) contract will involve substantial non-Navy contract support.

E. Performance Metrics

(1) The Software Correlator will complete Phase 2 and will achieve Initial Operational Capability (IOC).
(2) Antenna will be installed at Kokee Park, HI.
(3) Rb Fountain System will reach FOC at AMC in FY17.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603207N / *Air/Ocean Tactical Applications*	**Project (Number/Name)** 2344. / *Precise Time and Astrometry*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Primary Hardware Development (NPOI) 1.8m Telescope Project (1)	SS/FFP	Lowell Observatory : Flagstaff, AZ	0.000	2.172	Oct 2015	0.482	Mar 2017	0.993	Mar 2017	-		0.993	0.000	3.647	-
Primary Hardware Development (NPOI) 1.8m Telescope (2)	SS/FFP	AZ Embeded System : Not Specified	0.000	0.000		0.200	Oct 2016	0.000		-		0.000	0.000	0.200	-
Ancillary Hardware Development 1	Various	U.S. Naval Observatory : Washington, DC	0.057	0.030	Oct 2015	0.020	Jan 2016	0.120	Oct 2016	-		0.120	0.000	0.227	-
Ancillary Hardware Development 2	Various	U.S. Naval Observatory : Washington, DC	0.057	0.030	Oct 2015	0.020	Oct 2016	0.120	Jan 2017	-		0.120	0.000	0.227	-
Ancillary Hardware Development 3	Various	U.S. Naval Observatory : Washington, DC	0.094	0.030	Apr 2016	0.021	Nov 2016	0.101	Apr 2017	-		0.101	0.000	0.246	-
Ancillary Hardware Development 4	Various	U.S. Naval Observatory : Washington, DC	0.000	0.030	Jan 2015	0.021	Nov 2016	0.100	Jul 2017	-		0.100	0.000	0.151	-
Primary Hardware Development for CTD (System Integration)	C/FP	Classified : Not Specified	1.644	0.600	Dec 2015	0.600	Dec 2015	0.600	Dec 2016	-		0.600	0.000	3.444	-
Primary Hardware Development for CTD (RF Interface)	MIPR	Classified : Not Specified	1.580	1.500	Dec 2015	1.000	Dec 2015	1.000	Dec 2016	-		1.000	0.000	5.080	-
Primary Hardware Development for CTD (Line Interface)	MIPR	Classified : Not Specified	1.775	2.483	Mar 2016	0.963	Mar 2017	1.000	Mar 2017	-		1.000	0.000	6.221	-
Primary Hardware Development for CTD (Reference Upgrade)	C/FFP	Symmetricom : San Jose, CA	0.200	0.200	Jun 2016	0.100	Jun 2017	0.342	Jun 2017	-		0.342	0.000	0.842	-
Two Way Satellite Time Transfer Modernization	TBD	TBD : Not Specified	0.000	0.000		0.000		0.000	Jun 2017	-		0.000	0.000	0.000	-
		Subtotal	5.407	7.075		3.427		4.376		-		4.376	0.000	20.285	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603207N / *Air/Ocean Tactical Applications*	Project (Number/Name) 2344. / *Precise Time and Astrometry*	

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Development Support (All PTA - Labor) 1	Allot	U.S. Naval Observatory (Civilian Labor) : Washington, DC	0.195	0.152	Oct 2015	0.103	Oct 2016	0.100	Oct 2016	-		0.100	Continuing	Continuing	Continuing
Development Support (All PTA - Labor) 2	Allot	U.S. Naval Observatory (Civilian Labor) : Washington, DC	0.195	0.152	Jan 2016	0.103	Jan 2017	0.100	Jan 2017	-		0.100	Continuing	Continuing	Continuing
Development Support (All PTA - Labor) 3	Allot	U.S. Naval Observatory (Civilian Labor) : Washington, DC	0.195	0.152	Apr 2016	0.103	Apr 2017	0.100	Apr 2017	-		0.100	Continuing	Continuing	Continuing
Development Support (All PTA - Labor) 4	Allot	U.S. Naval Observatory (Civilian Labor) : Washington, DC	0.195	0.152	Jul 2016	0.103	Jul 2017	0.100	Jul 2017	-		0.100	Continuing	Continuing	Continuing
Software Development (EOP Automation)	C/FFP	U.S. Naval Observatory (Civilian Labor) : Washington, DC	0.568	0.050	Jun 2016	0.440	Jun 2017	0.356	May 2017	-		0.356	0.000	1.414	-
Travel 1	Allot	U.S. Naval Observatory (Civilian Travel) : Varies	0.017	0.010	Dec 2015	0.005	Oct 2016	0.005	Oct 2016	-		0.005	0.000	0.037	-
Travel 2	Allot	U.S. Naval Observatory (Civilian Travel) : Varies	0.017	0.010	Jan 2016	0.005	Jan 2017	0.005	Jan 2017	-		0.005	0.000	0.037	-
Travel 3	Allot	U.S. Naval Observatory (Civilian Travel) : Varies	0.018	0.010	Apr 2015	0.005	Apr 2016	0.005	Apr 2017	-		0.005	0.000	0.038	-
Travel 4	Allot	U.S. Naval Observatory (Civilian Travel) : Varies	0.018	0.010	Jul 2016	0.005	Jul 2017	0.005	Jul 2017	-		0.005	0.000	0.038	-
VLBI2010 Testing and Integration	MIPR	NASA : GSFC	0.000	0.444	Jan 2016	0.678	Jan 2017	0.484	Jan 2017	-		0.484	0.000	1.606	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603207N / *Air/Ocean Tactical Applications*	Project (Number/Name) 2344. / *Precise Time and Astrometry*	

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
		Subtotal	1.418	1.142		1.550		1.260		-		1.260	-	-	-

	Prior Years	FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	6.825	8.217		4.977		5.636		-		5.636	-	-	-

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603207N / *Air/Ocean Tactical Applications*	**Project (Number/Name)** 2344. / *Precise Time and Astrometry*

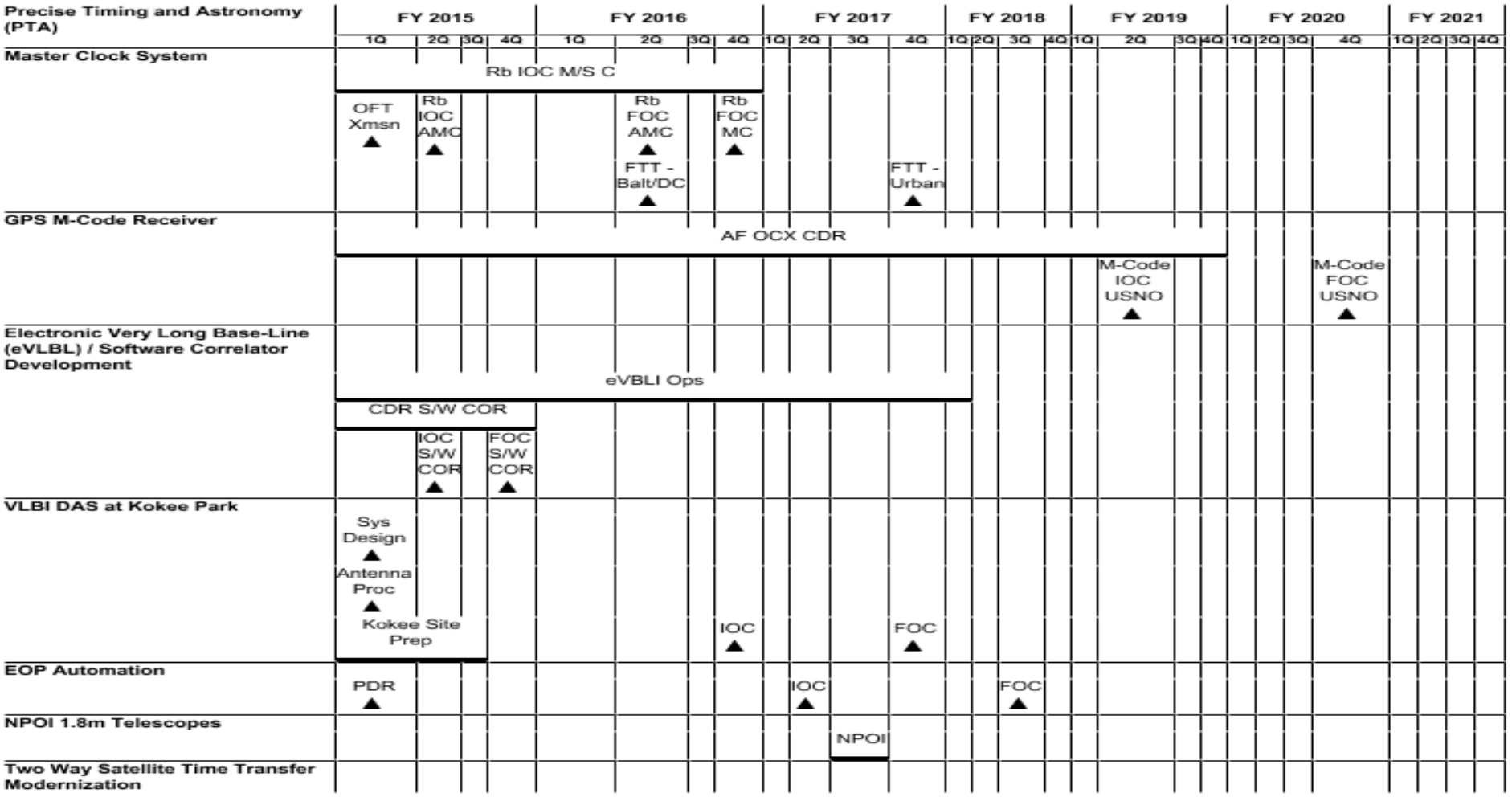


Exhibit R-4, RDT&E Schedule Profile: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603207N / *Air/Ocean Tactical Applications*	**Project (Number/Name)** 2344. / *Precise Time and Astrometry*

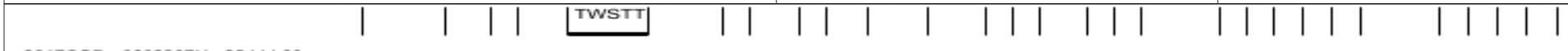


Exhibit R-4A, RDT&E Schedule Details: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603207N / *Air/Ocean Tactical Applications*	**Project (Number/Name)** 2344. / *Precise Time and Astrometry*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Precise Timing and Astronomy (PTA)				
Master Clock System: Rubidium (Rb) Fountain Initial Operational Capability (IOC) - Milestone C (Master Clock -MC)	1	2015	4	2016
Master Clock System: IOC for Rb Fountain Clocks at Alternate Master Clock (AMC)	2	2015	2	2015
Master Clock System: Rb Full Operational Capability (FOC) - AMC	4	2016	4	2016
Master Clock System: Rb FOC - AMC	2	2016	2	2016
Master Clock System: Optical Fiber Time (OFT) Transmission	1	2015	1	2015
Master Clock System: Fiber Time Transmission (FTT) in Baltimore/DC Area	2	2016	2	2016
Master Clock System: Fiber Time Transmission - Urban Demo	4	2017	4	2017
GPS M-Code Receiver: AF Operational Control Segment (OCX) Project Critical Design Review (CDR)	1	2015	4	2019
GPS M-Code Receiver: M-Code IOC at USNO	2	2019	2	2019
GPS M-Code Receiver: M-Code FOC at USNO	4	2020	4	2020
Electronic Very Long Base-Line (eVLBL) / Software Correlator Development: Wide Band eVBLI Operations Start	1	2015	1	2018
Electronic Very Long Base-Line (eVLBL) / Software Correlator Development: CDR Software COR	1	2015	4	2015
Electronic Very Long Base-Line (eVLBL) / Software Correlator Development: IOC - Software COR	2	2015	2	2015
Electronic Very Long Base-Line (eVLBL) / Software Correlator Development: FOC - SW COR Upgrade	4	2015	4	2015
VLBI DAS at Kokee Park: Design VLBI 2010 System	1	2015	1	2015
VLBI DAS at Kokee Park: Antenna Procurement Contract	1	2015	1	2015
VLBI DAS at Kokee Park: Kokee Park Site Preparation	1	2015	3	2015

Exhibit R-4A, RDT&E Schedule Details: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603207N / *Air/Ocean Tactical Applications*	**Project (Number/Name)** 2344. / *Precise Time and Astrometry*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
VLBI DAS at Kokee Park: IOC	4	2016	4	2016
VLBI DAS at Kokee Park: FOC	4	2017	4	2017
EOP Automation: Preliminary Design Review (PDR)	1	2015	1	2015
EOP Automation: IOC	2	2017	2	2017
EOP Automation: FOC	3	2018	3	2018
NPOI 1.8m Telescopes: Dome structures and electrical installed	3	2017	3	2017
Two Way Satellite Time Transfer Modernization: Develop TWSTT Modem	1	2016	1	2016

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603207N / *Air/Ocean Tactical Applications*	Project (Number/Name) 2363. / *Remote Sensing Capability Development*	

COST ($ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
2363.: *Remote Sensing Capability Development*	0.000	4.949	2.479	3.855	-	3.855	1.023	0.988	0.970	0.991	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

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

FY 2017 request provides for continued target data collection, enhancements on algorithms and continue to integrate algorithms for access over the network. Remote Sensing Capability Development characterized the ocean environment using a variety of remote sensing techniques that provide that capability to discriminate atypical oceanographic phenomena from the natural environment that will greatly improve undersea dominance capabilities. The Naval Oceanographic Office will employ oceanographic data to refine and extend environmental characterization of the phenomena and disseminate data to the Fleet.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Title: Remote Sensing Capability Development	3.967	1.819	3.636	0.000	3.636
Articles:	-	-	-	-	-
FY 2015 Accomplishments: Collected remote sensing and ground truth data in various weather and sea states to broaden the range of environmental conditions and reduce uncertainty in environmental prediction. Developed the Requirements Definition Package (RDP). Enhanced software algorithms to automatically detect oceanographic phenomena.Integrated algorithms for access over the network. Enhanced existing toolsets to provide users robust applications to assist in their daily tasks. Initiated development of training to provide the user community education on using the different tools and applications.					
FY 2016 Plans: Continue data collection in various weather and sea states to broaden the range of environmental conditions and reduce uncertainty in environmental prediction. Continue software algorithm enhancements to automatically detect oceanographic phenomena. Conduct algorithm Acceptance Decision. Continue to integrate algorithms for access over the network. Conduct Algorithm Transition Board. Continue evolving development of training to					

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603207N / *Air/Ocean Tactical Applications*	**Project (Number/Name)** 2363. / *Remote Sensing Capability Development*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
provide the user community education on using the different tools and applications. Coordinate Task, Collect, Process, Exploit, Disseminate (TCPED) process amongst inter-agencies to support Navy Missions. Provide Navy leadership status on emerging capabilities. ***FY 2017 Base Plans:*** Develop data collection strategy and collections process. Continue data collection in various weather and sea states to broaden the range of environmental conditions and reduce uncertainty in environmental prediction. Conduct software algorithm performance analysis. Continue software algorithm enhancements to automatically detect oceanographic phenomena and modifications to support transition to a new architecture. Develop and implement the algorithm performance assessment strategy and test and evaluation plans. Document software algorithm test reports. Conduct algorithm Acceptance Decision. Continue to integrate algorithms for access over the network. Conduct algorithm Fielding Decision. Continue development of training to provide the user community education on using the different tools and applications. Coordinate TCPED process amongst inter-agencies to support Navy Missions. Provide Navy leadership status on emerging capabilities. Award contract for Development and Integration efforts. ***FY 2017 OCO Plans:*** N/A					
Title: Remote Sensing Capability Dev. ***Articles:*** ***FY 2015 Accomplishments:*** N/A ***FY 2016 Plans:*** N/A ***FY 2017 Base Plans:*** - Continue all efforts of FY 2016 less those noted as completed above. - Coordinate TCPED process across DoD and civilian government agencies to support Navy Missions. ***FY 2017 OCO Plans:*** N/A	0.982 -	0.660 -	0.219 -	0.000 -	0.219 -
Accomplishments/Planned Programs Subtotals	4.949	2.479	3.855	0.000	3.855

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603207N / *Air/Ocean Tactical Applications*	**Project (Number/Name)** 2363. / *Remote Sensing Capability Development*

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

Remote Sensing Capability Development is being managed as a PEO Project, via a Project Definition Document (PDD) construct for acquisition rigor and oversight.
Remote Sensing Capability Development is being managed as a PEO Project leveraging the Rapid Development and Deployment (RDD) construct for rigor and discipline.

E. Performance Metrics

Available in the Project's Requirements Definition Package (RDP).
Classified performance metrics are available in the Project's Requirements Definition Package (RDP) approved 14 July 2015

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603207N / *Air/Ocean Tactical Applications*	**Project (Number/Name)** 2363. / *Remote Sensing Capability Development*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Remote Sensing Capability Development Data Collection	C/FFP	SAIC : Virginia	0.000	1.284	Jul 2015	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Remote Sensing Capability Development Data Collection	WR	NRL : Washington, DC	0.000	0.841	Mar 2015	0.387	Jan 2016	0.773	Jan 2017	-		0.773	0.000	2.001	-
Remote Sensing Capability Development Data Collection	C/FFP	Raytheon : MA	0.000	0.566	Jul 2015	0.521	Dec 2015	1.041	Dec 2016	-		1.041	0.000	2.128	-
Remote Sensing Capability Development Data Collection	WR	NUWC : Not Specified	0.000	0.000		0.248	Jan 2016	0.496	Jan 2017	-		0.496	0.000	0.744	-
REMOTE SENSING CAPABILITY DEVELOPMENT DATA COLLECTION	Various	VARIOUS : VARIOUS	0.000	0.000		0.000		0.219	Jan 2017	-		0.219	5.176	5.395	-
		Subtotal	0.000	2.691		1.156		2.529		-		2.529	-	-	-

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Remote Sensing Capability Development Data Collection	WR	SSC PAC : San Diego, CA	0.000	0.219	Dec 2014	0.253	Mar 2016	0.506	Mar 2017	-		0.506	0.000	0.978	-
		Subtotal	0.000	0.219		0.253		0.506		-		0.506	0.000	0.978	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603207N / *Air/Ocean Tactical Applications*	Project (Number/Name) 2363. / *Remote Sensing Capability Development*	

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Remote Sensing Capability Development Data Collection	WR	SSC PAC : San Diego, CA	0.000	0.712	Dec 2014	0.410	Jan 2016	0.820	Jan 2017	-		0.820	0.000	1.942	-
Remote Sensing Capability Development Data Collection	WR	SSC Pacific : SAN DIEGO, CA	0.000	0.480	Dec 2014	0.625	Oct 2015	0.000		-		0.000	0.375	1.480	-
		Subtotal	0.000	1.192		1.035		0.820		-		0.820	0.375	3.422	-

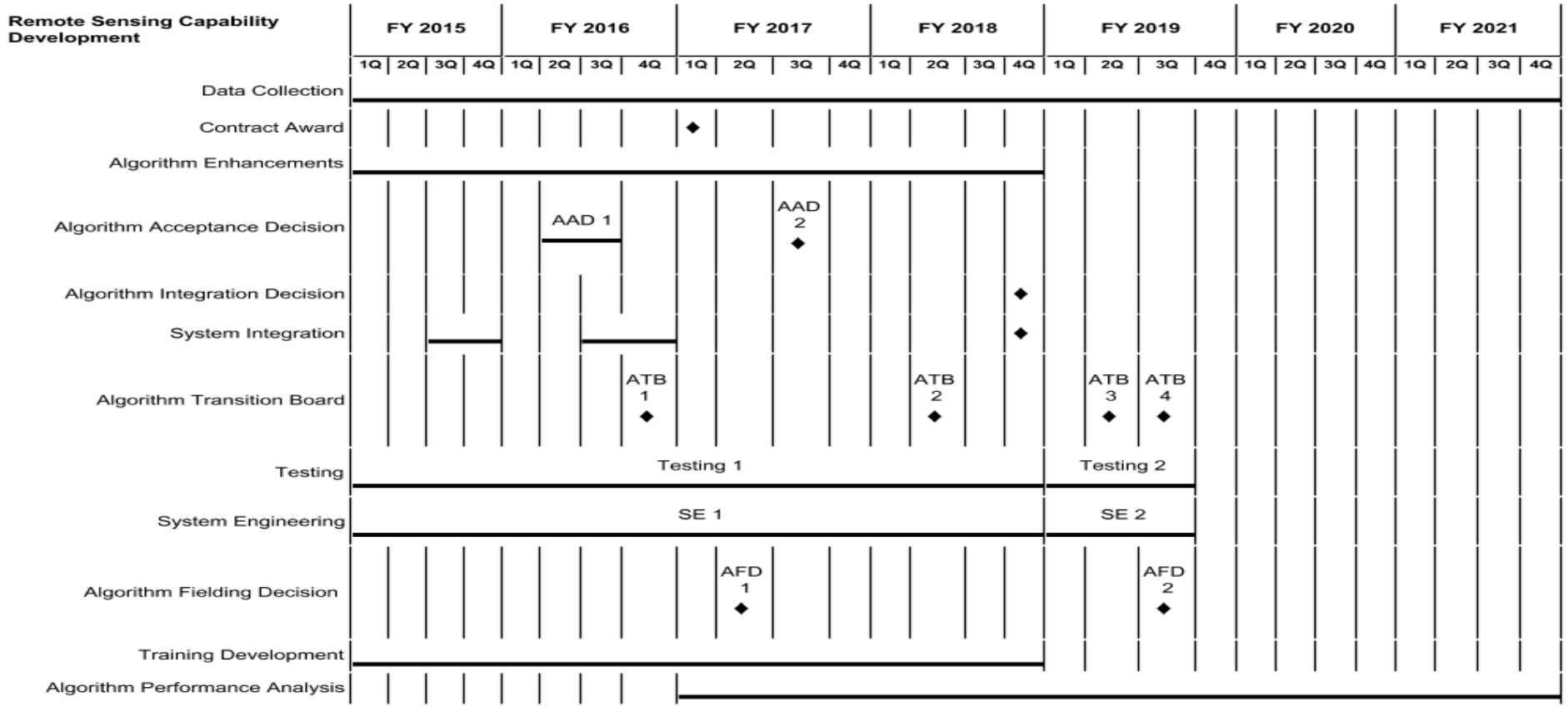
Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Remote Sensing Capability Development Data Collection	C/FP	BAH : Virgina	0.000	0.345	Jul 2015	0.000		0.000		-		0.000	0.000	0.345	-
Remote Sensing Capability Development Data Collection	C/FP	BAH : VIRGINIA	0.000	0.502	Feb 2015	0.035	Dec 2015	0.000		-		0.000	0.374	0.911	-
		Subtotal	0.000	0.847		0.035		0.000		-		0.000	0.374	1.256	-

	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	4.949		2.479		3.855		-		3.855	-	-	-

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603207N / *Air/Ocean Tactical Applications*	**Project (Number/Name)** 2363. / *Remote Sensing Capability Development*



2017PB - 0603207N - 2363.L39

Exhibit R-4, RDT&E Schedule Profile: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603207N / *Air/Ocean Tactical Applications*	**Project (Number/Name)** 2363. / *Remote Sensing Capability Development*

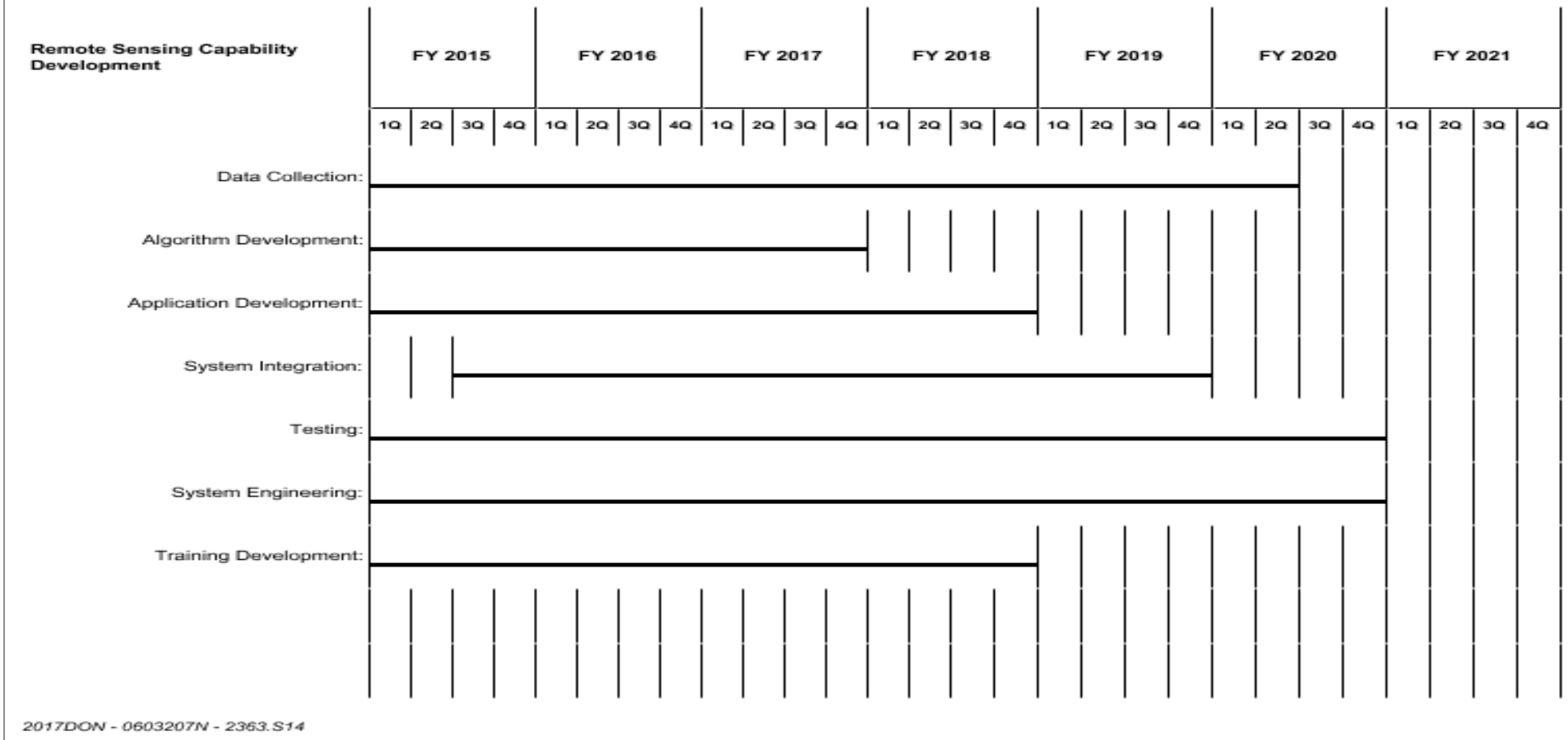


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Exhibit R-4A, RDT&E Schedule Details: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603207N / *Air/Ocean Tactical Applications*	**Project (Number/Name)** 2363. / *Remote Sensing Capability Development*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Remote Sensing Capability Development				
Data Collection:	1	2015	4	2021
Contract Award:	1	2017	1	2017
Algorithm Enhancements:	1	2015	4	2018
Algorithm Acceptance Decision: Algorithm Acceptance Decision 1	2	2016	3	2016
Algorithm Acceptance Decision: Algorithm Acceptance Decision 2	3	2017	3	2017
Algorithm Integration Decision:	4	2018	4	2018
System Integration: System Integration 1	3	2015	4	2015
System Integration: System Integration 2	3	2016	4	2016
System Integration: System Integration 3	4	2018	4	2018
Algorithm Transition Board: Algorithm Transition Board 1	4	2016	4	2016
Algorithm Transition Board: Algorithm Transition Board 2	2	2018	2	2018
Algorithm Transition Board: Algorithm Transition Board 3	2	2019	2	2019
Algorithm Transition Board: Algorithm Transition Board 4	3	2019	3	2019
Testing: Testing 1	1	2015	4	2018
Testing: Testing 2	1	2019	3	2019
System Engineering: System Engineering 1	1	2015	4	2018
System Engineering: System Engineering 2	1	2019	3	2019
Algorithm Fielding Decision: Algorithm Fielding Decision 1	2	2017	2	2017
Algorithm Fielding Decision: Algorithm Fielding Decision 2	3	2019	3	2019
Training Development:	1	2015	4	2018
Algorithm Performance Analysis:	1	2017	4	2021

Exhibit R-4A, RDT&E Schedule Details: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603207N / *Air/Ocean Tactical Applications*	**Project (Number/Name)** 2363. / *Remote Sensing Capability Development*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Remote Sensing Capability Dev.				
Data Collection:: Schedule Detail	1	2015	2	2020
Algorithm Development:: Schedule Detail	1	2015	4	2017
Application Development:: Schedule Detail	1	2015	4	2018
System Integration:: Schedule Detail	3	2015	4	2019
Testing:: Schedule Detail	1	2015	4	2020
System Engineering:: Schedule Detail	1	2015	4	2020
Training Development:: Schedule Detail	1	2015	4	2018

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603207N / *Air/Ocean Tactical Applications*	Project (Number/Name) 3207 / *Fleet Synthetic Training*	

COST ($ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
3207: *Fleet Synthetic Training*	1.182	2.185	0.993	0.970	-	0.970	1.033	1.055	1.076	1.098	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

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.

Ballistic Missile Defense (BMD) Fleet Synthetic Training (FST) at sea effort will provide the capability to conduct integrated Live, Virtual and Constructive (LVC) single or multi-ship exercises with ships at sea using the Navy Continuous Training Environment (NCTE). This capability will support BMD mission area Fleet training and mission rehearsal in theater, allow ships to participate in Combatant Command (COCOM) mandated BMD exercises while pierside or underway, as well as enhance BMD training objective accomplishment in current Fleet Requirements Training Plan (FRTP) underway training events such as Composite Training Unit Exercises (COMPTUEX) and Joint Task Force Exercises (JTFEX). The NCTE and FST directly support Fleet training readiness, strike group and BMD platform deployment certifications.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Title: Fleet Synthetic Training	0.579	0.993	0.970	0.000	0.970
Articles:	-	-	-	-	-
Description: Develop and deliver 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. Accomplishments include development of Meteorological and Oceanographic (METOC) environmental databases for total of 10 of 14 Navy Continuous Training Environment (NCTE) exercise areas. Conducted data and architecture testing between Commander, Navy Information Dominance Forces Command (NAVIDFOR) data and the Environmental Data Cube Support system (EDCSS). Integrated environmental database hosting					

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603207N / *Air/Ocean Tactical Applications*	**Project (Number/Name)** 3207 / *Fleet Synthetic Training*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
at the Naval Oceanographic Office. Developed capability to realistically simulate bathythermograph data collection based on synthetic ocean environment for total of 6 of 14 NCTE areas. Enhanced realism of training environment by providing synthetic satellite/radar imagery based on synthetic enviromental data. Made improvements in generating acoustic performance products used by Anti-Submarine Warfare (ASW) white cell and ASW commander staff. Conducted verification and validation of acoustic performance products. United States Fleet Forces Command and Commander Pacific Fleet jointly signed out the Fleet Live, Virtual, and Constructive (LVC) Training Capability Requirement on 31 Jan 2013. The document states that an integrated LVC Training Environment is essential for future force readiness. As such, physical environment efforts are required to be undertaken to meet the desired LVC end state of a seamless training environment that enables robust, realistic, and cost effective training by integrating live, virtual, and constructive training systems to support the effective and efficient generation of maritime forces in support of Combatant Commander requirements. Specifically, Live, Virtual, and Constructive simulations each have unique requirements for METOC representation, as well as their Concept of Operations (CONOPS) for its use. The EDCSS is capable of providing a single integrated METOC representation to each simulation in a manner and format uniquely suited to that platform. In addition, EDCSS is source agnostic and can provide such representations from historical reference scenarios or live operational METOC data sources. These capabilities of EDCSS have been previously developed, however their use within LVC federations, most notable NCTE, continues to be defined and as such the final technical approach, deployment and validation must still be accomplished. ***FY 2015 Accomplishments:*** * Complete full integration of EDCSS production capability at NWDC. * Complete COAMPS-OS Modeling on Demand. IOC estimated in Q2 FY15. * Continue work on FMV support. * Convert 17 year HYbrid Coordinate Ocean Model (HYCOM) database to a mineable format. ***FY 2016 Plans:*** * Research/implement live virtual constructive capability. * Develop support for Electromagnetic Spectrum Maneuver Warfare (EMMW) and FMV.					

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603207N / *Air/Ocean Tactical Applications*	**Project (Number/Name)** 3207 / *Fleet Synthetic Training*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
* Develop Machine-to-Machine (M2M) capability for EDCSS interface in support of environmental product generation. ***FY 2017 Base Plans:*** * Research/Implement live virtual constructive capability leveraging virtual testbed and FMV/JSAF/NGTS research. * Develop support for Electromagnetic Spectrum Maneuver Warfare (EMMW) leveraging FMV/JSAF/NGTS research. * Develop Machine-to-Machine (M2M) capability for EDCSS interface in support of environmental product generation. * Research EDCSS Cloud architecture (COOP capability and potential for shipboard integration). ***FY 2017 OCO Plans:*** N/A					
Title: Ballistic Missile Defense (BMD) Fleet Synthetic Training (FST) at Sea ***Articles:*** ***Description:*** Develop a distributed training capability to provide simulation data via a satellite network to the ship underway to stimulate the combat systems and operators. Coordinate efforts with NAVSEA, SPAWAR, and NAVAIR. ***FY 2015 Accomplishments:*** * Finalize development, test, certification and demonstration of the capability. * Test and certification of the capability will be conducted FY 2015. ***FY 2016 Plans:*** N/A ***FY 2017 Base Plans:*** N/A ***FY 2017 OCO Plans:*** N/A	1.606 -	0.000 -	0.000 -	0.000 -	0.000 -
Accomplishments/Planned Programs Subtotals	2.185	0.993	0.970	0.000	0.970

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603207N / *Air/Ocean Tactical Applications*	**Project (Number/Name)** 3207 / *Fleet Synthetic Training*

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

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

E. Performance Metrics

1) NAVIDFOR will produce meteorological and oceanographic environmental databases for all Navy Continuous Training Environment (NCTE) exercise areas. Will implement, test, and integrate with JSAF and other federates in accordance with requirements.

2) NAVIDFOR will complete data and architecture integration, including information assurance compliance for provision of synthetic Meteorological and Oceanographic Command (METOC) data to the NCTE. Data and products will be available via NEP-Oc, DVD and/or Machine-to-Machine (M2M) during planning and execution of FST events.

3) NAVIDFOR will produce products based on synthetic ocean environment and synthetic satellite/radar imagery based on meteorological environmental data for all NCTE exercise areas. Products are utilized in planning and execution of FST events.

4) NWDC, in FY15 will finalize development, test, certify, and demonstrate capability for BMD FST at sea.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603207N / *Air/Ocean Tactical Applications*	Project (Number/Name) 3207 / *Fleet Synthetic Training*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Primary Hardware Development	WR	NAWC TSD : Orlando, FL	0.248	0.000		0.000		0.000		-		0.000	0.248	0.496	-
		Subtotal	0.248	0.000		0.000		0.000		-		0.000	0.248	0.496	-

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Development Support	WR	NRL / AER : MS / CA / VA	0.230	0.000		0.142	Nov 2015	0.229	Nov 2016	-		0.229	Continuing	Continuing	Continuing
Software Development	SS/CPFF	AER / GEOCENT : VA / MS	0.640	0.000		0.200	Jan 2016	0.250	Nov 2016	-		0.250	Continuing	Continuing	Continuing
Configuration Management	WR	AER / GEOCENT : VA / MS	0.064	0.000		0.000		0.230	Nov 2016	-		0.230	0.000	0.294	-
Studies and Analysis	Various	Various : Various	0.000	0.579	May 2015	0.440	May 2016	0.000		-		0.000	0.000	1.019	-
TCSS Development	WR	NAWC TSD : Orlando, FL	0.000	0.150	Nov 2014	0.000		0.000		-		0.000	0.000	0.150	-
TechnologyDevelopment	C/CPFF	Alion Science & Technology : Norfolk, VA	0.000	1.456	Dec 2014	0.000		0.000		-		0.000	0.000	1.456	-
Technical Data	WR	NRL : MS	0.000	0.000		0.021	May 2016	0.000		-		0.000	0.000	0.021	-
		Subtotal	0.934	2.185		0.803		0.709		-		0.709	-	-	-

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Development Test and Evaluation	WR	NRL : Monterey, CA	0.000	0.000		0.190	Dec 2015	0.261	Dec 2016	-		0.261	0.000	0.451	-
		Subtotal	0.000	0.000		0.190		0.261		-		0.261	0.000	0.451	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603207N / *Air/Ocean Tactical Applications*	Project (Number/Name) 3207 / *Fleet Synthetic Training*	

	Prior Years	FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	1.182	2.185		0.993		0.970		-		0.970	-	-	-

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603207N / *Air/Ocean Tactical Applications*	**Project (Number/Name)** 3207 / *Fleet Synthetic Training*

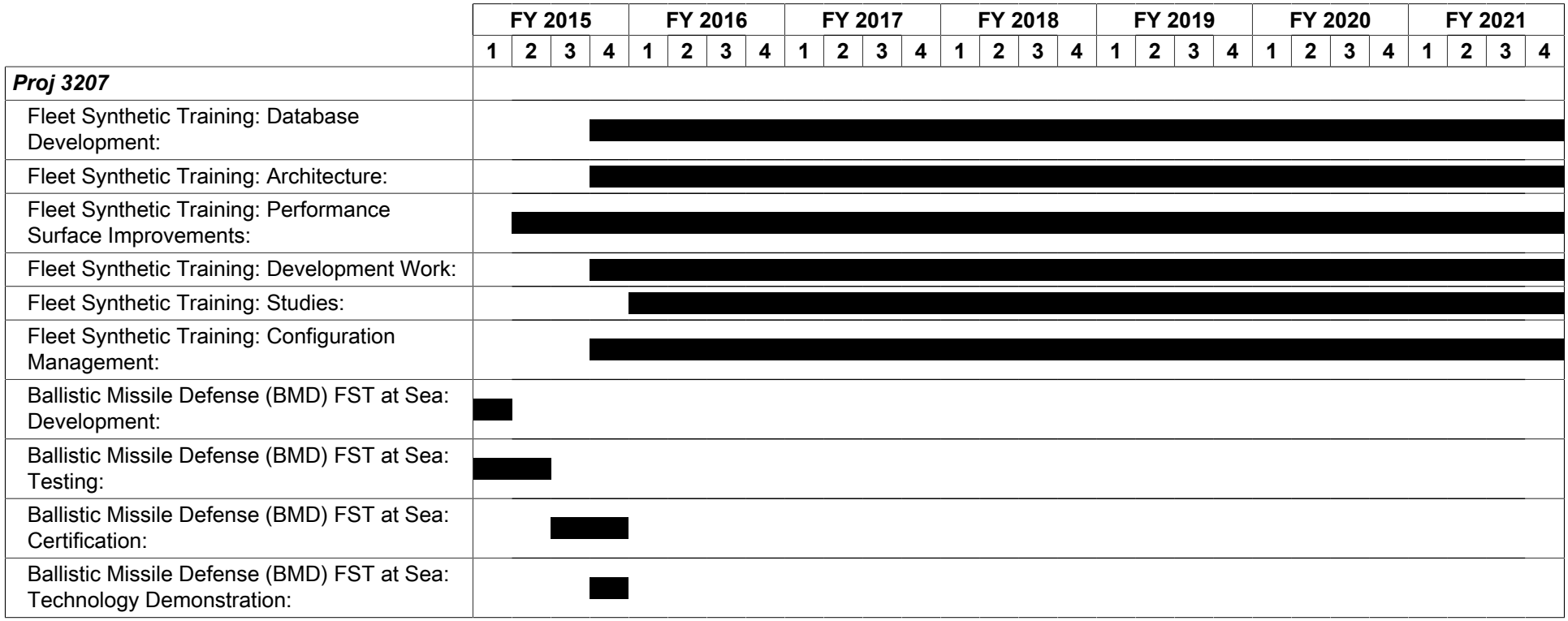


Exhibit R-4A, RDT&E Schedule Details: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603207N / *Air/Ocean Tactical Applications*	**Project (Number/Name)** 3207 / *Fleet Synthetic Training*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 3207				
Fleet Synthetic Training: Database Development:	4	2015	4	2021
Fleet Synthetic Training: Architecture:	4	2015	4	2021
Fleet Synthetic Training: Performance Surface Improvements:	2	2015	4	2021
Fleet Synthetic Training: Development Work:	4	2015	4	2021
Fleet Synthetic Training: Studies:	1	2016	4	2021
Fleet Synthetic Training: Configuration Management:	4	2015	4	2021
Ballistic Missile Defense (BMD) FST at Sea: Development:	1	2015	1	2015
Ballistic Missile Defense (BMD) FST at Sea: Testing:	1	2015	2	2015
Ballistic Missile Defense (BMD) FST at Sea: Certification:	3	2015	4	2015
Ballistic Missile Defense (BMD) FST at Sea: Technology Demonstration:	4	2015	4	2015

Exhibit R-2, RDT&E Budget Item Justification: PB 2017 Navy											Date: February 2016	
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 4: *Advanced Component Development & Prototypes (ACD&P)*					R-1 Program Element (Number/Name) PE 0603216N *I Aviation Survivability*							
COST ($ in Millions)	**Prior Years**	**FY 2015**	**FY 2016**	**FY 2017 Base**	**FY 2017 OCO**	**FY 2017 Total**	**FY 2018**	**FY 2019**	**FY 2020**	**FY 2021**	**Cost To Complete**	**Total Cost**
Total Program Element	173.600	4.280	10.904	5.239	-	5.239	5.847	5.809	5.830	5.956	Continuing	Continuing
0584: *Acft Protective Clothing*	95.693	1.363	2.306	2.441	-	2.441	2.701	2.627	2.647	2.703	Continuing	Continuing
0591: *Acft Survivability, Vulnerability & Safety*	42.481	1.346	1.476	1.383	-	1.383	1.493	1.515	1.520	1.554	Continuing	Continuing
0592: *Acft & Ordnance Safety*	33.389	1.045	1.043	0.907	-	0.907	1.064	1.070	1.063	1.086	Continuing	Continuing
1819: *CV Acft Fire Suppress System*	2.037	0.526	0.579	0.508	-	0.508	0.589	0.597	0.600	0.613	Continuing	Continuing
9999: *Congressional Adds*	0.000	0.000	5.500	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	5.500

Note

9999 Congressional Add belongs to 0603261N.

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.

JUSTIFICATION FOR BUDGET ACTIVITY: This program is funded under ADVANCED COMPONENT DEVELOPMENT AND PROTOTYPES because it includes all efforts necessary to evaluate integrated technologies, representative models or prototype systems in a high fidelity and realistic operating environment.

B. Program Change Summary ($ in Millions)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Previous President's Budget	4.325	5.404	6.113	-	6.113
Current President's Budget	4.280	10.904	5.239	-	5.239
Total Adjustments	-0.045	5.500	-0.874	-	-0.874
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	5.500			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.045	0.000			
• Rate/Misc Adjustments	0.000	0.000	-0.874	-	-0.874

Exhibit R-2, RDT&E Budget Item Justification: PB 2017 Navy	Date: February 2016
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 0603216N *I Aviation Survivability*

Congressional Add Details ($ in Millions, and Includes General Reductions)

	FY 2015	FY 2016
Project: 9999: *Congressional Adds*		
Congressional Add: *Unmanned System Integration*	0.000	5.500
Congressional Add Subtotals for Project: 9999	0.000	5.500
Congressional Add Totals for all Projects	0.000	5.500

Change Summary Explanation

Technical: Not applicable.

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603216N / *Aviation Survivability*	Project (Number/Name) 0584 / *Acft Protective Clothing*	

COST ($ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
0584: *Acft Protective Clothing*	95.693	1.363	2.306	2.441	-	2.441	2.701	2.627	2.647	2.703	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

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, optimization of Intelligence Surveillance and Reconnaissance (ISR), and Forward Air Control-Air 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 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 Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Title: Advanced Technology Crew Station	0.806	1.272	1.292	0.000	1.292
Articles:	-	-	-	-	-

FY 2015 Accomplishments:

Continued development and testing of 4+ megapixel cameras and displays. Began integration into fully digital night vision goggle. Integrated head/neck injury model into protection flight equipment testing.

FY 2016 Plans:

Complete integration and development of 4 megapixel sensor, display, and electronics into a new variant of a night vision goggle. Integrated units will be used for environmental and other required testing to ready the capability for transition into safety of flight testing. Begin work on ultra-high resolution displays (20/15 acuity at overcast starlight) and solid state low light sensors. Begin verification and validation of head, neck and spine model for helmet mounted displays and the model's predictive validity of head mounted systems during crash events.

FY 2017 Base Plans:

Continue development of the seat vibration attenuation and continue to mature an aviation physiologic monitoring/warning system. Develop and evaluate potential second sources for high resolution digital near infra-red sensors and micro displays. Pursue the new silicon wafer design, Next Gen Electron Bombarded Active Pixel Sensor. Explore solid state low light sensors; alternate micro display technologies such as Wave Guide, Quantum dot, and flexible displays; and short wave infra-red sensor development.

FY 2017 OCO Plans:

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603216N / *Aviation Survivability*	**Project (Number/Name)** 0584 / *Acft Protective Clothing*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
N/A					
Title: Advanced Integrated Life Support System	0.557	1.034	1.149	0.000	1.149
Articles:	-	-	-	-	-
FY 2015 Accomplishments: Continued integrating anthropometric software and models into modeling for design of optimized protective equipment. Continued working with the Army to document and define methodologies to mitigate head/neck injury.					
FY 2016 Plans: Integrate recently patented stacked optical filter test methodology/device and determine true optical power and limits for helmet mounted systems. Complete and validate indicator of solar degradation on protective eyewear and equipment. Continue development of in-house expertise in digital human modeling and 3D scanning capabilities.					
FY 2017 Base Plans: Investigate active visor tinting and prototype integration with advanced helmet mounted display concepts. Assess optical quality of compound multiple surfaces on the aggregate optical powers. Complete testing of solarization indicators and determine type and location on spectacle or visor systems. Upgrade laser systems to assess the impact on laser bleaching of ultra-short pulses. Continue to mature on shore supplier of Dielectric Coatings. Mature digital human modeling capability which may include investing in additional crash testing. Performance moderators to the SANTOSHUMAN suite and add an additional joint H-46 crash test.					
FY 2017 OCO Plans: N/A					
Accomplishments/Planned Programs Subtotals	1.363	2.306	2.441	0.000	2.441

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
• OPN 4268: *Aviation Support Equipment*	47.105	49.773	39.099	-	39.099	35.574	40.367	60.537	60.928	Continuing	Continuing

Remarks

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603216N / *Aviation Survivability*	**Project (Number/Name)** 0584 / *Acft Protective Clothing*

D. Acquisition Strategy

Primary Hardware Development for the Navy Advanced Technology Crew Station efforts will be performed under a Cost Plus Fixed Fee Indefinite Delivery Indefinite Quantity contract.

E. Performance Metrics

Develop 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 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603216N / *Aviation Survivability*	Project (Number/Name) 0584 / *Acft Protective Clothing*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Systems Engineering	WR	NAWCAD : Pax River MD	32.650	0.577	Dec 2014	0.539	Dec 2015	0.267	Dec 2016	-		0.267	Continuing	Continuing	Continuing
Primary Hardware Development	C/CPFF	Intevac : San Jose CA	4.618	0.000		0.729	Jun 2016	0.720	Jun 2017	-		0.720	0.000	6.067	6.067
Primary Hardware Development	MIPR	US Army CERDEC : Ft. Belvoir VA	3.495	0.000		0.221	Jun 2016	0.400	Jun 2017	-		0.400	0.000	4.116	4.116
Primary Hardware Development	C/CPFF	TBD : TBD	0.000	0.000		0.000		0.530	Dec 2016	-		0.530	0.000	0.530	0.530
Prior Year Prod Dev no Longer Funded in Budget Year or Outyears	Various	Various : Various	23.340	0.000		0.000		0.000		-		0.000	0.000	23.340	-
		Subtotal	64.103	0.577		1.489		1.917		-		1.917	-	-	-

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Configuration Management	WR	NAWCAD : Pax River MD	2.044	0.220	Dec 2014	0.130	Dec 2015	0.068	Dec 2016	-		0.068	Continuing	Continuing	Continuing
Prior Year Support no Longer Funded in Budget Year or Outyears	Various	Various : Various	3.232	0.000		0.000		0.000		-		0.000	0.000	3.232	-
		Subtotal	5.276	0.220		0.130		0.068		-		0.068	-	-	-

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation	WR	NAWCAD : Pax River MD	4.217	0.345	Dec 2014	0.400	Dec 2015	0.277	Dec 2016	-		0.277	Continuing	Continuing	Continuing
Prior Year T&E no Longer Funded in Budget Year or Outyears	Various	Various : Various	18.240	0.000		0.000		0.000		-		0.000	0.000	18.240	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603216N / *Aviation Survivability*	Project (Number/Name) 0584 / *Acft Protective Clothing*	

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
		Subtotal	22.457	0.345		0.400		0.277		-		0.277	-	-	-

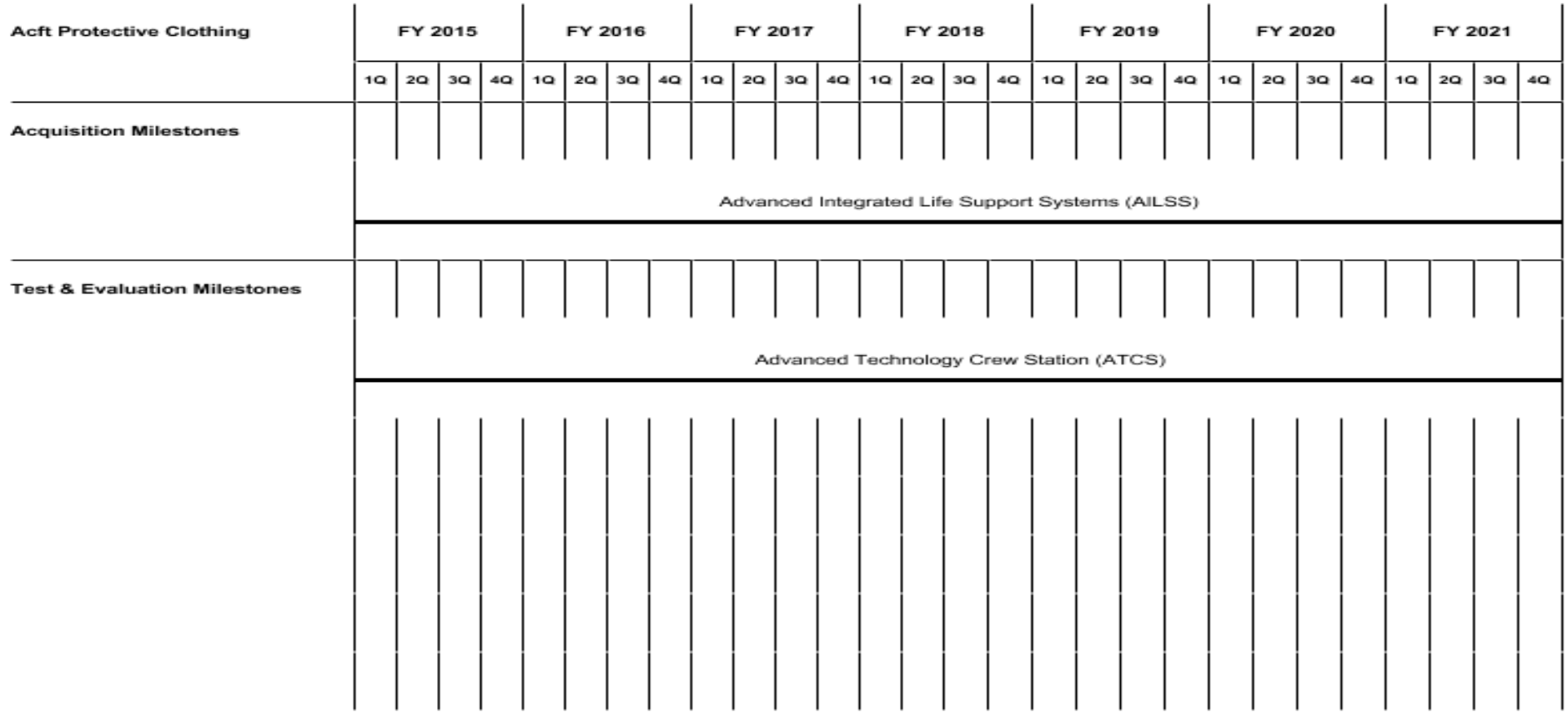
Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Support	WR	NAWCAD : Pax River MD	3.411	0.201	Dec 2014	0.272	Dec 2015	0.164	Dec 2016	-		0.164	Continuing	Continuing	Continuing
Travel	PO	NAVAIR : Pax River MD	0.436	0.020	Oct 2014	0.015	Oct 2015	0.015	Oct 2016	-		0.015	Continuing	Continuing	Continuing
Prior Year Mgmt Svcs no Longer Funded in Budget Year or Outyears	Various	Various : Various	0.010	0.000		0.000		0.000		-		0.000	0.000	0.010	-
		Subtotal	3.857	0.221		0.287		0.179		-		0.179	-	-	-

	Prior Years	FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	95.693	1.363		2.306		2.441		-		2.441	-	-	-

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603216N / *Aviation Survivability*	**Project (Number/Name)** 0584 / *Acft Protective Clothing*



2017DON - 0603216N - 0584

Exhibit R-4A, RDT&E Schedule Details: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603216N / *Aviation Survivability*	**Project (Number/Name)** 0584 / *Acft Protective Clothing*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Acft Protective Clothing				
Acquisition Milestones: Advanced Integrated Life Support Systems (AILSS)	1	2015	4	2021
Test & Evaluation Milestones: Advanced Technology Crew Station	1	2015	4	2021

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603216N / *Aviation Survivability*	Project (Number/Name) 0591 / *Acft Survivability, Vulnerability & Safety*	

COST ($ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
0591: *Acft Survivability, Vulnerability & Safety*	42.481	1.346	1.476	1.383	-	1.383	1.493	1.515	1.520	1.554	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

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 Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Title: Technology Requirements	0.181	0.090	0.181	0.000	0.181
Articles:	-	-	-	-	-
FY 2015 Accomplishments: Planned trade studies include acoustic and infrared signature reduction, rotary wing survivability requirements, threat systems analysis, and updates to the Survivability Master Plan.					
FY 2016 Plans: Planned trade studies include threats assessments, rotary wing survivability requirements, and vulnerability assessment of both fixed wing and rotary wing aircraft platforms.					
FY 2017 Base Plans: Planned trade studies include threats assessments, vulnerability assessments of both rotary wing and fixed wing aircraft, and updates to the Survivability Master Plan.					
FY 2017 OCO Plans: N/A					
Title: Technology Design & Development	1.165	0.990	0.944	0.000	0.944
Articles:	-	-	-	-	-
FY 2015 Accomplishments: Assessed technologies to address shortfalls identified as part of the OPNAV Aircraft Survivability Investment Strategy project, with emphasis on acoustic and infrared signature reduction of operational platforms. Developed polymer applications for self-sealing fuel and lubricant systems to meet stated operational					

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603216N / *Aviation Survivability*	**Project (Number/Name)** 0591 / *Acft Survivability, Vulnerability & Safety*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
requirements. Conduct asymmetric threats modeling and analyses based on accumulated combat field assessments. ***FY 2016 Plans:*** Assess technologies to address shortfalls identified as part of the OPNAV Aircraft Survivability Investment Strategy (OASIS) project. Establish an architecture to integrate Aviation Survivability Equipment (iASE) between USN/USMC aircraft platforms. ***FY 2017 Base Plans:*** Assess technologies to address shortfalls identified as part of the OASIS project. Establish an architecture to iASE between USN/USMC aircraft platforms. ***FY 2017 OCO Plans:*** N/A					
Title: Technology Test & Evaluation ***Articles:*** ***FY 2015 Accomplishments:*** Performed testing on candidate signature reduction materials/hardware. Performed testing to validate asymmetric threats modeling results. ***FY 2016 Plans:*** Integration, laboratory and flight testing of prototype hardware in support of the iASE architecture development. Ballistic testing representative sample material against identified threats for incorporation into OASIS models. ***FY 2017 Base Plans:*** Integration, laboratory, and flight testing of prototype hardware in support of the iASE architecture development and in support of countermeasures simulation hardware. ***FY 2017 OCO Plans:*** N/A	0.000 -	0.396 -	0.258 -	0.000 -	0.258 -
Accomplishments/Planned Programs Subtotals	1.346	1.476	1.383	0.000	1.383

C. Other Program Funding Summary ($ in Millions)

N/A

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603216N / *Aviation Survivability*	**Project (Number/Name)** 0591 / *Acft Survivability, Vulnerability & Safety*

C. Other Program Funding Summary ($ in Millions)

Remarks

D. Acquisition Strategy

Primary Hardware Development will be performed under either a Cost Plus Fixed Fee or a Firm Fixed Price contract.

E. Performance Metrics

Evaluate 100% of deployed/developmental United States Navy/United States Marine Corp 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 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603216N / *Aviation Survivability*	**Project (Number/Name)** 0591 / *Acft Survivability, Vulnerability & Safety*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Systems Engineering	WR	NAWCAD : Pax River, MD	12.558	0.186	Oct 2014	0.150	Oct 2015	0.120	Oct 2016	-		0.120	Continuing	Continuing	Continuing
Systems Engineering	WR	NAWCWD : China Lake, CA	0.196	0.082	Oct 2014	0.083	Oct 2015	0.066	Oct 2016	-		0.066	Continuing	Continuing	Continuing
Systems Engineering	C/CPFF	John Hopkins University : Laurel, MD	0.225	0.225	Apr 2015	0.225	Apr 2016	0.225	Apr 2017	-		0.225	0.000	0.900	0.900
Systems Engineering	MIPR	DTIC : Ft. Belvoir, VA	0.151	0.116	Jan 2015	0.257	Jan 2016	0.275	Jan 2017	-		0.275	0.000	0.799	-
System Engineering	C/CPFF	Engility : Chantilly, VA	0.000	0.520	Dec 2014	0.675	Dec 2015	0.554	Dec 2016	-		0.554	0.000	1.749	1.749
Prior Year Prod Dev cost no longer funded in FYDP	Various	Various : Various	17.242	0.000		0.000		0.000		-		0.000	0.000	17.242	-
		Subtotal	30.372	1.129		1.390		1.240		-		1.240	-	-	-

Remarks

Funding increases from FY16 to FY17 support the assessment of technologies to address shortfalls identified as part of the OASIS project.

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Prior Year Support cost no longer funded in FYDP	Various	Various : Various	4.569	0.000		0.000		0.000		-		0.000	0.000	4.569	-
		Subtotal	4.569	0.000		0.000		0.000		-		0.000	0.000	4.569	-

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation	WR	NAWCAD : Patuxent River, MD	2.414	0.000		0.000		0.021	Oct 2016	-		0.021	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603216N / *Aviation Survivability*	**Project (Number/Name)** 0591 / *Acft Survivability, Vulnerability & Safety*

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Prior Year T&E cost no longer funded in FYDP	Various	Various : Various	2.995	0.000		0.000		0.000		-		0.000	0.000	2.995	-
		Subtotal	5.409	0.000		0.000		0.021		-		0.021	-	-	-

Remarks

Funding increase from FY16 to FY17 supports the integration, laboratory, and flight testing of prototype hardware in support of the iASE architecture development.

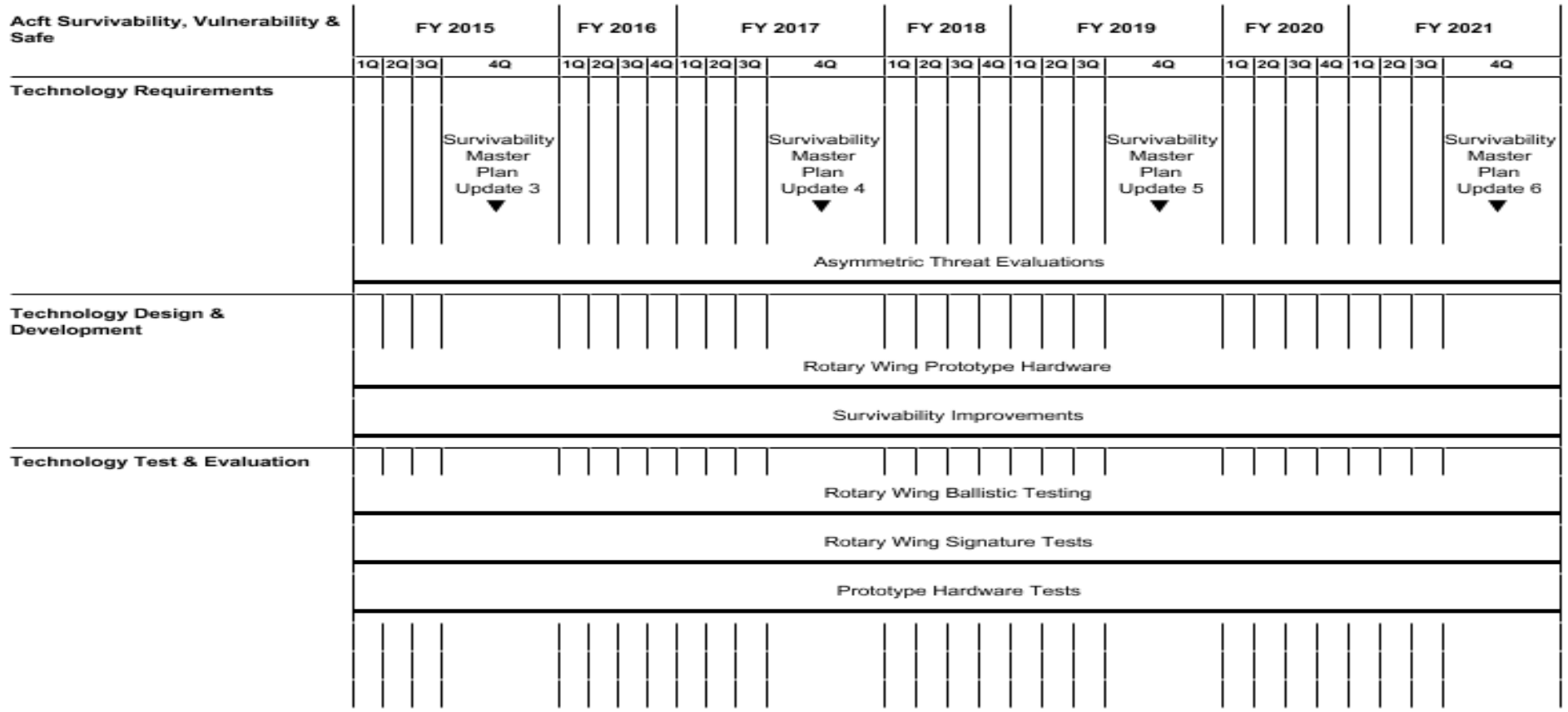
Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Support	WR	NAWCAD : Pax River, MD	1.426	0.212	Oct 2014	0.081	Oct 2015	0.117	Oct 2016	-		0.117	Continuing	Continuing	Continuing
Travel	PO	NAVAIR : Patuxent River, MD	0.365	0.005	Oct 2014	0.005	Oct 2015	0.005	Oct 2016	-		0.005	Continuing	Continuing	Continuing
Prior Year Mgmt cost no longer funded in FYDP	Various	Various : Various	0.340	0.000		0.000		0.000		-		0.000	0.000	0.340	-
		Subtotal	2.131	0.217		0.086		0.122		-		0.122	-	-	-

	Prior Years	FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	42.481	1.346		1.476		1.383		-		1.383	-	-	-

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603216N / *Aviation Survivability*	**Project (Number/Name)** 0591 / *Acft Survivability, Vulnerability & Safety*



2017OSD - 0603216N - 0591

Exhibit R-4A, RDT&E Schedule Details: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603216N / *Aviation Survivability*	**Project (Number/Name)** 0591 / *Acft Survivability, Vulnerability & Safety*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Acft Survivability, Vulnerability & Safe				
Technology Requirements: Survivability Master Plan Update 3	4	2015	4	2015
Technology Requirements: Survivability Master Plan Update 4	4	2017	4	2017
Technology Requirements: Survivability Master Plan Update 5	4	2019	4	2019
Technology Requirements: Survivability Master Plan Update 6	4	2021	4	2021
Technology Requirements: Asymmetric Threat Evaluations	1	2015	4	2021
Technology Design & Development: Rotary Wing Prototype Hardware	1	2015	4	2021
Technology Design & Development: Survivability Improvements	1	2015	4	2021
Technology Test & Evaluation: Rotary Wing Ballistic Testing	1	2015	4	2021
Technology Test & Evaluation: Rotary Wing Signature Tests	1	2015	4	2021
Technology Test & Evaluation: Prototype Hardware Tests	1	2015	4	2021

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603216N / *Aviation Survivability*	Project (Number/Name) 0592 / *Acft & Ordnance Safety*	

COST ($ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
0592: *Acft & Ordnance Safety*	33.389	1.045	1.043	0.907	-	0.907	1.064	1.070	1.063	1.086	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

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 Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Title: Insensitive Munitions (IM)	1.045	1.043	0.907	0.000	0.907
Articles:	-	-	-	-	-
FY 2015 Accomplishments: Improve Air-to-Air Demonstration: Continue Sidewinder warhead/rocket motor technology risk reduction evaluation in support of PMA 259 FY16 planned block II+/III transition. Continue IM technology evaluation for metal matrix composite rocket motor IM demonstration in support of future Navy rocket transitions. Improve Air-Launched Weapons: Continue minimum smoke (MS) propellant demonstration of a cast/cure MS composite propellant that will meet -65 degree requirement for fixed-wing platforms in the current Hellfire configuration. Conduct booster/explosive transition testing and system demonstrations for Joint Service Insensitive Munitions Technology Program transition explosive for the PMA-201 planned Bomb Live Unit 110 upgrade. Advanced Containment/Case/Warhead Materials: Initiate a Mk 135 rocket motor nozzle design/demonstration to improve operational performance in the hybrid Mk 135, enabling both improved IM and operational performance of the Tomahawk missile. Shock/Blast Barrier Protection Modeling, Demonstration, and Testing: Continue shape charge jet (SCJ) barrier evaluation/demonstration for SCJ mitigation in air-launched systems.					

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603216N / *Aviation Survivability*	**Project (Number/Name)** 0592 / *Acft & Ordnance Safety*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Advanced Energetic Materials: Finalize evaluation of coated explosive material premix for safe production scale manufacture of C-139 explosive (affordable, high-performance Insensitive Munitions (IM) explosive) and testing for new production research department explosive (elimination of browning effect). ***FY 2016 Plans:*** Improve Air-to-Air Demonstration: Continue Sidewinder warhead/rocket motor technology risk reduction evaluation in support of PMA-259 planned block II+/III transition with high-level group high-performance motor, digital detection initiator, improved multi-layered case warhead design, and radio frequency cook-off sensor. Continue IM technology evaluation for metal matrix composite rocket motor IM demonstration in support of future Navy rocket transitions. Improve Air-Launched Weapons: Continue final IM testing/static fire of minimum smoke (MS) propellant demonstration of a cast/cure MS composite propellant that will meet -65 degree requirement for fixed-wing platforms in the current Hellfire configuration. Conduct IM evaluation of the Bomb Live Unit (BLU) 110 vented base plug redesign that failed during previous qualification testing. Advanced Containment/Case/Warhead Materials: Demonstrate IM performance of the Joint Multiple Effects Warhead System warhead with the redesigned fuze well on the follow-through bomb to enhance survivability during penetration. Initiate an IM evaluation of Mk 135 rocket motor with venting on Mk 14 container used in both shipping and storage of Tomahawk. Shock/Blast Barrier Protection Modeling, Demonstration, and Testing: Continue shape charge jet (SCJ) barrier evaluation/demonstration for SCJ mitigation in air-launched systems. Advanced Energetic Materials: Evaluate a Joint Service Insensitive Munitions Technology Program (JIMTP) transition new explosive fill for BLU 111 to address Navy unique issues (i.e., irreversible growth, explosive train reliability for a very insensitive main fill, and thermal environments and ullage requirements for the fill to ensure improved IM demonstrated in JIMTP). ***FY 2017 Base Plans:*** Improve Air-to-Air Demonstration: Continue Sidewinder warhead/rocket motor technology risk reduction evaluation in support of PMA-259 planned block III transition with highly-loaded-grain, high-performance motor, digital detonation initiator, improved multi-layered case warhead design, and radio frequency cook-off sensor. Evaluate metal matrix composite rocket motor for application into air to air/ground weapon systems.					

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603216N / *Aviation Survivability*	**Project (Number/Name)** 0592 / *Acft & Ordnance Safety*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Improve Air-Launched Weapons: Continue Insensitive Munitions (IM) testing/static fire of minimum smoke propellant demonstration of a cast/cure minimum smoke composite propellant that will meet -65 degree requirement for fixed-wing platforms. Testing will be done in a Hellfire configuration to demonstrate transition ability to a system with equivalent requirements. Finalize IM evaluation of the Bomb Live Unit (BLU) 110 vented base plug redesign that failed during previous qualification testing and transition to PMA 201 for final qualification. Finalize evaluation of Highly-loaded-grain high performance rocket motor and application of Slow-cook-off-sensor technology in Advanced Anti-Radiation Guided Missile configuration for transition to PMA 242 Engineering, Manufacturing and Development (EMD). Advanced Containment/Case/Warhead Materials: Demonstrate IM performance of the Joint Multiple Effects Warhead System in the new revised configuration for transition to PMA 280 EMD program. Shock/Blast Barrier Protection Modeling, Demonstration, and Testing: Continue tech-watch investigation for effective, affordable blast barrier and impact mitigation for application to Tomahawk weapon. Advanced Energetic Materials: Evaluate a Joint Service Insensitive Munitions Technology Program (JIMTP) transition new explosive fill for BLU 111 to address Navy unique issues (i.e., irreversible growth, explosive train reliability for a very insensitive main fill, and thermal environments and ullage requirements for the fill to ensure improved IM demonstrated in JIMTP). ***FY 2017 OCO Plans:*** N/A					
Accomplishments/Planned Programs Subtotals	1.045	1.043	0.907	0.000	0.907

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

All planned programs are accomplished via civilian labor and use of government testing facilities.

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603216N / *Aviation Survivability*	**Project (Number/Name)** 0592 / *Acft & Ordnance Safety*

E. Performance Metrics

The Aircraft and Ordnance Safety program will initiate six to nine technology development/maturation efforts to improve 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 IM strategic plan.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603216N / *Aviation Survivability*	Project (Number/Name) 0592 / *Acft & Ordnance Safety*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Systems Engineering	WR	NAWCWD : China Lake, CA	33.381	1.045	Nov 2014	1.043	Oct 2015	0.907	Oct 2016	-		0.907	Continuing	Continuing	Continuing
		Subtotal	33.381	1.045		1.043		0.907		-		0.907	-	-	-

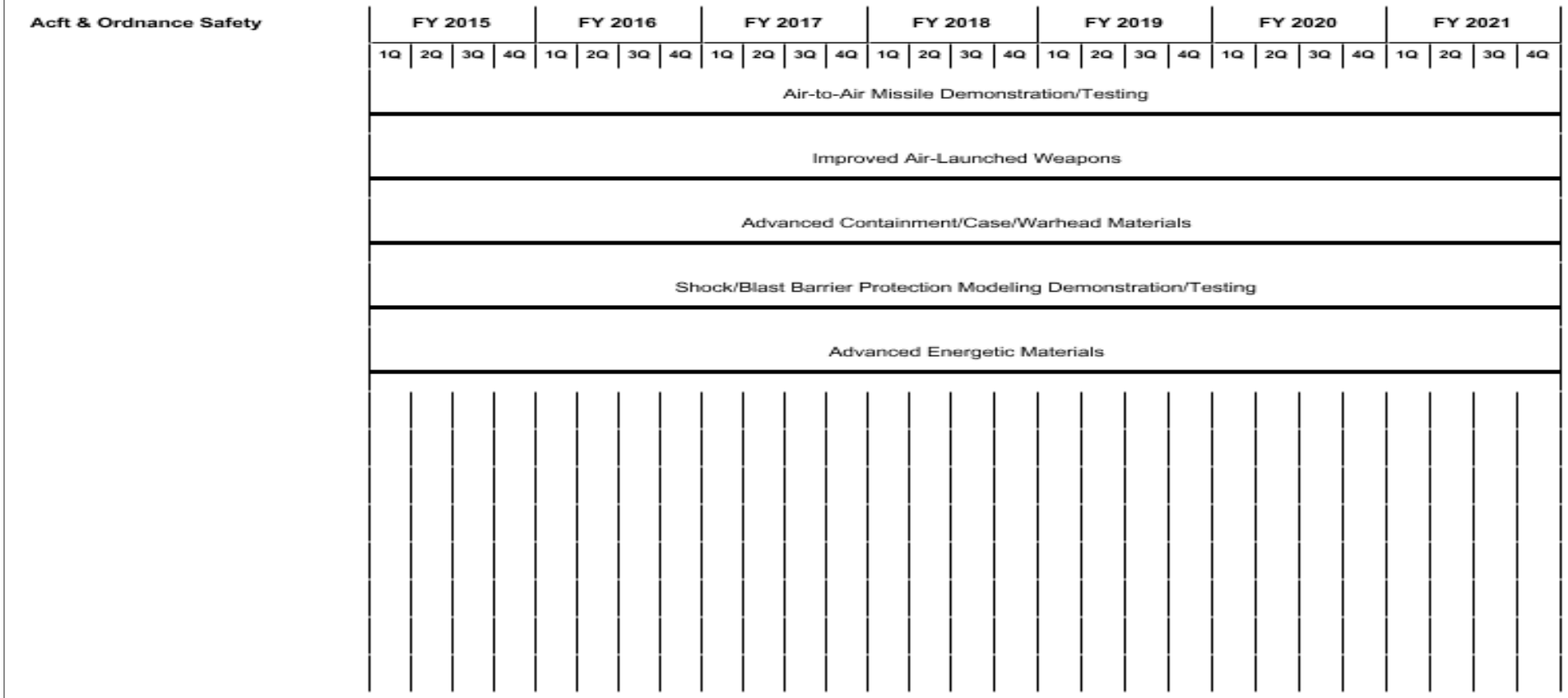
Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Prior Year Mgmt no longer funded in FYDP	Various	Various : Various	0.008	0.000		0.000		0.000		-		0.000	0.000	0.008	-
		Subtotal	0.008	0.000		0.000		0.000		-		0.000	0.000	0.008	-

	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	33.389	1.045		1.043		0.907		-		0.907	-	-	-

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603216N / *Aviation Survivability*	**Project (Number/Name)** 0592 / *Acft & Ordnance Safety*



2017DON - 0603216N - 0592

Exhibit R-4A, RDT&E Schedule Details: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603216N / *Aviation Survivability*	**Project (Number/Name)** 0592 / *Acft & Ordnance Safety*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Acft & Ordnance Safety				
Air-to-Air Missile Demonstration/Testing	1	2015	4	2021
Improved Air-Launched Weapons	1	2015	4	2021
Advanced Containment/Case/Warhead Materials	1	2015	4	2021
Shock/Blast Barrier Protection Modeling Demonstration/Testing	1	2015	4	2021
Advanced Energetic Materials	1	2015	4	2021

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603216N / *Aviation Survivability*	Project (Number/Name) 1819 / *CV Acft Fire Suppress System*	

COST ($ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
1819: *CV Acft Fire Suppress System*	2.037	0.526	0.579	0.508	-	0.508	0.589	0.597	0.600	0.613	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

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 Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Title: Fire-Fighting	0.526	0.579	0.508	0.000	0.508
Articles:	-	-	-	-	-

FY 2015 Accomplishments:

Continue research to prevent aircraft loss and ship storage concerns due to Li-ion battery runaway casualty. Conclude research into thermal imaging camera usage in weapons cooling analysis and provide guidance for flight deck usage and training. Conduct research and testing of lightweight aircraft tiedown chains. Continue work on Electromagnetic Aircraft Launch Systems (EMALS) fire suppression procedures and equipment. Conduct research into commercial product or development to replace the existing flight deck crash-fire-rescue boot. Continue research into finding battery-operated rescue saw. Continue research and testing for development of procedures and training for helicopter rollover rescue aboard air-capable ships.

FY 2016 Plans:

Continue support for Naval Air Training and Operating Procedures Standardization improvements, and modeling and simulation for fire prediction. Complete the purple K efficiency based on particle size testing and industry assessment. Continue monitoring aqueous film forming foam developments and other clean agents. Continue to develop improved protocols for helicopter roll-over crashes, and evaluate equipment improvements for saws, spreaders, and other improvements. Evaluate flash-hood and crash-fire-rescue face shield improvements. Determine final requirements and business case for eye protection for metal and ordnance fires. Continue to monitor and recommend EMALS fire doctrine, Carrier Fixed Wing Aircraft Nuclear hangar bay conflagration management system operations, and unmanned carrier-launched airborne surveillance and strike firefighting operations impacts. Evaluate and develop the protocols to mitigate the risks of mixed fuels on-board carriers.

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603216N / *Aviation Survivability*	**Project (Number/Name)** 1819 / *CV Acft Fire Suppress System*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Prioritize highest payoff areas on carriers and other vessels that will lead to the development of automation systems to reduce manning. ***FY 2017 Base Plans:*** Continue support for Naval Air Training and Operating Procedures Standardization improvements, and modeling and simulation for fire prediction. Continue monitoring aqueous film forming foam developments and other clean agents. Continue to develop improved protocols for helicopter roll-over crashes, and evaluate equipment improvements for saws, spreaders, and other improvements. Finalize evaluations for flash-hood, crash-fire-rescue face shield and firefighter personnel floatation device improvements. Continue to monitor and recommend Electromagnetic Aircraft Launch Systems fire doctrine, Carrier Fixed Wing Aircraft Nuclear hangar bay conflagration management system operations, and unmanned carrier launched airborne surveillance and strike firefighting operations impacts. Start new project looking at firefighter issues related to unmanned air vehicle systems including composites, weapons and fuels. Conduct testing on new sensor and automation systems to improve firefighter response to weapons fires. ***FY 2017 OCO Plans:*** N/A					
Accomplishments/Planned Programs Subtotals	0.526	0.579	0.508	0.000	0.508

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

This is a non-ACAT program. Procurement strategy is determined by market survey and cooperative opportunities.

E. Performance Metrics

The Carrier Aircraft Fire Suppression (CAFS) program will, at a minimum, fund six to ten 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 Department of the Navy shipboard aircraft fire-fighting procedures and documentation.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603216N / *Aviation Survivability*	Project (Number/Name) 1819 / *CV Acft Fire Suppress System*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Systems Engineering	C/CPFF	ICI : Virginia Beach, VA	0.000	0.020	Dec 2014	0.000		0.000		-		0.000	0.000	0.020	0.020
Systems Engineering	WR	NAWCWD : China Lake, CA	0.000	0.000		0.083	Oct 2015	0.082	Oct 2016	-		0.082	Continuing	Continuing	Continuing
Systems Engineering	C/CPFF	Hughes Associates : Baltimore, MD	0.000	0.000		0.046	Nov 2015	0.005	Nov 2016	-		0.005	0.000	0.051	0.051
Systems Engineering	WR	NSWC : Philadelphia, PA	0.000	0.000		0.025	Oct 2015	0.018	Oct 2016	-		0.018	Continuing	Continuing	Continuing
Systems Engineering	C/CPFF	AVW : Chesapeake, VA	0.000	0.000		0.051	Nov 2015	0.000		-		0.000	0.000	0.051	0.051
Prior Yr Prod Dev no longer funded in the FYDP	Various	Various : Various	0.220	0.000		0.000		0.000		-		0.000	0.000	0.220	0.220
		Subtotal	0.220	0.020		0.205		0.105		-		0.105	-	-	-

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Engineering Support	C/CPFF	ICI : Virginia Beach, VA	0.105	0.000		0.045	Nov 2015	0.015	Nov 2016	-		0.015	0.000	0.165	0.165
Engineering Support	WR	NAWCWD : China Lake, CA	0.000	0.000		0.098	Oct 2015	0.100	Oct 2016	-		0.100	Continuing	Continuing	Continuing
Engineering Support	C/CPFF	Hughes Associates : Baltimore, MD	0.000	0.000		0.051	Nov 2015	0.020	Nov 2016	-		0.020	0.000	0.071	0.071
Engineering Support	WR	NSWC : Philadelphia, PA	0.000	0.000		0.035	Oct 2015	0.018	Oct 2016	-		0.018	Continuing	Continuing	Continuing
Engineering Support	C/CPFF	AVW : Chesapeake, VA	0.000	0.062	Jan 2015	0.020	Nov 2015	0.040	Nov 2016	-		0.040	0.000	0.122	0.122
		Subtotal	0.105	0.062		0.249		0.193		-		0.193	-	-	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603216N / *Aviation Survivability*	Project (Number/Name) 1819 / *CV Acft Fire Suppress System*	

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Technology Test & Evaluation	WR	NAWCWD : China Lake, CA	0.868	0.326	Oct 2014	0.080	Oct 2015	0.130	Oct 2016	-		0.130	Continuing	Continuing	Continuing
Technology Test & Evaluation	C/FFP	Hughes Associates : Baltimore, MD	0.415	0.103	Dec 2014	0.020	Nov 2015	0.015	Nov 2016	-		0.015	0.000	0.553	0.553
Technology Test & Evaluation	C/CPFF	AVW : Chesapeake, VA	0.000	0.000		0.020	Nov 2015	0.000		-		0.000	0.000	0.020	0.020
Technology Test & Evaluation	C/CPFF	ICI : Virginia Beach, VA	0.000	0.000		0.000		0.010	Nov 2016	-		0.010	0.000	0.010	0.010
Prior yr T&E no longer funded in the FYDP	Various	Various : Various	0.292	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
		Subtotal	1.575	0.429		0.120		0.155		-		0.155	-	-	-

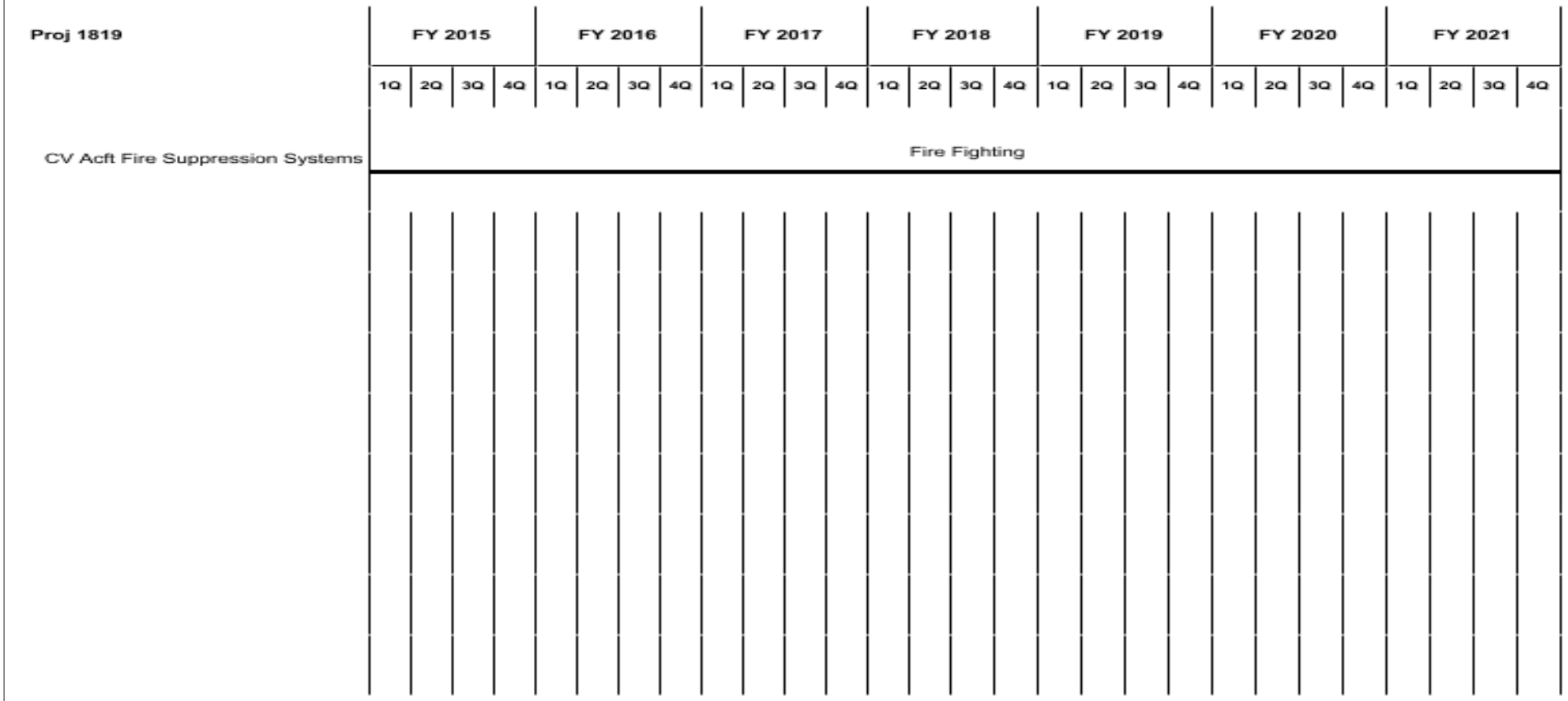
Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management	WR	NAWCWD : China Lake, CA	0.137	0.015	Oct 2014	0.005	Oct 2015	0.055	Oct 2016	-		0.055	Continuing	Continuing	Continuing
		Subtotal	0.137	0.015		0.005		0.055		-		0.055	-	-	-

	Prior Years	FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	2.037	0.526		0.579		0.508		-		0.508	-	-	-

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603216N / *Aviation Survivability*	**Project (Number/Name)** 1819 / *CV Acft Fire Suppress System*



2017OSD - 0603216N - 1819

Exhibit R-4A, RDT&E Schedule Details: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603216N / *Aviation Survivability*	**Project (Number/Name)** 1819 / *CV Acft Fire Suppress System*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 1819				
CV Acft Fire Suppression Systems: Fire Fighting	1	2015	4	2021

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603216N / *Aviation Survivability*	Project (Number/Name) 9999 / *Congressional Adds*	

COST ($ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
9999: *Congressional Adds*	0.000	0.000	5.500	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	5.500
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

In order for Navy UAS to meet mission needs, both national and international policies relating to airspace access and use by UAS need to continue to evolve. Navy efforts will focus on advancing future policies that will permit unfettered access to airspace for UAS. Additionally, advancements are needed in Detect and Avoid technology in the areas of sensors, algorithms, and the integration of the sensors, displays, and integration with the U.S.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2015	FY 2016
Congressional Add: Unmanned System Integration	0.000	5.500
FY 2015 Accomplishments: N/A		
FY 2016 Plans: Develop Integrated Separation Concepts, Airspace Integration Safety Case/Assessment; Detect and Avoid and Fusion, Separation Algorithms, Safe and Efficient Terminal Airspace Surface Operations and Traffic/Airspace Information displays. Assess Availability/Quality of Surveillance Data, Human-Automation Interaction; and Predictability/Contingency Management.		
Congressional Adds Subtotals	0.000	5.500

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

E. Performance Metrics

Navy's efforts are in alignment with the most recent Department of Defense Report to Congress on The Progress of Research Activities to Advance Access of Unmanned Aircraft Systems to the National Airspace System - Jan 2015.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603216N / *Aviation Survivability*	Project (Number/Name) 9999 / *Congressional Adds*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Systems Engineering	Various	Various : Not Specified	0.000	0.000		3.770	Mar 2016	0.000		-		0.000	0.000	3.770	-
		Subtotal	0.000	0.000		3.770		0.000		-		0.000	0.000	3.770	-

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Government Engineering	WR	NAWCAD : Patuxent River, MD	0.000	0.000		1.500	Feb 2016	0.000		-		0.000	0.000	1.500	-
		Subtotal	0.000	0.000		1.500		0.000		-		0.000	0.000	1.500	-

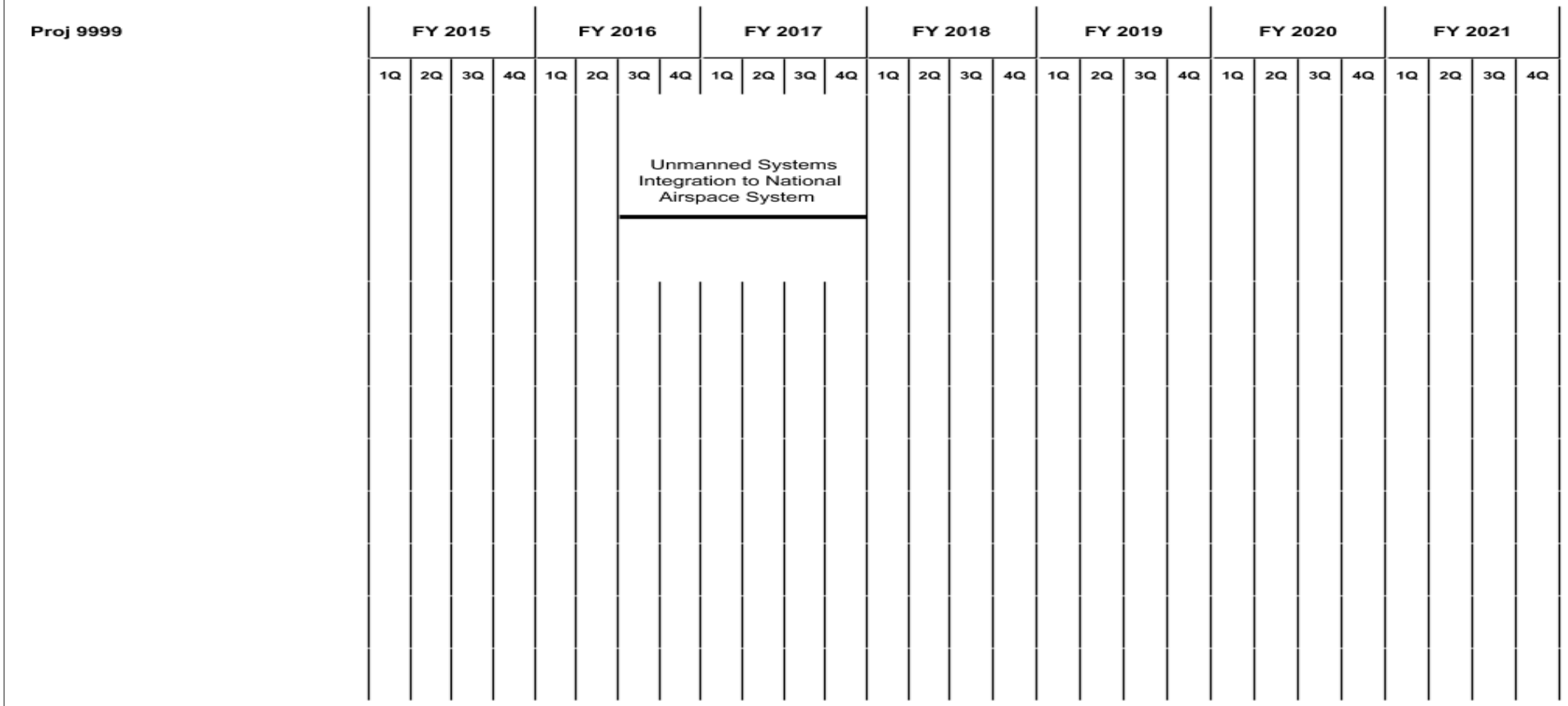
Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Support	WR	NAWCAD : Patuxent River, MD	0.000	0.000		0.230	Feb 2016	0.000		-		0.000	0.000	0.230	-
		Subtotal	0.000	0.000		0.230		0.000		-		0.000	0.000	0.230	-

	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	0.000		5.500		0.000		-		0.000	0.000	5.500	-

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603216N / *Aviation Survivability*	**Project (Number/Name)** 9999 / *Congressional Adds*



2017PB - 0603216N - 9999

Exhibit R-4A, RDT&E Schedule Details: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603216N / *Aviation Survivability*	**Project (Number/Name)** 9999 / *Congressional Adds*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 9999				
Unmanned Systems Integration to National Airspace System: Unmanned Systems Integration to National Airspace System	3	2016	4	2017

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Exhibit R-2, RDT&E Budget Item Justification: PB 2017 Navy	Date: February 2016
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 0603237N *I Deployable JT Cmd & Control*

COST ($ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
Total Program Element	227.858	2.991	3.086	0.000	-	0.000	0.000	0.000	0.000	0.000	83.311	317.246
3050: *Deployable JT Command and Control*	227.858	2.991	3.086	0.000	-	0.000	0.000	0.000	0.000	0.000	83.311	317.246

Note

Funding for FY17 and out has been moved from PE 0603237N to PE 0607700N as part of the PE consolidation effort.

A. Mission Description and Budget Item Justification

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

B. Program Change Summary ($ in Millions)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Previous President's Budget	2.991	3.086	3.120	-	3.120
Current President's Budget	2.991	3.086	0.000	-	0.000
Total Adjustments	0.000	0.000	-3.120	-	-3.120
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Program Adjustments	0.000	0.000	-3.120	-	-3.120

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603237N / *Deployable JT Cmd & Control*	Project (Number/Name) 3050 / *Deployable JT Command and Control*	

COST ($ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
3050: *Deployable JT Command and Control*	227.858	2.991	3.086	0.000	-	0.000	0.000	0.000	0.000	0.000	83.311	317.246
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

Note

Funding for FY17 and out has been moved from PE 0603237N to PE 0607700N as part of the PE consolidation effort.

A. Mission Description and Budget Item Justification

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

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Title: Systems Engineering & Integration	1.164	1.240	0.000	0.000	0.000
Articles:	-	-	-	-	-
FY 2015 Accomplishments: Undertook development efforts for the infrastructure and communication subsystems as well as information technology enhancements. Additionally, obsolescence and security posture enhancements were addressed.					
FY 2016 Plans: Continue development efforts of emerging cyber security technologies and new deployable capabilities to meet the warfighter needs.					
FY 2017 Base Plans:					

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603237N / *Deployable JT Cmd & Control*	**Project (Number/Name)** 3050 / *Deployable JT Command and Control*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
N/A ***FY 2017 OCO Plans:*** N/A					
Title: DJC2 RDT&E Test Bed	1.827	1.846	0.000	0.000	0.000
Articles:	-	-	-	-	-
FY 2015 Accomplishments: Incorporated fixes to the network system and validated through regression testing to support fielding decisions. Developed, designed and integrated new information technology into the DJC2. Used DJC2 test bed for software testing and development of new capabilities. ***FY 2016 Plans:*** Continue to develop, design and integrate new information technology into the DJC2 in order to facilitate virtualization. Continue to use DJC2 test bed for software testing and development of new capabilities. ***FY 2017 Base Plans:*** N/A ***FY 2017 OCO Plans:*** N/A					
Accomplishments/Planned Programs Subtotals	2.991	3.086	0.000	0.000	0.000

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
• OPN /2804: *DJC2*	1.205	1.314	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	162.717
• OPN /2906: *DJC2*	0.000	0.000	1.500	-	1.500	2.500	2.201	2.250	2.297	Continuing	Continuing

Remarks

D. Acquisition Strategy

This RDT&E line supports an evolutionary acquisition strategy. The intent of this strategy is to: develop a system based upon a current understanding of joint requirements; rapidly field systems based upon those requirements; analyze operational utilization of the systems; and roll the results of the analysis into periodic upgrades of the systems to maintain currency and maximize operational effectiveness. The baseline configuration is based upon existing Command, Control,

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603237N / *Deployable JT Cmd & Control*	**Project (Number/Name)** 3050 / *Deployable JT Command and Control*

Communications, Computers, & Intelligence (C4I) systems, scaled to the Combatant Command level. The follow-on configurations will include newly developed capabilities based on emergent, joint requirements and operational feedback based upon utilization of earlier delivered systems.

E. Performance Metrics

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

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603237N / *Deployable JT Cmd & Control*	Project (Number/Name) 3050 / *Deployable JT Command and Control*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Systems Engineering	WR	NSWC : PCD	48.277	0.717	Dec 2014	0.965	Dec 2015	0.000		-		0.000	0.000	49.959	-
Engineering Facility Development	WR	NSWC : PCD	36.863	0.867	Dec 2014	0.547	Dec 2015	0.000		-		0.000	0.000	38.277	-
Hardware Development	WR	NSWC : PCD	21.447	0.383	Dec 2014	0.529	Dec 2015	0.000		-		0.000	0.000	22.359	-
		Subtotal	106.587	1.967		2.041		0.000		-		0.000	0.000	110.595	-

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Software Integration	WR	NSWC : PCD	41.495	0.546	Dec 2014	0.557	Dec 2015	0.000		-		0.000	0.000	42.598	-
Technical Investigations	MIPR	MISC : VA	13.426	0.000		0.000		0.000		-		0.000	0.000	13.426	-
Trade-off Studies & Analyses	MIPR	MISC : VA	9.000	0.000		0.000		0.000		-		0.000	0.000	9.000	-
		Subtotal	63.921	0.546		0.557		0.000		-		0.000	0.000	65.024	-

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation	WR	NSWC : PCD	10.544	0.150	Dec 2014	0.153	Dec 2015	0.000		-		0.000	0.000	10.847	-
Operational Test & Evaluation	WR	NSWC : PCD	11.807	0.144	Dec 2014	0.147	Dec 2015	0.000		-		0.000	0.000	12.098	-
Test Assets	MIPR	MISC : MISC	4.000	0.000		0.000		0.000		-		0.000	0.000	4.000	-
		Subtotal	26.351	0.294		0.300		0.000		-		0.000	0.000	26.945	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603237N / *Deployable JT Cmd & Control*	**Project (Number/Name)** 3050 / *Deployable JT Command and Control*

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Support	WR	NSWC : PCD	30.970	0.184	Dec 2014	0.188	Dec 2015	0.000		-		0.000	0.000	31.342	-
Acquisition Work Force	WR	NSWC : PCD	0.029	0.000		0.000		0.000		-		0.000	0.000	0.029	-
		Subtotal	30.999	0.184		0.188		0.000		-		0.000	0.000	31.371	-

	Prior Years	FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	227.858	2.991		3.086		0.000		-		0.000	0.000	233.935	-

Remarks

Funding for FY17 and out has been moved from PE 0603237N to PE 0607700N as part of the BLI consolidation effort.

Exhibit R-4, RDT&E Schedule Profile: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603237N / *Deployable JT Cmd & Control*	**Project (Number/Name)** 3050 / *Deployable JT Command and Control*

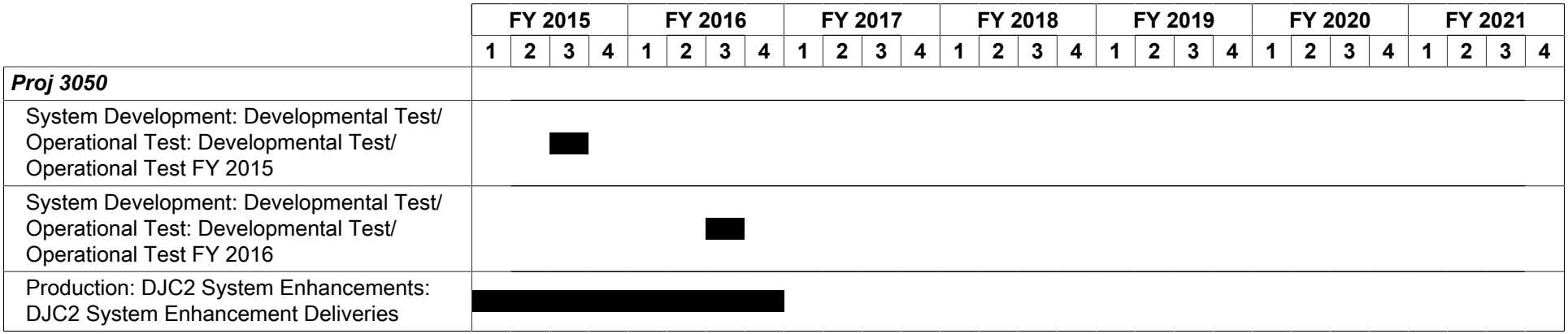

Exhibit R-4A, RDT&E Schedule Details: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603237N / *Deployable JT Cmd & Control*	**Project (Number/Name)** 3050 / *Deployable JT Command and Control*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 3050				
System Development: Developmental Test/Operational Test: Developmental Test/ Operational Test FY 2015	3	2015	3	2015
System Development: Developmental Test/Operational Test: Developmental Test/ Operational Test FY 2016	3	2016	3	2016
Production: DJC2 System Enhancements: DJC2 System Enhancement Deliveries	1	2015	4	2016

Exhibit R-2, RDT&E Budget Item Justification: PB 2017 Navy	Date: February 2016
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 0603251N *I (U)AIRCRAFT SYSTEMS*

COST ($ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
Total Program Element	31.910	14.270	26.643	1.519	-	1.519	0.717	0.805	1.508	1.521	Continuing	Continuing
2777: *Highly Integrated Photonics (HIP)*	17.724	11.154	9.920	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	38.798
3331: *C-2 System Development*	14.186	3.116	1.723	1.519	-	1.519	0.717	0.805	1.508	1.521	Continuing	Continuing
9999: *Congressional Adds*	0.000	0.000	15.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	15.000

A. Mission Description and Budget Item Justification

Decrease in (U)AIRCRAFT SYSTEMS by $0.064M as required for the Department of the Navy to comply with the Bipartisan Budget Act of 2015.

This program element supports the study, evaluation, optimization and enhancements of fielded aircraft systems not supported by a system specific Research, Development, Test and Evaluation, Navy program element. The supported efforts will provide a basis to recommend options for improved efficiency, minimization of life cycle cost, and other affordable options. As naval aircraft systems age, and analysis of the programmatic and /or reliability enhancements options allows the Department of the Navy to more effectively understand and manage system lifecycle costs and implications in future airborne platforms.

This program is funded under ADVANCED COMPONENT DEVELOPMENT AND PROTOTYPES because it includes all efforts necessary to evaluate integrated technologies, representative models or prototype systems in a high fidelity and realistic operating environment.

B. Program Change Summary ($ in Millions)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Previous President's Budget	12.651	11.643	1.735	-	1.735
Current President's Budget	14.270	26.643	1.519	-	1.519
Total Adjustments	1.619	15.000	-0.216	-	-0.216
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	15.000			
• Congressional Directed Transfers	-	-			
• Reprogrammings	2.000	0.000			
• SBIR/STTR Transfer	-0.381	0.000			
• Program Adjustments	0.000	0.000	-0.065	-	-0.065
• Rate/Misc Adjustments	0.000	0.000	-0.151	-	-0.151

Exhibit R-2, RDT&E Budget Item Justification: PB 2017 Navy	Date: February 2016
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 0603251N *I (U)AIRCRAFT SYSTEMS*

Congressional Add Details ($ in Millions, and Includes General Reductions)	FY 2015	FY 2016
Project: 9999: *Congressional Adds*		
Congressional Add: *Highly Integrated Photonics (HIP) - Cong*	0.000	15.000
Congressional Add Subtotals for Project: 9999	0.000	15.000
Congressional Add Totals for all Projects	0.000	15.000

Change Summary Explanation

Technical: Not applicable.

Schedule: Not Applicable.

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603251N / *(U)AIRCRAFT SYSTEMS*	Project (Number/Name) 2777 / *Highly Integrated Photonics (HIP)*	

COST ($ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
2777: *Highly Integrated Photonics (HIP)*	17.724	11.154	9.920	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	38.798
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This program element supports the requirements study, technology maturation, system design and demonstration of a general-purpose, future-proof avionics network that replaces copper with glass. As both analog and digital onboard information transport and processing requirements continue to grow, life cycle costs associated with maintaining and upgrading current stove-piped networks aboard naval aircraft systems becomes unsustainable. The size, weight, power, high data rate and scalability advantages of a single-mode fiber optic network have significant total ownership cost savings implications that will allow the Department of the Navy to more affordably and effectively meet mission requirements well into the future. The activities funded will provide a networking baseline or standard that can be incorporated into airborne platforms that maximize networking system capability while minimizing associated life cycle costs. While the development under this program does specifically address airborne platforms where size and weight of the cable plant is particularly important, ultimately the network technology developed will have broad applicability to shipboard and submarine platform network requirements as well.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Title: Highly Integrated Photonics Naval Networking	11.154	9.920	0.000	0.000	0.000
Articles:	-	-	-	-	-
Description: The overarching objective of this activity is to develop and demonstrate a highly integrated Local Area Network for airborne platforms incorporating an optical fiber network that uses wavelength division multiplexing (WDM) to address demanding military network re-configurability, scalability, and technology refresh challenges. The telecommunication network application of WDM technology is fully mature for commercial environments with little constraint on size, weight, and power (SWAP). The program will leverage and enhance the telecommunication standards for optical fiber networks while addressing the SWAP restrictions and severe environmental requirements of military airborne platforms. The functionality of the technology developed cannot be obtained through Commercial-Off-The-Shelf components due to SWAP constraints and the military environment. Effort will involve understanding the properties of engineered optical fiber components and electronic semiconductors as they apply to highly integrated optical fiber networks. Ultimately these higher performance components and networks will address the needs for all classes of military platforms.					
FY 2015 Accomplishments:					

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603251N / *(U)AIRCRAFT SYSTEMS*	**Project (Number/Name)** 2777 / *Highly Integrated Photonics (HIP)*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Continue development and demonstration of highly integrated local area network for naval platforms. Fabrication of hardware, integration, and start of testing in platform representative environments. Testing will include engineering unit testing, integration for risk reductions, and environmental testing of the link components. ***FY 2016 Plans:*** Continue development and testing of components for Technology Readiness Level Six assessment in aircraft System Integration Lab environments. Begin initial flight testing of links to establish readiness for transition to platform/systems applications at acceptable risks. ***FY 2017 Base Plans:*** N/A ***FY 2017 OCO Plans:*** N/A					
Accomplishments/Planned Programs Subtotals	11.154	9.920	0.000	0.000	0.000

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

Highly Integrated Photonics Naval Networking strategy began as a joint effort with Defense Advanced Research Projects Agency for development and demonstration of Analog and Digital Wavelength Division Multiplex Highly Integrated Photonics for aviation applications with the focus being a future technology refresh for the F-35 and, as an enterprise level technology, other applications. Funding extends the development and technology maturation to a technology/manufacturing readiness level compatible with transition to one, or more, Program(s) of Record.

E. Performance Metrics

Performance that adheres to the conventional Wavelength Division Multiplex optical network protocol standards, wavelengths and interface with Ethernet 10Gbit/s, MIL-STD-1553, and other protocols running concurrently on one or more single-mode fibers along with analog signals. Each critical component has a set of physical, environmental, and operational requirements driven by representative platform, systems, and operational metrics. Includes testing in a Systems/Software Integration Laboratory and in test aircraft.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603251N / *(U)AIRCRAFT SYSTEMS*	Project (Number/Name) 2777 / *Highly Integrated Photonics (HIP)*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Developmental & Architectural Studies	C/FFP	APIC Corp : Culver, CA	0.500	1.600	Dec 2014	0.000		0.000		-		0.000	0.000	2.100	2.100
Primary Hardware Development	C/FFP	APIC Corp : Culver, CA	1.830	3.767	Dec 2014	3.820	Dec 2015	0.000		-		0.000	0.000	9.417	9.417
Component Foundry & Fabrication	C/FFP	APIC Corp : Culver, CA	11.753	3.533	Dec 2014	0.000		0.000		-		0.000	0.000	15.286	15.286
Systems Engineering & Testing	C/FFP	APIC Corp : Culver, CA	2.386	1.434	Dec 2014	0.000		0.000		-		0.000	0.000	3.820	3.820
Systems Engineering & Testing	WR	SPAWARSYSCEN : San Diego, CA	0.000	0.150	Nov 2014	0.150	Dec 2015	0.000		-		0.000	0.000	0.300	-
Systems Engineering	WR	NRL : Washington, DC	0.000	0.250	Dec 2014	0.953	Dec 2015	0.000		-		0.000	0.000	1.203	-
Systems Engineering	C/CPFF	Pennsylvania State University : Freeport, PA	0.000	0.100	Sep 2015	0.247	Dec 2015	0.000		-		0.000	0.000	0.347	0.347
Developmental & Architectural Studies	C/CPFF	The Mitre Corp. : McLean, VA	0.000	0.000		1.487	Dec 2015	0.000		-		0.000	0.000	1.487	1.487
Primary Hardware Development, Systems Engineering & Testing	C/CPFF	MIT-LL : Lexington, MA	0.000	0.000		0.900	Apr 2016	0.000		-		0.000	0.000	0.900	0.900
Systems Engineering & Testing	WR	NUWC : Newport, RI	0.000	0.000		2.192	Feb 2016	0.000		-		0.000	0.000	2.192	-
		Subtotal	16.469	10.834		9.749		0.000		-		0.000	0.000	37.052	-

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Government Engineering Support	WR	NAWCAD : Pax River, MD	0.855	0.167	Dec 2014	0.100	Nov 2015	0.000		-		0.000	0.000	1.122	-
		Subtotal	0.855	0.167		0.100		0.000		-		0.000	0.000	1.122	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603251N / *(U)AIRCRAFT SYSTEMS*	Project (Number/Name) 2777 / *Highly Integrated Photonics (HIP)*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management	WR	NAWCAD : Pax River, MD	0.400	0.149	Dec 2014	0.071	Nov 2015	0.000		-		0.000	0.000	0.620	-
Travel	Various	Various : Various	0.000	0.004	Feb 2015	0.000		0.000		-		0.000	0.000	0.004	-
		Subtotal	0.400	0.153		0.071		0.000		-		0.000	0.000	0.624	-

	Prior Years	FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	17.724	11.154		9.920		0.000		-		0.000	0.000	38.798	-

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603251N / *(U)AIRCRAFT SYSTEMS*	**Project (Number/Name)** 2777 / *Highly Integrated Photonics (HIP)*

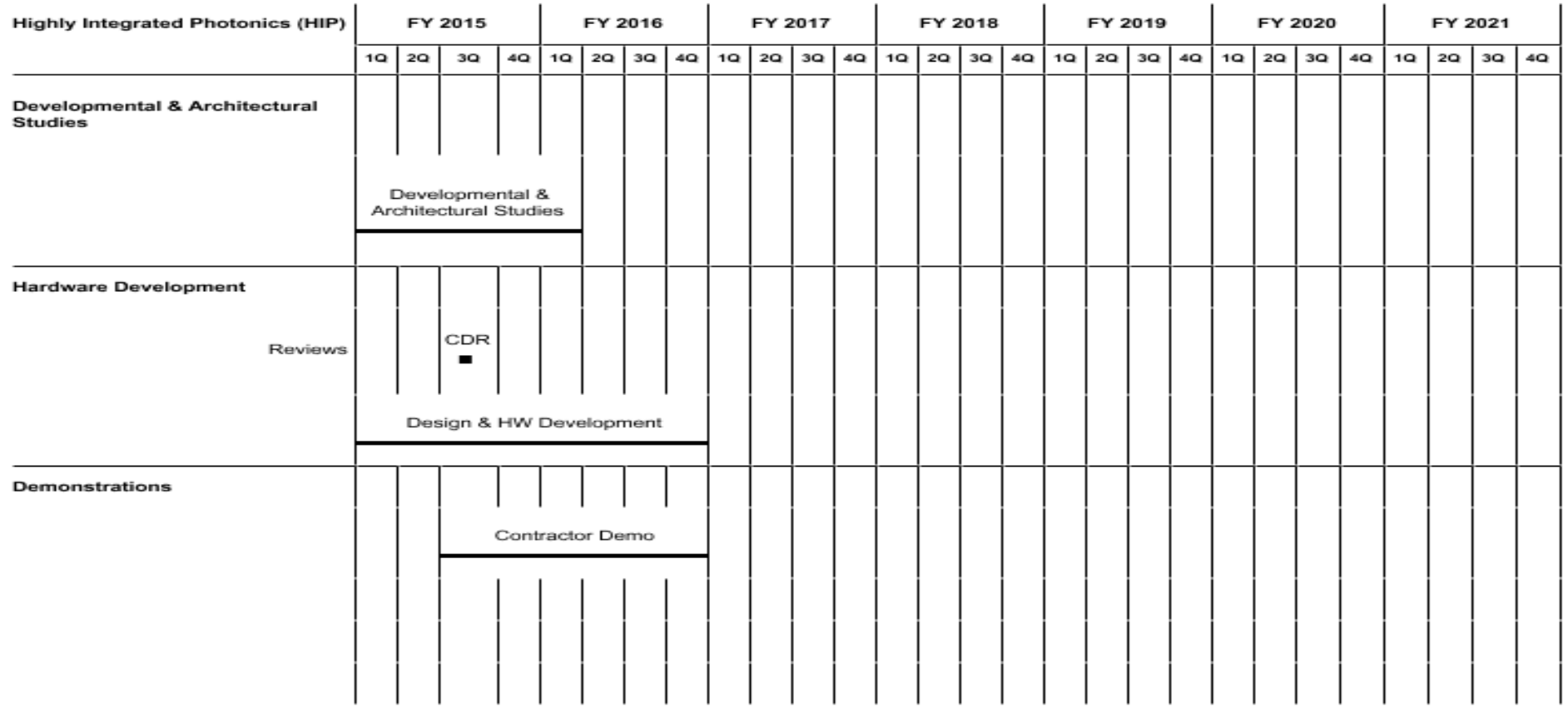

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Exhibit R-4A, RDT&E Schedule Details: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603251N / *(U)AIRCRAFT SYSTEMS*	**Project (Number/Name)** 2777 / *Highly Integrated Photonics (HIP)*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Highly Integrated Photonics (HIP)				
Developmental & Architectural Studies: Developmental & Architectural Studies	1	2015	1	2016
Hardware Development: Reviews: CDR	3	2015	3	2015
Hardware Development: Reviews: Design & Hardware Development	1	2015	4	2016
Demonstrations: Contractor Demo	3	2015	4	2016

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603251N / *(U)AIRCRAFT SYSTEMS*	Project (Number/Name) 3331 / *C-2 System Development*	

COST ($ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
3331: *C-2 System Development*	14.186	3.116	1.723	1.519	-	1.519	0.717	0.805	1.508	1.521	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The C-2A Greyhound is a high wing monoplane, twin engine turbo-prop aircraft capable of operating from both a shore base and all operational United States Navy aircraft carrier classes. The mission of the C-2A is to provide rapid response Carrier Onboard Delivery of fleet essential supplies, repair parts, and personnel to sustain at sea operations of deployed battle groups. In addition, the C-2A provides airdrop delivery and mobilization support for special operations forces from land bases and carriers, Search and Rescue, and Humanitarian Relief.

This project will fund required development, analysis, and testing of a Critical Brake Upgrade and other subsystems required to operate the C-2A to the end of its service life.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Title: Critical Brake Upgrade	3.116	0.000	0.000	0.000	0.000
Articles:	-	-	-	-	-
Description: Provides funding for development, design, integration and test of an anti-skid brake system for the C-2A aircraft. This will correct a deficiency related to the operational ground controllability of the C-2A. ***FY 2015 Accomplishments:*** Funding is for on-going efforts to complete development, design, integration and test of anti-skid brake system for the C-2A aircraft. ***FY 2016 Plans:*** N/A ***FY 2017 Base Plans:*** N/A ***FY 2017 OCO Plans:*** N/A					
Title: Combat Readiness	0.000	1.723	1.519	0.000	1.519
Articles:	-	-	-	-	-

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603251N / *(U)AIRCRAFT SYSTEMS*	**Project (Number/Name)** 3331 / *C-2 System Development*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Description: C-2 Combat Readiness establishes an enduring capacity to address obsolescence, safety, and readiness degrader issues for the C-2A(R) aircraft until the end of it's service life. ***FY 2015 Accomplishments:*** N/A ***FY 2016 Plans:*** Funding is for development and design for C-2 combat readiness. ***FY 2017 Base Plans:*** Funding provides for the continuation of C-2 combat readiness development and design. ***FY 2017 OCO Plans:*** N/A					
Accomplishments/Planned Programs Subtotals	3.116	1.723	1.519	0.000	1.519

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
• APN/0556: *C-2A Series*	0.000	7.157	19.066	-	19.066	22.694	19.655	17.952	7.890	6.075	557.621

Remarks

D. Acquisition Strategy

The C-2 Operational Ground Controllability strategy will be exercised under an Engineering Change Proposal.

E. Performance Metrics

Test and evaluation started 3Q FY15 with 1Q FY16 completion. Final Test Report is planned for 2Q FY16.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603251N / *(U)AIRCRAFT SYSTEMS*	Project (Number/Name) 3331 / *C-2 System Development*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Primary Hardware Development	SS/CPFF	NGC : Bethpage, NY	9.718	0.652	Mar 2015	0.000		0.000		-		0.000	0.000	10.370	10.370
Prior year Prod Dev no longer funded in the FYDP	Various	Various : Various	0.022	0.000		0.000		0.000		-		0.000	0.000	0.022	-
		Subtotal	9.740	0.652		0.000		0.000		-		0.000	0.000	10.392	-

Remarks

Totals may not add due to rounding.

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Government Engineering Support	WR	NAWCAD : Pax River, MD	3.456	0.393	Nov 2014	0.000		0.000		-		0.000	0.000	3.849	-
Government Engineering Support	WR	Various : Various	0.000	0.000		1.178	Jan 2016	0.326	Nov 2016	-		0.326	Continuing	Continuing	Continuing
Government Engineering Support	WR	North Island : North Island, CA	0.874	0.263	Nov 2014	0.000		0.000		-		0.000	0.000	1.137	-
Development Support	WR	North Island : North Island, CA	0.000	0.000		0.440	Jan 2016	0.546	Nov 2016	-		0.546	Continuing	Continuing	Continuing
ILS Support	WR	North Island : North Island, CA	0.000	0.000		0.045	Jan 2016	0.045	Nov 2016	-		0.045	Continuing	Continuing	Continuing
Prior year Support no longer funded in the FYDP	Various	Various : Various	0.100	0.000		0.000		0.000		-		0.000	0.000	0.100	-
		Subtotal	4.430	0.656		1.663		0.917		-		0.917	-	-	-

Remarks

Totals may not add due to rounding.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603251N / *(U)AIRCRAFT SYSTEMS*	Project (Number/Name) 3331 / *C-2 System Development*	

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation	WR	NAWCAD : Pax River, MD	0.000	1.808	Nov 2014	0.050	Jan 2016	0.592	Nov 2016	-		0.592	Continuing	Continuing	Continuing
		Subtotal	0.000	1.808		0.050		0.592		-		0.592	-	-	-

Remarks

Totals may not add due to rounding.

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Travel	Various	Various : Various	0.016	0.000	Oct 2014	0.010	Jan 2016	0.010	Nov 2016	-		0.010	Continuing	Continuing	Continuing
		Subtotal	0.016	0.000		0.010		0.010		-		0.010	-	-	-

Remarks

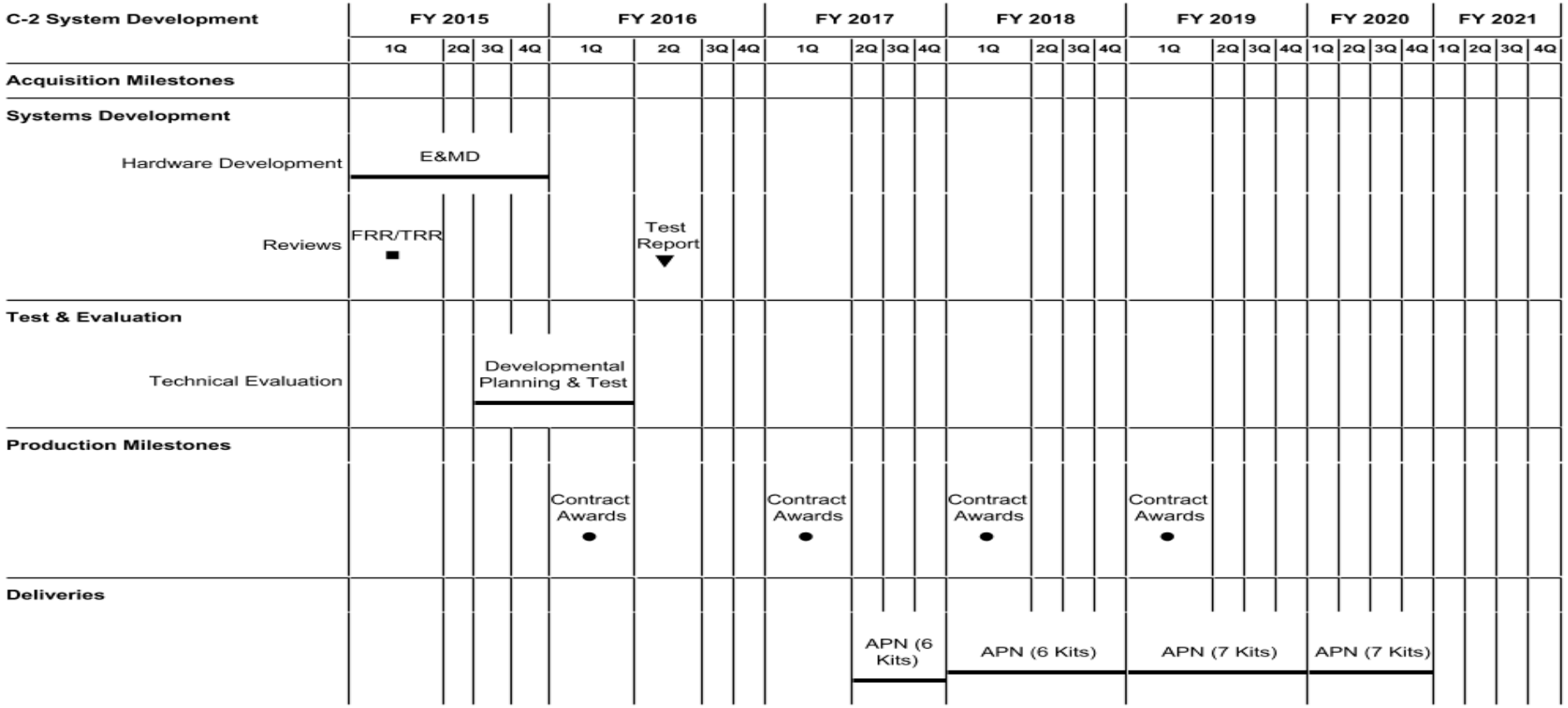
Totals may not add due to rounding.

	Prior Years	FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	14.186	3.116		1.723		1.519		-		1.519	-	-	-

Remarks

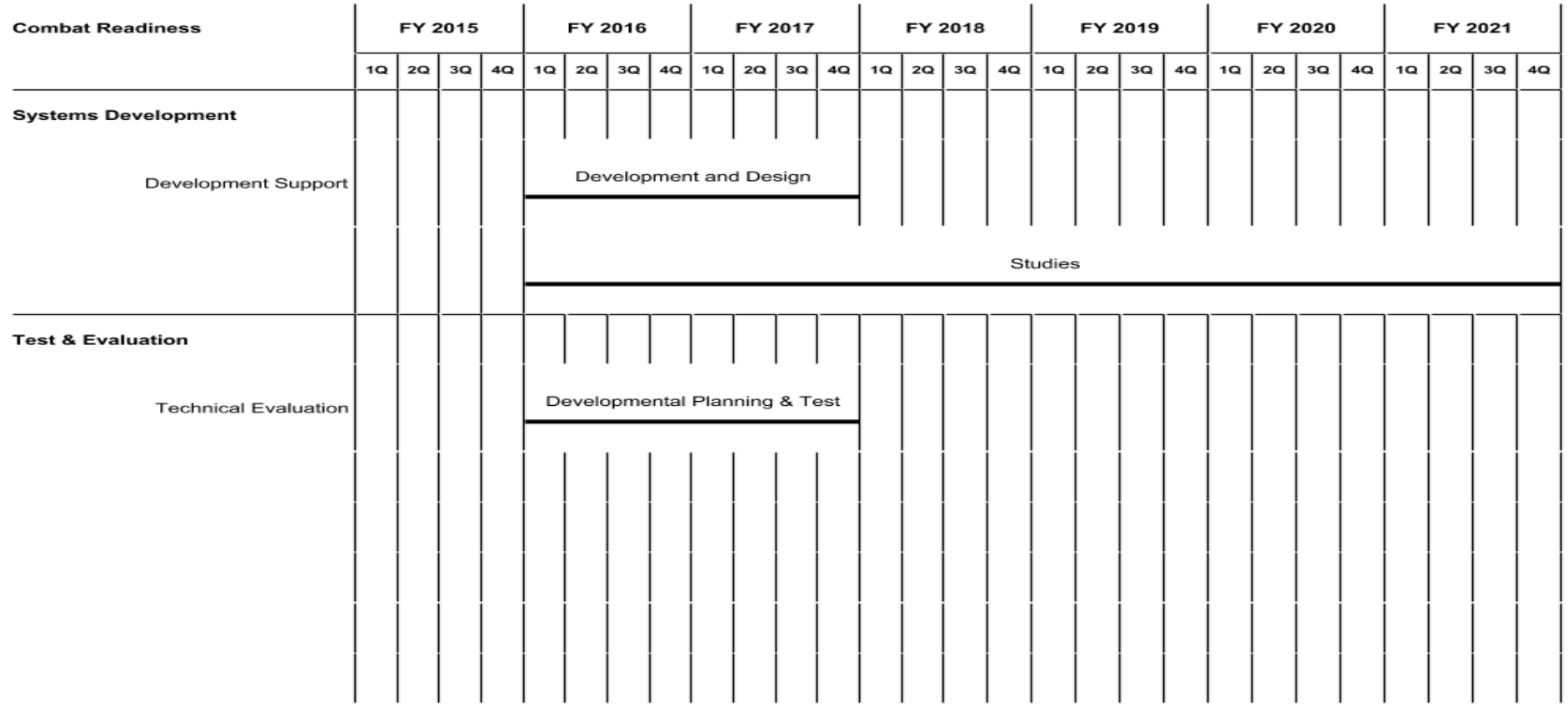
Totals may not add due to rounding.

Exhibit R-4, RDT&E Schedule Profile: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603251N / *(U)AIRCRAFT SYSTEMS*	**Project (Number/Name)** 3331 / *C-2 System Development*



2017PB - 0603251N - 3331

Exhibit R-4, RDT&E Schedule Profile: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603251N / *(U)AIRCRAFT SYSTEMS*	**Project (Number/Name)** 3331 / *C-2 System Development*



2017PB - 0603251N - 3331

Exhibit R-4A, RDT&E Schedule Details: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603251N / *(U)AIRCRAFT SYSTEMS*	**Project (Number/Name)** 3331 / *C-2 System Development*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
C-2 System Development				
Systems Development: Hardware Development: Engineering & Manufacturing Development	1	2015	4	2015
Systems Development: Reviews: Funtional Readiness Review/Test Readiness Review	1	2015	1	2015
Systems Development: Reviews: Test Report	2	2016	2	2016
Test & Evaluation: Technical Evaluation: Developmental Planning & Test	3	2015	1	2016
Production Milestones: Contract Awards FY16	1	2016	1	2016
Production Milestones: Contract Awards FY17	1	2017	1	2017
Production Milestones: Contract Awards FY18	1	2018	1	2018
Production Milestones: Contract Awards FY19	1	2019	1	2019
Deliveries: Production Deliveries - APN (6 Kits) FY17	2	2017	4	2017
Deliveries: Production Deliveries - APN (6 Kits) FY18	1	2018	4	2018
Deliveries: Production Deliveries - APN (7 Kits) FY19	1	2019	4	2019
Deliveries: Production Deliveries - APN (7 Kits) FY20	1	2020	4	2020
Combat Readiness				
Systems Development: Development Support: Development Support	1	2016	4	2017
Systems Development: Development Support: Studies	1	2016	4	2021
Test & Evaluation: Technical Evaluation: Developmental Planning & Test	1	2016	4	2017

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603251N / *(U)AIRCRAFT SYSTEMS*	Project (Number/Name) 9999 / *Congressional Adds*	

COST ($ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
9999: *Congressional Adds*	0.000	0.000	15.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	15.000
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

N/A

B. Accomplishments/Planned Programs ($ in Millions)	FY 2015	FY 2016
Congressional Add: Highly Integrated Photonics (HIP) - Cong	0.000	15.000
FY 2015 Accomplishments: N/A		
FY 2016 Plans: Develop and test integrated photonic components for modernizing DOD aircraft (and other platform) avionics, sensors, and electronic warfare systems.		
Congressional Adds Subtotals	0.000	15.000

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

E. Performance Metrics

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603251N / *(U)AIRCRAFT SYSTEMS*	Project (Number/Name) 9999 / *Congressional Adds*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Photonic Component Development	C/FFP	TBD : TBD	0.000	0.000		10.000	May 2016	0.000		-		0.000	0.000	10.000	10.000
		Subtotal	0.000	0.000		10.000		0.000		-		0.000	0.000	10.000	10.000

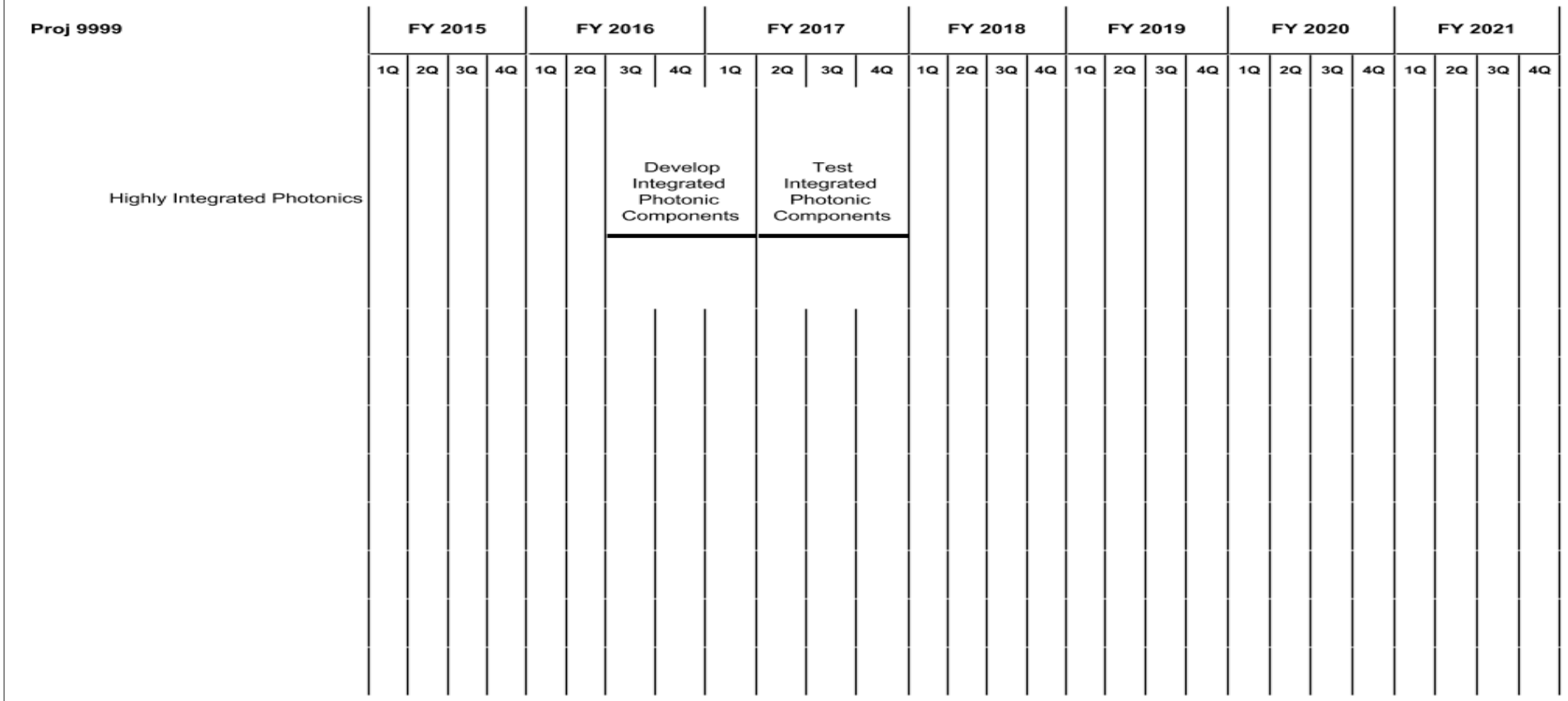
Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Photonic Component Test	C/FFP	TBD : TBD	0.000	0.000		5.000	Dec 2016	0.000		-		0.000	0.000	5.000	5.000
		Subtotal	0.000	0.000		5.000		0.000		-		0.000	0.000	5.000	5.000

	Prior Years	FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	0.000		15.000		0.000		-		0.000	0.000	15.000	15.000

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603251N / *(U)AIRCRAFT SYSTEMS*	**Project (Number/Name)** 9999 / *Congressional Adds*



2017PB - 0603251N - 9999

Exhibit R-4A, RDT&E Schedule Details: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603251N / *(U)AIRCRAFT SYSTEMS*	**Project (Number/Name)** 9999 / *Congressional Adds*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 9999				
Highly Integrated Photonics: Develop Integrated Photonic Components	3	2016	1	2017
Highly Integrated Photonics: Test Integrated Photonic Components	2	2017	4	2017

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Exhibit R-2, RDT&E Budget Item Justification: PB 2017 Navy											Date: February 2016	
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 4: *Advanced Component Development & Prototypes (ACD&P)*					R-1 Program Element (Number/Name) PE 0603254N *I ASW Systems Development*							
COST ($ in Millions)	**Prior Years**	**FY 2015**	**FY 2016**	**FY 2017 Base**	**FY 2017 OCO**	**FY 2017 Total**	**FY 2018**	**FY 2019**	**FY 2020**	**FY 2021**	**Cost To Complete**	**Total Cost**
Total Program Element	124.896	7.603	5.551	7.041	-	7.041	7.746	7.279	7.397	7.554	Continuing	Continuing
1292: *Adv ASW Sensors & Proc*	112.834	5.451	3.674	7.041	-	7.041	7.746	7.279	7.397	7.554	Continuing	Continuing
3222: *Advanced High Altitude ASW*	12.062	2.152	1.877	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	16.091

A. Mission Description and Budget Item Justification

Decrease in ASW SYSTEMS DEVELOPMENT by $0.294M as required for the Department of the Navy to comply with the Bipartisan Budget Act of 2015.

Includes RDT&E funds for advanced development and developmental testing of airborne anti-submarine warfare (ASW) systems, including aircraft, equipment, and devices for use against all types of submarine targets.

JUSTIFICATION FOR BUDGET ACTIVITY: This program is funded under ADVANCED COMPONENT DEVELOPMENT AND PROTOTYPES because it includes all efforts necessary to evaluate integrated technologies, representative models or prototype systems in a high fidelity and realistic operating environment.

B. Program Change Summary ($ in Millions)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Previous President's Budget	7.782	5.555	8.181	-	8.181
Current President's Budget	7.603	5.551	7.041	-	7.041
Total Adjustments	-0.179	-0.004	-1.140	-	-1.140
• Congressional General Reductions	-	-0.004			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.180	0.000			
• Rate/Misc Adjustments	0.001	0.000	-1.140	-	-1.140

Change Summary Explanation

Technical: Not applicable.

Schedule:

1292. Received administrative adjustment starting in FY17. Project Units H3222 and H1292 were consolidated into H1292. Added Next Generation Acoustic Passive System (NGAPS) to schedule 1Q/20 through 4Q/21.

Exhibit R-2, RDT&E Budget Item Justification: PB 2017 Navy	Date: February 2016
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 0603254N *I ASW Systems Development*

3222. Received administrative adjustment starting in FY17. Project Units H3222 and H1292 were merged into H1292.

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603254N / *ASW Systems Development*	Project (Number/Name) 1292 / *Adv ASW Sensors & Proc*	

COST ($ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
1292: *Adv ASW Sensors & Proc*	112.834	5.451	3.674	7.041	-	7.041	7.746	7.279	7.397	7.554	Continuing	Continuing
Quantity of RDT&E Articles		100	100	100	-	100	-	-	-	-		

A. Mission Description and Budget Item Justification

This program provides Air Anti-Submarine Warfare (ASW) effectiveness through development and maturization of advanced hardware and software associated with airborne acoustic and non-acoustic systems. This includes sensors and components, 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 and components, improved detection, classification, localization, tracking, and increased capacity and flexibility to handle multi-sensor data loads. Furthermore, technologies that can be affordably implemented as payload across fixed wing, rotary and unmanned platforms engaged in ASW, will be pursued. Programs being funded during the FYDP will evaluate technologies such as: Over the Horizon (OTH) communications, sonobuoy communication link to/from aircraft, 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 and maturization 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 sources and receivers, laser technologies, electro-optical and Multi-Spectral camera technologies, Radar, and Magnetic Anomaly Detection sensors. Those technologies that are deemed mature and provide increased operational capability will be approved for a production Rapid Capability Insertion (RCI) build. The test articles, which consist of passive/active sensors/components and associated processors, will support at-sea trials and experiments.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Title: System performance assessments	5.451	3.674	7.041	0.000	7.041
Articles:	100	100	100	-	100
FY 2015 Accomplishments: Conducted system performance assessments for Multi-Static Active Coherent ASW algorithms and other Acoustic and Non-Acoustic system enhancements using test articles and prototype software while supporting at-sea trials and experiments such as USWEET. Conducted data analysis for the engineering measurement program on Science and Technology, Research and Development and operational fleet collected data.					
FY 2016 Plans: System performance assessments for Multi-Static Active Coherent ASW algorithms and other prospective Acoustic and Non-Acoustic systems and enhancements. The test articles, which consist of passive/active sensors/components and associated processors, will support at-sea trial and experiments. Develop prototype software for use in at-sea experiment/exercise participation and data collection. Conduct data analysis for the					

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603254N / *ASW Systems Development*	**Project (Number/Name)** 1292 / *Adv ASW Sensors & Proc*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
engineering measurement program on Science and Technology, Research and Development and operational fleet collected data. ***FY 2017 Base Plans:*** Received technical adjustment starting in FY17. Project Units H3222 and H1292 were consolidated into H1292. 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/components and associated processors, will support at-sea trial and experiments. Develop prototype software for use in at-sea experiment/exercise participation and data collection. Conduct data analysis for the engineering measurement program on Science and Technology, Research and Development and operational fleet collected data. ***FY 2017 OCO Plans:*** N/A					
Accomplishments/Planned Programs Subtotals	5.451	3.674	7.041	0.000	7.041

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
• RDT&E/0480: *ASW Sensors & Proc*	17.354	22.378	29.967	-	29.967	33.755	25.327	44.213	45.126	Continuing	Continuing

Remarks

D. Acquisition Strategy

Develop and mature promising acoustic and non-acoustic ASW technologies that have high potential for meeting documented capability gaps and Fleet requirements. As funding permits, transition those technologies into acquisition programs of record for eventual Fleet release on ASW platforms.

E. Performance Metrics

Potential ASW technologies are quantitatively assessed for effect on ASW kill chain in relation to cost, schedule and performance metrics.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603254N / *ASW Systems Development*	Project (Number/Name) 1292 / *Adv ASW Sensors & Proc*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Primary Hdw Development	Various	Various : Various	1.937	0.200	Dec 2014	0.200	Dec 2015	0.100	Dec 2016	-		0.100	Continuing	Continuing	Continuing
		Subtotal	1.937	0.200		0.200		0.100		-		0.100	-	-	-

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Software Development	WR	NAWCAD : PATUXENT RIVER, MD	3.625	0.400	Dec 2014	0.200	Dec 2015	1.000	Dec 2016	-		1.000	0.000	5.225	-
Studies & Analysis	WR	NAWCAD : PATUXENT RIVER, MD	5.681	0.400	Dec 2014	0.600	Dec 2015	1.883	Dec 2016	-		1.883	Continuing	Continuing	Continuing
		Subtotal	9.306	0.800		0.800		2.883		-		2.883	-	-	-

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Dev Test & Eval	Various	Various : Various	19.246	1.863	Dec 2014	0.838	Dec 2015	1.800	Dec 2016	-		1.800	Continuing	Continuing	Continuing
		Subtotal	19.246	1.863		0.838		1.800		-		1.800	-	-	-

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Contractor Eng Spt	Various	Various : Various	18.591	1.381	Dec 2014	0.500	Dec 2015	1.000	Dec 2016	-		1.000	Continuing	Continuing	Continuing
ENG & TECH SVCS (NON-FFRDC)	Various	Various : Various	2.802	0.045	Dec 2014	0.047	Dec 2015	0.100	Dec 2016	-		0.100	Continuing	Continuing	Continuing
MGT & PROF SVCS (FFRDC)	Various	Various : Various	1.087	0.153	Dec 2014	0.133	Dec 2015	0.100	Dec 2016	-		0.100	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603254N / *ASW Systems Development*	Project (Number/Name) 1292 / *Adv ASW Sensors & Proc*	

Management Services ($ in Millions)

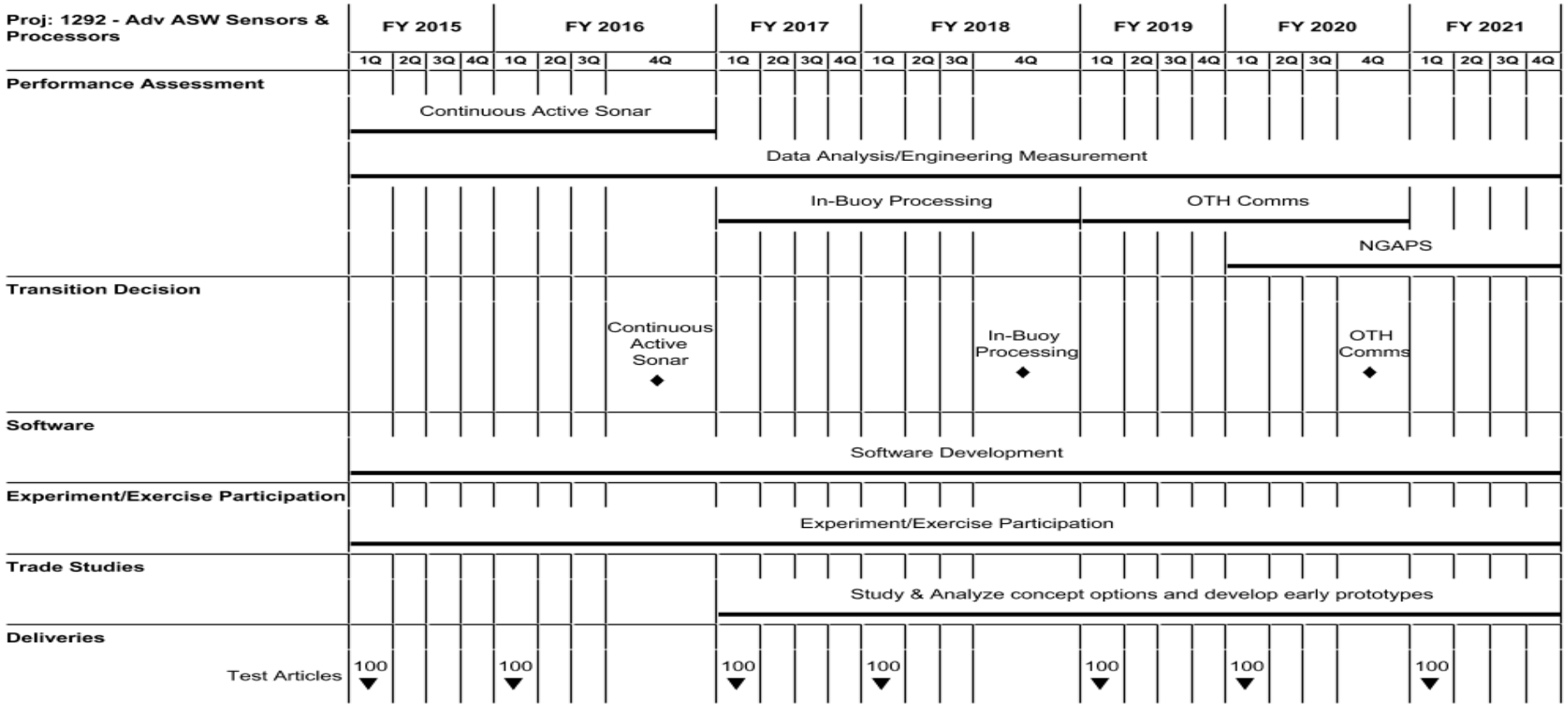
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Government Eng Spt	WR	NAWCAD : PATUXENT RIVER, MD	59.733	1.001	Dec 2014	1.148	Dec 2015	1.050	Dec 2016	-		1.050	Continuing	Continuing	Continuing
Travel	Various	VARIOUS : VARIOUS	0.132	0.008	Dec 2014	0.008	Dec 2015	0.008	Dec 2016	-		0.008	Continuing	Continuing	Continuing
		Subtotal	82.345	2.588		1.836		2.258		-		2.258	-	-	-

	Prior Years	FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	112.834	5.451		3.674		7.041		-		7.041	-	-	-

Remarks

FY16 to FY17 growth results from a technical adjustment starting in FY17. Project units H3222 and H1292 were consolidated into H1292 as funding for both projects has historically been executed on the same contracts. Additionally, increased focus on common payload (Hardware and Software) approaches and technologies that benefit multiple platforms has resulted in a more holistic approach to the execution of Program Element (PE) 0603254N.

Exhibit R-4, RDT&E Schedule Profile: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603254N / *ASW Systems Development*	**Project (Number/Name)** 1292 / *Adv ASW Sensors & Proc*



2017PB - 0603254N - 1292 Received technical adjustment starting in FY17. Project Units H3222 and H1292 were consolidated into H1292.

Exhibit R-4A, RDT&E Schedule Details: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603254N / *ASW Systems Development*	**Project (Number/Name)** 1292 / *Adv ASW Sensors & Proc*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj: 1292 - Adv ASW Sensors & Processors				
Performance Assessment: Continuous Active Sonar	1	2015	4	2016
Performance Assessment: Data Analysis/Engineering Measurement	1	2015	4	2021
Performance Assessment: In-Buoy Processing	1	2017	4	2018
Performance Assessment: OTH Comms	1	2019	4	2020
Performance Assessment: Next Generation Acoustic Passive System	1	2020	4	2021
Transition Decision: Continuous Active Sonar	4	2016	4	2016
Transition Decision: In-Buoy Processing	4	2018	4	2018
Transition Decision: OTH Comms	4	2020	4	2020
Software: Software Development	1	2015	4	2021
Experiment/Exercise Participation: Experiment/Exercise Participation	1	2015	4	2021
Trade Studies: Trade Studies	1	2017	4	2021
Deliveries: Test Articles: Test Article Deliveries (4)	1	2015	1	2015
Deliveries: Test Articles: Test Article Deliveries (5)	1	2016	1	2016
Deliveries: Test Articles: Test Article Deliveries (6)	1	2017	1	2017
Deliveries: Test Articles: Test Article Deliveries (7)	1	2018	1	2018
Deliveries: Test Articles: Test Article Deliveries (8)	1	2019	1	2019
Deliveries: Test Articles: Test Article Deliveries (9)	1	2020	1	2020
Deliveries: Test Articles: Test Article Deliveries (10)	1	2021	1	2021

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603254N / *ASW Systems Development*	Project (Number/Name) 3222 / *Advanced High Altitude ASW*	

COST ($ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
3222: *Advanced High Altitude ASW*	12.062	2.152	1.877	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	16.091
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

Note

Received administrative adjustment starting in FY17. Project Units H3222 and H1292 were consolidated into H1292.

A. Mission Description and Budget Item Justification

Advanced High Altitude Anti-Submarine Warfare (Adv HAASW) program performs research, analyses, and early prototype demonstration activities for new technologies to support future Air Anti-Submarine Warfare (ASW) programs for P-8A and other platforms. Emphasis is placed on evaluation of technologies and prototype systems in realistic operating environments with a focus on new sensors and system components.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Title: Research, analyses, and early prototype demonstration activities	2.152	1.877	0.000	0.000	0.000
Articles:	-	-	-	-	-
FY 2015 Accomplishments: Scheduled to perform studies, analyses and early prototyping of acoustic and non-acoustic technologies suitable for High Altitude ASW operations for the P-8A aircraft.					
FY 2016 Plans: Scheduled to perform studies, analyses and early prototyping of acoustic, non-acoustic and communications technologies suitable for high altitude ASW operations.					
FY 2017 Base Plans: N/A					
FY 2017 OCO Plans: N/A					
Accomplishments/Planned Programs Subtotals	2.152	1.877	0.000	0.000	0.000

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603254N / *ASW Systems Development*	**Project (Number/Name)** 3222 / *Advanced High Altitude ASW*

D. Acquisition Strategy

Develop modifications to incorporate capability into current sonobuoy sensors and integration into Air ASW platforms, P-8A as the lead aircraft.

E. Performance Metrics

Perform Studies and Analysis to better define Advanced HAASW program needs. Early prototypes will be developed to reduce risk for ASW operations at high altitudes by the P-8A aircraft.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603254N / *ASW Systems Development*	Project (Number/Name) 3222 / *Advanced High Altitude ASW*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Prior years Hdw Dev cost no longer funded in the FYDP	Various	Various : Various	1.370	0.000		0.000		0.000		-		0.000	0.000	1.370	-
		Subtotal	1.370	0.000		0.000		0.000		-		0.000	0.000	1.370	-

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Studies & Analysis	WR	NAWCAD : PATUXENT RIVER, MD	1.673	0.359	Nov 2014	0.752	Nov 2015	0.000		-		0.000	0.000	2.784	-
Studies & Analysis	WR	Various : Various	0.000	1.001	Nov 2014	0.579	Dec 2015	0.000		-		0.000	0.000	1.580	-
Prior Year Support no longer funded in the FYDP	Various	VARIOUS : VARIOUS	5.137	0.000		0.000		0.000		-		0.000	0.000	5.137	-
		Subtotal	6.810	1.360		1.331		0.000		-		0.000	0.000	9.501	-

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Prior year T&E no longer funded in the FYDP	Various	Various : Various	0.230	0.000		0.000		0.000		-		0.000	0.000	0.230	-
		Subtotal	0.230	0.000		0.000		0.000		-		0.000	0.000	0.230	-

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Contractor Eng Spt	Various	Various : Various	0.685	0.136	Nov 2014	0.119	Dec 2015	0.000		-		0.000	0.000	0.940	Continuing
ENG & TECH SVCS (NON-FFRDC)	Various	Various : Various	0.905	0.209	Nov 2014	0.188	Dec 2015	0.000		-		0.000	0.000	1.302	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603254N / *ASW Systems Development*	Project (Number/Name) 3222 / *Advanced High Altitude ASW*	

Management Services ($ in Millions)

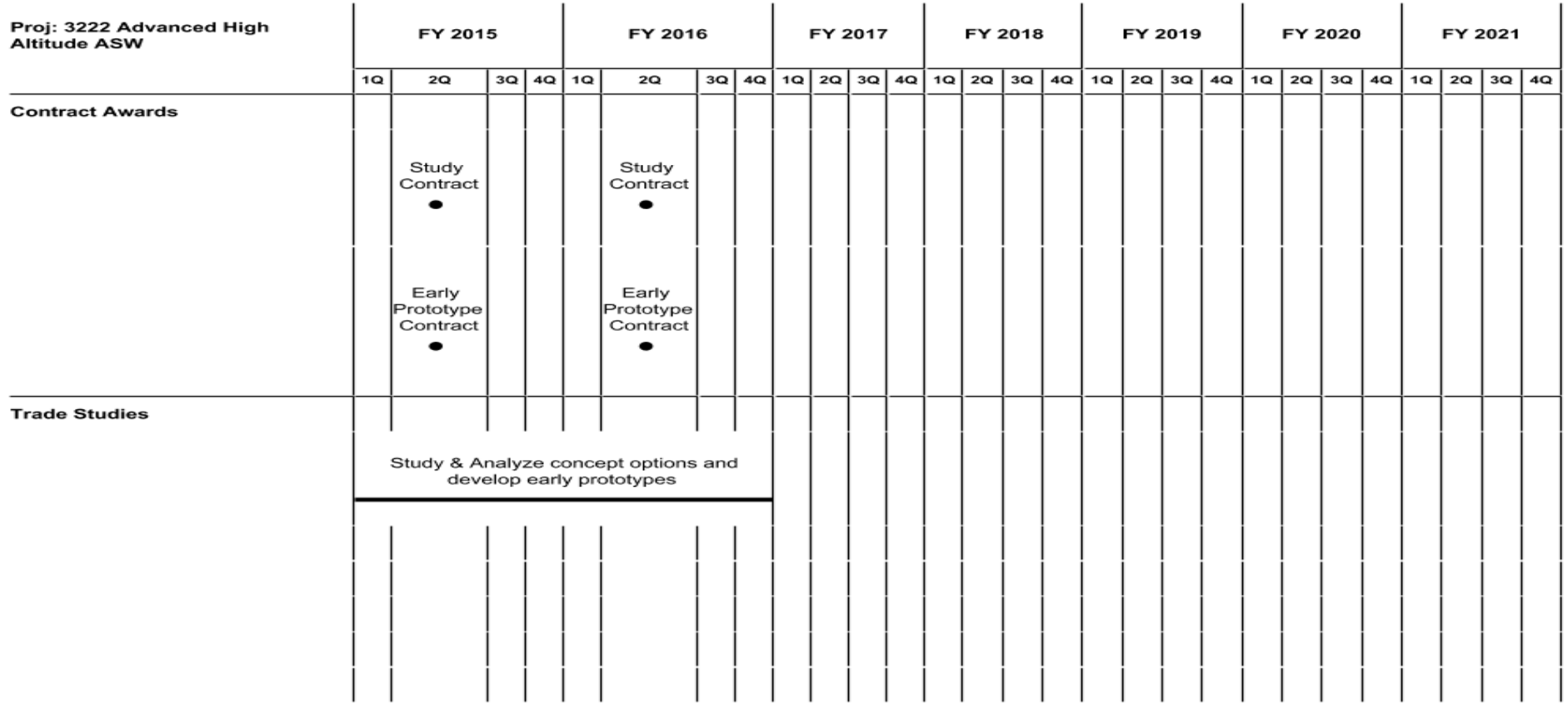
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Government Eng Spt	WR	NAWCAD : PATUXENT RIVER, MD	2.030	0.441	Nov 2014	0.231	Dec 2015	0.000		-		0.000	0.000	2.702	-
Travel	Various	Various : Various	0.032	0.006	Nov 2014	0.008	Nov 2015	0.000		-		0.000	0.000	0.046	-
		Subtotal	3.652	0.792		0.546		0.000		-		0.000	0.000	4.990	-

	Prior Years	FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	12.062	2.152		1.877		0.000		-		0.000	0.000	16.091	-

Remarks

FY16 to FY17 reduction results from a administrative adjustment starting in FY17. Project units H3222 and H1292 were consolidated into H1292 as funding for both projects has historically been executed on the same contracts. Additionally, increased focus on common payload (Hardware and Software) approaches and technologies that benefit multiple platforms has resulted in a more holistic approach to the execution of Program Element (PE) 0603254N.

Exhibit R-4, RDT&E Schedule Profile: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603254N / *ASW Systems Development*	**Project (Number/Name)** 3222 / *Advanced High Altitude ASW*



2017PB - 0603254N - 3222 Received technical adjustment starting in FY17. Project Units H3222 and H1292 were consolidated into H1292.

Exhibit R-4A, RDT&E Schedule Details: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603254N / *ASW Systems Development*	**Project (Number/Name)** 3222 / *Advanced High Altitude ASW*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj: 3222 Advanced High Altitude ASW				
Contract Awards: Study Contract (3)	2	2015	2	2015
Contract Awards: Study Contract (4)	2	2016	2	2016
Contract Awards: Early Prototype Contract (3)	2	2015	2	2015
Contract Awards: Early Prototype Contract (4)	2	2016	2	2016
Trade Studies: Trade Studies	1	2015	4	2016

Exhibit R-2, RDT&E Budget Item Justification: PB 2017 Navy	Date: February 2016
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 0603261N *I Tactical Airborne Reconnaissance*

COST ($ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
Total Program Element	64.001	5.870	3.080	3.274	-	3.274	3.675	3.599	3.572	3.650	Continuing	Continuing
2467: *UAV Conops*	64.001	5.870	3.080	3.274	-	3.274	3.675	3.599	3.572	3.650	Continuing	Continuing

A. Mission Description and Budget Item Justification

Decrease in TACTICAL AIRBORNE RECONNAISSANCE by $0.148M as required for the Department of the Navy to comply with the Bipartisan Budget Act of 2015.

This program element funds efforts to develop Concept of Operations in support of the Navy's overall Unmanned Aircraft Systems (UAS) Strategy integrating UAS into the Chief of Naval Operations 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 providing experimentation for Unmanned Aerial Vehicle technology assessment, insertion, demonstration, transfer as well as simulation and exercise support.

This program is funded under ADVANCED COMPONENT DEVELOPMENT AND PROTOTYPES because it includes all efforts necessary to evaluate integrated technologies, representative models or prototype systems in a high fidelity and realistic operating environment.

B. Program Change Summary ($ in Millions)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Previous President's Budget	5.270	3.087	3.652	-	3.652
Current President's Budget	5.870	3.080	3.274	-	3.274
Total Adjustments	0.600	-0.007	-0.378	-	-0.378
• Congressional General Reductions	-	-0.007			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	0.600	0.000			
• SBIR/STTR Transfer	-	-			
• Rate/Misc Adjustments	0.000	0.000	-0.378	-	-0.378

Change Summary Explanation

Technical: Not applicable to baseline program. FY15 funding was reprogrammed for CONOPS/requirements development for concept aircraft and a common ship based launch and recovery system for group I through group III UAVs.

Schedule: Not applicable.

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603261N / *Tactical Airborne Reconnaissance*	Project (Number/Name) 2467 / *UAV Conops*	

COST ($ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
2467: *UAV Conops*	64.001	5.870	3.080	3.274	-	3.274	3.675	3.599	3.572	3.650	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

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

In support of the Navy's overall UAS strategy, this program develops Concept of Operations (CONOPS) that integrate UAS into the Chief of Naval Operations Navy Vision of Sea Power 21 (Sea Shield, Sea Strike, Sea Basing and FORCEnet). By providing fleet input based on current operations with UAS in a simulated combat environment, this CONOPS development investment is the foundation of how the Carrier Strike Group and the Expeditionary Strike Group will operate a combined Manned and Unmanned Naval Air Force. This program establishes the common architecture, including Command & Control, for all unmanned systems to support and inform CONOPS development. This effort provides for a cross-program view of Naval Unmanned Systems and is the entry point for Office of the Secretary of the Defense (OSD) and other services for commonality and interoperability. 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 Aviation Enterprise through interoperability and common system solutions.
- Develops the Naval UAS FoS Architecture to support integration into the Integrated Warfighter Capability Process.
- Provides Naval support for development of Standards across Department of Defense (DoD) UAS and North Atlantic Treaty Organization, emphasizing standardization and interoperability.
- Conducts CONOPS studies, demonstrations, and exercises for Vehicle Control, Targeting, and Weapons, Sensor and Payload Employment.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Title: Studies and Demonstrations	1.253	1.523	1.666	0.000	1.666
Articles:	-	-	-	-	-
Description: Studies and demonstrations to develop CONOPS for manned-unmanned integration of UAS and aircraft systems. Build a UAS simulation environment for Modeling and Simulation of common UAS components in representative battlespace architectures.					
FY 2015 Accomplishments: Conducted a Trident Warrior 15 Fleet experiment to demonstrate Fleet Concept of Operations and Manned/ Unmanned interoperability. Specifically the capabilities of existing Visual Information (VI) Programs of Record,					

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603261N / *Tactical Airborne Reconnaissance*	**Project (Number/Name)** 2467 / *UAV Conops*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
and emerging VI systems to meet current Navy Operational Tasking Orders and Joint Urgent Operational Needs for Tactical VI to the fleet. ***FY 2016 Plans:*** Continue to conduct studies, demonstrations, and testing to validate the Naval Interoperability profiles within the context of Integrated Warfare Capabilities. ***FY 2017 Base Plans:*** Continue development of the Unmanned Aircraft Systems (UAS) modeling and simulation of Fleet Concept of Operations scenarios. Demonstrate Manned/Unmanned Interoperability. Provide government engineering support, program office travel, and contract support services. ***FY 2017 OCO Plans:*** N/A					
Title: UAV CONOPS Requirements Development for Common Launch and Recovery ***Articles:*** ***Description:*** Develop UAV CONOPS, project plans, and requirements to support developing a common ship based group I through group III launch and recovery system. ***FY 2015 Accomplishments:*** Initiated development of a common launch and recovery system roadmap and associated requirements documentation in support of group I through group III UAV shipboard operations. Identified a common control architecture for the common launch and recovery system. ***FY 2016 Plans:*** N/A ***FY 2017 Base Plans:*** N/A ***FY 2017 OCO Plans:*** N/A	0.600 -	0.000 -	0.000 -	0.000 -	0.000 -
Title: Architecture Support/Common Ground Station ***Articles:***	1.824 -	0.000 -	0.000 -	0.000 -	0.000 -

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603261N / *Tactical Airborne Reconnaissance*	**Project (Number/Name)** 2467 / *UAV Conops*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Description: Develop a Joint Service revision and configuration management of UAS interoperability profiles and Joint Common Ground Station Architecture and related government engineering support. ***FY 2015 Accomplishments:*** Completed development of a Joint Service revision and configuration management of UAS interoperability profiles and Joint Common Ground Station Architecture and related government engineering support. ***FY 2016 Plans:*** N/A ***FY 2017 Base Plans:*** N/A ***FY 2017 OCO Plans:*** N/A					
Title: Naval Interoperability & Standardization	2.193	1.557	1.608	0.000	1.608
Articles:	-	-	-	-	-
Description: Increase Naval Unmanned Systems interoperability emphasizing Naval, Joint Service, and international standardization. ***FY 2015 Accomplishments:*** In support of Naval UAS FoS Architecture, Office of the Secretary of the Defense (OSD) Joint Service and North Atlantic Treaty Organization (NATO) coalition interoperability, developed and released the following Unmanned Systems Interoperability profiles and Navy implementation conventions: Advanced Command & Control, Motion Imagery, Full Motion Video and Navy Wide Area Network. Provided government engineering support, program office travel, and contract support services. ***FY 2016 Plans:*** Continue to develop Unmanned Systems Naval Interoperability Profiles in support of Integrated Warfare Capability Packages. Support OSD Joint Service and NATO coalition interoperability efforts. Provide government engineering support, program office travel, and contract support services. ***FY 2017 Base Plans:***					

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603261N / *Tactical Airborne Reconnaissance*	**Project (Number/Name)** 2467 / *UAV Conops*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Continue to develop Unmanned Systems Naval Interoperability Profiles in support of Integrated Warfare Capability Packages. Support OSD Joint Service and NATO coalition interoperability efforts. Provide government engineering support, program office travel, and contract support services. ***FY 2017 OCO Plans:*** N/A					
Accomplishments/Planned Programs Subtotals	5.870	3.080	3.274	0.000	3.274

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

The program office will leverage existing Government facilities (e.g., Joint Technology Center/System Integration Laboratory and Naval Unmanned Aircraft Systems (UAS) Program of Record assets as available) to develop and demonstrate Naval UAS Concept of Operations. Government engineering support will be used for Standards Development, Architectural Analysis, Modeling and Simulation efforts and testing.

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 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603261N / *Tactical Airborne Reconnaissance*	**Project (Number/Name)** 2467 / *UAV Conops*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Ship Integration	C/CPFF	L-3 Titan : Marlton, NJ	9.696	1.336	Dec 2014	0.000		0.000		-		0.000	0.000	11.032	11.032
Systems Engineering	WR	NAWCAD : Pax River, MD	3.486	0.243	Dec 2014	0.000		0.000		-		0.000	0.000	3.729	-
Requirements Development	WR	NAWCD : Pax River, MD	0.000	0.600	Oct 2015	0.000		0.000		-		0.000	0.000	0.600	-
Prior year Prod Dev no longer funded in the FYDP	Various	Various : Various	3.350	0.000		0.000		0.000		-		0.000	0.000	3.350	-
		Subtotal	16.532	2.179		0.000		0.000		-		0.000	0.000	18.711	-

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Development Support	Various	Various : Various	14.085	0.212	Jan 2015	0.000		0.000		-		0.000	0.000	14.297	14.297
Software Development	MIPR	TACOM : Warren, MI	1.745	0.330	Jul 2015	0.000		0.000		-		0.000	0.000	2.075	2.075
Software Development	MIPR	ARMDEC : Redstone Arsenal, AL	0.000	0.562	Jul 2015	0.000		0.000		-		0.000	0.000	0.562	0.562
Software Development	WR	NAWCWD : China Lake, CA	0.000	0.520	Feb 2015	0.000		0.000		-		0.000	0.000	0.520	-
Studies & Demonstrations	WR	NAWCAD : Pax River, MD	4.220	0.234	Dec 2014	0.234	Dec 2015	0.175	Dec 2016	-		0.175	Continuing	Continuing	Continuing
Standards Development	C/CPFF	Engility : Lexington Park, MD	0.000	0.000		1.235	Jan 2016	1.239	Jan 2017	-		1.239	0.000	2.474	2.474
Prior year Support no longer funded in the FYDP	Various	Various : Various	12.361	0.000		0.000		0.000		-		0.000	0.000	12.361	12.361
		Subtotal	32.411	1.858		1.469		1.414		-		1.414	-	-	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603261N / *Tactical Airborne Reconnaissance*	Project (Number/Name) 2467 / *UAV Conops*	

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Prior year Test & Eval no longer funded in the FYDP	Various	Various : Various	2.627	0.000		0.000		0.000		-		0.000	0.000	2.627	-
		Subtotal	2.627	0.000		0.000		0.000		-		0.000	0.000	2.627	-

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Support	Various	Various : Various	4.043	0.135	Dec 2014	0.322	Jan 2016	0.119	Jan 2017	-		0.119	0.000	4.619	4.619
Government Engineering Support	WR	NAWCAD : Pax River, MD	6.792	1.693	Dec 2014	1.284	Dec 2015	1.739	Dec 2016	-		1.739	Continuing	Continuing	Continuing
Travel	WR	NAVAIR HQ : Pax River, MD	0.546	0.005	Nov 2014	0.005	Nov 2015	0.002	Oct 2016	-		0.002	Continuing	Continuing	Continuing
Prior year Mgmt Services no longer funded in the FYDP	Various	Various : Various	1.050	0.000		0.000		0.000		-		0.000	0.000	1.050	-
		Subtotal	12.431	1.833		1.611		1.860		-		1.860	-	-	-

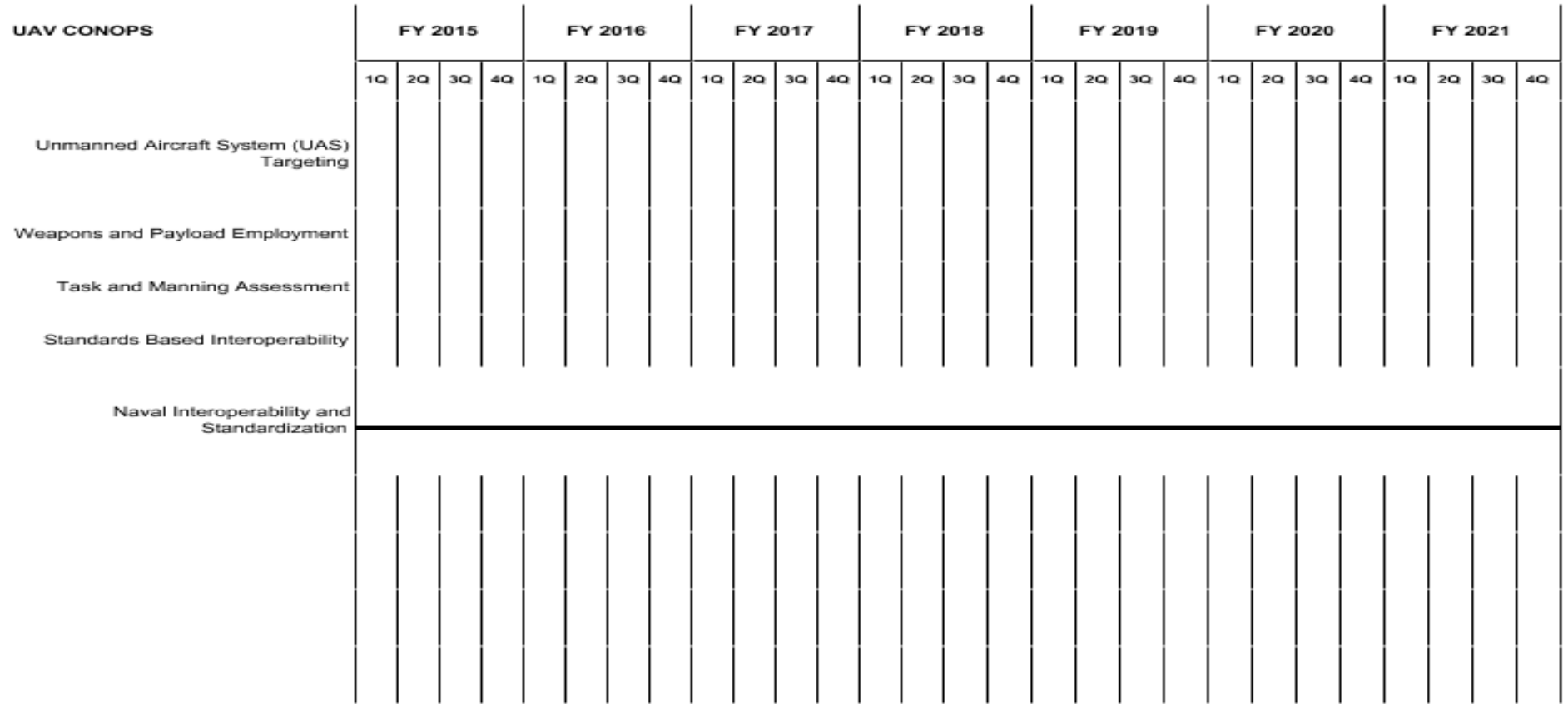
Remarks

Travel contract type is TO.

	Prior Years	FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	64.001	5.870		3.080		3.274		-		3.274	-	-	-

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603261N / *Tactical Airborne Reconnaissance*	**Project (Number/Name)** 2467 / *UAV Conops*



2017OSD - 0603261N - 2467

Exhibit R-4A, RDT&E Schedule Details: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603261N / *Tactical Airborne Reconnaissance*	**Project (Number/Name)** 2467 / *UAV Conops*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
UAV CONOPS				
Naval Interoperability and Standardization: Naval UASs interoperability on Joint Service and International Standardization	1	2015	4	2021

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Exhibit R-2, RDT&E Budget Item Justification: PB 2017 Navy											Date: February 2016	
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 4: *Advanced Component Development & Prototypes (ACD&P)*					R-1 Program Element (Number/Name) PE 0603382N *I Advanced Combat Systems Tech*							
COST ($ in Millions)	**Prior Years**	**FY 2015**	**FY 2016**	**FY 2017 Base**	**FY 2017 OCO**	**FY 2017 Total**	**FY 2018**	**FY 2019**	**FY 2020**	**FY 2021**	**Cost To Complete**	**Total Cost**
Total Program Element	64.083	1.582	1.631	57.034	-	57.034	57.592	57.088	58.292	59.219	Continuing	Continuing
0324: *Adv Combat System Technology*	64.083	1.582	1.631	1.651	-	1.651	1.869	1.855	1.842	1.879	Continuing	Continuing
0385: *Rapid Prototype Development*	0.000	0.000	0.000	40.356	-	40.356	40.633	40.135	41.347	42.218	Continuing	Continuing
0399: *Unmanned Rapid Prototype Development*	0.000	0.000	0.000	15.027	-	15.027	15.090	15.098	15.103	15.122	Continuing	Continuing
Program MDAP/MAIS Code: 180												

A. Mission Description and Budget Item Justification

The Advanced Combat System Technology line is 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 C5I systems programs of record in an open architecture environment. The priority was 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 to maintain and update an information exchange environment to improve transparency of design disclosure and information exchange on past and current investments to support the principle of cross-program reuse, and to provide the tools and leadership for assisting programs through the transition to Naval Open Architecture (OA). The other elements of the OA transformation effort are being realized as management efficiencies within programs. Those elements include ensuring that all naval systems, families of systems, and programs move to modular OA in accordance with Department of Defense (DoD) Instruction 5000.1 dated 12 May 2003 which mandates that all DoD programs utilize open systems architectures to rapidly field affordable and interoperable systems. By direction of the Navy Service Acquisition Executive (SAE), PEO IWS was assigned overall responsibility and authority to direct the Navy's OA effort until that duty transferred to DASN (RDTE) in 2011. The Core OA funding line has remained with PEO IWS. That policy established a need to coordinate acquisition strategies, develop guidance and tools, and develop analysis of alternatives to determine OA software reuse practices within and across the Navy Communities of Interest (COI - Surface, Subsurface, Air, Space, C4I, USMC, and ONR). This project facilitates a strategic shift in the acquisition business process to facilitate cooperative competition in cross-domain/COI business relationships. This improves innovation and economies of scale throughout the Navy and Marine Corps. This leadership effort has identified the business case and potential return on investment for moving the Navy towards an open systems approach, supported the development of open systems technologies, and integrated best business and technical practices for open systems development within Naval acquisition. Naval OA ensures Navy-wide system architectures 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, reuse methodologies, and extensible product lines. In summary, this funding supports the management of a reuse repository and reuse information exchange portal, and the evolving business, systems engineering, and cultural changes required across all Naval programs as they migrate to function in a Joint, net-centric warfare environment.

Exhibit R-2, RDT&E Budget Item Justification: PB 2017 Navy	Date: February 2016
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 0603382N *I Advanced Combat Systems Tech*

Project Unit 0385: The Rapid Prototype Development project is new in FY17 and addresses the advancement and transition of combat systems technology. It supports the goals and objectives of the Chief of Naval Operations (CNO) Navigation Plan, Commandant of the Marine Corps (CMC) Planning Guidance, and the Cooperative Strategy for 21st Century Seapower. This project also supports the Secretary of the Navy's (SECNAV) Innovation Vision and the Implementation Directive for Better Buying Power 3.0. These efforts will reinvigorate and increase the use of prototyping and experimentation to rapidly field new warfighting capabilities, concepts and technologies, and engineering solutions.

The Rapid Prototype Development project With an emphasis on "Field Early" or "Fail Fast" methodologies, the project is intended to expedite the development, exploration and fielding of combat system innovations in six warfighting domains: surface warfare, air warfare, undersea warfare, expeditionary warfare, information dominance and special operations warfare. Prototype development efforts will be used to develop/refine Concepts of Operation (CONOPS) and operational requirements; evaluate the operational utility and technical feasibility of technology/engineering innovations; support limited fielding of prototypes (if required); and mitigate cost, schedule and performance risks associated with follow-on acquisition programs.

Project Unit 0399: The Unmanned Rapid Prototype Development project is new in FY17 and was created to implement the Secretary of the Navy's (SECNAV) reorganization of the department to emphasize unmanned warfare systems and addresses the advancement and transition of naval warfare systems technology. This project funds Navy's prioritized portfolio of unmanned system (UxS) rapid development technology initiatives based on Navy warfighting needs and capability gaps. This project supports the goals and objectives of the Chief of Naval Operations (CNO) Navigation Plan and the Cooperative Strategy for 21st Century Seapower. Additionally, this project supports the Secretary of the Navy's (SECNAV) Innovation Vision and the Implementation Directive for Better Buying Power 3.0. The project will increase the use of rapid prototyping and demonstration to quickly introduce technologically advanced UxS capabilities to the Fleet and provide warfighters with direct opportunities to explore and refine operational concepts.

The Unmanned Rapid Prototype Development project enables a strategic focus on the prioritization of UxS requirements and concepts, development of innovative UxS technologies, and the concurrent development of warfighting capabilities. With emphasis on "Field Early" or "Fail Fast" methodologies, the project will expedite the development, exploration and Fleet introduction of UxS technologies in the warfare areas of Surface, Air, Anti-Submarine, and Expeditionary Warfare, Information Dominance and Special Operations Warfare. The project will provide the Navy and Marine Corps with technical and operational utility assessments of technology/ engineering innovations; ability to refine operational requirements and concepts of operation; support limited fielding of prototypes (as required); and mitigate cost, schedule and performance risk associated with follow-on acquisition programs.

Exhibit R-2, RDT&E Budget Item Justification: PB 2017 Navy					Date: February 2016
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 4: *Advanced Component Development & Prototypes (ACD&P)*			R-1 Program Element (Number/Name) PE 0603382N *I Advanced Combat Systems Tech*		
B. Program Change Summary ($ in Millions)	**FY 2015**	**FY 2016**	**FY 2017 Base**	**FY 2017 OCO**	**FY 2017 Total**
Previous President's Budget	1.639	1.636	1.775	-	1.775
Current President's Budget	1.582	1.631	57.034	-	57.034
Total Adjustments	-0.057	-0.005	55.259	-	55.259
• Congressional General Reductions	-	-0.005			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.057	0.000			
• Rate/Misc Adjustments	0.000	0.000	55.259	-	55.259

Change Summary Explanation

The FY 2017 funding request was reduced by -$0.124 million to account for the availability of prior year execution balances.

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603382N / *Advanced Combat Systems Tech*	Project (Number/Name) 0324 / *Adv Combat System Technology*	

COST ($ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
0324: *Adv Combat System Technology*	64.083	1.582	1.631	1.651	-	1.651	1.869	1.855	1.842	1.879	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Project Unit 0324: Funding is to maintain and update a information exchange environment to improve transparency of design disclosure and information exchange on past and current investments to support the principle of cross-program reuse, and to provide the tools and leadership for assisting programs through the transition to Naval Open Architecture (OA). The other elements of the OA transformation effort are being realized as management efficiencies within programs. Those elements include ensuring that all naval systems, families of systems, and programs move to modular OA in accordance with Department of Defense (DoD) Instruction 5000.1 dated 12 May 2003 which mandates that all DoD programs utilize open systems architectures to rapidly field affordable and interoperable systems. By direction of the Navy Service Acquisition Executive (SAE), PEO IWS was assigned overall responsibility and authority to direct the Navy's OA effort until the duty transferred to DASN (RDTE) in 2011 The Core OA funding line has remained with PEO IWS. That policy established a need to coordinate acquisition strategies, develop guidance and tools, and develop analysis of alternatives to determine OA software reuse practices within and across the Navy Communities of Interest (COI - Surface, Subsurface, Air, Space, C4I, USMC, and ONR). This project facilitates a strategic shift in the acquisition business process to facilitate cooperative competition in cross-domain/COI business relationships. This improves innovation and economies of scale throughout the Navy and Marine Corps. This leadership effort has identified the business case and potential return on investment for moving the Navy towards an open systems approach, supported the development of open systems technologies, and integrated best business and technical practices for open systems development within Naval acquisition. Naval OA ensures Navy-wide system architectures 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, reuse methodologies, and extensible product lines. In summary, this funding supports the management of a reuse repository and reuse information exchange portal, and the evolving business, systems engineering, and cultural changes required across all Naval programs as they migrate to function in a Joint, net-centric warfare environment.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Title: Align the Naval Enterprise Across All Domains to Implement OA	0.272	0.292	0.320	0.000	0.320
Articles:	-	-	-	-	-
FY 2015 Accomplishments: Established transition of programs to fully utilize the principles and practices of OA in accordance with the ASN(RDA) approved Naval OSA Strategy of November 2012. Transitioned the sustainment of the OSA initiative from a unique OA Executive forum to a permanent organization; the Systems Engineering Stakeholders Group. Continued to coordinate and develop the quarterly OA Report to Congress, annual budget submission and					

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603382N / *Advanced Combat Systems Tech*	**Project (Number/Name)** 0324 / *Adv Combat System Technology*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
financial reporting for this project. In FY-15 the Naval OSA Strategy was revisited and updated to stay current with changes in best practices to include all other activities as the SESG, DASN RDT&E or ASN(RDA) directs. ***FY 2016 Plans:*** Continue FY2015 Plan in addition to: Implement Enterprise architecture of modular development and maximum reuse. Promote tailor-able open standards relative to Technical Reference Frameworks attributes. ***FY 2017 Base Plans:*** Continue FY16 Plan in addition to: Extending out reach efforts to increase OSA Adoption to programs of record. ***FY 2017 OCO Plans:*** N/A					
Title: Change the Naval and Marine Corps Cultures to Institutionalize OA Principle	0.373	0.378	0.383	0.000	0.383
Articles:	-	-	-	-	-
FY 2015 Accomplishments: Continued with direct engagement with programs to improve OA principles and practices through stakeholder management, communications, mentoring, training, and curriculum adjustment. Established and maintained communication and transparency across programs to highlight new opportunities for enterprise product reuse and improved interoperability. Sustained a strong message to the public and industry on the value of OA for cost-effective management of the acquisition portfolio. ***FY 2016 Plans:*** Continue with FY2015 Plan in addition to: Adjust funding techniques for cross-Enterprise co-development. Identify best practices and collaborative forums to increase the likelihood of transitioning maturing technology into programs of record. ***FY 2017 Base Plans:*** Continue with FY2016 Plan in addition to: Coordinate the development of information systems to assist in using Technical Reference Frameworks for common platforms. ***FY 2017 OCO Plans:***					

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603382N / *Advanced Combat Systems Tech*	**Project (Number/Name)** 0324 / *Adv Combat System Technology*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
N/A					
Title: OA Systems Engineering Leadership	0.375	0.395	0.415	0.000	0.415
Articles:	-	-	-	-	-
FY 2015 Accomplishments: Key activities of the third year of the strategy include inter-program alignment toward the use of common technical frameworks. Established transition of programs to fully utilize the principles and practices of OA in accordance with the ASN(RDA) approved Naval OSA Strategy of November 2012. Established collaboration and cooperation incentives, and improved techniques for finding and using modular capabilities. Completed the transformation of oversight and governance of programs that are implementing or have implemented OA principles and practices through mechanisms such as Community of Interest forums, Technical Authority, Technical Warrant Holders and Product DASN engagments.					
FY 2016 Plans: Continue FY2015 Plan in addition to: Adjust incentives for collaboration and cooperation between programs. Establish reward mechanisms for programs and personnel successful in achieving OSA implementations that rapidly integrate innovation and lower total ownership costs.					
FY 2017 Base Plans: Continue with FY2016 Plan in addition to: Sponsor Communities of Interest to support cooperation between programs.					
FY 2017 OCO Plans: N/A					
Title: Knowledge Products for Implementing OSA	0.562	0.566	0.533	0.000	0.533
Articles:	-	-	-	-	-
FY 2015 Accomplishments: Evolved the Program Managers OSA Workbook and other associated knowledge products to position Naval Programs to take advantage of consistent business and technical practices. Established collaboration forums so that best practices can be shared so that the OA related knowledge products are kept up to date with the latest innovations being used in program execution. This included working with outside organizations such as DISA's Forge.mil as well as the Navy's NSERC/NARS environments. Ensured that DAU is addressing training on OSA as directed to them under the Better Buying Power implementation memo that assigns DASN RDT&E					

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603382N / *Advanced Combat Systems Tech*	**Project (Number/Name)** 0324 / *Adv Combat System Technology*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
the lead for providing baseline information for curriculum development. Continued to develop new training on OA, including deployment of Naval unique training on OA throughout the SYSCOMs and PEOs. ***FY 2016 Plans:*** Continue FY2015 Plan in addition to: Minimize DAU courses to fill needed knowledge gaps. Establish an OSA mentoring program for acquisition professionals. ***FY 2017 Base Plans:*** Continue with FY2016 Plan in addition to: Continue to support update DAU courses and the OSA Program Manager's workbook. ***FY 2017 OCO Plans:*** N/A					
Accomplishments/Planned Programs Subtotals	1.582	1.631	1.651	0.000	1.651

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

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 Business Case Analysis (BCA) baselines for future system changes and spiral developments.

E. Performance Metrics

Change Naval Processes and business practices to cost-effectively innovate and deploy improved warfighting capability based on fleet requirements. Provide OA Systems Engineering to field common, interoperable capabilities; Change Navy and Marine Corps Business processes to Institutionalize OA Principles.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603382N / *Advanced Combat Systems Tech*	Project (Number/Name) 0324 / *Adv Combat System Technology*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
SE/OA Domain Support	C/FP	APL/ IET Contract : VARIOUS	2.007	0.569	Nov 2014	0.653	Nov 2015	0.569	Nov 2016	-		0.569	0.000	3.798	Continuing
Systems Engineering	MIPR	NSWC / Dahlgren : Dahlgren, VA	13.059	0.248	Nov 2014	0.261	Nov 2015	0.284	Nov 2016	-		0.284	Continuing	Continuing	Continuing
Systems Engineering	WR	NSWC/CRANE, Carderock, DISA : VARIOUS	2.854	0.265	Dec 2014	0.205	Dec 2015	0.213	Dec 2016	-		0.213	0.000	3.537	Continuing
Systems Engineering	C/CPAF	ASSETT; Lockheed Martin, NJ; Gartner, VA : Washington DC	5.114	0.000		0.000		0.000		-		0.000	0.000	5.114	Continuing
OA DOMAIN SUPPORT	WR	NUWC/Newport, Spawar, Navair : VARIOUS	11.931	0.000		0.000		0.000		-		0.000	0.000	11.931	Continuing
SE/Signal Processor	C/CPAF	Lockheed Martin : VARIOUS	6.000	0.000		0.000		0.000		-		0.000	0.000	6.000	Continuing
SE/Signal Processor	C/CPAF	BAE : VARIOUS	0.300	0.000		0.000		0.000		-		0.000	0.000	0.300	Continuing
SE/Signal Processor	C/CPAF	Raytheon : VARIOUS	0.100	0.000		0.000		0.000		-		0.000	0.000	0.100	Continuing
SE/Signal Processor	WR	NSWC/DD, NRL, PHD : VARIOUS	0.600	0.000		0.000		0.000		-		0.000	0.000	0.600	Continuing
		Subtotal	41.965	1.082		1.119		1.066		-		1.066	-	-	-

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Industry Development	C/FP	IBM, ANGLE, TBD (New IET Contract) : VARIOUS	9.432	0.373	Nov 2014	0.000		0.000		-		0.000	0.000	9.805	Continuing
Technical Data-Academia	WR	NPS-Monterey/DAU : MONTEREY, CA	2.221	0.127	Nov 2014	0.000		0.000		-		0.000	0.000	2.348	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603382N / *Advanced Combat Systems Tech*	Project (Number/Name) 0324 / *Adv Combat System Technology*	

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Software Development	C/FP	TRIDENT, ASSET : VARIOUS	0.309	0.000		0.000		0.000		-		0.000	0.000	0.309	Continuing
		Subtotal	11.962	0.500		0.000		0.000		-		0.000	0.000	12.462	-

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Operational Test & Evaluation	WR	NSWC/DD : DAHLGREN, VA	2.216	0.000		0.000		0.000		-		0.000	0.000	2.216	Continuing
OA Asset Repository (SBIR Account)	WR	Miscellaneous : VARIOUS	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	-

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Support	C/CPAF	Miscellaneous : VARIOUS	3.021	0.000		0.378	Nov 2015	0.390	Nov 2016	-		0.390	Continuing	Continuing	Continuing
SBIR Assessment (Cong Add)	WR	NSWC/DD : DAHLGREN, VA	4.748	0.000		0.134	Nov 2015	0.195	Nov 2016	-		0.195	0.000	5.077	Continuing
DAWDF	TBD	TBD : TBD	0.021	0.000		0.000		0.000		-		0.000	0.000	0.021	Continuing
		Subtotal	7.790	0.000		0.512		0.585		-		0.585	-	-	-

	Prior Years	FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	64.083	1.582		1.631		1.651		-		1.651	-	-	-

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603382N / *Advanced Combat Systems Tech*	**Project (Number/Name)** 0324 / *Adv Combat System Technology*

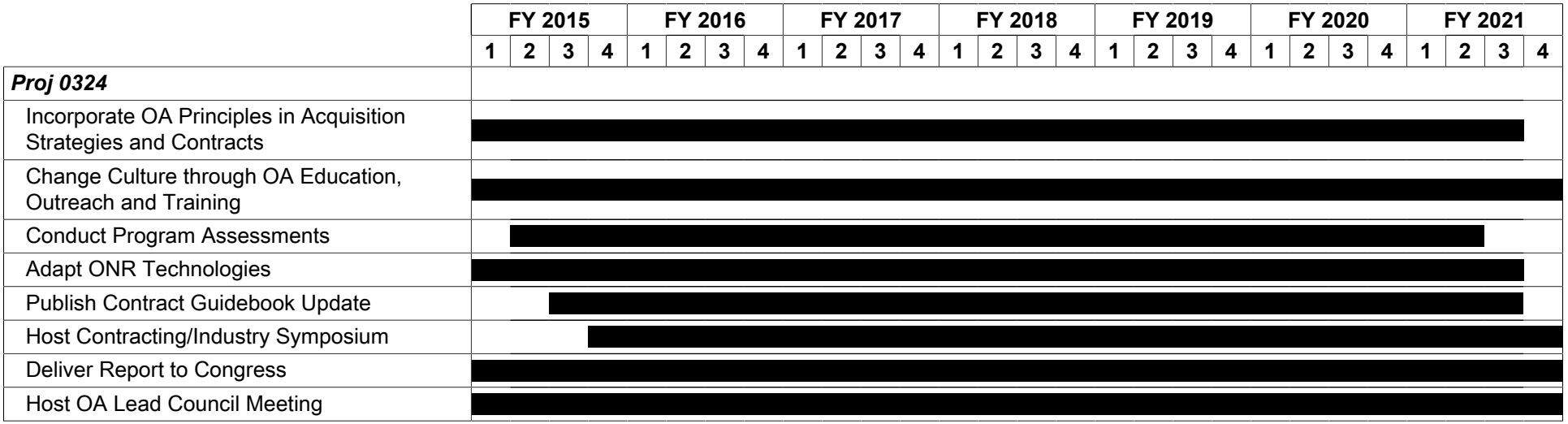

Exhibit R-4A, RDT&E Schedule Details: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603382N / *Advanced Combat Systems Tech*	**Project (Number/Name)** 0324 / *Adv Combat System Technology*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 0324				
Incorporate OA Principles in Acquisition Strategies and Contracts	1	2015	3	2021
Change Culture through OA Education, Outreach and Training	1	2015	4	2021
Conduct Program Assessments	2	2015	2	2021
Adapt ONR Technologies	1	2015	3	2021
Publish Contract Guidebook Update	3	2015	3	2021
Host Contracting/Industry Symposium	4	2015	4	2021
Deliver Report to Congress	1	2015	4	2021
Host OA Lead Council Meeting	1	2015	4	2021

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603382N / *Advanced Combat Systems Tech*	Project (Number/Name) 0385 / *Rapid Prototype Development*	

COST ($ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
0385: *Rapid Prototype Development*	0.000	0.000	0.000	40.356	-	40.356	40.633	40.135	41.347	42.218	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

Note

This project is new in FY2017. Beginning in FY17, funding for the CNO Rapid Innovation Cell (CRIC) (Project 2140) is realigned from PE 0604707N Space and Electronic Warfare (SEW) Architecture/Eng, as well as funding from the Rapid Technology Transition (RTT) program from PE 0203761N to support to rapid prototype development in support of the CNO's Design for Maintaining Superiority strategy and lines of effort that focus on warfighting and learning faster.

A. Mission Description and Budget Item Justification

Department of Navy (DON) leadership has acknowledged that maintaining maritime superiority depends in part on our ability to accelerate the speed of warfighting and technological innovations in order to extend our advantage to offset our adversary's growing capabilities. The Rapid Prototype Development project supports the goals and objectives of the Chief of Naval Operations (CNO) Navigation Plan and Design for Maintaining Maritime Superiority, Commandant of the Marine Corps (CMC) Planning Guidance, and the Cooperative Strategy for 21st Century Seapower, and is fundamental to the DON's efforts to improve our acquisition outcomes. This project is aligned with, and in direct response to, calls for increased prototyping and experimentation in USD(AT&L)'s Better Buying Power 3.0, Secretary of the Navy's (SECNAV) Task Force Innovation direction, and the CNO direction to Achieve High Velocity Learning at Every Level. These efforts will reinvigorate and increase the use of prototyping and experimentation to rapidly field new warfighting capabilities, concepts and technologies, and engineering solutions faster than the typical budget cycle time.

The Rapid Prototype Development project funds a strategic focus on rapid prototyping and experimentation of innovative combat system technologies and engineering innovations to explore Fleet-proposed capability concepts and needs, as well as foster advancements in naval warfighting capabilities. With an emphasis on "Field Early" or "Fail Fast" methodologies, the project is intended to expedite the development, exploration and fielding of technology and engineering prototypes to provide advanced warfighting capabilities, new technologies and engineering innovations across all Naval warfighting domains. Prototype development efforts will be used to inform/refine Concepts of Operation (CONOPS) and operational requirements; evaluate the operational utility and technical feasibility of technology/engineering innovations; support limited fielding of prototypes; and mitigate cost, schedule and performance risks associated with follow-on acquisition programs.

By fully leveraging the scientific and engineering expertise and technical infrastructure within the Naval Research and Development Establishment (NR&DE), and in collaboration with, and support of, the Fleet Forces Command, Naval Warfighting Development Centers, Naval Warfare Development Command, and the Marine Corps Combat Development and Integration Command, this project will produce sensor, weapon system, and command, control, and communications prototypes to address naval warfighting challenges and/or to pursue future naval warfighting concepts. Additionally, new and emerging technologies and engineering innovations that offer the potential to reduce cost, increase readiness, or improve the overall efficiency or effectiveness of naval forces will be explored. A key distinction is that the process and battle rhythm is designed for optimal responsiveness to Fleet needs.

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603382N / *Advanced Combat Systems Tech*	**Project (Number/Name)** 0385 / *Rapid Prototype Development*

The DON will work with Congress in accordance with an agreed-to framework of governance and oversight that will ensure the effective and efficient use of this funding for its intended purpose.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Title: Rapid Prototype Development, Experimentation and Demonstration	0.000	0.000	40.356	0.000	40.356
Articles:	-	-	-	-	-
Description: Technologies, innovations, and threats continually emerge and require rapid response. Pre-set, yearly, or even quarterly proposal/review cycles are not sufficiently responsive to the dynamic nature of cutting-edge technological breakthroughs, engineering innovations, new operational concepts, and/or emerging threats. The DON has developed a responsive and agile Department wide approach for Rapid Prototyping, Experimentation, and Demonstration (RPED). The approach: - improves alignment across Fleet and Marine Corps forces, Requirements, Budgeting, and Research & Development organizations to prioritize initiatives and streamline management and execution of rapid prototyping and experimentation, - allows the DON to "learn fast" through prototyping - completing projects as rapidly as possible to improve follow-on system acquisition decisions before incurring significant costs, - replaces the current Speed-to-Fleet process, - and unleashes the intrinsic ingenuity of the Navy's Science and Technology (S&T) community, the NR&DE, and our talented Sailors and Marines. In response to Fleet needs, the RPED approach will identify and select prototyping initiatives based on direct and continuous Fleet engagements. Integrated teams consisting of scientists and engineers from across the NR&DE are promptly deployed to interact with Fleet Commands, the Navy Warfare Development Command, and Warfighting Development Centers. The entire project initiation cycle will be completed in less than twelve weeks. The RPED approach considers maturing S&T technologies and engineering innovations produced through Future Naval Capabilities , Innovative Naval Prototypes , Naval Innovative Science and Engineering (NISE) Section 219, Emerging Capabilities and Prototypes, and commercial technologies as potential prototypes. Direct and continuous interactions between our scientists and engineers and the operators they support will drive innovation and, more importantly, align technical ideas with operational needs at the earliest stages in prototype development and experimentation. Prototypes are used to refine operational concepts and requirements through experimentation campaigns making maximum use of tools, ranges, and test facilities readily available within our NR&DE and Fleet experimentation venues. Prototypes will be demonstrated to the operational forces in less than 24 months.					

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603382N / *Advanced Combat Systems Tech*	**Project (Number/Name)** 0385 / *Rapid Prototype Development*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Deliverables include actual integrated hardware/software prototype system(s) and experimentation events, CONOPS, requirements analysis, test report(s), and technical data package(s) to support experimentation events, limited fielding decisions, and to inform leadership decisions on the development of an acquisition program. ***FY 2015 Accomplishments:*** N/A ***FY 2016 Plans:*** N/A ***FY 2017 Base Plans:*** The FY 2017 execution plan will be finalized in Q4 FY 2016 and will address the key focus areas outlined below. It is important to note that we will continuously assess prototype initiatives to ensure we are responding to Fleet needs and priorities. 1. Electromagnetic Maneuver Warfare Electromagnetic Maneuver Warfare (EMW) is the Navy and Marine Corps warfighting approach to gain decisive military advantage in the electromagnetic spectrum, to enable freedom of action across all naval mission areas. Advanced components and prototypes will demonstrate multi-spectral sensors; passive detection, tracking, and targeting systems; real time spectrum awareness; robust, resilient circuits, transceivers, links; electronic protection; emissions management; spread spectrum techniques; deception and decoys; electronic attack (including directed energy); networked sensors and weapon systems; battle management aids; or cyber situational awareness, security, and operations. 1.1 Battlespace Awareness Emerging technology and engineering innovations from Naval/DoD research and development, industry, and academia will be integrated to demonstrate intelligence, surveillance, reconnaissance (ISR), and targeting support. Advanced sensing capabilities (ship-, airborne-, and ground-based; multi-, hyper-spectral, and other) capable of long-range sensing and discrimination are required to understand electromagnetic emissions and ultimately produce fire control quality data. This work will explore the warfighting utilization of emerging naval innovations such as Tactical Nighttime Wide-Area Surveillance, Ultra Wide Field Of View (FOV) Area Surveillance, and others.					

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603382N / *Advanced Combat Systems Tech*	**Project (Number/Name)** 0385 / *Rapid Prototype Development*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
- Survey naval research and development, industry and academia sources for emerging sensors and processing capabilities. - Conduct trade studies to support CONOPS refinement. - Develop prototypes and perform sub-system and integration testing. - Conduct experiments at naval labs and test ranges. - Assess technical performance and operational utility at focused events such as Rim of the Pacific Exercise (RIMPAC) 2018. - Develop objectives for follow-on Fleet experiments that include alternative technologies, more robust capabilities, or alternative employment scenarios. - Assess and support INP and other emerging technologies for transition to acquisition through prototyping and experimentation. 1.2 Naval Tactical Data Links and Networks Emerging technology and engineering innovations from Naval/DoD research and development, industry, and academia will be integrated to demonstrate secure, reliable, collection, analysis, and fusion of ISR and targeting data from organic assets and sensors. This work will explore the warfighting utilization of emerging naval and industry innovations, to include INPs , such as multiple, simultaneous, wideband data links, for signal and imagery data transmission between organic assets and Battle Group level processing systems. Technologies with the potential to provide Unit-level access to ISR data will be submitted to the Fleet for experimentation. Project will integrate mature technologies developed through naval investments in the areas of low probability of intercept and detection techniques, high data rate, long-range, multi-band and wide-band links, networked and software defined modes, and encryption and signal processing technologies, as well as various Nemesis modules. - Conduct requirements analysis in support of CONOPS refinement. - Complete design and demonstration objective reviews. - Perform sub-system and integration testing. - Conduct experiments in a simulated maritime relevant environment. - Assess technical performance and operational utility. - Submit to Fleet experimentation venues such as the Naval Tactical Data Network at-sea experiment. - Assess technical performance and operational utility. - Develop objectives for follow-on experiments that include alternative technologies, more robust capabilities, or alternative employment scenarios.					

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603382N / *Advanced Combat Systems Tech*	**Project (Number/Name)** 0385 / *Rapid Prototype Development*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
- Assess and support INP and other emerging technologies for transition to acquisition through prototyping and experimentation. 1.3 Counter ISR and Targeting Emerging technology and engineering innovations from Naval/DoD research and development, industry, and academia will be integrated to demonstrate directed energy and other prototype systems to counter enemy ISR and targeting systems, conduct electronic attack, and deploy jammers and decoys. . This work will explore the warfighting utilization of emerging naval and industry innovations, such as High Power Radio Frequency Counter-UAS, Tactical EO-IE-SIGINT Integrated for Targeting, various Nemesis modules as well as other prototypes which, due to the nature of those projects, specific applications and detailed plans are available at a higher classification level. - Technical assessment of emerging sensors, systems, and processing capabilities. - Participate and provide technical inputs to planned naval tabletop workshops, mission planning events, and wargames such as those planned in support of the Naval Integrated Fires Campaign. - Complete design and demonstration objective reviews. - Perform sub-system and integration testing. - Conduct experiments against threat surrogates in a maritime relevant environment. - Assess technical performance and operational utility. - Develop objectives for follow-on wargames and Trident Warrior/Rim of the Pacific (RIMPAC 2018). - Assess and support INP and other emerging technologies for transition to acquisition through prototyping and experimentation. 1.4 Data Fusion and Tactical Decision Aid Emerging technology and engineering innovations from Naval/DoD research and development, industry, and academia will be integrated to demonstrate automated data-fusion engines and networked tactical decision aids which leverage networked sensors, radars, combat systems, and weapons to overcome single-platform limitations. This work will explore the warfighting utilization of emerging naval and industry innovations, to include INPs, autonomous data fusion and processing modules, various Nemesis modules, as well as other prototypes. - Conduct requirements analysis in support of CONOPS refinement. - Complete demonstration objective reviews. - Software development and integration testing. - Conduct experiments in a simulated maritime relevant environment. - Assess technical performance and operational utility.					

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603382N / *Advanced Combat Systems Tech*	**Project (Number/Name)** 0385 / *Rapid Prototype Development*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
- Human System Interface (HSI) assessments. - Develop objectives for follow-on experiments that include alternative technologies, more robust capabilities, or alternative employment scenarios. - Assess and support INP and other emerging technologies for transition to acquisition through prototyping and experimentation. 2. Undersea Dominance Undersea Dominance is focused on developing advanced components and prototypes to compliment the submarine force with affordable fixed and mobile arrays, distributed netted sensors, autonomous systems, and advanced payloads. Technologies with the potential to close anti-submarine warfare and mine warfare warfighting gaps will be submitted to the undersea dominance operating concept and mine warfare at-sea experiments. 2.1 Advanced Payloads and Sensors Emerging technology and engineering innovations from Naval/DoD research and development, industry, and academia will be integrated to demonstrate advanced payloads and sensors to support anti-submarine and mine warfare missions. This work will explore the warfighting utilization of emerging naval and industry innovations such as Remote Aerial Sonar and Communications Acoustic Laser System, Acoustic Communications modules that enable collaborative mission execution between distributed systems such as the heavy weight torpedo, Compact Rapid Attack Weapon, and Compact Modular Sensor and processing Suite as well as other projects which due to their nature, specific applications and detailed plans are available at a higher classification level. - Update requirements and CONOPS based on emerging technology and experimentation results - Conduct delta-design and delta-demonstration objective reviews - Perform acoustic sub-system and integration testing with airborne platform - Conduct experiments at Naval test ranges - Assess technical performance and operational utility - Submit to undersea dominance operating concept at-sea Fleet experiment - Assess and support INP and other emerging technologies for transition to acquisition through prototyping and experimentation. 2.2 Advanced Undersea Weapons					

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603382N / *Advanced Combat Systems Tech*	**Project (Number/Name)** 0385 / *Rapid Prototype Development*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Advanced Undersea Weapons initiatives provide limited area denial capability to support Fleet operations. This work will explore the warfighting utilization of emerging naval and industry innovations such as the Multi-Compact Very Light Weight Torpedo Launcher, High Speed Electric Propulsion for the Anti-Torpedo Torpedo as well as other projects which, due to their nature, specific applications and detailed plans, are available at a higher classification level. - Provide technical input to workshops and wargames such as the Undersea Innovation Seminar War Game. - Conduct delta-design and delta-demonstration objective reviews. - Sub-system and integration testing into such programs as the ultra-lightweight torpedo. - Conduct experiments at Naval test ranges. - Assess technical performance and operational utility. - Submit experiments to mine warfare at-sea Fleet experiments such as the Undersea Domain Operation Concept at-sea experiment. - Develop objectives for follow-on experiments that include alternative technologies, more robust capabilities, or alternative employment scenarios. - Assess and support INP and other emerging technologies for transition to acquisition through prototyping and experimentation. 3. Surface Dominance Surface Dominance is focused on a fleet initiative to give the operational commander options to employ naval combat power in any anti-access/area-denial (A2/AD) environment. The emergence of sophisticated sea-denial strategies has driven a need to shift to an offensive imperative to control the seas. Increasing surface-force distributed lethality in offensive weapons and associated concept of operations need more strike options for joint-force commanders and add battlespace complexity to an adversary's calculus. The prototypes and associated experiments will explore new concepts in Naval force employment and enforce the core competencies of sea control when applied with bold new offensive methods. Prototypes in this area will explore: 1. Identification of advanced research in the sensors and weapons that can be used to project power and counter rapidly evolving missile, air, submarine, and surface threats that challenge our ability to establish dominance at the times and places of our choosing. 2. Development and exploration of new sensors and planning tools that will address a more complex targeting problem while creating more favorable conditions to project power where required.					

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603382N / *Advanced Combat Systems Tech*	**Project (Number/Name)** 0385 / *Rapid Prototype Development*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
3. Experimentation with technologies and methods to more fully integrate the Navy and Marine Corps combat team to provide persistent presence that can influence and control events at sea and in the littorals. 4. Provide feedback to the planning and production of weapons, sensor, tactical tools and employment methods to address a more broadly deployed lethality. 3.1 Weapon Systems and Integration This project will explore innovative and emerging electronics and control systems, sensors, payloads, and weapons technologies that have the capability of upgrading the offensive capability of surface combatants. Rapidly integrate and demonstrate weapon system prototypes into existing and modular weapon systems to demonstrate increased lethality, range and effectiveness. This work will explore the warfighting utilization of emerging naval and industry innovations, such as advanced gun systems and propelling charge designs, low cost imaging terminal seekers, enhanced lethality warheads, and directed energy technologies. - Assess and support INPs, naval research and development emerging technologies, and industry innovations - Alternative weapon platform/payload concept optimization study - Conduct demonstration objective review - Provide technical inputs to Fleet Battle experiments and wargames - Perform sub-system and tactical decision aid integration testing - Conduct range tests - Using experimentation, assess technical performance and operational utility. - Experimentation planning for multiple alternative platforms in a maritime relevant environment. 3.2 Persistent Over-the-Horizon Engagement This aspect of the campaign will concentrate on how to use alternative weapon concepts and the integration of innovative payloads. This work will explore the warfighting utilization of emerging naval research and development and industry innovations, such as the various Nemesis modules the nature of which, specific applications and detailed plans are available at a higher classification level. - Conduct requirements and trade space analysis in support of CONOPS refinement. - Complete design and demonstration objective reviews. - Perform sub-system and integration testing. - Conduct experiments in a maritime relevant environment during Trident Warrior and RIMPAC exercises. - Assess technical performance and operational utility. - Develop objectives for follow-on experiments that include alternative technologies, more robust capabilities, or alternative employment scenarios.					

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603382N / *Advanced Combat Systems Tech*	**Project (Number/Name)** 0385 / *Rapid Prototype Development*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
- Assess INP and other emerging technologies for transition to acquisition through prototyping and experimentation ***FY 2017 OCO Plans:*** N/A					
Accomplishments/Planned Programs Subtotals	0.000	0.000	40.356	0.000	40.356

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

The strategy for this non-acquisition program is to fully leverage the scientific and engineering expertise and technical infrastructure within the Naval Research and Development Establishment (NR&DE), and in collaboration with and support of the Fleet Forces Command, Naval Warfighting Development Centers, Naval Warfare Development Command, and the Combat Development and Integration Command, produce technology and engineering solutions to address naval warfighting challenges and to develop innovations in future Naval warfighting concepts and capabilities.

E. Performance Metrics

Performance metrics are specific to each of the projects funded. All will include measures identified in the Statement of Objectives (SOO), including completions, successes, terminations, and iterative prototype cycle times reported against schedules and deliverables stated in the requirement documents.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603382N / *Advanced Combat Systems Tech*	**Project (Number/Name)** 0385 / *Rapid Prototype Development*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Prototype Development, Experimentation and Demonstration	PO	NRL : Washington, DC	0.000	0.000		0.000		4.261	Jan 2017	-		4.261	Continuing	Continuing	Continuing
Prototype Development, Experimentation and Demonstration	PO	NSWC : Various	0.000	0.000		0.000		9.668	Jan 2017	-		9.668	Continuing	Continuing	Continuing
Prototype Development, Experimentation and Demonstration	PO	NUWC : Various	0.000	0.000		0.000		8.679	Jan 2017	-		8.679	Continuing	Continuing	Continuing
Prototype Development, Experimentation and Demonstration	PO	SPAWAR : Various	0.000	0.000		0.000		8.739	Jan 2017	-		8.739	Continuing	Continuing	Continuing
Prototype Development, Experimentation and Demonstration	PO	NAWC : Various	0.000	0.000		0.000		9.009	Jan 2017	-		9.009	Continuing	Continuing	Continuing
		Subtotal	0.000	0.000		0.000		40.356		-		40.356	-	-	-

	Prior Years	FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	0.000		0.000		40.356		-		40.356	-	-	-

Remarks

Support and Test and Evaluation costs are directly associated with the delivery of the primary product and included in the product development cost category for rapid prototype development, experimentation and demonstration cost categories.

Exhibit R-4, RDT&E Schedule Profile: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603382N / *Advanced Combat Systems Tech*	**Project (Number/Name)** 0385 / *Rapid Prototype Development*

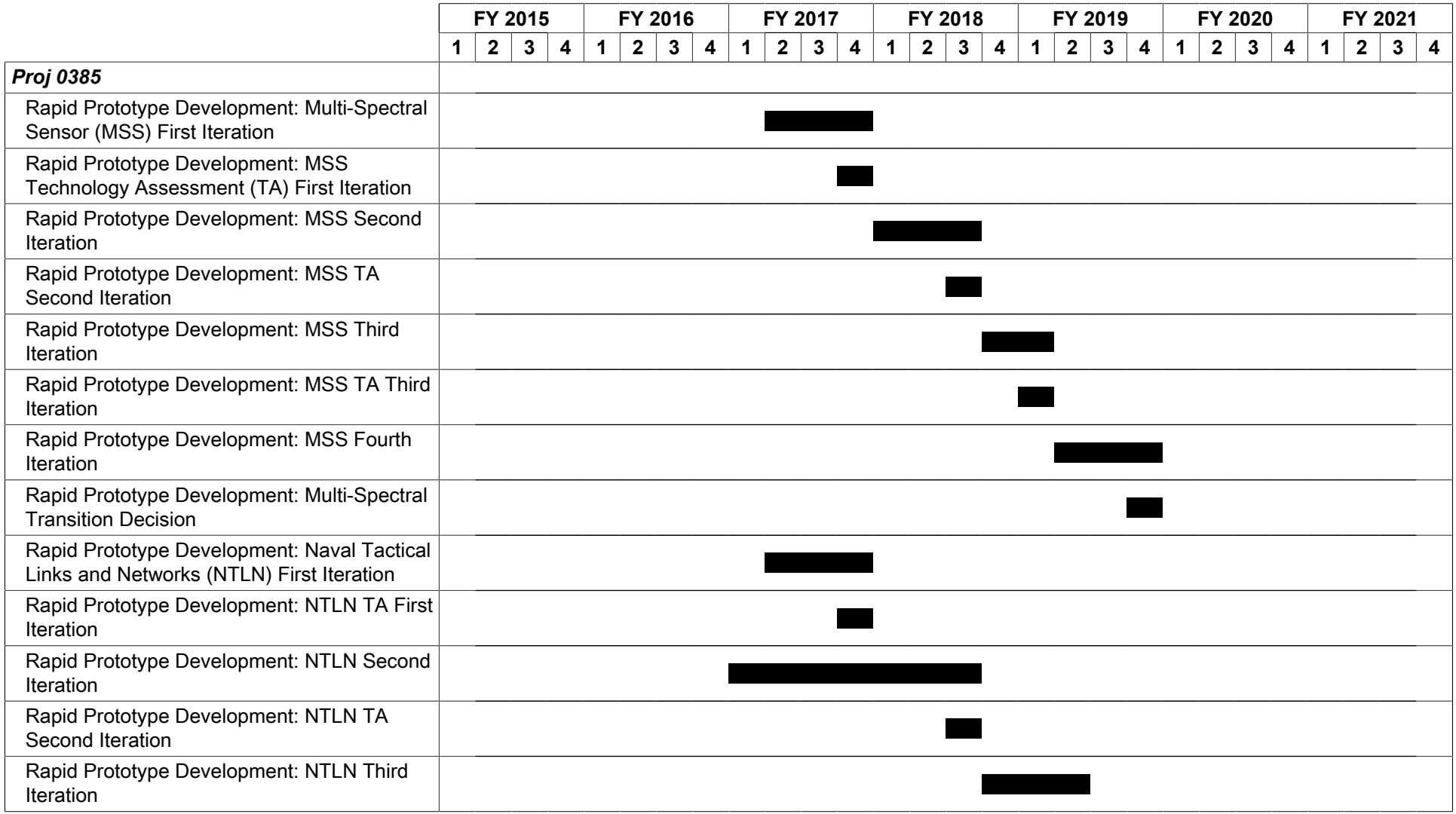

Exhibit R-4, RDT&E Schedule Profile: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603382N / *Advanced Combat Systems Tech*	**Project (Number/Name)** 0385 / *Rapid Prototype Development*

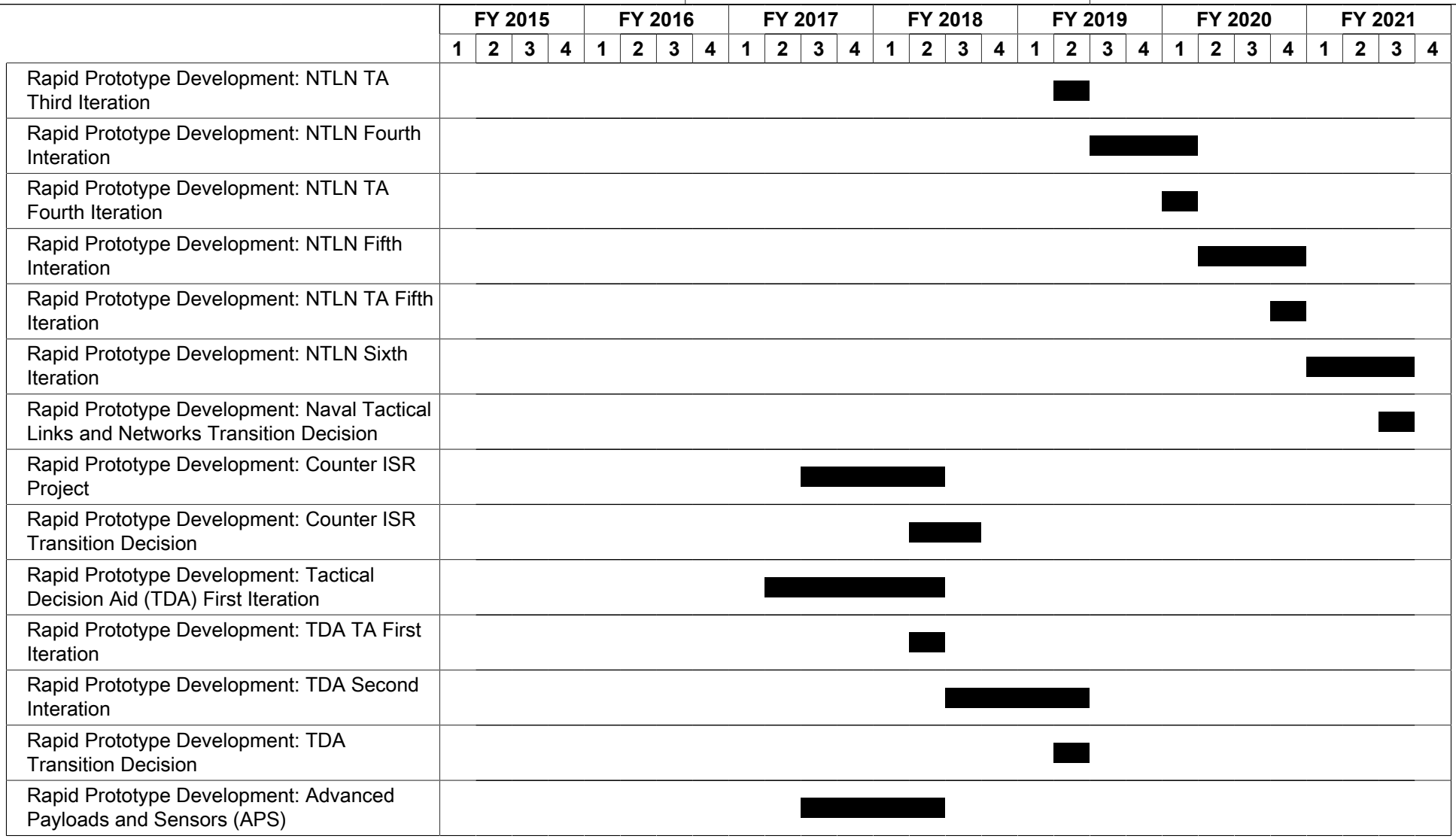

Exhibit R-4, RDT&E Schedule Profile: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603382N / *Advanced Combat Systems Tech*	**Project (Number/Name)** 0385 / *Rapid Prototype Development*

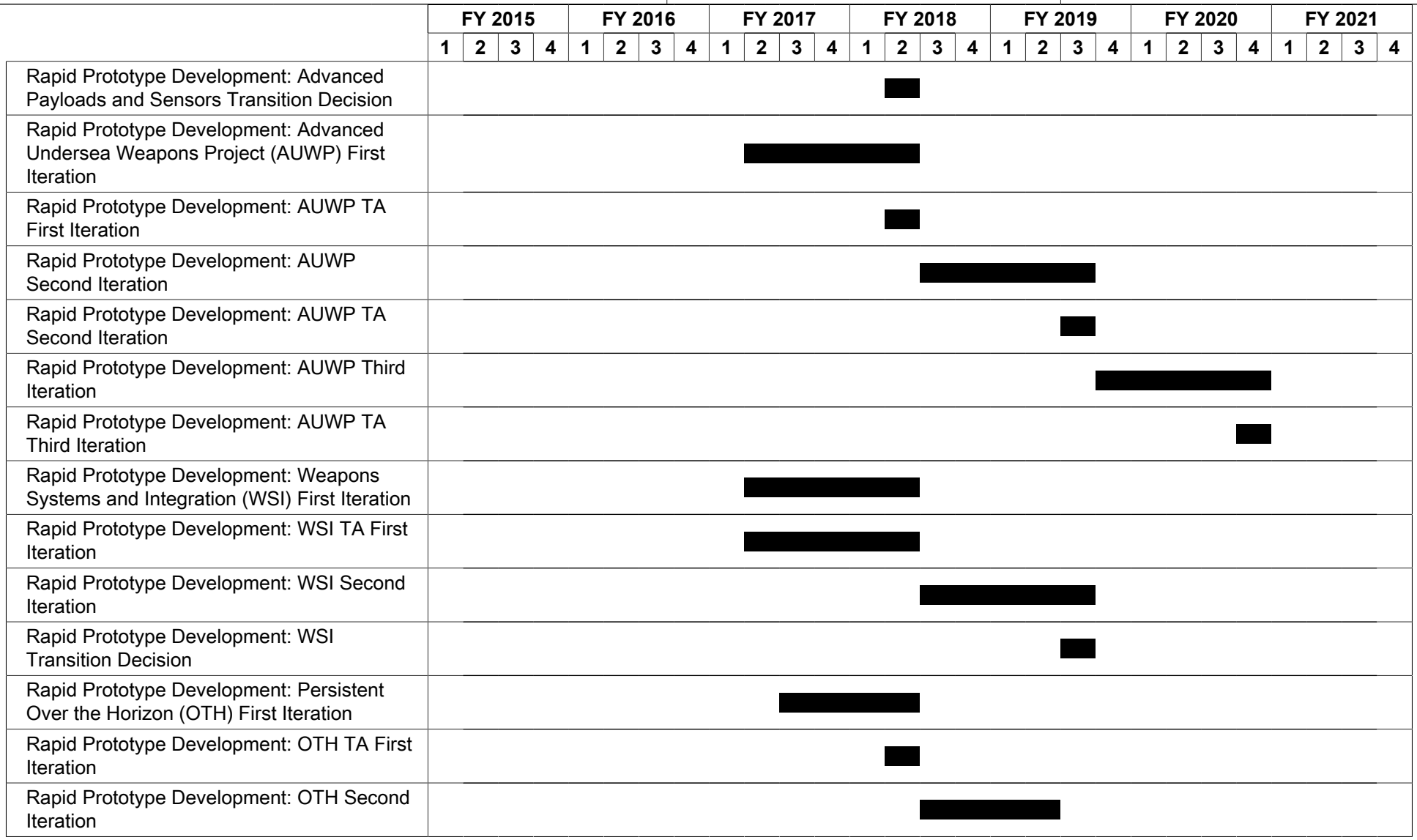

Exhibit R-4, RDT&E Schedule Profile: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603382N / *Advanced Combat Systems Tech*	**Project (Number/Name)** 0385 / *Rapid Prototype Development*

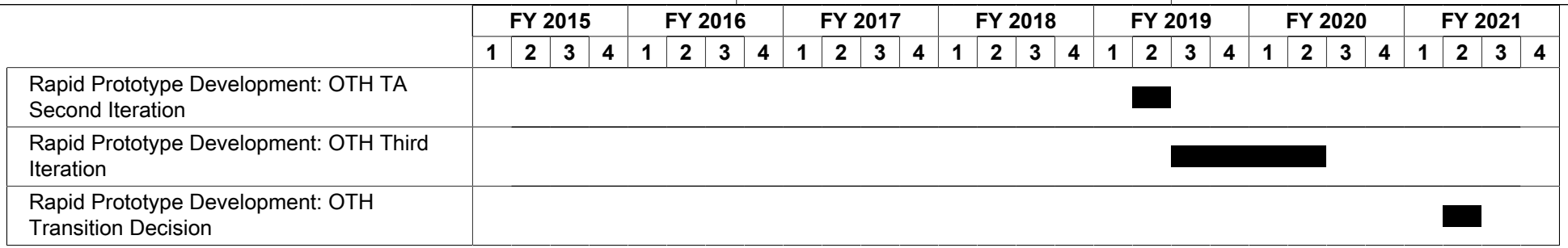

Exhibit R-4A, RDT&E Schedule Details: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603382N / *Advanced Combat Systems Tech*	**Project (Number/Name)** 0385 / *Rapid Prototype Development*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 0385				
Rapid Prototype Development: Multi-Spectral Sensor (MSS) First Iteration	2	2017	4	2017
Rapid Prototype Development: MSS Technology Assessment (TA) First Iteration	4	2017	4	2017
Rapid Prototype Development: MSS Second Iteration	1	2018	3	2018
Rapid Prototype Development: MSS TA Second Iteration	3	2018	3	2018
Rapid Prototype Development: MSS Third Iteration	4	2018	1	2019
Rapid Prototype Development: MSS TA Third Iteration	1	2019	1	2019
Rapid Prototype Development: MSS Fourth Iteration	2	2019	4	2019
Rapid Prototype Development: Multi-Spectral Transition Decision	4	2019	4	2019
Rapid Prototype Development: Naval Tactical Links and Networks (NTLN) First Iteration	2	2017	4	2017
Rapid Prototype Development: NTLN TA First Iteration	4	2017	4	2017
Rapid Prototype Development: NTLN Second Iteration	1	2017	3	2018
Rapid Prototype Development: NTLN TA Second Iteration	3	2018	3	2018
Rapid Prototype Development: NTLN Third Iteration	4	2018	2	2019
Rapid Prototype Development: NTLN TA Third Iteration	2	2019	2	2019
Rapid Prototype Development: NTLN Fourth Interation	3	2019	1	2020
Rapid Prototype Development: NTLN TA Fourth Iteration	1	2020	1	2020
Rapid Prototype Development: NTLN Fifth Interation	2	2020	4	2020
Rapid Prototype Development: NTLN TA Fifth Iteration	4	2020	4	2020
Rapid Prototype Development: NTLN Sixth Iteration	1	2021	3	2021
Rapid Prototype Development: Naval Tactical Links and Networks Transition Decision	3	2021	3	2021

Exhibit R-4A, RDT&E Schedule Details: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603382N / *Advanced Combat Systems Tech*	**Project (Number/Name)** 0385 / *Rapid Prototype Development*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Rapid Prototype Development: Counter ISR Project	3	2017	2	2018
Rapid Prototype Development: Counter ISR Transition Decision	2	2018	3	2018
Rapid Prototype Development: Tactical Decision Aid (TDA) First Iteration	2	2017	2	2018
Rapid Prototype Development: TDA TA First Iteration	2	2018	2	2018
Rapid Prototype Development: TDA Second Interation	3	2018	2	2019
Rapid Prototype Development: TDA Transition Decision	2	2019	2	2019
Rapid Prototype Development: Advanced Payloads and Sensors (APS)	3	2017	2	2018
Rapid Prototype Development: Advanced Payloads and Sensors Transition Decision	2	2018	2	2018
Rapid Prototype Development: Advanced Undersea Weapons Project (AUWP) First Iteration	2	2017	2	2018
Rapid Prototype Development: AUWP TA First Iteration	2	2018	2	2018
Rapid Prototype Development: AUWP Second Iteration	3	2018	3	2019
Rapid Prototype Development: AUWP TA Second Iteration	3	2019	3	2019
Rapid Prototype Development: AUWP Third Iteration	4	2019	4	2020
Rapid Prototype Development: AUWP TA Third Iteration	4	2020	4	2020
Rapid Prototype Development: Weapons Systems and Integration (WSI) First Iteration	2	2017	2	2018
Rapid Prototype Development: WSI TA First Iteration	2	2017	2	2018
Rapid Prototype Development: WSI Second Iteration	3	2018	3	2019
Rapid Prototype Development: WSI Transition Decision	3	2019	3	2019
Rapid Prototype Development: Persistent Over the Horizon (OTH) First Iteration	3	2017	2	2018
Rapid Prototype Development: OTH TA First Iteration	2	2018	2	2018
Rapid Prototype Development: OTH Second Iteration	3	2018	2	2019
Rapid Prototype Development: OTH TA Second Iteration	2	2019	2	2019
Rapid Prototype Development: OTH Third Iteration	3	2019	2	2020
Rapid Prototype Development: OTH Transition Decision	2	2021	2	2021

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603382N / *Advanced Combat Systems Tech*	Project (Number/Name) 0399 / *Unmanned Rapid Prototype Development*	

COST ($ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
0399: *Unmanned Rapid Prototype Development*	0.000	0.000	0.000	15.027	-	15.027	15.090	15.098	15.103	15.122	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

Note

This project is new in FY2017.

A. Mission Description and Budget Item Justification

Department of Navy (DON) leadership has acknowledged that maintaining maritime superiority depends in part on our ability to accelerate the speed of warfighting and technological innovations in order to extend our advantage to offset our adversary's growing capabilities. The Unmanned Systems (UxS) Rapid Prototype Development project supports the goals and objectives of the Chief of Naval Operations (CNO) Navigation Plan and Design for Maintaining Maritime Superiority, Commandant of the Marine Corps (CMC) Planning Guidance, and the Cooperative Strategy for 21st Century Seapower, and is fundamental to the DON's efforts to improve our acquisition outcomes. This project is aligned with, and in direct response to, calls for increased prototyping and experimentation in USD(AT&L)'s Better Buying Power 3.0, Secretary of the Navy's (SECNAV) Task Force Innovation direction, and the CNO direction to Achieve High Velocity Learning at Every Level. These efforts will reinvigorate and increase the use of unmanned prototyping and experimentation to rapidly field new warfighting capabilities, concepts and technologies, and engineering solutions faster than the typical budget cycle time.

The Unmanned Rapid Prototype Development project funds a strategic focus on prioritization of UxS rapid prototyping and experimentation of innovative combat system technologies and engineering innovations to explore Fleet-proposed capability concepts and needs, as well as foster advancements in naval warfighting capabilities. With an emphasis on "Field Early" or "Fail Fast" methodologies, the project is intended to expedite the development, exploration and fielding of technology and engineering prototypes to provide advanced warfighting capabilities, new technologies and engineering innovations across all Naval warfighting domains. Prototype development efforts will be used to inform/refine Concepts of Operation (CONOPS) and operational requirements; evaluate the operational utility and technical feasibility of technology/engineering innovations; support limited fielding of prototypes; and mitigate cost, schedule and performance risks associated with follow-on acquisition programs.

By fully leveraging the scientific and engineering expertise and technical infrastructure within the Naval Research and Development Establishment (NR&DE), and in collaboration with, and support of, the Fleet Forces Command, Naval Warfighting Development Centers, Naval Warfare Development Command, and the Marine Corps Combat Development and Integration Command, this project will produce UxS sensors, weapon systems, and command, control, and communications prototypes to address naval warfighting challenges and/or to pursue future naval warfighting concepts. Additionally, new and emerging UxS technologies and engineering innovations that offer the potential to reduce cost, increase readiness, or improve the overall efficiency or effectiveness of naval forces will be explored. A key distinction is that the process and battle rhythm is designed for optimal responsiveness to Fleet needs.

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603382N / *Advanced Combat Systems Tech*	**Project (Number/Name)** 0399 / *Unmanned Rapid Prototype Development*

The CNO and DON will work with Congress in accordance with an agreed-to framework of governance and oversight that will ensure the effective and efficient use of this funding for its intended purpose.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Title: Unmanned Rapid Prototype Development, Experimentation and Demonstration	0.000	0.000	15.027	0.000	15.027
Articles:	-	-	-	-	-

Description: The project implements a pioneering strategic approach to the development and introduction of innovative unmanned system (UxS) technologies to the Fleet.

The iterative rapid development cycle consists of:
- the identification of requirements and priorities for unmanned warfare systems
- the survey of existing technologies for the most promising to satisfy the warfighting needs and to close capability gaps
- the rapid prototyping and demonstration of the highest priority technologies to verify capability and military utility prior to transition to acquisition

Prototype and demonstration efforts refine the innovative UxS technologies and their associated operational concepts through a series of progressive experiments (live-virtual-constructive, test ranges, and/or at-sea experiments) leveraging the in-house Naval Research and Development Establishment (NR&DE) infrastructure and Fleet experimentation venues. Deliverables include actual integrated hardware/software prototype systems, Concept of Operations (CONOPS), requirements, test reports, technical data, and associated doctrine, organization, training, leadership and education, and personnel aspects necessary to support decision making. These decisions include the transition of technologies to acquisition, further refinement of the technology, or termination and reinvestment of remaining funds to other technologies that add military value. In addition, these efforts will enable the NR&DE to assess and support INP and other emerging technologies for efficient transition to acquisition through prototyping and experimentation. The project technology initiatives will deliver game-changing capability to meet warfighting needs and close capability gaps with unmanned systems on the ground, in the air, on the sea, and under the sea.

FY 2015 Accomplishments:
N/A

FY 2016 Plans:

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603382N / *Advanced Combat Systems Tech*	**Project (Number/Name)** 0399 / *Unmanned Rapid Prototype Development*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
N/A					
FY 2017 Base Plans: The Unmanned Systems Rapid Prototype, Development, Experimentation and Demonstration process is iterative, nimble, and responsive to warfighting needs, capability gaps, naval priorities, and technology opportunities. The FY 2017 execution plan will draw upon the focus areas, projects and plans outlined below, with final FY 2017 technologies and prioritization completed in Q4 FY 2016 based on Fleet and Type Commander (TYCOM) priorities, assessments of emerging technology, and as informed by recent analysis, wargames and other experimentation results. The project focus areas are in alignment with DoD and Navy Unmanned System Roadmaps, reflect the Navy's strategic shift in national security to the Asia-Pacific Theater, and also address the requirement to continue to reduce lifecycle costs across all systems, including unmanned systems. The FY 2017 rapid development cycle execution plan will select promising technologies for rapid prototype and demonstration consistent with the focus areas. 1. Advanced UxS Air, Surface, Undersea, and Ground System Payloads and Platforms This focus is on the development and integration of emerging UxS platforms and/or system payloads from across naval research and development, industry, and academia to inform requirements/trade space analysis, CONOPS development, and to evaluate the warfighting utility and multi-mission employment options of advanced prototypes. UxS prototypes will be evaluated through a series of iterative prototypes and demonstrations. Those UxS prototypes which demonstrate the potential to satisfy warfighting capability needs or gaps or expand UxS employment options will be incorporated into planned UxS rapid prototyping and demonstration events in FY17. Project will integrate mature technologies developed through Naval S&T investments, such as autonomous and supervisory control systems, dynamic contingency re-planning, advanced power/energy systems, artificial intelligence, advanced GPS and radar technology, Fast data fusion algorithms, and modular weapons as developed for the Autonomous Aerial Cargo Utility System (AACUS), the Common UAS Launch and Recovery Project, the Medium Displacement Unmanned Surface Vehicle (MDUSV), Cargo Unmanned Ground Vehicle (UGV), Low-cost UAV swarming Technology (LOCUST), USV swarm prototypes, and other S&T prototypes. More specifically, the emerging technologies that contribute to the following needed Joint Capability Areas (JCAs) will receive priority: a. Battlespace Awareness. UxS payloads and/or platforms in all domains (air, sea, undersea, and ground) that significantly advance the ability to conduct Intelligence, Surveillance, and Reconnaissance (ISR) and environment collection related tasks.					

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603382N / *Advanced Combat Systems Tech*	**Project (Number/Name)** 0399 / *Unmanned Rapid Prototype Development*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
b. Force Application. In the air domain, technologies for Unmanned Aircraft Systems (UAS) for air-to-air combat, electronic warfare, and suppression and defeat of enemy air defense. In the maritime domain, both Unmanned Undersea Vehicle (UUV) and Unmanned Surface Vehicle (USV) technologies for mine laying and mine neutralization. c. Protection. Advanced technologies to assist in attack prevention or effects mitigation, including explosive ordnance disposal (EOD). d. Logistics. Cargo payload or platform systems with persistence to provide resupply of sea-based assets in high risk Anti-Access/Area Denial (A2/AD) environments. Specific project efforts in this comprehensive focus area include: - Conduct warfighter requirement, capability gap, and technical solution trade space analysis. - Evaluate technology assessments and review requirements analysis. - Evaluate potential for multi-mission utility and employment options. - Develop initial design, technical performance and demonstration objectives. - Prototype interoperable payload and platform systems and capabilities. - Complete prototype system/sub-system development, integration and testing for demonstration in relevant (to include simulated) maritime environments. - Perform final design, technical performance, and demonstration objective reviews. - Provide technical and demonstration objectives in support of CONOPS/Tactics, Techniques, and Procedures (TTP) development. - Refine and deliver demonstration plans in support of experiment/Fleet exercise events. - Execute demonstration plans and assess technical performance and operational utility. - Develop design change and new objectives for follow-on experiments/Fleet exercises, as required, to address alternative technologies, addition of more robust capabilities, or alternative employment methods to include multiple-UxS scenarios. - Update requirements and CONOPS/TTPs based on experiment/Fleet exercise results. - Provide technical data to inform Fleet models, simulations and wargames. 2. Autonomy and Cognitive Behavior					

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603382N / *Advanced Combat Systems Tech*	**Project (Number/Name)** 0399 / *Unmanned Rapid Prototype Development*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Apply emerging technology and engineering innovations in all domains to provide control of basic vehicle operations and behavior for communications, systems effectiveness, and reduced manpower. Technologies for manpower reduction during mission performance, data collection and analysis, and planning and re-planning are high priorities. Additional emerging technology includes increased system, sensor, and analytical automation to develop, record, playback, project, and parse data and deliver "actionable" intelligence. - Conduct warfighter requirement, capability gap, and technical solution tradespace analysis. - Evaluate technology assessments and review requirements analysis. - Conduct Human-System Interface (HSI) assessment. - Evaluate potential for multi-mission utility and employment. - Develop initial design, technical performance and demonstration objectives. - Complete prototype system/sub-system development, integration and testing for demonstration in relevant (to include simulated) environments. - Perform final design, technical performance, and demonstration objective reviews. - Provide technical and demonstration objectives in support of CONOPS/CONEMP development. - Refine and deliver demonstration plans in support of experiment/Fleet exercise events. - Execute demonstration plans and assess technical performance, operational utility, and extent of manpower interaction with the UxS. - Assess need for design change and new objectives for follow-on experiments/Fleet exercises that may address alternative technologies, additional capabilities, or use methods. - Update CONOPS/CONEMPS based on experiment/Fleet exercise results. - Provide technical data to inform Fleet models, simulations and wargames. 3. Common Command and Control System Leverage emerging technologies and engineering innovations which support the warfighting utility and multi-mission capability of unmanned systems across vehicle classes, variants, and domains for integration in common Naval architecture and frameworks for the common command and control of vehicles. The project integrates mature technologies developed through naval research and development investments to enable UxS long-range and autonomous operation, such as developed for the Large Diameter UUV, Autonomous Aerial Cargo Utility System and Anti-Submarine Continuous Trail Unmanned Vessel (ACTUV). Additional technologies and capabilities to be developed include doctrine, systems and procedures to dynamically task and manage remote UxS and associated sensors, and Navy UxS interoperability with United States Air Force (USAF) and DoD/OGA where operationally or fiscally beneficial.					

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603382N / *Advanced Combat Systems Tech*	**Project (Number/Name)** 0399 / *Unmanned Rapid Prototype Development*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Specific project efforts in this comprehensive focus area include: - Conduct warfighter requirement, capability gap, and technical solution tradespace analysis. - Evaluate technology assessments and review requirements analysis. - Evaluate potential for multi-platform, multi-mission utility and employment methods. - Develop initial design, technical performance and demonstration objectives. - Prototype interoperable and common command and control system technologies/capabilities, including mission planning and mission control software. - Complete prototype system/sub-system development, integration and testing for demonstration in relevant (to include simulated) environments. - Perform final design, technical performance, and demonstration objective reviews. - Provide technical and demonstration objectives in support of CONOPS/CONEMP development. - Refine and deliver demonstration plans in support of experiment/Fleet exercise events. - Execute demonstration plans and assess technical performance and operational utility. - Develop design change and new objectives for follow-on experiments/Fleet exercises. - Update requirements and CONOPS/CONEMPS based on experiment/Fleet exercise results. - Provide technical data to inform Fleet models, simulations and wargames.					
4. Common Data Exfiltration and Transport Integrate emerging technologies and engineering innovations for transporting collected data from each UxS into existing C4I networks, including technologies for UxS platforms to adaptively connect to a network; a compatible means to rapidly offload collected sensor data for immediate exploitation and analysis; the tagging and universal discovery of all UxS collected data and information; and the mitigation of potential network vulnerabilities associated with UxS data transport. Specific project efforts in this comprehensive focus area include: - Conduct warfighter requirement, capability gap, and technical solution tradespace analysis. - Evaluate technology assessments and review requirements analysis. - Evaluate potential for multi-platform, multi-mission utility and employment. - Develop initial design, technical performance and demonstration objectives. - Prototype interoperable, common, data exfiltration and transport hardware/software technologies.					

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603382N / *Advanced Combat Systems Tech*	**Project (Number/Name)** 0399 / *Unmanned Rapid Prototype Development*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
- Complete prototype system/sub-system development, integration and testing for demonstration in relevant (to include simulated) environments. - Perform final design, technical performance, and demonstration objective reviews. - Provide technical and demonstration objectives in support of CONOPS/TTP development. - Refine and deliver demonstration plans in support of experiment/Fleet exercise events. - Execute demonstration plans and assess technical performance and operational utility. - Develop design change and new objectives for follow-on experiments/Fleet exercises, if required, that may address alternative technologies, addition of more robust capabilities, or alternative employment methods. - Update requirements and CONOPS/TTPs based on experiment/Fleet exercise results. - Provide technical data to inform Fleet models, simulations and wargames. 5. Communication Systems, Spectrum, and Resilience Development and integration of emerging technologies to increase the availability of UxS communication links, the amount of data the communication links support, certification of the communication spectrum, and the resilience of all radio frequency (RF) subsystems against interference (e.g., electromagnetic). Advanced technologies include multi-focused, super cooled antennas, conformal phased array antennas, cloud-enabled enterprise data centers, advanced error control, network path diversity, optical communications, and commercial gateway points-of-presence with digital inter-facility transport. Specific project efforts in this comprehensive focus area include: - Conduct warfighter requirement, capability gap, and technical solution tradespace analysis. - Evaluate technology assessments and review requirements analysis. - Evaluate potential for multi-platform, multi-mission utility and employment. - Develop initial design, technical performance and demonstration objectives. - Prototype interoperable, certifiable communication systems and resilience technology. - Complete prototype system/sub-system development, integration and testing for demonstration in relevant (to include simulated) environments. - Perform final design, technical performance, and demonstration objective reviews. - Provide technical and demonstration objectives in support of CONOPS/TTP development. - Refine and deliver demonstration plans in support of experiment/Fleet exercise events. - Execute demonstration plans and assess technical performance and operational utility.					

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603382N / *Advanced Combat Systems Tech*	**Project (Number/Name)** 0399 / *Unmanned Rapid Prototype Development*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
- Develop design change and new objectives for follow-on experiments/Fleet exercises, if required, that may address alternative technologies, addition of more robust capabilities, or alternative employment methods. - Update requirements and CONOPS/TTPs based on experiment/Fleet exercise results. - Provide technical data to inform Fleet models, simulations and wargames. 6. Interoperability and Modularity Development and integration, in cooperation with joint, interagency, intergovernmental, and multinational (JIIM) partners, of standard information exchange requirements (IERs) that address joint and Service needs, interoperability profiles (IOPs), middleware, and other technologies needed to achieve the necessary level of interoperability across manned and unmanned systems. Emerging capabilities include software reprogrammable interfaces, universal payload adapters, federated mission computing, and multiple input/ multiple output systems and subsystems. Specific project efforts in this comprehensive focus area include: - Conduct warfighter requirement, capability gap, and technical solution tradespace analysis. - Evaluate technology assessments and review requirements analysis. - Evaluate potential for multi-platform, multi-mission utility and employment, as well as life-cycle, integration, capability upgrade, maintenance and sustainment cost savings. - Develop initial design, technical performance and demonstration objectives. - Prototype interoperable, modular services and software modules. - Complete prototype system/sub-system development, integration and testing for demonstration in relevant (to include simulated) environments. - Perform final design, technical performance, and demonstration objective reviews. - Provide technical and demonstration objectives in support of CONOPS/CONEMP development. - Refine and deliver demonstration plans in support of experiment/Fleet exercise events. - Execute demonstration plans and assess technical performance and operational utility. - Develop design change and new objectives for follow-on experiments/Fleet exercises, if required, that may address alternative technologies, addition of more robust capabilities, or alternative employment methods. - Update requirements and CONOPS/CONEMPS based on experiment/Fleet exercise results. Provide technical data to inform Fleet models, simulations and wargames.					

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
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B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
7. Persistent Resilience Leverage emerging technologies and engineering innovation design schema to provide more effective on-station time for unmanned vehicles in all domains. This includes development and integration of the miniaturization of avionics, power and propulsion technology; reliability, maintainability, and survivability technology improvement; optimized material properties to allow unmanned systems to endure in extreme environments ranging from sandy and hot climates to humid or freezing climates and from high altitudes to fathoms beneath the oceans; and fuel-efficient propulsion and power output technology. Advanced capabilities include reduced size, weight, power, and cooling consumption technologies, low cost/high reliability materials/ components, miniaturized warning/self-protection systems, durable materials, and efficient electrical power generation, thermal management propulsion systems. The project integrates mature technologies developed through Naval S&T investments, such as alternative fuels, power and propulsion, and energy systems (including battery, fuel cell, renewable sources) developed for the Large Diameter UUV (LDUUV), Anti-Submarine Continuous Trail Unmanned Vessel (ACTUV), and other power/energy initiatives. Specific project efforts in this comprehensive focus area include: - Conduct warfighter requirement, capability gap, and technical solution tradespace analysis. - Evaluate technology assessments and review requirements analysis. - Evaluate potential for mission endurance and/or multi-platform, multi-mission utility. - Develop initial design, technical performance and demonstration objectives. - Prototype emerging technologies. - Complete prototype system/sub-system development, integration and testing for demonstration in relevant (to include simulated) environments. - Perform final design, technical performance, and demonstration objective reviews. - Provide technical and demonstration objectives in support of CONOPS/CONEMP development. - Refine and deliver demonstration plans in support of experiment/Fleet exercise events. - Execute demonstration plans and assess technical performance and operational utility. - Develop design change and new objectives for follow-on experiments/Fleet exercises, if required, that may address alternative technologies, addition of more robust capabilities, or alternative employment methods. - Update requirements and CONOPS/CONEMPs based on experiment/Fleet exercise results. - Provide technical data to inform Fleet models, simulations and wargames. 8. Research and Intelligence/Technology Protection (RITP)					

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603382N / *Advanced Combat Systems Tech*	**Project (Number/Name)** 0399 / *Unmanned Rapid Prototype Development*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Development and integration of emerging UxS technologies to prevent unauthorized access/control, unauthorized/unintentional disclosure of data, and preservation of technological superiority from across naval research and development, industry, and academia. Specific project efforts in this comprehensive focus area include: - Evaluate project technologies in terms of RITP preservation of critical mission advantage over adversaries. - Implement and assess information controls in project development and execution to ensure RITP is maintained. - Incorporate RITP and cyber security protection in project requirements, and investigate additional capabilities and CONOPs/CONEMPS serving to counter or mitigate adversary responses. - Prototype technologies with potential to advance RITP postures. - Execute demonstration plans and assess technical performance and operational utility. - Update project requirements and CONOPS/CONEMPs based on technology developments and experiment/ Fleet exercise results. ***FY 2017 OCO Plans:*** N/A					
Accomplishments/Planned Programs Subtotals	0.000	0.000	15.027	0.000	15.027

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

The strategy for this non-acquisition program is to fully leverage the scientific and engineering expertise and technical infrastructure within the Naval Research and Development Establishment (NR&DE), and in collaboration with and support of the Fleet Forces Command, Naval Warfighting Development Centers, Naval Warfare Development Command, and the
Combat Development and Integration Command, produce advanced technology and engineering solutions to address naval warfighting challenges and/or to develop innovations in future Naval unmanned warfighting concepts and capabilities.

E. Performance Metrics

Performance metrics are specific to each of the projects funded. All will include measures identified in the Statement of Objectives (SOO), including completions, successes,terminations, and iterative prototype cycle times reported against schedules and deliverables stated in the requirement documents.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy		Date: February 2016
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Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Prototype Development, Experimentation and Demonstration	PO	NRL : Washington, DC	0.000	0.000		0.000		1.391	Jan 2017	-		1.391	Continuing	Continuing	Continuing
Prototype Development, Experimentation and	PO	NSWC : Various	0.000	0.000		0.000		3.625	Jan 2017	-		3.625	Continuing	Continuing	Continuing
Prototype Development, Experimentation and	PO	NUWC : Various	0.000	0.000		0.000		3.211	Jan 2017	-		3.211	Continuing	Continuing	Continuing
Prototype Development, Experimentation and	PO	SPAWAR : Various	0.000	0.000		0.000		3.236	Jan 2017	-		3.236	Continuing	Continuing	Continuing
Prototype Development, Experimentation and	PO	NAWC : Various	0.000	0.000		0.000		3.564	Jan 2017	-		3.564	Continuing	Continuing	Continuing
		Subtotal	0.000	0.000		0.000		15.027		-		15.027	-	-	-

	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	0.000		0.000		15.027		-		15.027	-	-	-

Remarks

Support and Test and Evaluation costs are directly associated with the delivery of the primary product and included in the product development cost category for rapid prototype development, experimentation and demonstration cost categories.

Exhibit R-4, RDT&E Schedule Profile: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603382N / *Advanced Combat Systems Tech*	**Project (Number/Name)** 0399 / *Unmanned Rapid Prototype Development*

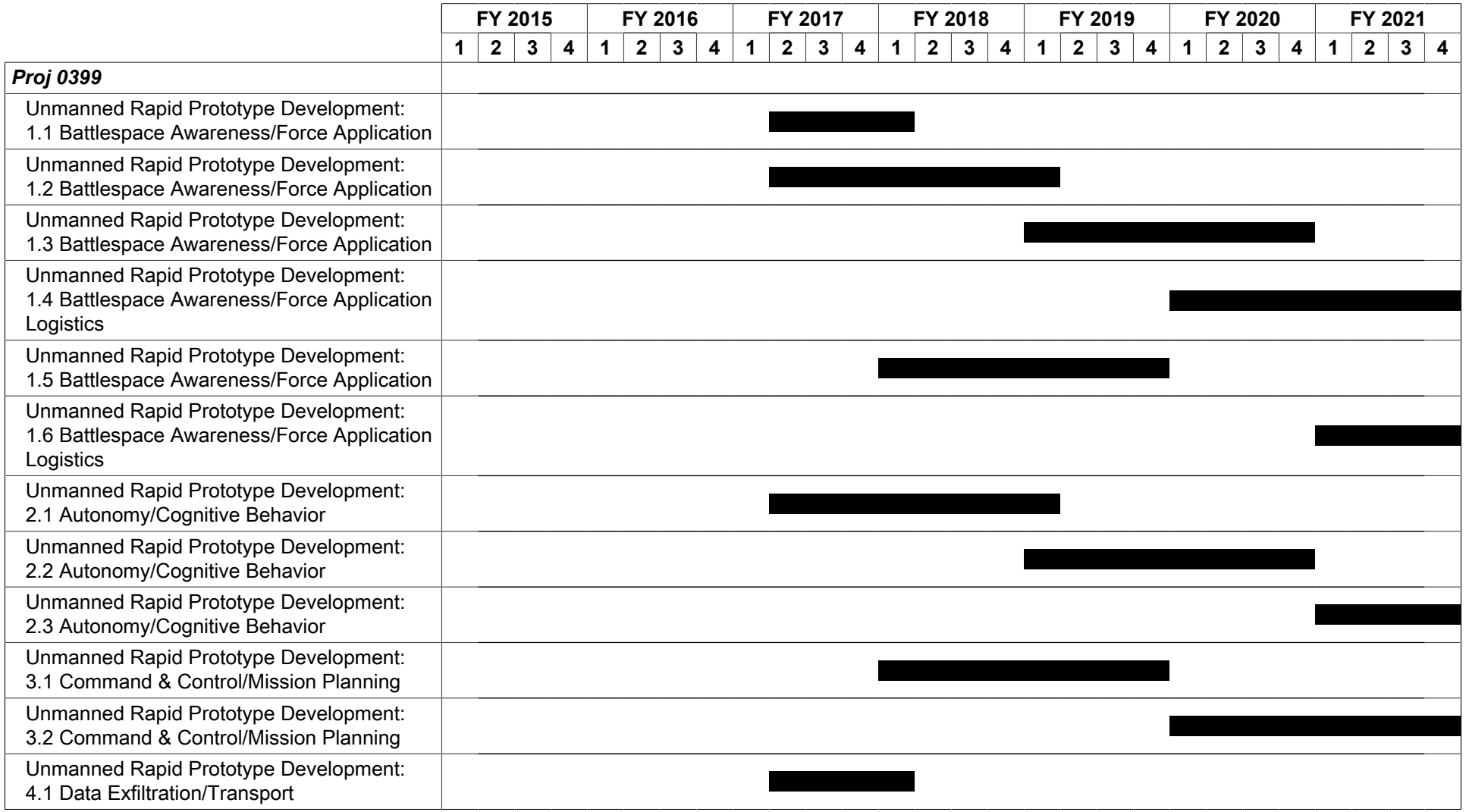

Exhibit R-4, RDT&E Schedule Profile: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603382N / *Advanced Combat Systems Tech*	**Project (Number/Name)** 0399 / *Unmanned Rapid Prototype Development*

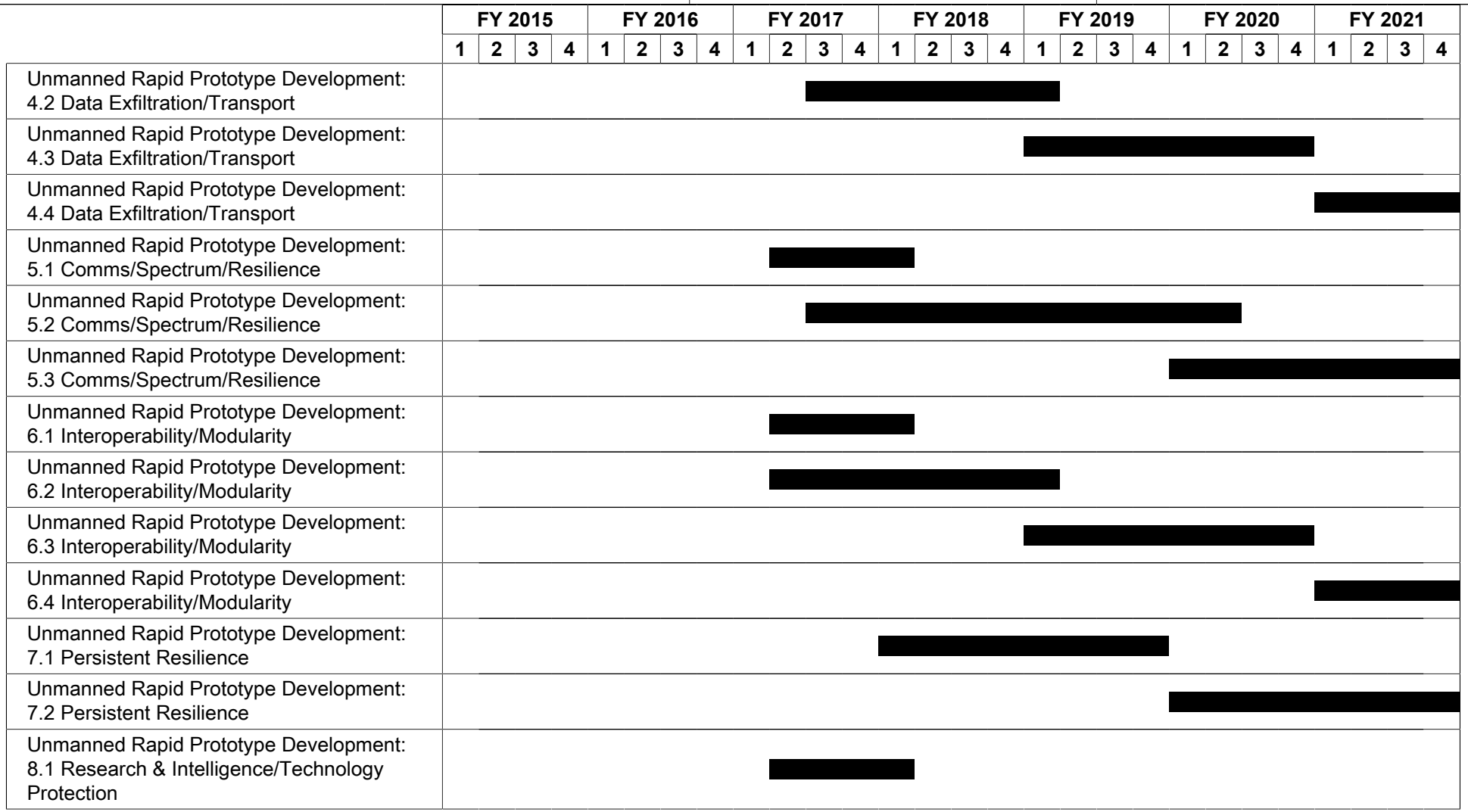

Exhibit R-4, RDT&E Schedule Profile: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603382N / *Advanced Combat Systems Tech*	**Project (Number/Name)** 0399 / *Unmanned Rapid Prototype Development*

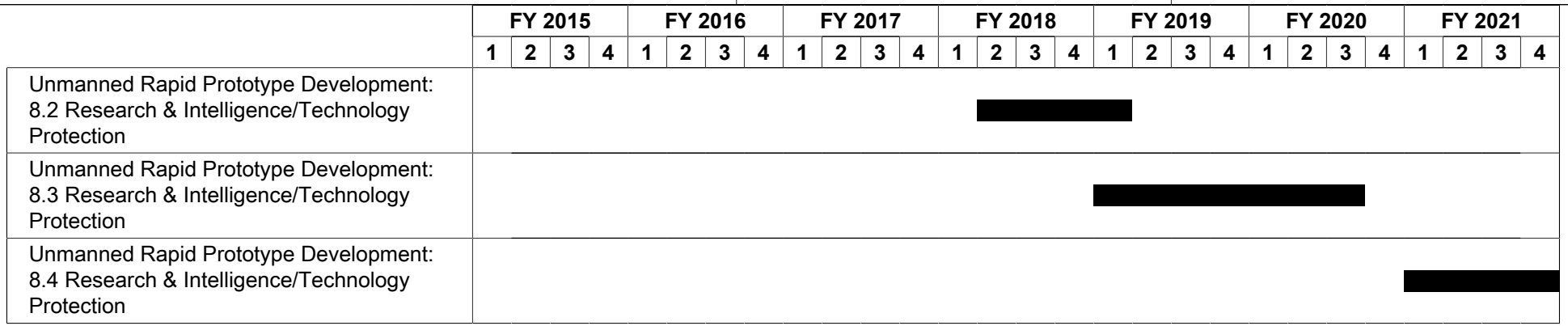

Exhibit R-4A, RDT&E Schedule Details: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603382N / *Advanced Combat Systems Tech*	**Project (Number/Name)** 0399 / *Unmanned Rapid Prototype Development*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 0399				
Unmanned Rapid Prototype Development: 1.1 Battlespace Awareness/Force Application	2	2017	1	2018
Unmanned Rapid Prototype Development: 1.2 Battlespace Awareness/Force Application	2	2017	1	2019
Unmanned Rapid Prototype Development: 1.3 Battlespace Awareness/Force Application	1	2019	4	2020
Unmanned Rapid Prototype Development: 1.4 Battlespace Awareness/Force Application Logistics	1	2020	4	2021
Unmanned Rapid Prototype Development: 1.5 Battlespace Awareness/Force Application	1	2018	4	2019
Unmanned Rapid Prototype Development: 1.6 Battlespace Awareness/Force Application Logistics	1	2021	4	2021
Unmanned Rapid Prototype Development: 2.1 Autonomy/Cognitive Behavior	2	2017	1	2019
Unmanned Rapid Prototype Development: 2.2 Autonomy/Cognitive Behavior	1	2019	4	2020
Unmanned Rapid Prototype Development: 2.3 Autonomy/Cognitive Behavior	1	2021	4	2021
Unmanned Rapid Prototype Development: 3.1 Command & Control/Mission Planning	1	2018	4	2019
Unmanned Rapid Prototype Development: 3.2 Command & Control/Mission Planning	1	2020	4	2021
Unmanned Rapid Prototype Development: 4.1 Data Exfiltration/Transport	2	2017	1	2018
Unmanned Rapid Prototype Development: 4.2 Data Exfiltration/Transport	3	2017	1	2019
Unmanned Rapid Prototype Development: 4.3 Data Exfiltration/Transport	1	2019	4	2020
Unmanned Rapid Prototype Development: 4.4 Data Exfiltration/Transport	1	2021	4	2021
Unmanned Rapid Prototype Development: 5.1 Comms/Spectrum/Resilience	2	2017	1	2018
Unmanned Rapid Prototype Development: 5.2 Comms/Spectrum/Resilience	3	2017	2	2020

Exhibit R-4A, RDT&E Schedule Details: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603382N / *Advanced Combat Systems Tech*	**Project (Number/Name)** 0399 / *Unmanned Rapid Prototype Development*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Unmanned Rapid Prototype Development: 5.3 Comms/Spectrum/Resilience	1	2020	4	2021
Unmanned Rapid Prototype Development: 6.1 Interoperability/Modularity	2	2017	1	2018
Unmanned Rapid Prototype Development: 6.2 Interoperability/Modularity	2	2017	1	2019
Unmanned Rapid Prototype Development: 6.3 Interoperability/Modularity	1	2019	4	2020
Unmanned Rapid Prototype Development: 6.4 Interoperability/Modularity	1	2021	4	2021
Unmanned Rapid Prototype Development: 7.1 Persistent Resilience	1	2018	4	2019
Unmanned Rapid Prototype Development: 7.2 Persistent Resilience	1	2020	4	2021
Unmanned Rapid Prototype Development: 8.1 Research & Intelligence/Technology Protection	2	2017	1	2018
Unmanned Rapid Prototype Development: 8.2 Research & Intelligence/Technology Protection	2	2018	1	2019
Unmanned Rapid Prototype Development: 8.3 Research & Intelligence/Technology Protection	1	2019	3	2020
Unmanned Rapid Prototype Development: 8.4 Research & Intelligence/Technology Protection	1	2021	4	2021

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Exhibit R-2, RDT&E Budget Item Justification: PB 2017 Navy											Date: February 2016	
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 4: *Advanced Component Development & Prototypes (ACD&P)*					R-1 Program Element (Number/Name) PE 0603502N *I Surface & Shallow Water MCM*							
COST ($ in Millions)	**Prior Years**	**FY 2015**	**FY 2016**	**FY 2017 Base**	**FY 2017 OCO**	**FY 2017 Total**	**FY 2018**	**FY 2019**	**FY 2020**	**FY 2021**	**Cost To Complete**	**Total Cost**
Total Program Element	1,141.797	83.793	90.472	165.775	-	165.775	157.821	184.838	212.970	222.095	Continuing	Continuing
0530: *Mine Hunt Systems*	270.881	0.000	9.536	9.851	-	9.851	4.109	4.261	4.351	4.438	Continuing	Continuing
1233: *Surface MCM Mid-life Upgrade*	137.929	12.161	6.349	4.237	-	4.237	1.956	1.903	1.033	1.054	Continuing	Continuing
1234: *Unmanned Surface Vehicle (USV)*	0.000	23.259	23.672	43.412	-	43.412	23.586	13.908	6.164	6.317	Continuing	Continuing
1235: *Mine Warfare Planning and Analysis*	0.000	0.000	7.760	8.910	-	8.910	7.515	6.826	6.967	7.108	Continuing	Continuing
2094.: *Unmanned Underwater Vehicle*	52.199	13.416	12.165	67.607	-	67.607	79.336	122.469	154.342	163.841	Continuing	Continuing
2131: *Assault Breaching System*	577.790	17.348	15.598	20.201	-	20.201	16.080	18.526	19.123	17.495	Continuing	Continuing
3123: *SMCM UUV*	102.998	17.609	15.392	11.557	-	11.557	25.239	16.945	20.990	21.842	Continuing	Continuing

A. Mission Description and Budget Item Justification

This program element provides resources for development of mine countermeasure systems to provide minehunting, minesweeping, and neutralization to counter known and projected mine threats. The mine countermeasures systems provide mobile, quick reaction forces capable of land or sea-based minehunting and minesweeping operations worldwide. Resources are for developing and deploying advanced mine-hunting and minesweeping systems and the intelligence and oceanographic capabilities that will enable mine warfare superiority. Tactics and techniques used vary across a diversity of environments and a diversity of threats, including both asymmetric and emerging. Resources provide for systems and support of mine warfare systems, maritime systems, and expeditionary systems to allow for continuous operations of the Navy's warships and support vessels, other military vessels, and commercial vessels. Core capabilities include forward presence, deterrence, sea control, power projection, maritime security, humanitarian assistance and disaster response to maintain freedom of the seas. Increased capability includes conducting minefield reconnaissance (mine density and location) at high area search rates, improving detection capability, decreasing sensor false alarm rates, reducing or eliminating post-mission analysis detect, classify, identify, decide time, improving neutralization time, improving network communications, automatic target recognition, and achieving in-stride detect-to-engage capability. Concept of operations includes development of cooperative, unmanned, modular systems; the establishment of a capable networked command and control systems; and standing up an accurate and interactive environmental system with the ability to form and disseminate a Common Environmental Picture. Efforts benefit the MCM force by transforming the Navy from the platform-centered legacy set of systems to a capability-centered force that is distributed, networked, and able to provide unique maritime influence and access across the entire maritime domain.

The Surface Mine Countermeasures (SMCM) programs are platform independent and will provide detection, classification, localization, identification, neutralization, and influence clearance capabilities. Programs develop: (1) remote minehunting capability for surface platforms; (2) the integration and improvement of new and existing systems (3) support for systems which detect, localize, classify, identify, and neutralize all mine types across Mine Countermeasure (MCM) Avenger Class and other

Exhibit R-2, RDT&E Budget Item Justification: PB 2017 Navy	Date: February 2016
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 0603502N *I Surface & Shallow Water MCM*

platforms; (4) systems for neutralizing mines and light obstacles through the entire water column to include shallow water, very shallow water, surf zones, and beach landing craft zones in support of operations; (5) the integration of Unmanned Undersea Vehicles (UUVs) to meet Undersea Surveillance capabilities as well as other prioritized and enduring capabilities, requirements and gaps and (6) integrate hardware for experimental testing related to surface ship, aircraft, and other cross platform applications.

B. Program Change Summary ($ in Millions)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Previous President's Budget	86.333	118.588	134.937	-	134.937
Current President's Budget	83.793	90.472	165.775	-	165.775
Total Adjustments	-2.540	-28.116	30.838	-	30.838
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-28.104			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-2.540	0.000			
• Program Adjustments	0.000	0.000	34.372	-	34.372
• Rate/Misc Adjustments	0.000	-0.012	-3.534	-	-3.534

Change Summary Explanation

Program Adjustments:
Decrease in FY 2017 Surface & Shallow Water MCM by $2.6 million as required for the Department of the Navy to comply with the Bipartisan Budget Act of 2015.

FY15 -$2,540K Total adjustments; SBIR -$2,540K.

FY16 -$28,116K Total adjustments; Congressional Reductions -$1,500K SSQ-94 Trainer development growth, -$10,400K MHU Craft Fabrication, -1,304K MEDAL development growth, -$2,000K Knifefish program delay, -$12,900K LDUUV product development; -$12K Miscellaneous Reductions.

FY17 +$30,838K Total adjustments; Program Adjustments +$5,844K Unmanned Influence Sweep System (UISS)Surface Vehicle, -$9,800 Reduce LDUUV Prototype conversion, +$3,520 LDUUV Submarine Integration, +$7,100K Knifefish SMCM UUV Technology Transition, +27,708K Net Zero adjustment USV w/ AQS-20A, $3,534K Miscellaneous adjustments.

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603502N / *Surface & Shallow Water MCM*	Project (Number/Name) 0530 / *Mine Hunt Systems*	

COST ($ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
0530: *Mine Hunt Systems*	270.881	0.000	9.536	9.851	-	9.851	4.109	4.261	4.351	4.438	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This project contains resources for systems, subsystems, and sensors integrated for use with the Remote Minehunting System (RMS) Remote Multi-Mission Vehicle (RMMV) for mine detection, classification, localization, identification, neutralization, and influence clearance capabilities. Research, development, test, and evaluation efforts are for increasing capability by decreasing time required to conduct Mine Countermeasures (MCM) operations, ensuring low risk to naval and commercial vessels, and removing the man from the minefield. Increased capability includes conducting minefield reconnaissance (mine density and location) at high area search rates, improving detection capability, decreasing sensor false alarm rates, and reducing post-mission analysis for detection, classification, identification, and neutralization.

The AN/AQS-20A is a mine hunting and identification system with acoustic and optic sensors housed in an underwater towed body. The acoustic sensors are designated for the detection, classification and localization of bottom, close-tethered, and volume targets in a single plas. The Electro-Optic Identification Device (EOID) replaces the Volume Search Sonar (VSS) for identification of bottom targets. The system will be deployed from the Littoral Combat Ship (LCS) as part of the MCM Mission Package. The RMS Remote Multi-Mission Vehicle (RMMV) tows the AN/AQS-20A.

The AN/AQS-20A Block 1 is undergoing a Pre-Planned Product Improvement (P3I) program to upgrade the Forward Looking Sonar (FLS) and Side-Looking Sonars (SLS) to improve Probability of Classifying a Mine-like object as a Mine, False Classification, and Depth Localization performance to meet Block 2 performance. The Forward Looking Sonar
will be replaced with a new High Frequency Wideband design. The SLS will be replaced with a new Multi-function SLS with Synthetic Aperture Sonar (SAS) capability, as well as, improved signal processing and Signal to Noise Ratio. The Block 1 P3I program began in FY12 and will complete in FY16. Award and management for Block 2 production units began in FY14. Materiel Reliability, obsolescence, and performance Engineering Change Proposal (ECP) efforts continue beyond FY21.

In FY 2017, the AN/AQS-20A Block 2 P3I program will initiate Synthetic Aperture Sonar Acoustic (SAS) Recognition development and test. The AN/AQS-20A program will also complete mission analysis software tools for the AN/AQS-20A Block 2. The Block 2 P3I program began in FY17 and continues beyond FY21. Development of Depot Maintenance Overhaul and Technical Insertion plans will also occur. Development and Material Reliability, obsolescence, and performance Engineering Change Proposal (ECP) efforts will continue beyond FY 2020.

This is not a new start. Realigned program funding from Program Element 0604373N/Project Unit 0529 beginning in FY16.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Title: AN/AQS-20A Product Development:	0.000	3.500	2.900	0.000	2.900

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603502N / *Surface & Shallow Water MCM*	**Project (Number/Name)** 0530 / *Mine Hunt Systems*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Articles:	-	-	-	-	-
FY 2015 Accomplishments: -Cited in Program Element 0604373N. ***FY 2016 Plans:*** - Complete Software updates for AN/AQS-20A Block 2 EDMs - Initiate Mission Analysis Software tools for AN/AQS-20A Block 2. ***FY 2017 Base Plans:*** - Initiate SAS Acoustic mine recognition development. - Initiate SAS Acoustic mine recognition ECP. - Complete Mission Analysis Software for AN/AQS-20A Block 2. - Correction of deficiencies identified during testing ***FY 2017 OCO Plans:*** N/A					
Title: AN/AQS-20A Support:	0.000	2.971	2.300	0.000	2.300
Articles:	-	-	-	-	-
FY 2015 Accomplishments: -Cited in Program Element 0604373N. ***FY 2016 Plans:*** - Provide ongoing technical engineering support to AN/AQS-20A. - Complete updates to logistics products based on the results of LCS MCM MP testing. - Conduct repairs to AN/AQS-20A from LCS MCM MP TECHEVAL. - Conduct minefield maintenance ***FY 2017 Base Plans:*** - Continue to provide ongoing technical engineering support to AN/AQS-20A. - Develop Depot Maintenance (Overhaul) Plan. - Continue to conduct minefield maintenance. - Develop Technical Insertion Plan. ***FY 2017 OCO Plans:***					

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603502N / *Surface & Shallow Water MCM*	**Project (Number/Name)** 0530 / *Mine Hunt Systems*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
N/A					
Title: AN/AQS-20A Test and Evaluation	0.000	1.765	3.300	0.000	3.300
Articles:	-	-	-	-	-
FY 2015 Accomplishments: - Cited in Program Element 0604373N.					
FY 2016 Plans: - Conduct AN/AQS-20A Block 2 EDM Testing. - Complete AN/AQS-20A Block 2 EDM performance analysis.					
FY 2017 Base Plans: - Conduct AN/AQS-20A Block 2 LRIP Developmental Testing. - Conduct SAS Acoustic recognition Testing. - Test Planning for AN/AQS-20A Block 2 IOT&E.					
FY 2017 OCO Plans: N/A					
Title: AN/AQS-20A Management Services	0.000	1.300	1.351	0.000	1.351
Articles:	-	-	-	-	-
FY 2015 Accomplishments: -Cited in Program Element 0604373N.					
FY 2016 Plans: - Provide planning and management for the AN/AQS-20A program. - Provide Program Office travel support.					
FY 2017 Base Plans: - Provide planning and management for the AN/AQS-20A program. - Update acquisition documentation in support of Full Rate Production (FRP) Decision Review and Initial Operational Capability (IOC). - Continue to provide Program Office travel support.					
FY 2017 OCO Plans:					

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603502N / *Surface & Shallow Water MCM*	**Project (Number/Name)** 0530 / *Mine Hunt Systems*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
N/A					
Accomplishments/Planned Programs Subtotals	0.000	9.536	9.851	0.000	9.851

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
• OPN 1601: *LCS MCM Mission Modules*	15.270	67.451	57.146	-	57.146	161.605	197.738	103.496	203.284	1,002.735	1,875.439
• RDTE&E 0604373N: *Airborne Mine Countermeasures (AMCM)*	12.992	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	324.735

Remarks

Funding displayed on BLI 1601 OPN in total, does not reflect AQS-20A OPN dollars.

D. Acquisition Strategy

AN/AQS-20A LRIP procurement continues following Block 2 competitive contract award in FY14. Continue to meet MCM MP requirements to support production of Block 2 units.

E. Performance Metrics

AN/AQS-20A - Successfully complete Block 2 IOT&E in FY 2018.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603502N / *Surface & Shallow Water MCM*	**Project (Number/Name)** 0530 / *Mine Hunt Systems*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
AN/AQS-20A Hardware/ Software Development Q-20 on the H-53	SS/CPIF	Raytheon : Portsmouth, RI	31.120	0.000		0.000		0.000		-		0.000	0.000	31.120	-
AN/AQS-20A Hardware/ Software Development Q-20A on the H-60	C/CPFF	Raytheon : Portsmouth, RI	60.150	0.000		0.000		0.000		-		0.000	0.000	60.150	-
AN/AQS-20A Hardware/ Software Development	WR	NSWC, PC : Panama City FL	14.578	0.000		0.000		0.000		-		0.000	0.000	14.578	-
AN/AQS-20A Hardware/ Software Development	C/FP	Northrop Grumman : Melbourne, FL	4.572	0.000		0.000		0.000		-		0.000	0.000	4.572	-
AN/AQS-20A P3I	C/CPFF	Raytheon : Portsmouth, RI	16.441	0.000		0.950	Nov 2015	1.100	Nov 2016	-		1.100	Continuing	Continuing	Continuing
AN/AQS-20A P3I	C/CPFF	ARL/UT : Austin, TX	7.767	0.000		1.250	Dec 2015	0.600	Dec 2016	-		0.600	Continuing	Continuing	Continuing
AN/AQS-20A P3I	WR	NSWC, PC : Panama City FL	3.732	0.000		1.300	Oct 2015	1.200	Oct 2016	-		1.200	0.000	6.232	-
AN/AQS-20A Materiel Reliability ECP Development	C/CPFF	Raytheon : Portsmouth, RI	0.000	0.000		0.000		0.000		-		0.000	0.000	0.000	-
AN/AQS-20A P3I	WR	Naval Research Lab : Stennis Space Center, MS	0.225	0.000		0.000		0.000		-		0.000	0.000	0.225	-
		Subtotal	138.585	0.000		3.500		2.900		-		2.900	-	-	-

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
AN/AQS-20A Engineering Services	WR	NSWC, PC : Panama City, FL	31.570	0.000		0.406	Oct 2015	0.410	Oct 2016	-		0.410	0.000	32.386	-
AN/AQS-20A Engineering Services	C/CPFF	Raytheon : Portsmouth, RI	3.686	0.000		0.800	Oct 2015	0.200	Oct 2016	-		0.200	0.000	4.686	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603502N / *Surface & Shallow Water MCM*	Project (Number/Name) 0530 / *Mine Hunt Systems*	

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
AN/AQS-20A Engineering Services	Various	Various : Various	54.018	0.000		0.000		0.000		-		0.000	0.000	54.018	-
AN/AQS-20A Engineering Services 2	SS/CPIF	Raytheon : Portsmouth, RI	3.464	0.000		0.000		0.000		-		0.000	0.000	3.464	-
AN/AQS-20A ILS Function	WR	NSWC, PC : Panama City FL	6.368	0.000		1.250	Oct 2015	1.165	Oct 2016	-		1.165	0.000	8.783	-
AN/AQS-20A ILS Function	SS/CPIF	Raytheon : Portsmouth, RI	1.546	0.000		0.000		0.000		-		0.000	0.000	1.546	-
AN/AQS-20A ILS Function	Various	Various : Various	0.981	0.000		0.000		0.000		-		0.000	0.000	0.981	-
AN/AQS-20A Engineering Services	WR	NSWC/CD : Carderock, MD	0.500	0.000		0.160	Oct 2015	0.165	Oct 2016	-		0.165	0.000	0.825	-
AN/AQS-20A Engineering Services	WR	NSWC/NPT : Newport, RI	0.000	0.000		0.355	Oct 2015	0.360	Oct 2016	-		0.360	0.000	0.715	-
		Subtotal	102.133	0.000		2.971		2.300		-		2.300	0.000	107.404	-

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
AN/AQS-20A T&E Functions	WR	COTF : Norfolk, VA	0.000	0.000		0.000		0.350	Nov 2016	-		0.350	0.000	0.350	-
AN/AQS-20A T&E Functions	WR	NSWC, PC : Panama City FL	18.115	0.000		1.765	Oct 2015	2.550	Oct 2016	-		2.550	0.000	22.430	-
AN/AQS-20A T&E Functions	C/CPFF	Raytheon : Portsmouth, RI	4.134	0.000		0.000		0.400	Apr 2017	-		0.400	0.000	4.534	-
AN/AQS-20A T&E Functions	Various	Various : Various	1.583	0.000		0.000		0.000		-		0.000	0.000	1.583	-
AN/AQS-20A T&E Functions	C/CPFF	ARL/UT : Austin, TX	0.000	0.000		0.000		0.000		-		0.000	0.000	0.000	-
		Subtotal	23.832	0.000		1.765		3.300		-		3.300	0.000	28.897	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603502N / *Surface & Shallow Water MCM*	Project (Number/Name) 0530 / *Mine Hunt Systems*	

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract

Remarks

COTF - Naval Command Operational Test and Evaluation Force

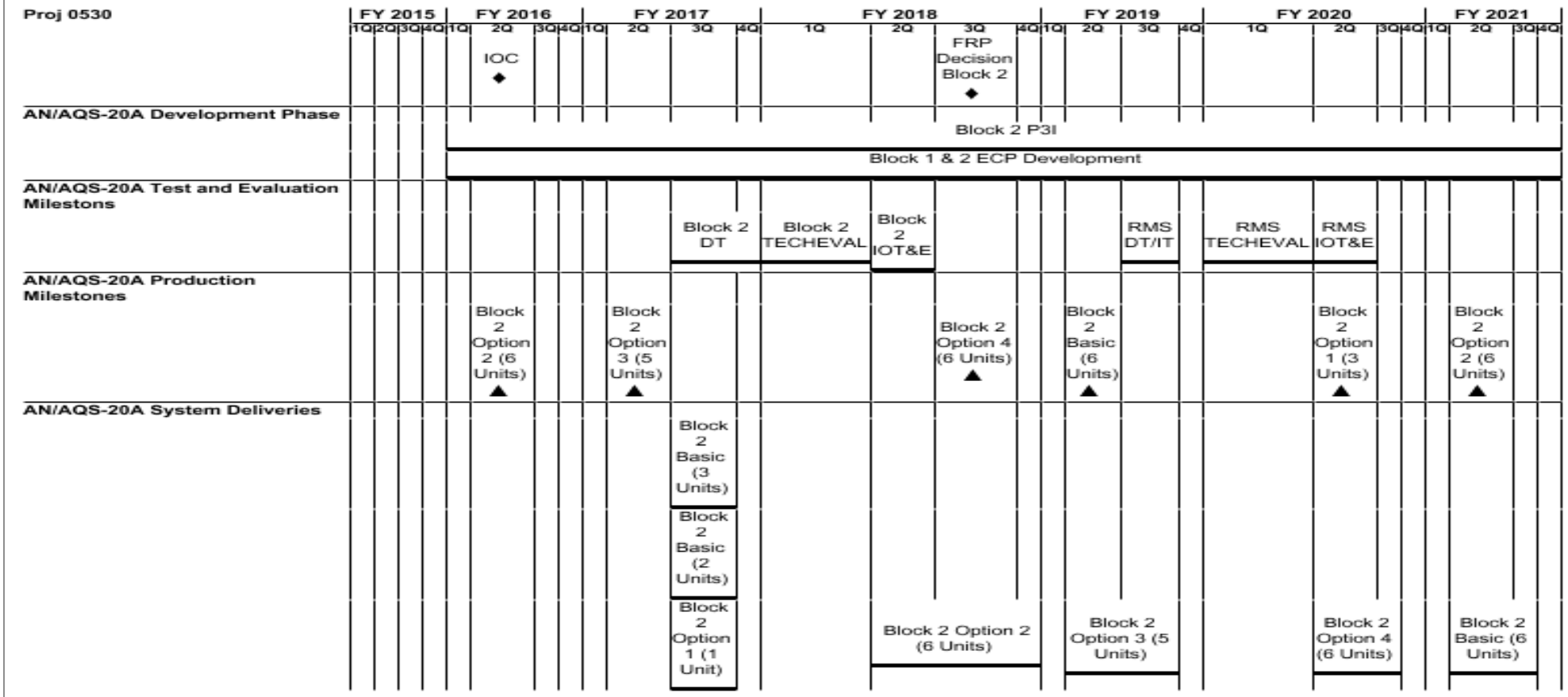
Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
AN/AQS-20A Management Services	TBD	Various : Various	5.732	0.000		1.260	Dec 2015	1.311	Dec 2016	-		1.311	0.000	8.303	-
AN/AQS-20A Travel	TBD	Various : Various	0.587	0.000		0.040	Jan 2016	0.040	Mar 2017	-		0.040	0.000	0.667	-
AN/AQS-20A Acquisition Workforce Fund	Various	Various : Various	0.012	0.000		0.000		0.000		-		0.000	0.000	0.012	-
Need Item Text	C/BA	Not Specified : Not Specified	0.000	0.000		0.000		0.000		-		0.000	0.000	0.000	-
		Subtotal	6.331	0.000		1.300		1.351		-		1.351	0.000	8.982	-

	Prior Years	FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	270.881	0.000		9.536		9.851		-		9.851	-	-	-

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603502N / *Surface & Shallow Water MCM*	**Project (Number/Name)** 0530 / *Mine Hunt Systems*



2017DON - 0603502N - 0530

Exhibit R-4A, RDT&E Schedule Details: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603502N / *Surface & Shallow Water MCM*	**Project (Number/Name)** 0530 / *Mine Hunt Systems*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 0530				
Initial Operatonal Capablity (IOC)	4	2018	4	2018
AN/AQS-20A Full Rate Production (FRP) Decision Block 2	3	2018	3	2018
AN/AQS-20A Development Phase: AN/AQS-20A Block 2 P3I	1	2016	4	2021
AN/AQS-20A Development Phase: AN/AQS-20A Materiel Reliability, Obsolesence, and Performance ECP Development (Block 1 & 2)	1	2016	4	2021
AN/AQS-20A Test and Evaluation Milestones: AN/AQS-20A Test Events Block 2 DT	3	2017	4	2017
AN/AQS-20A Test and Evaluation Milestones: AN/AQS-20A Test Events Block 2 TECHEVAL	1	2018	1	2018
AN/AQS-20A Test and Evaluation Milestones: AN/AQS-20A Test Events Block 2 IOT&E	2	2018	2	2018
AN/AQS-20A Test and Evaluation Milestones: RMS Test Events DT/IT	3	2019	3	2019
AN/AQS-20A Test and Evaluation Milestones: RMS Test Events TECHEVAL	1	2020	1	2020
AN/AQS-20A Test and Evaluation Milestones: RMS Test Events IOT&E	2	2020	2	2020
AN/AQS-20A Production Milestones: AN/AQS-20A Block 2- Option 2 Award (6 Units)	2	2016	2	2016
AN/AQS-20A Production Milestones: AN/AQS-20A Block 2 Option 3 Award (5 Units)	2	2017	2	2017
AN/AQS-20A Production Milestones: AN/AQS-20A Block 2 Option 4 Award (6 Units)	3	2018	3	2018
AN/AQS-20A Production Milestones: AN/AQS-20A Block 2 Basic Award (6 Units)	2	2019	2	2019
AN/AQS-20A Production Milestones: AN/AQS-20A Block 2 Option 1 Award (3 Units)	2	2020	2	2020
AN/AQS-20A Production Milestones: AN/AQS-20A Block 2 Option 2 Award (6 Units)	2	2021	2	2021
AN/AQS-20A System Deliveries: AN/AQS-20A Block 2 Basic Award Systems (3 Units)	3	2017	3	2017
AN/AQS-20A System Deliveries: AN/AQS-20A Block 2 Basic Award Systems (2 Units)	3	2017	3	2017
AN/AQS-20A System Deliveries: AN/AQS-20A Block 2 Option 1 Award System (1 Unit)	3	2017	3	2017

Exhibit R-4A, RDT&E Schedule Details: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603502N / *Surface & Shallow Water MCM*	**Project (Number/Name)** 0530 / *Mine Hunt Systems*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
AN/AQS-20A System Deliveries: AN/AQS-20A Block 2 Option 2 Award Systems (6 Units)	2	2018	4	2018
AN/AQS-20A System Deliveries: AN/AQS-20A Block 2 Option 3 Award Systems (5 Units)	2	2019	3	2019
AN/AQS-20A System Deliveries: AN/AQS-20A Block 2 Option 4 Award Systems (6 Units)	2	2020	3	2020
AN/AQS-20A System Deliveries: AN/AQS-20A Block 2 Basic Award Systems (6 Units)	2	2021	3	2021

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603502N / *Surface & Shallow Water MCM*	Project (Number/Name) 1233 / *Surface MCM Mid-life Upgrade*	

COST ($ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
1233: *Surface MCM Mid-life Upgrade*	137.929	12.161	6.349	4.237	-	4.237	1.956	1.903	1.033	1.054	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

Note

UISS and Multi-Function USV funding moved to PE 0603502N Proj:1234 Unmanned Surface Vehicle (USV)
Mine Warfare and Environmental Decision Aids Library (MEDAL) funding moved to Project Unit 1235

A. Mission Description and Budget Item Justification

This project provides resources for development, improvement and integration of MCM systems. A description of the major planned programs include the following:

1) AN/SQQ-32(V)4 High-Frequency, Wide Band (HFWB) is a technology upgrade to the AN/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 AN/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) The Unmanned Influence Sweep System (UISS) utilizes an Unmanned Surface Vehicle (USV) integrated with an Unmanned Surface Sweep System (US3), a magnetic/acoustic sweep system developed to sweep acoustic/magnetic influence mines, which can be deployed from the Littoral Combat Ship (LCS) or a ship of opportunity; 5) The Multi-Function USV replaces the sweep system with a minehunting sensor. The capability leverages off a common USV to conduct minehunting missions. 6) AN/SLQ-60 Mine Neutralization System (MNS) Seafox on the MCM Class ships. MNS is the replacement to the existing AN/SLQ-48 Mine Neutralization System. 7) SSQ-94 MCM Trainer upgrade will incorporate the AN/SQQ-32 (V)8 sonar, SSN2(V)5 PINS and Mine Neutralization System Team Trainer.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Title: HFWB/PRODUCT DEVELOPMENT:	0.856	0.890	0.312	0.000	0.312
Articles:	-	-	-	-	-
FY 2015 Accomplishments: Continued systems engineering, requirements analysis, design and development for AN/SQQ-32(V)4 HFWB P3I thru the sensor effort.					
FY 2016 Plans:					

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
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B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Continue systems engineering, requirements analysis, design and development for AN/SQQ-32(V)4 HFWB P3I thru the sensor effort. ***FY 2017 Base Plans:*** Continue systems engineering, requirements analysis, design and development for AN/SQQ-32(V)4 HFWB P3I thru the sensor effort. ***FY 2017 OCO Plans:*** N/A					
Title: HFWB/SUPPORT: ***Articles:*** ***FY 2015 Accomplishments:*** Continued software requirements, configuration, and software integration for AN/SQQ-32(V)4 HFWB P3I through the sensor; Towed Body Performance Monitoring and fault Location (PMFL) and Towed Body Positioning Solution efforts. ***FY 2016 Plans:*** Complete software requirements, configuration, and software integration for AN/SQQ-32(V)4 HFWB P3I through the sensor (TTS); Towed Body Performance Monitoring and fault Location (PMFL) and Towed Body Positioning Solution efforts. ***FY 2017 Base Plans:*** Continue software requirements, configuration, and software integration for AN/SQQ-32(V)4 HFWB P3I through the sensor. ***FY 2017 OCO Plans:*** N/A	0.369 -	0.155 -	0.150 -	0.000 -	0.150 -
Title: HFWB/TEST AND EVALUATION: ***Articles:*** ***FY 2015 Accomplishments:*** Continued to perform Lab and At Sea testing for AN/SQQ-32(V)4 HFWB P3I efforts to include through the sensor (TTS); Towed Body Performance Monitoring and fault Location (PMFL) and Towed Body Positioning Solution efforts. ***FY 2016 Plans:***	0.303 -	0.638 -	0.125 -	0.000 -	0.125 -

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
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B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Continue to perform Lab and At Sea testing for AN/SQQ-32(V)4 HFWB P3I TTS effort. Complete Lab and at sea testing for PMFL and Towed Body Positioning Solution. ***FY 2017 Base Plans:*** Continue to perform Lab and At Sea testing for AN/SQQ-32(V)4 HFWB P3I effort and thru the senor testing. ***FY 2017 OCO Plans:*** N/A					
Title: MEDAL/PRODUCT DEVELOPMENT: ***Articles:*** ***FY 2015 Accomplishments:*** Conducted Test & Evaluation of MINEnet Tactical (MEDAL EA). Integration activities with LCS Mission Package. Developed Information Assurance documentation for Authority to Operate on Navy networks. Conducted series of Devlopment tests (DTs). Continued planning for the development of MEDAL EA Increment 2. Began development of MEDAL EA course curriculum. Conducted series of regression tests. ***FY 2016 Plans:*** Moved to Project Unit (PU) 1235 ***FY 2017 Base Plans:*** N/A ***FY 2017 OCO Plans:*** N/A	3.512 -	0.000 -	0.000 -	0.000 -	0.000 -
Title: MEDAL/SUPPORT: ***Articles:*** ***FY 2015 Accomplishments:*** Oversaw technical integration of developed algorithms and models that have demonstrated their effectiveness with respect to their objectives. Supported effort to include communication with activities such as applied labs, government activities, and designated contractors. Assisted in providing the speed, agility, adaptability, and flexibility required for modern MCM operations. Completed introduction of CES capability and Planning on Risk (PoR) functionality via a limited fielding to Fleet Users including Mine Countermeasures Squadrons (MCMRONs)	0.436 -	0.000 -	0.000 -	0.000 -	0.000 -

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
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B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
and Naval Mine and Anti Submarine Warfare Command (NMAWC). Provided in-service support to MEDAL EA IOC units. ***FY 2016 Plans:*** Moved to Project Unit (PU) 1235 ***FY 2017 Base Plans:*** N/A ***FY 2017 OCO Plans:*** N/A					
Title: MEDAL/TEST AND EVALUATION: ***Articles:*** ***FY 2015 Accomplishments:*** Continued System Integration testing activities wih multiple platforms. Continued planning for subsequent OA events. Delivered to Fleet in accordance with the MEDAL EA Fielding Plan. Conducted system Integration testing activities with LCS, CANES and ISNS. ***FY 2016 Plans:*** Moved to Project Unit (PU) 1235 ***FY 2017 Base Plans:*** N/A ***FY 2017 OCO Plans:*** N/A	1.712 -	0.000 -	0.000 -	0.000 -	0.000 -
Title: MEDAL/MANAGEMENT: ***Articles:*** ***FY 2015 Accomplishments:*** Provided program management support and travel for MEDAL program. Program management included 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 MIEW, Expeditionary Warfare C4ISR, tactics development, long term planning, Naval Special Clearance Team (NSCT-1) Assault Breaching Systems of Systems (ABSoS), LCS, and	0.668 -	0.000 -	0.000 -	0.000 -	0.000 -

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
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B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
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 2016 Plans:*** Moved to Project Unit (PU) 1235 ***FY 2017 Base Plans:*** N/A ***FY 2017 OCO Plans:*** N/A					
Title: SSQ-94 MCM Trainer Development ***Articles:*** ***FY 2015 Accomplishments:*** SSQ-94 Mine Warfare Countermeasures Simulator; continued development of hardware and software upgrades to the combat system team/individual training capabilities on the MCM Class Ship ***FY 2016 Plans:*** SSQ-94 Mine Warfare Countermeasures Simulator; continue development of hardware and software upgrades to the combat system team/individual training capabilities on the MCM Class Ship ***FY 2017 Base Plans:*** SSQ-94 Mine Warfare Countermeasures Simulator; continue development of hardware and software upgrades to the combat system team/individual training capabilities on the MCM Class Ship ***FY 2017 OCO Plans:*** N/A	4.305 -	4.666 -	3.650 -	0.000 -	3.650 -
Accomplishments/Planned Programs Subtotals	12.161	6.349	4.237	0.000	4.237

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
• OPN/2622: *Minesweeping System Replacement*	36.259	21.014	56.675	-	56.675	55.423	41.358	41.578	42.404	Continuing	Continuing

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
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C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost

Remarks

D. Acquisition Strategy

HFWB - Naval Surface Warfare Center, Panama City (NSWC, PC) and ARL UT designed and developed 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 Naval Mine Warfare and Anti-Submarine Command (NMAWC).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. SSQ-94 MCM Trainer upgrade will incorporate the AN/SQQ-32 (V)8 sonar, SSN2(V)5 PINS and Mine Neutralization System Team Trainer.

UISS (US3)- The UISS program moved to Project Unit 1234 starting in FY15.

E. Performance Metrics

UISS - Successfully reached Milestone B in FY14; Awarded EDM contract.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy			Date: February 2016
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Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
MNS Development	Various	TBD : TBD	22.455	0.000		0.000		0.000		-		0.000	0.000	22.455	-
SSQ-94 Trainer	WR	NSWC, PC : NSWC, PC	4.100	4.305	Nov 2014	4.666	Nov 2015	3.650	Nov 2016	-		3.650	0.000	16.721	-
BSP: Develop Bottom Sediment Classifier	WR	NRL : WASHINGTON, DC	0.258	0.000		0.000		0.000		-		0.000	0.000	0.258	-
Systems Engineering and Integration	WR	NSWC, PC : PANAMA CITY, FL	0.306	0.000		0.000		0.000		-		0.000	0.000	0.306	-
System Development 1	WR	NSWC, PC : SAN DIEGO, CA	0.373	0.000		0.000		0.000		-		0.000	0.000	0.373	-
Systems Engineering 2	WR	NSWC, PC : PANAMA CITY, FL	2.915	0.000		0.000		0.000		-		0.000	0.000	2.915	-
Systems Engineering 3 MCM CES	WR	NSWC, PC : PANAMA CITY, FL	1.633	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
HFWB: Primary Hardware Development 1	C/CPAF	NSWC, PC/ARL UT : FLORIDA/TEXAS	15.511	0.000		0.000		0.000		-		0.000	0.000	15.511	-
Primary Hardware Development 2	WR	ARL-UT : AUSTIN, TX	0.000	0.000		0.000		0.000		-		0.000	0.000	0.000	-
HFWB: Tow Cable Development	C/CPAF	NSWC, PC/ARL UT : FLORIDA/TEXAS	1.399	0.000		0.000		0.000		-		0.000	0.000	1.399	-
HFWB: Ship Integration	WR	NSWC, PC : PANAMA CITY, FL	1.697	0.000		0.000		0.000		-		0.000	0.000	1.697	-
HFWB: SYSTEM ENGINEER	C/CPAF	NSWC/ARL UT : FLORIDA/TEXAS	7.007	0.856	Nov 2014	0.890	Nov 2015	0.312	Nov 2016	-		0.312	0.000	9.065	-
Software Development MEDAL EA	C/CPFF	SAIC : McLean, VA	37.668	3.512	Nov 2014	0.000		0.000		-		0.000	0.000	41.180	-
		Subtotal	95.322	8.673		5.556		3.962		-		3.962	-	-	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy			Date: February 2016
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Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Develop Logistics Products	WR	NSWC, PC : PANAMA CITY, FL	0.243	0.000		0.000		0.000		-		0.000	0.000	0.243	-
Software Development 1	C/CPFF	SAIC : McLean, VA	0.350	0.000		0.000		0.000		-		0.000	0.000	0.350	-
Software Development 2	C/CPFF	SAIC : McLean, Va	0.914	0.000		0.000		0.000		-		0.000	0.000	0.914	-
HFWB Software Development	WR	NSWC, PC/ARL-UT : FLORIDA/TEXAS	7.776	0.369	Nov 2014	0.155	Nov 2015	0.150	Nov 2016	-		0.150	0.000	8.450	-
HFWB Integrated Logistics Support	WR	NSWC, PC : PANAMA CITY, FL	2.765	0.000	Nov 2014	0.000		0.000		-		0.000	0.000	2.765	-
Software Engineering 1 MCM CES	WR	NSWC, PC : PANAMA CITY, FL	1.517	0.000		0.000		0.000		-		0.000	0.000	1.517	-
Software Engineering 2 MEDAL	WR	NSWC, PC : PANAMA CITY, FL	2.022	0.436	Nov 2014	0.000		0.000		-		0.000	0.000	2.458	-
		Subtotal	15.587	0.805		0.155		0.150		-		0.150	0.000	16.697	-

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
MEDAL Test and Evaluation	C/FP	SAIC : McLean, VA	5.924	1.712	Nov 2014	0.000		0.000		-		0.000	0.000	7.636	-
MCM CES Test and Evaluation 1	C/CPAF	VARIOUS : VARIOUS	1.782	0.000		0.000		0.000		-		0.000	0.000	1.782	-
HFWB: Developmental Test and Evaluation	WR	NSWC, PC/ARL-UT : FLORIDA/TEXAS	4.859	0.303	Nov 2014	0.638	Nov 2015	0.125	Nov 2016	-		0.125	0.000	5.925	-
Test and Evaluation 2	C/CPAF	VARIOUS : VARIOUS	5.204	0.000		0.000		0.000		-		0.000	0.000	5.204	-
		Subtotal	17.769	2.015		0.638		0.125		-		0.125	0.000	20.547	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy			Date: February 2016
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Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total 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	-
Travel 1	WR	NAVSEA : WNY, DC	0.084	0.000		0.000		0.000		-		0.000	0.000	0.084	-
Government Engineering Support1	WR	NSWC, PC : PANAMA CITY, FL	0.325	0.000		0.000		0.000		-		0.000	0.000	0.325	-
MEDAL Program Management Support 2	Various	VARIOUS : VARIOUS	2.159	0.668	Nov 2014	0.000		0.000		-		0.000	0.000	2.827	-
SBIR Assessment 2	Various	VARIOUS : VARIOUS	0.019	0.000		0.000		0.000		-		0.000	0.000	0.019	-
Program Management Support 3	C/CPFF	CACI : WASHINGTON, DC	1.341	0.000		0.000		0.000		-		0.000	0.000	1.341	-
Program Management Support 4	C/CPFF	CACI : WASHINGTON, DC	0.080	0.000		0.000		0.000		-		0.000	0.000	0.080	-
Government Engineering Support3	WR	NSWC, PC : PANAMA CITY, FL	0.090	0.000		0.000		0.000		-		0.000	0.000	0.090	-
Travel 3	C/CPAF	NAVSEA : WNY, DC	0.256	0.000		0.000		0.000		-		0.000	0.000	0.256	-
Program Management Support 5	C/CPFF	CACI : WASHINGTON, DC	0.167	0.000		0.000		0.000		-		0.000	0.000	0.167	-
Government Engineering Support4	WR	NSWC, PC : PANAMA CITY, FL	0.010	0.000		0.000		0.000		-		0.000	0.000	0.010	-
Travel4	C/CPAF	NSWC, PC : PANAMA CITY, FL	0.069	0.000		0.000		0.000		-		0.000	0.000	0.069	-
HFWB: Program Management Support 6	C/CPAF	VARIOUS : VARIOUS	1.442	0.000		0.000		0.000		-		0.000	0.000	1.442	-
HFWB: Government Engineering Support5	WR	NSWC, PC : PANAMA CITY, FL	0.750	0.000		0.000		0.000		-		0.000	0.000	0.750	-
HFWB: Travel 5	C/CPAF	NAVSEA : WNY, DC	0.080	0.000		0.000		0.000		-		0.000	0.000	0.080	-
Government Engineering Support6	WR	NSWC, PC : PANAMA CITY, FL	1.352	0.000		0.000		0.000		-		0.000	0.000	1.352	-
Travel 6	C/CPAF	NAVSEA : WNY, DC	0.238	0.000		0.000		0.000		-		0.000	0.000	0.238	-
SBIR Assessment 6	Various	VARIOUS : VARIOUS	0.054	0.000		0.000		0.000		-		0.000	0.000	0.054	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy			Date: February 2016
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Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Support 7	C/CPAF	VARIOUS : VARIOUS	0.350	0.000		0.000		0.000		-		0.000	0.000	0.350	-
Acquisition Workforce Fund	Various	VARIOUS : VARIOUS	0.122	0.000		0.000		0.000		-		0.000	0.000	0.122	-
		Subtotal	9.251	0.668		0.000		0.000		-		0.000	0.000	9.919	-

	Prior Years	FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	137.929	12.161		6.349		4.237		-		4.237	-	-	-

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2017 Navy		Date: February 2016
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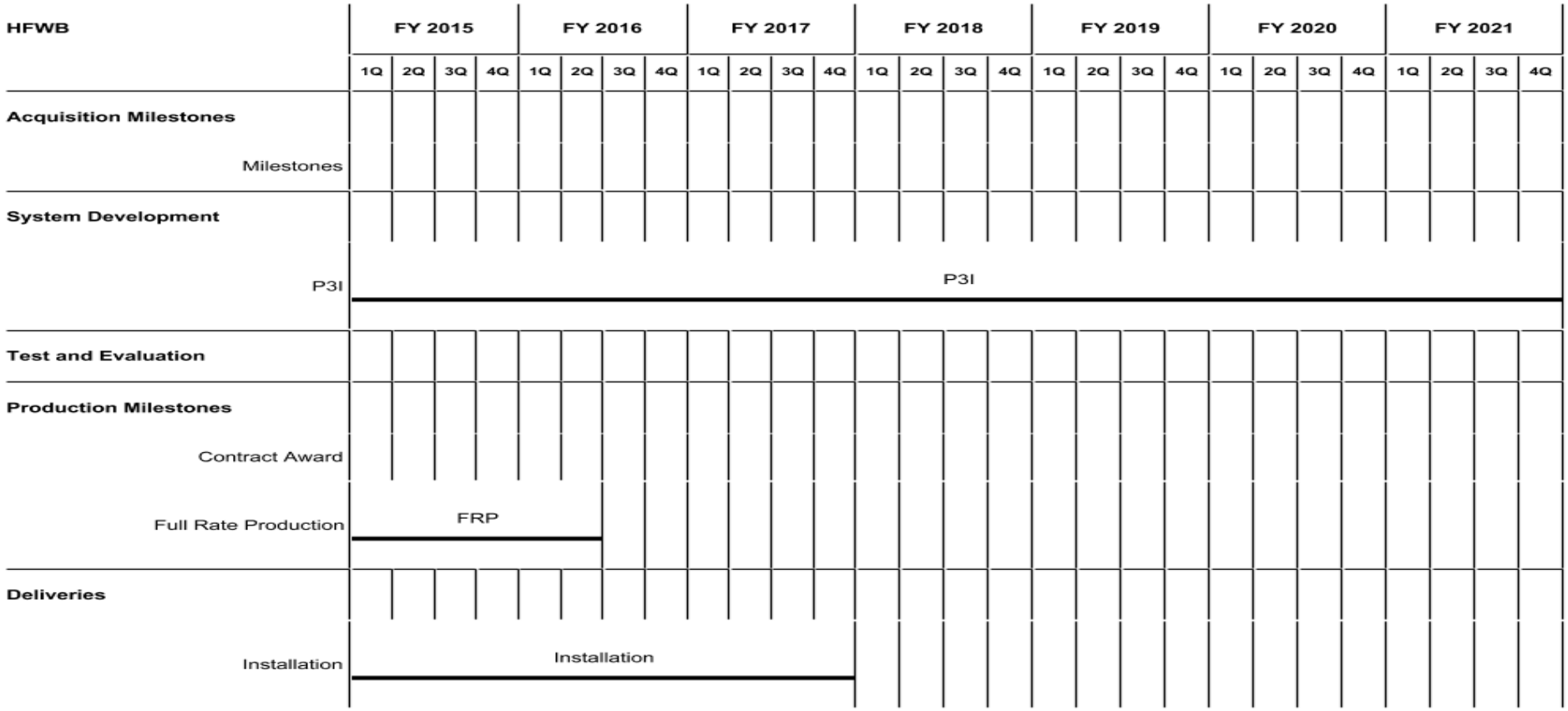

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Exhibit R-4, RDT&E Schedule Profile: PB 2017 Navy		Date: February 2016
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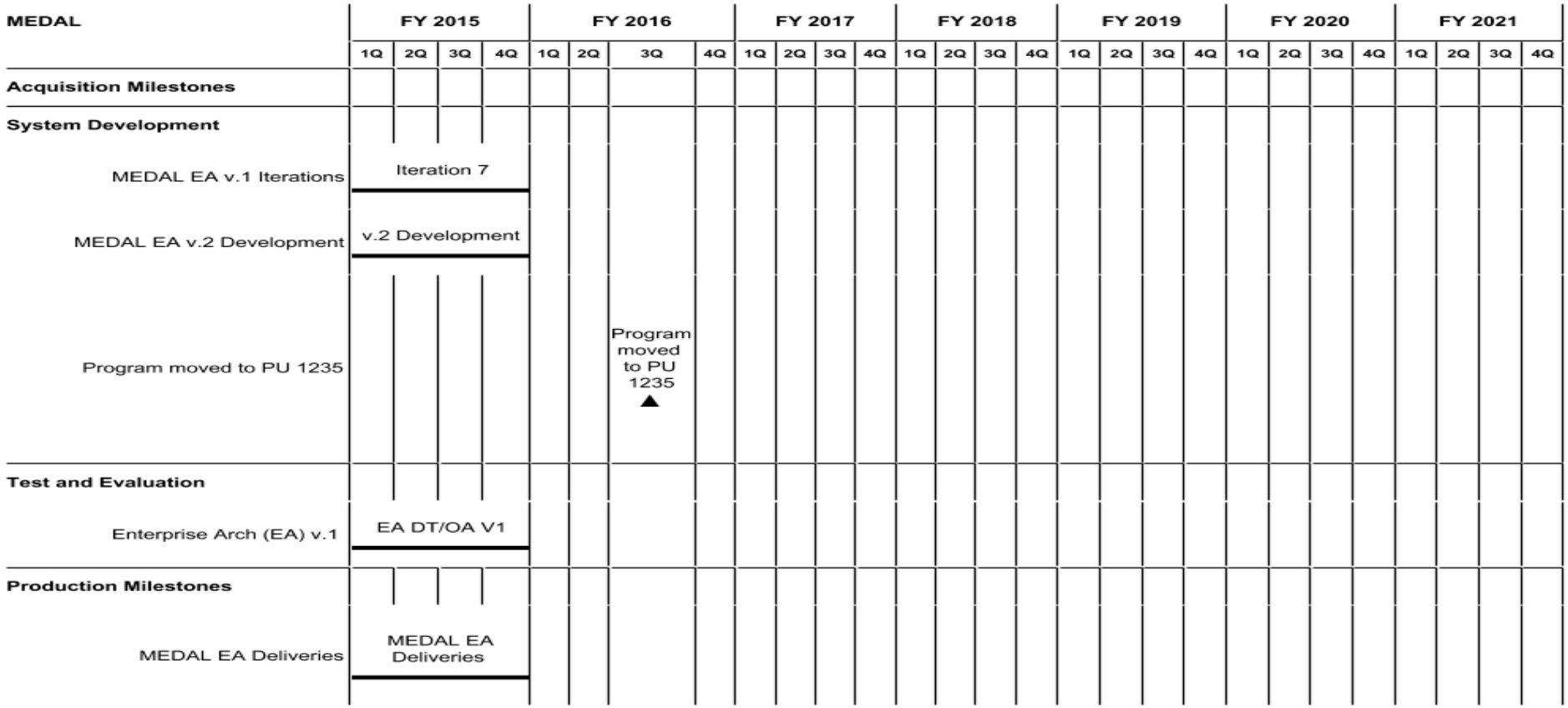

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Exhibit R-4, RDT&E Schedule Profile: PB 2017 Navy		Date: February 2016
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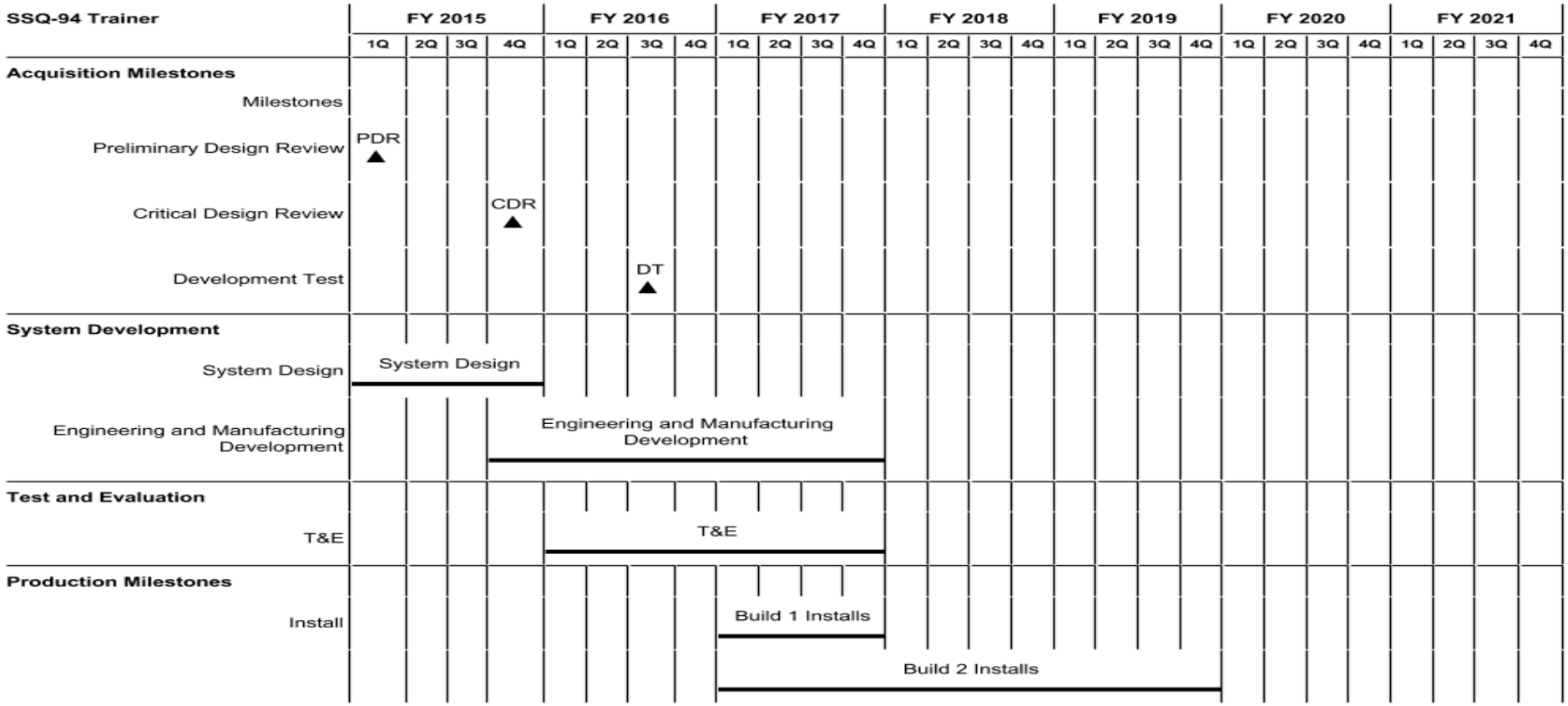

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Exhibit R-4A, RDT&E Schedule Details: PB 2017 Navy		Date: February 2016
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Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
HFWB				
System Development: P3I: P3I Development	1	2015	4	2021
Production Milestones: Full Rate Production: FRP	1	2015	2	2016
Deliveries: Installation: Installation	1	2015	4	2017
MEDAL				
System Development: MEDAL EA v.1 Iterations: EA v.1 Iteration 7	1	2015	4	2015
System Development: MEDAL EA v.2 Development: EA v.2 Development	1	2015	4	2015
System Development: Program moved to PU 1235: Program moved to PU 1235	3	2016	3	2016
Test and Evaluation: Enterprise Arch (EA) v.1: Enterprise Arch (EA) v.1 Development and Test	1	2015	4	2015
Production Milestones: MEDAL EA Deliveries: Deliveries	1	2015	4	2015
SSQ-94 Trainer				
Acquisition Milestones: Preliminary Design Review: Preliminary Design Review	1	2015	1	2015
Acquisition Milestones: Critical Design Review: Critical Design Review	4	2015	4	2015
Acquisition Milestones: Development Test: Development Test	3	2016	3	2016
System Development: System Design: System Design	1	2015	4	2015
System Development: Engineering and Manufacturing Development: Engineering and Manufacturing Development	4	2015	4	2017
Test and Evaluation: T&E: T&E	1	2016	4	2017
Production Milestones: Install: Build 1 Installs	1	2017	4	2017
Production Milestones: Install: Build 2 Installs	1	2017	4	2019

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603502N / *Surface & Shallow Water MCM*	Project (Number/Name) 1234 / *Unmanned Surface Vehicle (USV)*	

COST ($ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
1234: *Unmanned Surface Vehicle (USV)*	0.000	23.259	23.672	43.412	-	43.412	23.586	13.908	6.164	6.317	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This project provides resources for development, improvement and integration of Unmanned Surface Vehicle (USV) Mine Countermeasure systems. A description of the major planned programs include the following:

1) The Unmanned Influence Sweep System (UISS) utilizes an Unmanned Surface Vehicle (USV) integrated with an Unmanned Surface Sweep System (US3), a magnetic/acoustic sweep system developed to sweep acoustic/magnetic influence mines, which can be deployed from the Littoral Combat Ship (LCS) or a ship of opportunity; 2) Mine Hunting USVs (MHUs) include USVs towing AN/AQS-24A mine hunting sonars and associated support equipment, including a command and control center that will be deployed from shore and vessels of opportunity. MHUs are in response to an Urgent Operational Need (UON) from Naval Forces Central Command. FY16 Speed to Fleet (S2F) funding to design and fabricate a replacement MHU vehicle, including new command and control center, and associated in-theater support equipment. 3) Unmanned Surface Vehicle with AN/AQS-20A sonar will integrate the existing AQS-20 minehunting sonar with an Unmanned Surface Vehicle (USV). An existing USV design will be leveraged to include a modular payload capability.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Title: UISS Product Development	12.375	8.163	1.069	0.000	1.069
Articles:	-	-	-	-	-
FY 2015 Accomplishments: Continued building UISS Engineering Development Model (EDM). Conducted Preliminary Design Review (PDR). Conducted Critical Design Review (CDR).					
FY 2016 Plans: Complete UISS EDM.					
FY 2017 Base Plans: Finalize system configuration in preparation for LRIP					
FY 2017 OCO Plans: N/A					
Title: UISS Support	5.073	1.060	1.260	0.000	1.260
Articles:	-	-	-	-	-

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603502N / *Surface & Shallow Water MCM*	**Project (Number/Name)** 1234 / *Unmanned Surface Vehicle (USV)*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
FY 2015 Accomplishments: Continued engineering and integrated logistic support (ILS) for the UISS Engineering and Manufacturing Development (E&MD) phase. ***FY 2016 Plans:*** Complete engineering and logistic support for UISS E&MD. ***FY 2017 Base Plans:*** Engineering and logistics support for UISS system tests. ***FY 2017 OCO Plans:*** N/A					
Title: UISS Test and Evaluation	0.400	2.600	2.937	0.000	2.937
Articles:	-	-	-	-	-
FY 2015 Accomplishments: Completed UISS Test and Evaluation Master Plan (TEMP). ***FY 2016 Plans:*** Conduct contractor testing. Begin Developmental Testing (DT) and Operational Assessment (OA) of UISS EDM ***FY 2017 Base Plans:*** Complete all Developmental Testing (DT) and Operational Assessment (OA) of UISS EDM ***FY 2017 OCO Plans:*** N/A					
Title: UISS Management	1.050	1.034	0.838	0.000	0.838
Articles:	-	-	-	-	-
FY 2015 Accomplishments: Continued UISS EDM contract management. ***FY 2016 Plans:*** Continue UISS EDM contract management. Initiate development of Milestone (MS) C documentation. ***FY 2017 Base Plans:***					

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603502N / *Surface & Shallow Water MCM*	**Project (Number/Name)** 1234 / *Unmanned Surface Vehicle (USV)*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Complete UISS EDM contract management. Complete development of MS C documentation ***FY 2017 OCO Plans:*** N/A					
Title: MHU Product Development	3.780	10.415	8.186	0.000	8.186
Articles:	-	-	-	-	-
FY 2015 Accomplishments: Integrated upgraded minehunting sonar (AN/AQS-24B) onboard MHUs, to include upgrading Comand and Control (C2) center, MHU electronics and associated equipment. Conducted performance testing of AN/AQS-24B sonar towed from MHUs.					
FY 2016 Plans: Continue improvements to the Comand and Control (C2) center, MHU electronics and associated equipment. Complete integration of AN/AQS-24B sonar with MHU. Conduct performance testing of AN/AQS-24B sonar towed from MHUs. Commence design and fabrication of one improved MHU hull, additional C2 center equipment, and in-theater support equipment. Commence AN/AQS-24B integration with improved MHU vehicles.					
FY 2017 Base Plans: Complete fabrication of improved MHU hull with AN/AQS-24B Sonars. Conduct Developmental and Operational Test & Evaluation.					
FY 2017 OCO Plans: N/A					
Title: MHU Support	0.581	0.400	1.414	0.000	1.414
Articles:	-	-	-	-	-
FY 2015 Accomplishments: Provide engineering and logistic support for upgrade training and forward-deployed operations.					
FY 2016 Plans: Provide engineering and logistic support for product improvements and forward-deployed operations.					
FY 2017 Base Plans:					

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603502N / *Surface & Shallow Water MCM*	**Project (Number/Name)** 1234 / *Unmanned Surface Vehicle (USV)*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Provide engineering and logistics support for product improvements and forward deployed operations. Provide additional contractor training for enhanced hull and payload delivery systems. ***FY 2017 OCO Plans:*** N/A					
Title: USV w/AQS-20 Product Development ***Articles:*** ***FY 2015 Accomplishments:*** N/A ***FY 2016 Plans:*** N/A ***FY 2017 Base Plans:*** Begin design and fabrication of two USV EDMs with a modular payload capability. Design and fabricate deploy and retrieve system payload to integrate the AN/AQS-20A minehunting sonar with the USV. Conduct design reviews. Prepare USVs for system level testing. ***FY 2017 OCO Plans:*** N/A	0.000 -	0.000 -	23.000 -	0.000 -	23.000 -
Title: USV w/ AQS-20 Support ***Articles:*** ***FY 2015 Accomplishments:*** N/A ***FY 2016 Plans:*** N/A ***FY 2017 Base Plans:*** Provide engineering and technical support for USV EDM design and fabrication, and deploy and retrieve design and fabrication. Develop tactics, techniques, and procedures for USV w/AQS-20A. ***FY 2017 OCO Plans:*** N/A	0.000 -	0.000 -	4.708 -	0.000 -	4.708 -
Accomplishments/Planned Programs Subtotals	23.259	23.672	43.412	0.000	43.412

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603502N / *Surface & Shallow Water MCM*	**Project (Number/Name)** 1234 / *Unmanned Surface Vehicle (USV)*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
• 0603596N: *LCS Mission Modules*	24.329	2.348	7.129	-	7.129	3.894	0.000	0.000	0.000	0.000	46.700

Remarks

D. Acquisition Strategy

UISS - Requirements will be documented in the Unmanned Influence Sweep System (UISS) Capability Development Document (CDD). An Engineering and Manufacturing Development (E&MD) contract was awarded in FY14 with an option for Low Rate Initial Production (LRIP) in FY 2017.

E. Performance Metrics

UISS - Successfully reach Milestone C in 3Q FY 2017

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603502N / *Surface & Shallow Water MCM*	Project (Number/Name) 1234 / *Unmanned Surface Vehicle (USV)*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
UISS: Product Development 1	C/CPIF	Textron Systems Inc : Hunt Valley, MD	0.000	12.375	Feb 2015	8.163	Dec 2015	1.069	Dec 2016	-		1.069	Continuing	Continuing	Continuing
MHU: Product Development 1	C/FFP	TBD : TBD	0.000	2.150	Jan 2015	9.909	Jan 2016	3.370	Jan 2017	-		3.370	Continuing	Continuing	Continuing
MHU: Product Development 2	WR	NSWC PC : Panama City, FL	0.000	0.501	Dec 2014	0.260	Dec 2015	2.486	Dec 2016	-		2.486	Continuing	Continuing	Continuing
MHU: Product Development 3	WR	NUWC N : Newport, RI	0.000	0.360	Dec 2014	0.130	Dec 2015	1.620	Dec 2016	-		1.620	Continuing	Continuing	Continuing
MHU: Product Development 4	WR	NSWC CD : Bethesda, MD	0.000	0.110	Dec 2014	0.050	Dec 2015	0.220	Dec 2016	-		0.220	Continuing	Continuing	Continuing
MHU: Product Development 5	WR	Various : Various	0.000	0.420	Dec 2014	0.150	Dec 2015	0.490	Dec 2016	-		0.490	Continuing	Continuing	Continuing
USV w/Q-20: Product Development 1	TBD	TBD : TBD	0.000	0.000		0.000		13.250	Jan 2017	-		13.250	0.000	13.250	-
USV w/Q-20: Product Development 2	WR	NSWC PC : Panama City, FL	0.000	0.000		0.000		5.250	Jan 2017	-		5.250	0.000	5.250	-
USV w/Q-20: Product Development 3	WR	NUWC N : Newport, RI	0.000	0.000		0.000		4.500	Jan 2017	-		4.500	0.000	4.500	-
		Subtotal	0.000	15.916		18.662		32.255		-		32.255	-	-	-

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
UISS: Engineering Support 1	WR	NUWC, N : Newport, RI	0.000	0.200	Dec 2014	0.150	Dec 2015	0.150	Dec 2016	-		0.150	Continuing	Continuing	Continuing
UISS: Engineering Support 2	WR	NSWC, PC : Panama City, FL	0.000	1.486	Dec 2014	0.203	Dec 2015	0.250	Dec 2016	-		0.250	Continuing	Continuing	Continuing
UISS: Engineering Support 3	WR	NSWC, CD : Bethesda, MD	0.000	1.586	Dec 2014	0.125	Dec 2015	0.170	Dec 2016	-		0.170	Continuing	Continuing	Continuing
UISS: Engineering Support 4	C/CPFF	Textron Systems Inc : Hunt Valley, MD	0.000	0.550	Feb 2015	0.120	Dec 2015	0.250	Dec 2016	-		0.250	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603502N / *Surface & Shallow Water MCM*	**Project (Number/Name)** 1234 / *Unmanned Surface Vehicle (USV)*

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
UISS: Integrated Logistics 1	WR	NSWC, PC : Panama City, FL	0.000	0.200	Dec 2014	0.090	Dec 2015	0.090	Dec 2016	-		0.090	Continuing	Continuing	Continuing
UISS: Integrated Logistics 2	WR	NSWC, CD : Bethesda, MD	0.000	0.408	Dec 2014	0.203	Dec 2015	0.250	Dec 2016	-		0.250	Continuing	Continuing	Continuing
UISS: Integrated Logistics 3	C/CPFF	Textron Systems, Inc : Hunt Valley, MD	0.000	0.643	Feb 2015	0.085	Dec 2015	0.100	Dec 2016	-		0.100	Continuing	Continuing	Continuing
MHU: Engineering Support 1	WR	SSC, PAC : San Diego, CA	0.000	0.210	Dec 2014	0.050	Dec 2015	0.050	Dec 2016	-		0.050	Continuing	Continuing	Continuing
MHU: Engineering Support 2	WR	NSWC, PC : Panama City, FL	0.000	0.160	Dec 2014	0.200	Dec 2015	0.457	Dec 2016	-		0.457	Continuing	Continuing	Continuing
MHU: Engineering Support 3	WR	NUWC, N : Newport, RI	0.000	0.160	Dec 2014	0.100	Dec 2015	0.477	Dec 2016	-		0.477	Continuing	Continuing	Continuing
MHU: Engineering Support 4	WR	NSWC, CD : Bethesda, MD	0.000	0.110	Dec 2014	0.050	Dec 2015	0.090	Dec 2016	-		0.090	Continuing	Continuing	Continuing
MHU: Engineering Support 5	WR	Various : Various	0.000	0.180	Dec 2014	0.000		0.340	Dec 2016	-		0.340	Continuing	Continuing	Continuing
USV w/Q-20: Engineering Support 1	WR	NSWC, PC : Panama City, FL	0.000	0.000		0.000		2.458	Jan 2017	-		2.458	0.000	2.458	-
USV w/Q-20: Engineering Support 2	WR	NUWC, N : Newport, RI	0.000	0.000		0.000		2.250	Jan 2017	-		2.250	0.000	2.250	-
		Subtotal	0.000	5.893		1.376		7.382		-		7.382	-	-	-

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
UISS: Test and Evaluation 1	WR	NSWC, PC : Panama City, FL	0.000	0.100	Dec 2014	0.500	Mar 2016	1.771	Dec 2016	-		1.771	Continuing	Continuing	Continuing
UISS: Test and Evaluation 2	WR	NSWC, CD : Bethesda, MD	0.000	0.250	Dec 2014	0.600	Mar 2016	0.723	Dec 2016	-		0.723	Continuing	Continuing	Continuing
UISS: Test and Evaluation 3	C/CPIF	TBD : TBD	0.000	0.050	Dec 2014	1.500	Mar 2016	0.443	Dec 2016	-		0.443	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603502N / *Surface & Shallow Water MCM*	**Project (Number/Name)** 1234 / *Unmanned Surface Vehicle (USV)*

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
		Subtotal	0.000	0.400		2.600		2.937		-		2.937	-	-	-

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
UISS: Travel	WR	NAVSEA : Washington, DC	0.000	0.100	Jun 2015	0.100	Jun 2016	0.095	Jun 2017	-		0.095	0.000	0.295	-
UISS: Management 1	C/CPAF	TBD : TBD	0.000	0.950	Feb 2015	0.934	Dec 2015	0.743	Dec 2016	-		0.743	Continuing	Continuing	Continuing
		Subtotal	0.000	1.050		1.034		0.838		-		0.838	-	-	-

	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	23.259		23.672		43.412		-		43.412	-	-	-

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603502N / *Surface & Shallow Water MCM*	**Project (Number/Name)** 1234 / *Unmanned Surface Vehicle (USV)*

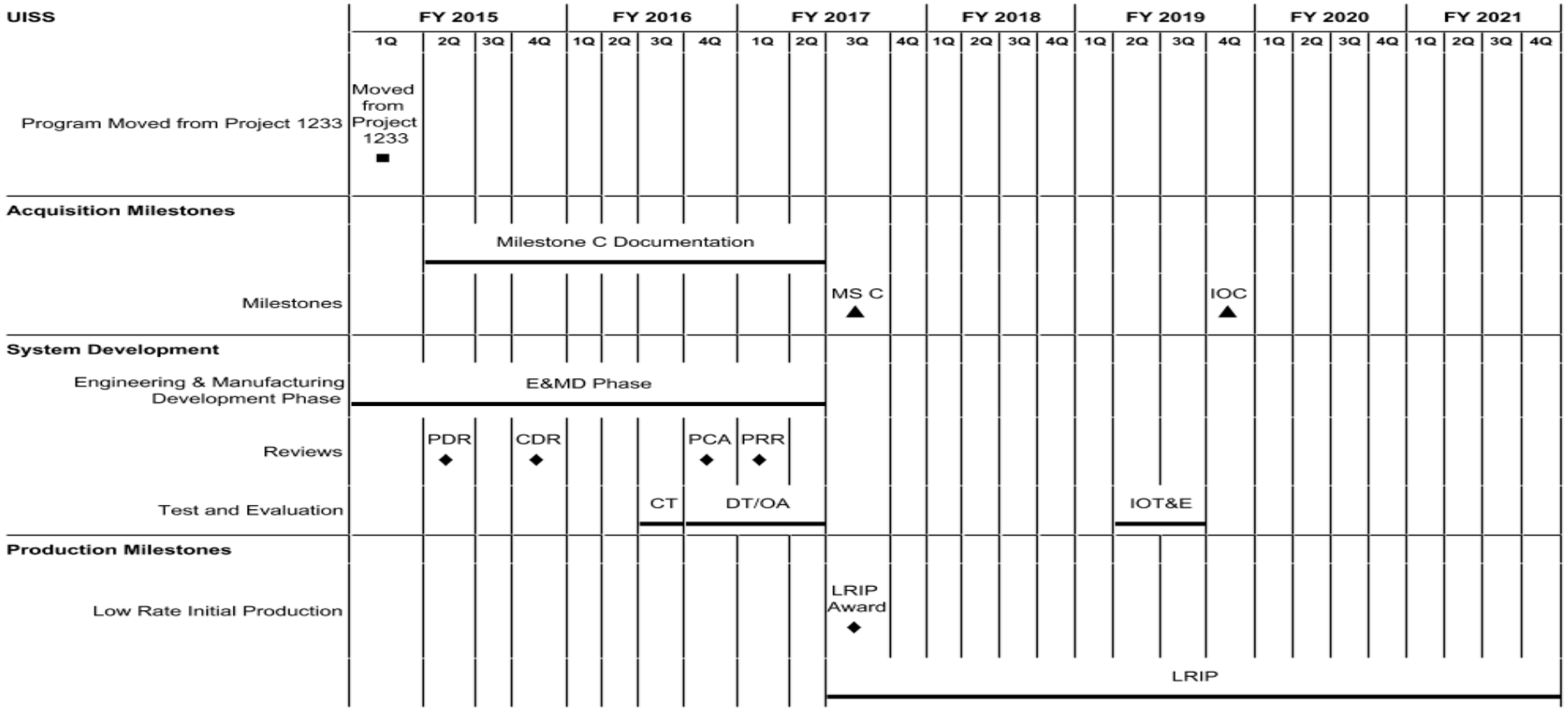

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Exhibit R-4, RDT&E Schedule Profile: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603502N / *Surface & Shallow Water MCM*	**Project (Number/Name)** 1234 / *Unmanned Surface Vehicle (USV)*

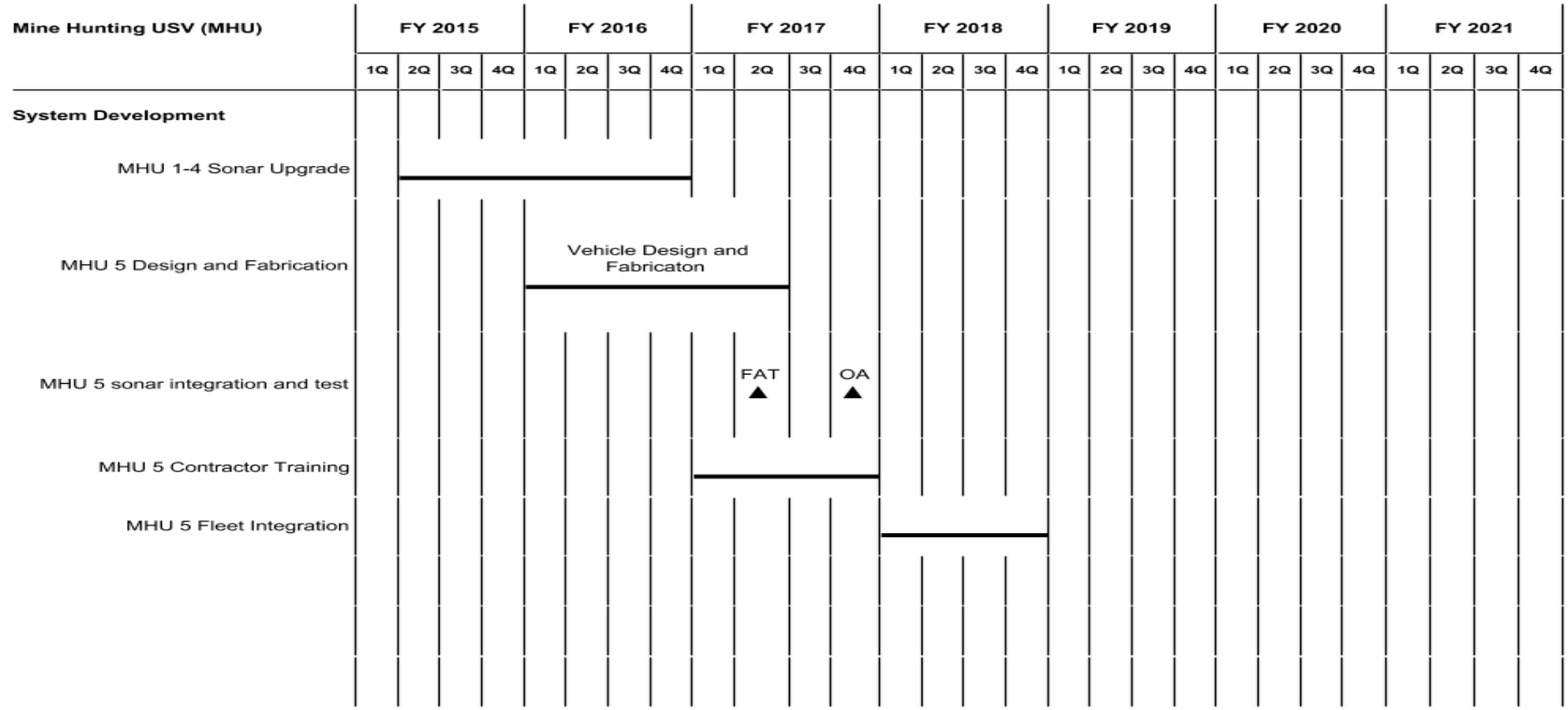

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Exhibit R-4, RDT&E Schedule Profile: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603502N / *Surface & Shallow Water MCM*	**Project (Number/Name)** 1234 / *Unmanned Surface Vehicle (USV)*

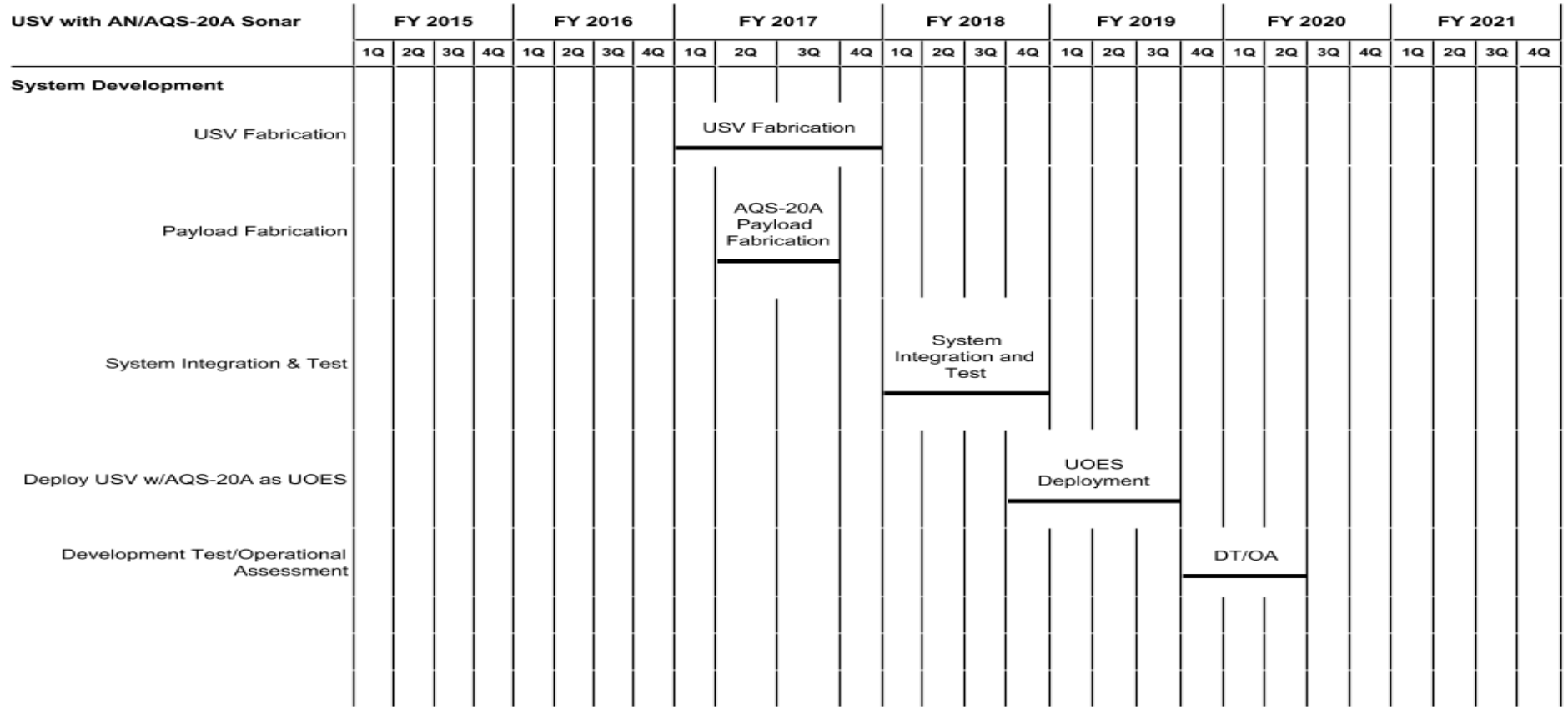

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Exhibit R-4A, RDT&E Schedule Details: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603502N / *Surface & Shallow Water MCM*	**Project (Number/Name)** 1234 / *Unmanned Surface Vehicle (USV)*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
UISS				
Program Moved from Project 1233: Program Moved from Project 1233	1	2015	1	2015
Acquisition Milestones: Milestone C Documentation	2	2015	2	2017
Acquisition Milestones: Milestones: Milestone C	3	2017	3	2017
Acquisition Milestones: Milestones: Initial Operational Capability	4	2019	4	2019
System Development: Engineering & Manufacturing Development Phase: Engineering & Manufacturing Development phase	1	2015	2	2017
System Development: Reviews: Preliminary Design Review (PDR)	2	2015	2	2015
System Development: Reviews: Critical Design Review (CDR)	4	2015	4	2015
System Development: Reviews: Production Readiness Review (PRR)	1	2017	1	2017
System Development: Reviews: Physical Configuration Audit (PCA)	4	2016	4	2016
System Development: Test and Evaluation: DT Testing	4	2016	2	2017
System Development: Test and Evaluation: Initial Operational Test & Evaluation	2	2019	3	2019
System Development: Test and Evaluation: Contractor Training	3	2016	3	2016
Production Milestones: Low Rate Initial Production: LRIP Contract Award	3	2017	3	2017
Production Milestones: Low Rate Initial Production: LRIP phase	3	2017	4	2021
Mine Hunting USV (MHU)				
System Development: MHU 1-4 Sonar Upgrade: Schedule Detail	2	2015	4	2016
System Development: MHU 5 Design and Fabrication: Schedule Detail	1	2016	2	2017
System Development: MHU 5 sonar integration and test: Factory Acceptance Test	2	2017	2	2017
System Development: MHU 5 sonar integration and test: Operational Assessment	4	2017	4	2017
System Development: MHU 5 Contractor Training: Contractor Training	1	2017	4	2017

Exhibit R-4A, RDT&E Schedule Details: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603502N / *Surface & Shallow Water MCM*	**Project (Number/Name)** 1234 / *Unmanned Surface Vehicle (USV)*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
System Development: MHU 5 Fleet Integration: Fleet Integration	1	2018	4	2018
USV with AN/AQS-20A Sonar				
System Development: USV Fabrication: Schedule Detail	1	2017	4	2017
System Development: Payload Fabrication: Schedule Detail	2	2017	3	2017
System Development: System Integration & Test: Schedule Detail	1	2018	4	2018
System Development: Deploy USV w/AQS-20A as UOES: Schedule Detail	4	2018	3	2019
System Development: Development Test/Operational Assessment: Schedule Detail	4	2019	2	2020

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603502N / *Surface & Shallow Water MCM*	Project (Number/Name) 1235 / *Mine Warfare Planning and Analysis*	

COST ($ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
1235: *Mine Warfare Planning and Analysis*	0.000	0.000	7.760	8.910	-	8.910	7.515	6.826	6.967	7.108	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

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.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Title: MEDAL Product Development	0.000	4.704	5.105	0.000	5.105
Articles:	-	-	-	-	-
FY 2015 Accomplishments: N/A - Funded in PU 1233					
FY 2016 Plans: MEDAL EA - Conduct Test & Evaluation of MINEnet Tactical. Continue MINEnet Tactical integration activities with LCS Mission Package. Continue to develop Information Assurance (IA) documentation for Authority to operate on Navy networks. MINEnet Tactical v1.2 development. Conduct Test and Evaluation of MINEnet Tactical v1.2 Conduct regression tests. Develop MEDAL EA v2 supporting documentation development. Conduct planning for the development of MEDAL EA v2. Continue MINEnet Tactical course curriculum development.					
FY 2017 Base Plans: MEDAL EA - MINEnet Tactical v1.3 development. Conduct Test and Evaluation of MINEnet Tactical v1.3and regressions tests. Conduct a series of development tests. Continue planning for the development of MEDAL EA v2.0 Continue development of MEDAL EA course curriculum.					
FY 2017 OCO Plans: N/A					
Title: MEDAL Support	0.000	0.247	0.557	0.000	0.557
Articles:	-	-	-	-	-
FY 2015 Accomplishments:					

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603502N / *Surface & Shallow Water MCM*	**Project (Number/Name)** 1235 / *Mine Warfare Planning and Analysis*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
N/A - Funded in PU 1233 ***FY 2016 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. Achieve IOC and begin fielding to achieve FOC. Begin the introduction of MEDAL EA MINEnet Tactical v1.1 capability and Planning on Risk (PoR) functionality via a limited fielding to Fleet Users including Mine Countermeasures Squadrons (MCMRONs) and Naval Surface and Mine War-fighting Development Center (SMWDC). ***FY 2017 Base Plans:*** Continue the development of MEDAL EA MINEnet Tactical v1.3 capability and Planning on Risk (PoR) functionality via a limited fielding to Fleet Users including Mine Countermeasures Squadrons (MCMRONs) and Naval Surface and Mine War-fighting Development Center (SMWDC). Provide 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 2017 OCO Plans:*** N/A					
Title: MEDAL Test and Evaluation	0.000	2.398	2.519	0.000	2.519
Articles:	-	-	-	-	-
FY 2015 Accomplishments: N/A - Funded in PU 1233 ***FY 2016 Plans:*** MEDAL EA - Conduct series of Devlopment tests (DTs) and a series of regression tests. Continue System Integration testing activities wih multiple platforms. Conduct planning for subsequent OA events. Deliver to Fleet in accordance with the MEDAL EA Fielding Plan. ***FY 2017 Base Plans:***					

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603502N / *Surface & Shallow Water MCM*	**Project (Number/Name)** 1235 / *Mine Warfare Planning and Analysis*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
MEDAL NG - Conduct series of Development tests (DTs) and a series of regression tests. Continue System Development testing activities wih multiple platforms. Deliver to Fleet in accordance with the MEDAL EA Fielding Plan. ***FY 2017 OCO Plans:*** N/A					
Title: MEDAL Management ***Articles:***	0.000 -	0.411 -	0.729 -	0.000 -	0.729 -
FY 2015 Accomplishments: N/A - Funded in PU 1233 ***FY 2016 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 MIEW, 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 2017 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 MIEW, 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 2017 OCO Plans:*** N/A					
Accomplishments/Planned Programs Subtotals	0.000	7.760	8.910	0.000	8.910

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603502N / *Surface & Shallow Water MCM*	**Project (Number/Name)** 1235 / *Mine Warfare Planning and Analysis*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
• 2622/LV075: *Mine Sweeping Replacement (MEDAL).*	1.855	2.973	4.349	-	4.349	3.673	1.135	0.798	0.850	0.000	16.628

Remarks

D. Acquisition Strategy

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 Naval Surface and Mine War-fighting Development Center (SMWDC). 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.

E. Performance Metrics

Mine Warfare and Environmental Decision Aids Library (MEDAL) development to include integration of data fusion techniques and incorporation of Data Access Layer (DAL) architecture to meet FORCEnet requirements.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603502N / *Surface & Shallow Water MCM*	Project (Number/Name) 1235 / *Mine Warfare Planning and Analysis*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
MEDAL EA	C/CPAF	SAIC : McLean, VA	0.000	0.000		4.704	Nov 2015	5.105	Nov 2016	-		5.105	Continuing	Continuing	Continuing
		Subtotal	0.000	0.000		4.704		5.105		-		5.105	-	-	-

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
MEDAL EA	MIPR	NSWC PC : Panama City FL	0.000	0.000		0.247	Nov 2015	0.557	Nov 2016	-		0.557	Continuing	Continuing	Continuing
		Subtotal	0.000	0.000		0.247		0.557		-		0.557	-	-	-

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
MEDAL EA	C/CPAF	SAIC : McLean, VA	0.000	0.000		2.398	Nov 2015	2.519	Nov 2016	-		2.519	Continuing	Continuing	Continuing
		Subtotal	0.000	0.000		2.398		2.519		-		2.519	-	-	-

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
MEDAL EA	MIPR	NSWC PC : Panama City Fl	0.000	0.000		0.411	Nov 2015	0.729	Nov 2016	-		0.729	0.000	1.140	-
		Subtotal	0.000	0.000		0.411		0.729		-		0.729	0.000	1.140	-

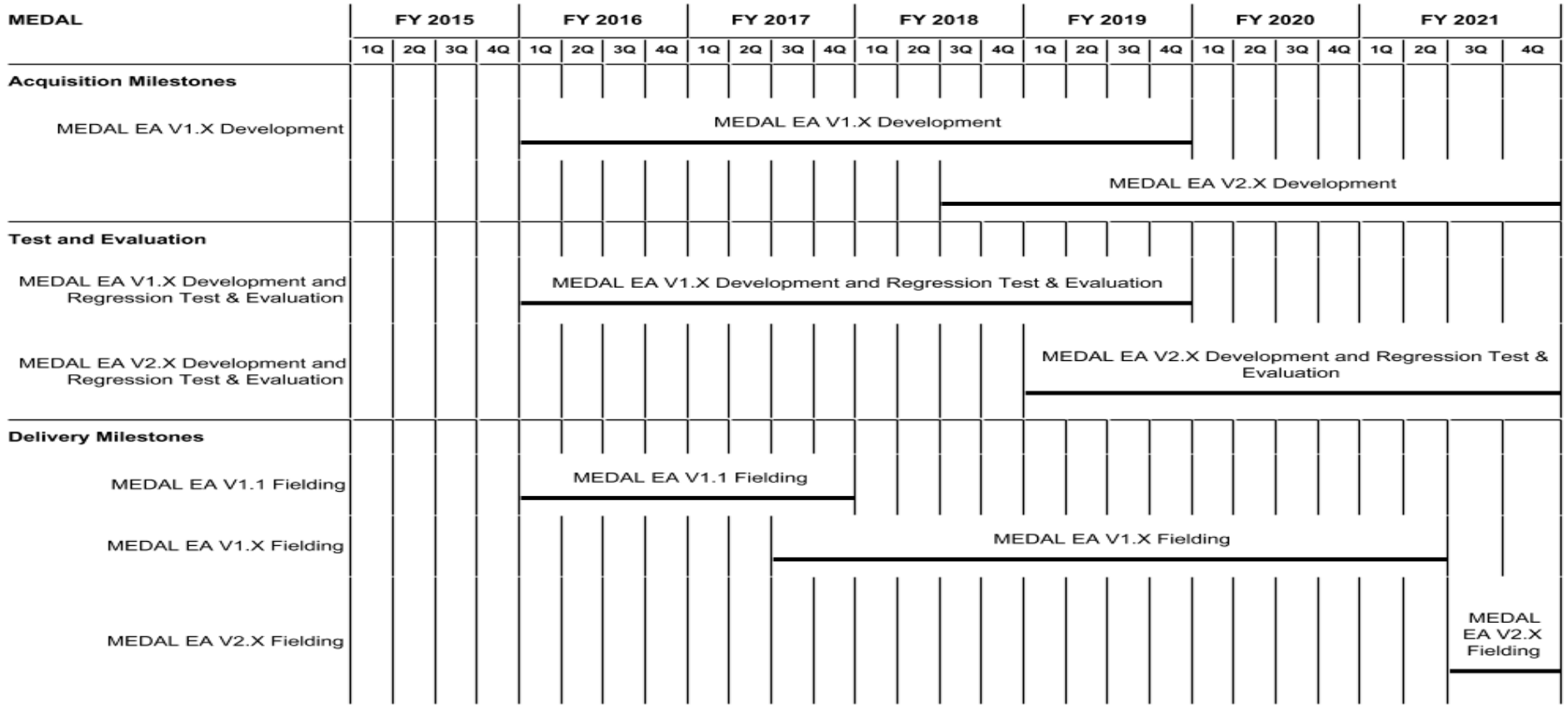
	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	0.000		7.760		8.910		-		8.910	-	-	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603502N / *Surface & Shallow Water MCM*	Project (Number/Name) 1235 / *Mine Warfare Planning and Analysis*	

	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	Cost To Complete	Total Cost	Target Value of Contract

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603502N / *Surface & Shallow Water MCM*	**Project (Number/Name)** 1235 / *Mine Warfare Planning and Analysis*



2017PB - 0603502N - 1235

Exhibit R-4A, RDT&E Schedule Details: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603502N / *Surface & Shallow Water MCM*	**Project (Number/Name)** 1235 / *Mine Warfare Planning and Analysis*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
MEDAL				
Acquisition Milestones: MEDAL EA V1.X Development: MEDAL EA V1.X Development	1	2016	4	2019
Acquisition Milestones: MEDAL EA V1.X Development: MEDAL EA V2.X Development	3	2018	4	2021
Test and Evaluation: MEDAL EA V1.X Development and Regression Test & Evaluation: MEDAL EA V1.X Development and Regression Test & Evaluation	1	2016	4	2019
Test and Evaluation: MEDAL EA V2.X Development and Regression Test & Evaluation: MEDAL EA V2.X Development and Regression Test & Evaluation	1	2019	4	2021
Delivery Milestones: MEDAL EA V1.1 Fielding: MEDAL EA V1.1 Fielding	1	2016	4	2017
Delivery Milestones: MEDAL EA V1.X Fielding: MEDAL EA V1.X Fielding	3	2017	2	2021
Delivery Milestones: MEDAL EA V2.X Fielding: MEDAL EA V2.X Fielding	3	2021	4	2021

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603502N / *Surface & Shallow Water MCM*	Project (Number/Name) 2094. / *Unmanned Underwater Vehicle*	

COST ($ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
2094.: *Unmanned Underwater Vehicle*	52.199	13.416	12.165	67.607	-	67.607	79.336	122.469	154.342	163.841	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Large Displacement Unmanned Undersea Vehicle (LDUUV) program will design and build a modular, reconfigurable Unmanned Undersea Vehicle (UUV) with Open Architecture (OA) software (SW) focused on introducing a new class (large displacement) of UUVs to the Navy to provide increased endurance, payload hosting, and delivery capability. The LDUUV will be modular in design and include hotel functionality (guidance and control, navigation, autonomy, situational awareness, core communications, and power distribution), energy and power, propulsion and maneuvering, mission sensors, and communications links. It is intended that modules will have well defined interfaces for the purposes of implementing cost-effective upgrades in future increments to leverage advances in technology.
The Persistent Littoral Undersea Surveillance (PLUS) program provides effective, adaptive and persistent undersea surveillance targets over large littoral areas.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Title: LDUUV Product Development	2.268	7.843	61.114	0.000	61.114
Articles:	-	-	-	-	-
FY 2015 Accomplishments: Achieved Milestone A. Developed draft Request for Proposal (RFP) for Engineering Development Model (EDM) contracts. Completed Interface Control Documents (ICD), Capability Development Document (CDD), and System Requirement Document (SRD). Prepared draft Test and Evaluation Master Plan (TEMP). Continued risk reduction engineering efforts to include Battery Certification, Autonomy, Reliability, and Submarine integration tasking.					
FY 2016 Plans: Complete Test and Evaluation Master Plan (TEMP). Develop government conceptual design for LDUUV prototype. Prepare for and complete Preliminary Design Review (PDR). Continue risk reduction experimentation and prototyping efforts to prove LDUUV can meet targets for extended unmanned operation, and submarine and ship integration efforts enabling LDUUV launch and recovery from submarines and ships.					
FY 2017 Base Plans: Develop detailed government design for LDUUV prototype. Prepare for Critical Design Review (CDR).					

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603502N / *Surface & Shallow Water MCM*	**Project (Number/Name)** 2094. / *Unmanned Underwater Vehicle*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Continue the Risk Reduction experimentation efforts to include SG270 battery certification, advanced autonomy and reliability efforts to prove LDUUV can meet targets for extended unmanned operation, and submarine/ship integration efforts enabling LDUUV launch and recovery from submarines and ships. ***FY 2017 OCO Plans:*** N/A					
Title: LDUUV Support ***Articles:*** ***FY 2015 Accomplishments:*** Conducted Milestone A. Developed statutory documents for Gate 4 and 5 reviews. Released draft RFP. Formulated proposal evaluation team to review bids. Conducted technology risk reduction efforts. ***FY 2016 Plans:*** Develop and update program documentation based on prototype conceptual design and PDR. ***FY 2017 Base Plans:*** Update program documentation based on prototype detail design. Prepare for CDR. ***FY 2017 OCO Plans:*** N/A	7.725 -	2.863 -	4.839 -	0.000 -	4.839 -
Title: LDUUV Management ***Articles:*** ***FY 2015 Accomplishments:*** Provided program management support and travel for the LDUUV 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. ***FY 2016 Plans:*** Provide program management support and travel for the LDUUV program. Program management shall include overall technical guidance and leadership for the program. Oversight of financial and logistics efforts and	0.705 -	1.459 -	1.654 -	0.000 -	1.654 -

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603502N / *Surface & Shallow Water MCM*	**Project (Number/Name)** 2094. / *Unmanned Underwater Vehicle*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
coordination with Navy and other DoD organizations and contractors as required to ensure successful execution of the program. ***FY 2017 Base Plans:*** Provide program management support and travel for the LDUUV 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. ***FY 2017 OCO Plans:*** N/A					
Title: Persistent Littoral Undersea Surveillance (PLUS) ***Articles:*** ***Description:*** Persistent Littoral Undersea Surveillance (PLUS): The Persistent Littoral Undersea Surveillance (PLUS) program provides effective, adaptive and persistent undersea surveillance targets over large littoral areas. ***FY 2015 Accomplishments:*** -Continue all efforts from FY14 unless noted as completed above. -Complete the testing of the updated communications throughout the system -Complete construction and the testing and evaluation of the Revised and Optimized PLUS Sensor Vehicle ***FY 2016 Plans:*** N/A ***FY 2017 Base Plans:*** N/A ***FY 2017 OCO Plans:*** N/A	2.718 -	0.000 -	0.000 -	0.000 -	0.000 -
Accomplishments/Planned Programs Subtotals	13.416	12.165	67.607	0.000	67.607

C. Other Program Funding Summary ($ in Millions)

N/A

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603502N / *Surface & Shallow Water MCM*	**Project (Number/Name)** 2094. / *Unmanned Underwater Vehicle*

C. Other Program Funding Summary ($ in Millions)

Remarks

D. Acquisition Strategy

The LDUUV program will design, build, and test two prototype UUVs to Navy requirements followed by award of production contract.
This effort will transition to PEO-LCS / PMS406 as a User Operational Evaluation System (UOES) in FY 2013.

E. Performance Metrics

LDUUV - PDR 4Q 2016
Performance metrics for this effort are classified.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603502N / *Surface & Shallow Water MCM*	Project (Number/Name) 2094. / *Unmanned Underwater Vehicle*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
LDUUV Experimentation and Prototype Design	WR	NUWC Newport : Newport, RI	2.347	2.097	Dec 2014	7.843	Mar 2016	61.114	Nov 2016	-		61.114	0.000	73.401	-
PLUS Prototype	Various	Various : Various	13.299	0.000		0.000		0.000		-		0.000	0.000	13.299	-
Arrays	C/CPFF	Ocean Acoustical Services and instrumentation : Lexington, MA	0.686	0.102	Oct 2014	0.000		0.000		-		0.000	0.000	0.788	-
TDA's	C/CPFF	Ocean Acoustical Services and instrumentation : Lexington, MA	0.411	0.050	Oct 2014	0.000		0.000		-		0.000	0.000	0.461	-
SP-Intergration	C/CPFF	Ocean Acoustical Services and instrumentation : Lexington, MA	0.686	0.050	Oct 2014	0.000		0.000		-		0.000	0.000	0.736	-
TDA's	C/CPFF	METRON : Reston, VA	0.411	0.050	Oct 2014	0.000		0.000		-		0.000	0.000	0.461	-
Navigation	C/FPRP	Woods Hole Oceanographic Institution : Woods Hole, MA	0.548	0.150	Oct 2014	0.000		0.000		-		0.000	0.000	0.698	-
SP-Intergration	Reqn	NAVSEA : Baltimore, MD	0.686	0.100	Oct 2014	0.000		0.000		-		0.000	0.000	0.786	-
TDA's	Reqn	NUWC : Newport, RI	0.411	0.150	Oct 2014	0.000		0.000		-		0.000	0.000	0.561	-
SP Intergration	Reqn	NUWC : Newport, RI	0.274	0.025	Oct 2014	0.000		0.000		-		0.000	0.000	0.299	-
Anti-Tamper	Reqn	Sandia Natl Lab : Livermore, CA	0.686	0.150	Oct 2014	0.000		0.000		-		0.000	0.000	0.836	-
Vehicle	C/CPFF	Hydroid Kongsberg Marine : Pocasset, MA	0.823	0.200	Oct 2014	0.000		0.000		-		0.000	0.000	1.023	-
		Subtotal	21.268	3.124		7.843		61.114		-		61.114	0.000	93.349	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603502N / *Surface & Shallow Water MCM*	Project (Number/Name) 2094. / *Unmanned Underwater Vehicle*	

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
LDUUV ILS & Engineering Support	Various	VAR : VAR	9.872	7.896	Dec 2014	2.863	Nov 2015	4.839	Nov 2016	-		4.839	0.000	25.470	-
PLUS ILS & Engineering Support	Various	VAR : VAR	8.321	0.000		0.000		0.000		-		0.000	0.000	8.321	-
Test	Reqn	NUWC : Newport, RI	0.041	0.150	Oct 2014	0.000		0.000		-		0.000	0.000	0.191	-
Test	Reqn	NSWD : Dahlgren, VA	0.082	0.150	Oct 2014	0.000		0.000		-		0.000	0.000	0.232	-
Test	Reqn	NUWC : Patuxent, MD	0.027	0.075	Oct 2014	0.000		0.000		-		0.000	0.000	0.102	-
IA	Reqn	NUWC : Newport, RI	0.205	0.075	Oct 2014	0.000		0.000		-		0.000	0.000	0.280	-
		Subtotal	18.548	8.346		2.863		4.839		-		4.839	0.000	34.596	-

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
PLUS Fleet Experimentation	Various	Various : Various	5.077	0.000		0.000		0.000		-		0.000	0.000	5.077	-
Test	C/CPFF	Ocean Acoustical Services and instrumentation : Lexington, MA	0.561	0.100	Oct 2014	0.000		0.000		-		0.000	0.000	0.661	-
Test	C/FPRP	Woods Hole Oceanographic Institution : Woods Hole, MA	1.223	0.150	Oct 2014	0.000		0.000		-		0.000	0.000	1.373	-
Testing	C/CPFF	Woods Hole Oceanographic Institution : Woods Hole, MA	0.480	0.125	Oct 2014	0.000		0.000		-		0.000	0.000	0.605	-
Testing	Reqn	NUWC : Newport, RI	0.437	0.175	Oct 2014	0.000		0.000		-		0.000	0.000	0.612	-
Testing	Reqn	NPS : Monterey, CA	0.034	0.025	Oct 2014	0.000		0.000		-		0.000	0.000	0.059	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603502N / *Surface & Shallow Water MCM*	Project (Number/Name) 2094. / *Unmanned Underwater Vehicle*	

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Testing	Reqn	SPAWAR : San Diego, CA	0.213	0.028	Oct 2014	0.000		0.000		-		0.000	0.000	0.241	-
		Subtotal	8.025	0.603		0.000		0.000		-		0.000	0.000	8.628	-

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
LDUUV Program Management	WR	NUWC Newport : Newport, RI	0.965	0.400	Dec 2014	0.450	Dec 2015	0.525	Dec 2016	-		0.525	Continuing	Continuing	Continuing
LDUUV Program Management 2	TBD	TBD : TBD	0.835	0.240	Feb 2015	0.824	Dec 2015	0.970	Dec 2016	-		0.970	0.000	2.869	-
LDUUV Travel	Various	NAVSEA : Washington, DC	0.150	0.065	Dec 2014	0.185	Dec 2015	0.159	Dec 2016	-		0.159	0.000	0.559	-
PLUS Program Management	Various	VAR : VAR	1.239	0.000		0.000		0.000		-		0.000	0.000	1.239	-
PLUS Travel	Various	NAVSEA : Washington, DC	0.161	0.000		0.000		0.000		-		0.000	0.000	0.161	-
Program	C/CPFF	Systems Planning & Analysis : Arlington, VA	0.400	0.150	Oct 2014	0.000		0.000		-		0.000	0.000	0.550	-
Program	SS/BA	Kentco : Sterling, VA	0.427	0.438	Oct 2014	0.000		0.000		-		0.000	0.000	0.865	-
Program	SS/BA	Mandex : Fairfax, VA	0.181	0.050	Oct 2014	0.000		0.000		-		0.000	0.000	0.231	-
		Subtotal	4.358	1.343		1.459		1.654		-		1.654	-	-	-

	Prior Years	FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	52.199	13.416		12.165		67.607		-		67.607	-	-	-

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603502N / *Surface & Shallow Water MCM*	**Project (Number/Name)** 2094. / *Unmanned Underwater Vehicle*

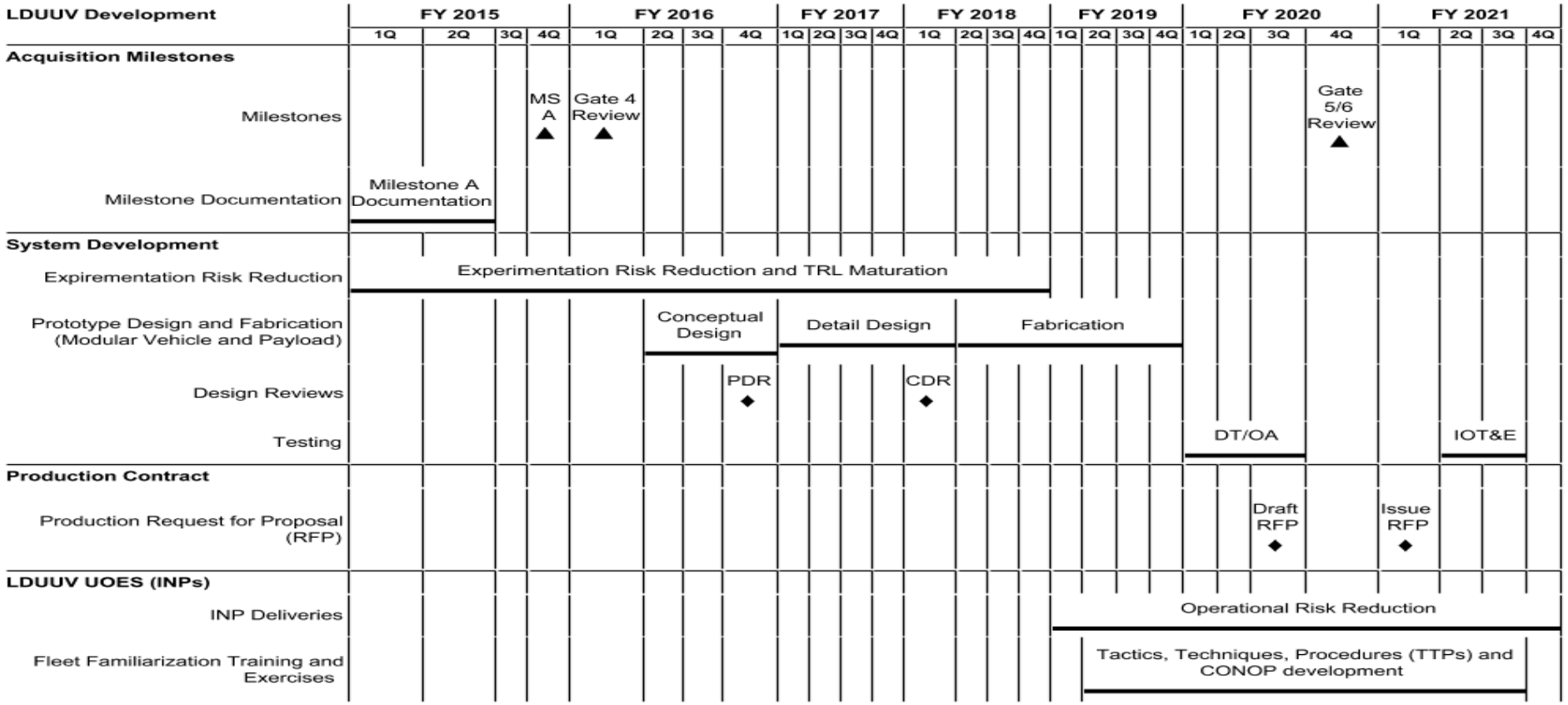


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Exhibit R-4, RDT&E Schedule Profile: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603502N / *Surface & Shallow Water MCM*	**Project (Number/Name)** 2094. / *Unmanned Underwater Vehicle*

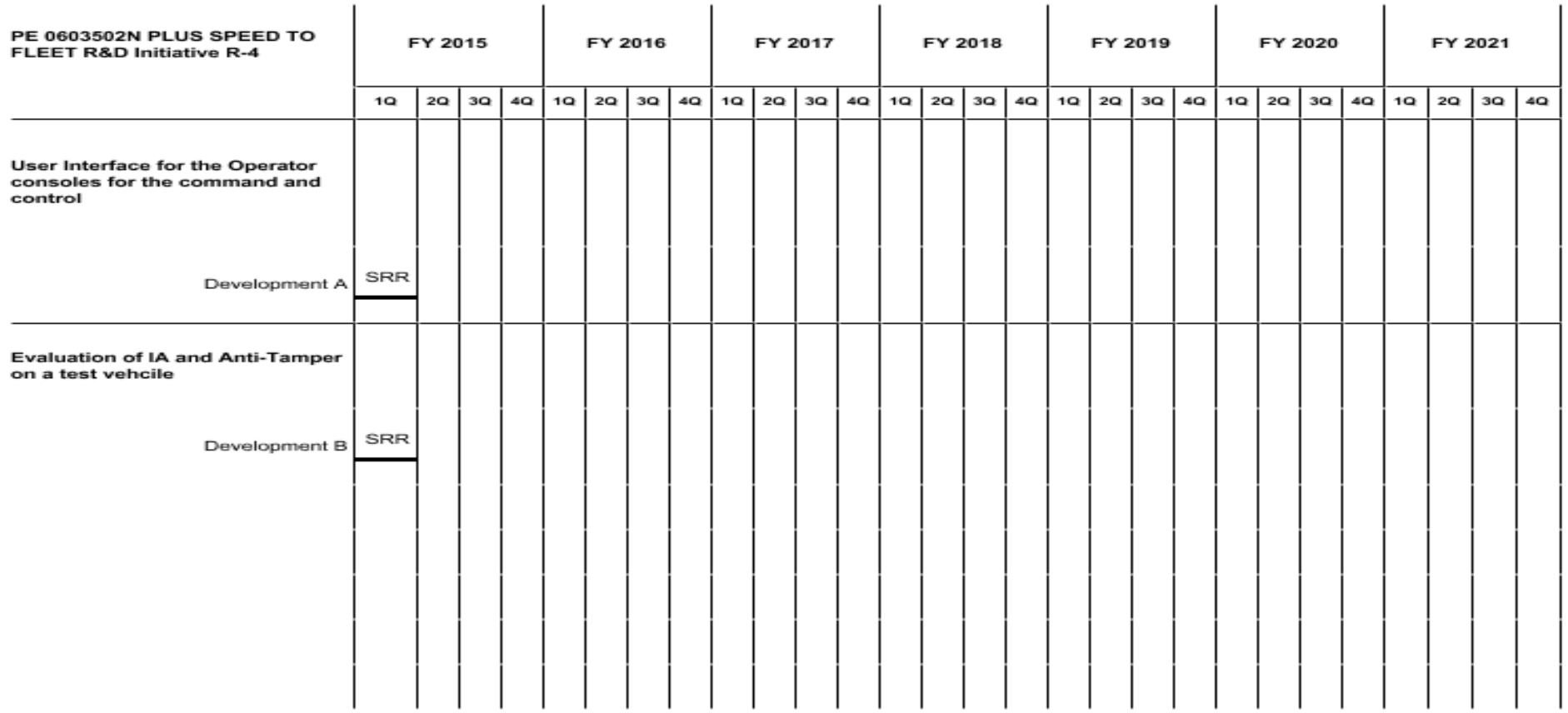

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Exhibit R-4A, RDT&E Schedule Details: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603502N / *Surface & Shallow Water MCM*	**Project (Number/Name)** 2094. / *Unmanned Underwater Vehicle*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
LDUUV Development				
Acquisition Milestones: Milestones: Milestone A	4	2015	4	2015
Acquisition Milestones: Milestones: Gate 4 Review	1	2016	1	2016
Acquisition Milestones: Milestones: Gate 5/6	4	2020	4	2020
Acquisition Milestones: Milestone Documentation: Milestone A Documentation	1	2015	2	2015
System Development: Expiremention Risk Reduction: Technology Risk Reduction	1	2015	4	2018
System Development: Prototype Design and Fabrication (Modular Vehicle and Payload): Prototype Conceptual Design	2	2016	4	2016
System Development: Prototype Design and Fabrication (Modular Vehicle and Payload): Protoype Detail Design	1	2017	1	2018
System Development: Prototype Design and Fabrication (Modular Vehicle and Payload): Prototype Fabrication	2	2018	4	2019
System Development: Design Reviews: PDRs	4	2016	4	2016
System Development: Design Reviews: CDRs	1	2018	1	2018
System Development: Testing: Devlopemental Testing/Operational Assessment	1	2020	3	2020
System Development: Testing: Initial Operation Test and Evaluation	2	2021	3	2021
Production Contract: Production Request for Proposal (RFP): Draft Production RFP	3	2020	3	2020
Production Contract: Production Request for Proposal (RFP): Isuue Production RFP	1	2021	1	2021
LDUUV UOES (INPs): INP Deliveries: Risk Reduction	1	2019	4	2021
LDUUV UOES (INPs): Fleet Familiarization Training and Exercises: Schedule Detail	2	2019	3	2021
PE 0603502N PLUS SPEED TO FLEET R&D Initiative R-4				
User Interface for the Operator consoles for the command and control: Development A: SRR	1	2015	1	2015

Exhibit R-4A, RDT&E Schedule Details: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603502N / *Surface & Shallow Water MCM*	**Project (Number/Name)** 2094. / *Unmanned Underwater Vehicle*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Evaluation of IA and Anti-Tamper on a test vehcile: Development B: SRR	1	2015	1	2015

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603502N / *Surface & Shallow Water MCM*	Project (Number/Name) 2131 / *Assault Breaching System*	

COST ($ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
2131: *Assault Breaching System*	577.790	17.348	15.598	20.201	-	20.201	16.080	18.526	19.123	17.495	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This program provides a combination of U.S. Navy systems to counter the threat to amphibious forces from obstacles and anti-landing/sea mines in the Beach Zone and Surf Zone (0-10 ft water). The Assault Breaching Systems (ABS) consist of a system of systems approach that includes the following programs: JABS - Joint Direct Attack Munition (JDAM) Assault Breaching System; CMS - Countermine System; COBRA - Coastal Battlefield Reconnaissance and Analysis; PNMS - Precision Navigation and Marking System; and C4I - Command, Control, Computers, Communications, and Intelligence. The Assault Breaching Systems enable the Navy-Marine Corps team to conduct Joint Forcible Entry Operations (JFEO), Ship-To-Objective Maneuver (STOM), and other combat operations to project power ashore.

The JDAM Assault Breaching System (JABS) is a currently fielded system that neutralizes surface mines and obstacles in the Beach Zone and Surf Zone. The ABS Tactical Decision Aid optimizes the Desired Points of Impact (DPI) for JDAM munitions to effectively neutralize mines and obstacles while minimizing the required number of munitions and friendly aircraft sorties. Continued testing is required to optimize the ABS Tactical Decision Aid database for the most common enemy mines and obstacles.

Coastal Battlefield Reconnaissance and Analysis (COBRA) is the ABS program to conduct ISR/T. This system provides Airborne Mine Countermeasures (AMCM) capability, and 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 is a multispectral sensor capable of daytime detection of surface-laid minefields and obstacles in the Beach Zone. Block II adds a 3D LIDAR (Light Detection and Ranging) sensor that enables nighttime detection of mines and obstacles in the Beach Zone and the Surf Zone (0-10 ft of water). Block II also adds on-board near real-time processing of multispectral imagery data. Block III adds an interferometric sensor that is capable of detecting buried mines. Blocks II and III will incorporate technology being developed by 6.3 S&T. COBRA consists of a modular payload architecture that can be integrated onto the MQ-8B Fire Scout Vertical Takeoff and Landing Unmanned Aerial Vehicle (VTUAV) or USN manned helicopters like the SH-60. COBRA will serve as the "detect" mission module in the Surf Zone and Beach Zone for the Littoral Combat Ship (LCS) Mine Warfare mission package.

Precision Navigation & Marking System (PNMS) provides navigational upgrades for the Landing Craft, Air Cushion (LCAC); Landing Craft, Utility (LCU); and Amphibious Assault Vehicle (AAV). A system of virtual lane marking improves the navigation ability of these three assault craft which enables them to navigate safely through the neutralized assault lanes provided by JABS and CMS. OPN funds 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 occur during scheduled LCAC SLEPs. AAV Navigation Upgrade : Modernize the navigation system to enable precise transit through the breached lane.

Command, Control, Computers, Communications and Intelligence (C4I) system will tie all of the above systems together under an integrated ABS architecture that is compatible with the existing Mine Warfare architecture.

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603502N / *Surface & Shallow Water MCM*	**Project (Number/Name)** 2131 / *Assault Breaching System*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Title: Product Development:	10.749	8.835	11.836	0.000	11.836
Articles:	-	-	-	-	-
FY 2015 Accomplishments: COBRA - Continued Block 1 integration Flight Tests with VTUAV. Continued design and development of COBRA Block II capability. JABS - Designed and engineered weapon effectivness for beach zones and surf zone. Precision Navigation/Marking (PN/M) - continued evaluation/assessment of EDMs supporting PN/M efforts.					
FY 2016 Plans: COBRA - Continue Block 1 integration Flight Tests with VTUAV. Continue design and development of COBRA Block II capability. JABS - Design and engineering of weapon effectivness for beach zones and surf zone. Precision Navigation/Marking (PN/M) - continue evaluation/assessment of EDMs supporting PN/M efforts.					
FY 2017 Base Plans: COBRA - Complete Block 1 integration Flight Tests with VTUAV. Increased design and development of COBRA Block II capability. JABS - Design and engineering of weapon effectivness for beach zones and surf zone. Precision Navigation/Marking (PN/M) - continue evaluation/assessment of EDMs supporting PN/M efforts.					
FY 2017 OCO Plans: N/A					
Title: Technical Support:	1.053	1.105	1.507	0.000	1.507
Articles:	-	-	-	-	-
FY 2015 Accomplishments:					

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603502N / *Surface & Shallow Water MCM*	**Project (Number/Name)** 2131 / *Assault Breaching System*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
COBRA - Provided mine magazine inventory management and shipping, contract and test/studies, C4I Data Fusion. Provided technical /acquisition support and documenttation (ILS, training, data, drawings). ***FY 2016 Plans:*** COBRA - Provide mine magazine inventory management and shipping, contract and test/studies, C4I Data Fusion. Provide technical /acquisition support and documenttation (ILS, training, data, drawings). ***FY 2017 Base Plans:*** COBRA - Provide mine magazine inventory management and shipping, contract and test/studies, C4I Data Fusion. Provide technical /acquisition support and documenttation (ILS, training, data, drawings). ***FY 2017 OCO Plans:*** N/A					
Title: Test and Evaluation:	4.427	4.523	5.723	0.000	5.723
Articles:	-	-	-	-	-
FY 2015 Accomplishments: COBRA - Conducted Block I Operational Assessment (OA). Advanced component Block II compnent Development Testing. JABS - Surf Zone (SZ) and Beach Zone (BZ) characterization testing. PN/M - Continue to test the Precision Navigation and Marking design capability. ***FY 2016 Plans:*** COBRA - Block I Development Testing (DT) and IOT&E. Continue Block II component Development Testing (DT). JABS - Surf Zone (SZ) and Beach Zone (BZ) characterization testing. PN/M - Continue to test the Precision Navigation and Marking design capability ***FY 2017 Base Plans:*** COBRA - Continue advanced component Block II compnent Development Testing. JABS - Surf Zone (SZ) and Beach Zone (BZ) characterization testing.					

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603502N / *Surface & Shallow Water MCM*	**Project (Number/Name)** 2131 / *Assault Breaching System*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
PN/M - Continue to test the Precision Navigation and Marking design capability. ***FY 2017 OCO Plans:*** N/A					
Title: Management:	1.119	1.135	1.135	0.000	1.135
Articles:	-	-	-	-	-
FY 2015 Accomplishments: Mine magazine inventory management and shipping, contract management and tests/studies, C4I/Data fusion. ***FY 2016 Plans:*** Mine magazine inventory management and shipping, contract management and tests/studies, C4I/Data fusion. ***FY 2017 Base Plans:*** Mine magazine inventory management and shipping, contract management and tests/studies, C4I/Data fusion. ***FY 2017 OCO Plans:*** N/A					
Accomplishments/Planned Programs Subtotals	17.348	15.598	20.201	0.000	20.201

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
• OPN/2624: *SHALLOW WATER Mine CM SHIP*	0.000	0.000	8.875	-	8.875	8.770	5.485	5.608	5.721	0.002	82.934

Remarks

D. Acquisition Strategy

Countermine/Counter Obstacle (CM/CO)is JDAM Assault Breaching System (JABS) and ABS Tactical Decision Aid testing is ongoing.

Intelligence/Surveillance/Reconnaissance/Targeting (ISR/T) - COBRA Block I achieved MS C in 3rd QTR FY 2009. COBRA Block II technology transferred from ONR and will achieve MS B in 2nd QTR FY17. COBRA Block III technology will transition in FY18.

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603502N / *Surface & Shallow Water MCM*	**Project (Number/Name)** 2131 / *Assault Breaching System*

Precision Navigation & Marking System (PNMS) - 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 2nd QTR FY 2015.

All of the above systems continue to meet or exceed their Key Performance Parameters.

E. Performance Metrics

Successful COBRA integration, flight tests: Operational Assessment (OA) and Development Testing (DT) into the Vertical Take-off Unmanned Arial Vehicle (VTUAV).

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603502N / *Surface & Shallow Water MCM*	Project (Number/Name) 2131 / *Assault Breaching System*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Primary Hardware Dev, COBRA	C/CPAF	Arete : MELBOURNE, FL	158.942	7.974	Nov 2014	5.827	Nov 2015	9.054	Nov 2016	-		9.054	0.000	181.797	-
Primary Hardware Dev, CMS	C/CPAF	Boeing : St. Louis, MO	99.974	0.000		0.000		0.000		-		0.000	0.000	99.974	-
Ancillary Hardware Dev, JABS	C/CPAF	Unknown : Unknown	22.078	0.000		0.000		0.000		-		0.000	0.000	22.078	-
Systems Engineering, COBRA	WR	NSWC, PC : PANAMA CITY, FL	20.860	0.000		0.000		0.000		-		0.000	0.000	20.860	-
Software Dev, COBRA	WR	NAVAIR : PANAMA CITY, FL	12.958	0.000		0.000		0.000		-		0.000	0.000	12.958	-
Systems Engineering, CMS	WR	NSWC, PC : PANAMA CITY, FL	31.505	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
JABS	WR	NSWC PC : NSWC IH	5.418	1.244	Nov 2014	1.801	Nov 2015	1.656	Nov 2016	-		1.656	0.000	10.119	-
Training Dev, COBRA	WR	NSWC, PC : PANAMA CITY, FL	9.336	0.775	Nov 2014	0.475	Nov 2015	0.775	Nov 2016	-		0.775	0.000	11.361	-
Tooling	WR	NSWC, PC : PANAMA CITY, FL	0.860	0.000		0.000		0.000		-		0.000	0.000	0.860	-
ABS IPT/Test Assets/Proj Eng	WR	NSWC, PC : PANAMA CITY, FL	8.463	0.351	Nov 2014	0.251	Nov 2015	0.351	Nov 2016	-		0.351	0.000	9.416	-
Precision Navigation & Marking	WR	NSWC, PC : PANAMA CITY, FL	15.640	0.405	Nov 2014	0.481	Nov 2015	0.000		-		0.000	0.000	16.526	-
		Subtotal	386.034	10.749		8.835		11.836		-		11.836	-	-	-

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Development Support Equipment	WR	NSWC, PC : PANAMA CITY, FL	19.285	0.797	Nov 2014	0.849	Nov 2015	0.849	Nov 2016	-		0.849	0.000	21.780	-
Software Development	WR	NSWC, PC : PANAMA CITY, FL	8.037	0.000		0.000		0.202	Nov 2016	-		0.202	0.000	8.239	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603502N / *Surface & Shallow Water MCM*	Project (Number/Name) 2131 / *Assault Breaching System*	

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Integrated Logistics Support	WR	NSWC, IH : NDIAN HEAD, MD	2.712	0.000		0.000		0.100	Nov 2016	-		0.100	0.000	2.812	-
Configuration Management	WR	NSWC, PC : PANAMA CITY, FL	3.744	0.000		0.000		0.100	Nov 2016	-		0.100	0.000	3.844	-
Technical Data	WR	NSWC, PC : PANAMA CITY, FL	2.588	0.000		0.000		0.000		-		0.000	0.000	2.588	-
Studies & Analysis	WR	NSWC, PC : PANAMA CITY, FL	5.864	0.256	Nov 2014	0.256	Nov 2015	0.256	Nov 2016	-		0.256	0.000	6.632	-
GFE	WR	NSWC, PC : PANAMA CITY, FL	0.400	0.000		0.000		0.000		-		0.000	0.000	0.400	-
		Subtotal	42.630	1.053		1.105		1.507		-		1.507	0.000	46.295	-

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Development Test & Evaluation	WR	NSWC, IH : NDIAN HEAD, MD	56.000	2.424	Nov 2014	2.474	Nov 2015	2.525	Nov 2016	-		2.525	0.000	63.423	-
Operational Test & Evaluation	WR	NSWC/ IH, PC : NDIAN HEAD, PANAMA CITY	8.655	0.000		0.000		1.175	Nov 2016	-		1.175	0.000	9.830	-
Tooling	WR	NSWC/ IH, PC : NDIAN HEAD, PANAMA CITY	0.700	0.000		0.000		0.000		-		0.000	0.000	0.700	-
GFE	WR	NSWC/ IH, PC : NDIAN HEAD, PANAMA CITY	0.400	0.000		0.000		0.000		-		0.000	0.000	0.400	-
Development Test	C/FP	NSWC PC : Panama City, FL	9.582	2.003	Nov 2014	2.049	Nov 2015	2.023	Nov 2016	-		2.023	0.000	15.657	-
		Subtotal	75.337	4.427		4.523		5.723		-		5.723	0.000	90.010	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603502N / *Surface & Shallow Water MCM*	**Project (Number/Name)** 2131 / *Assault Breaching System*

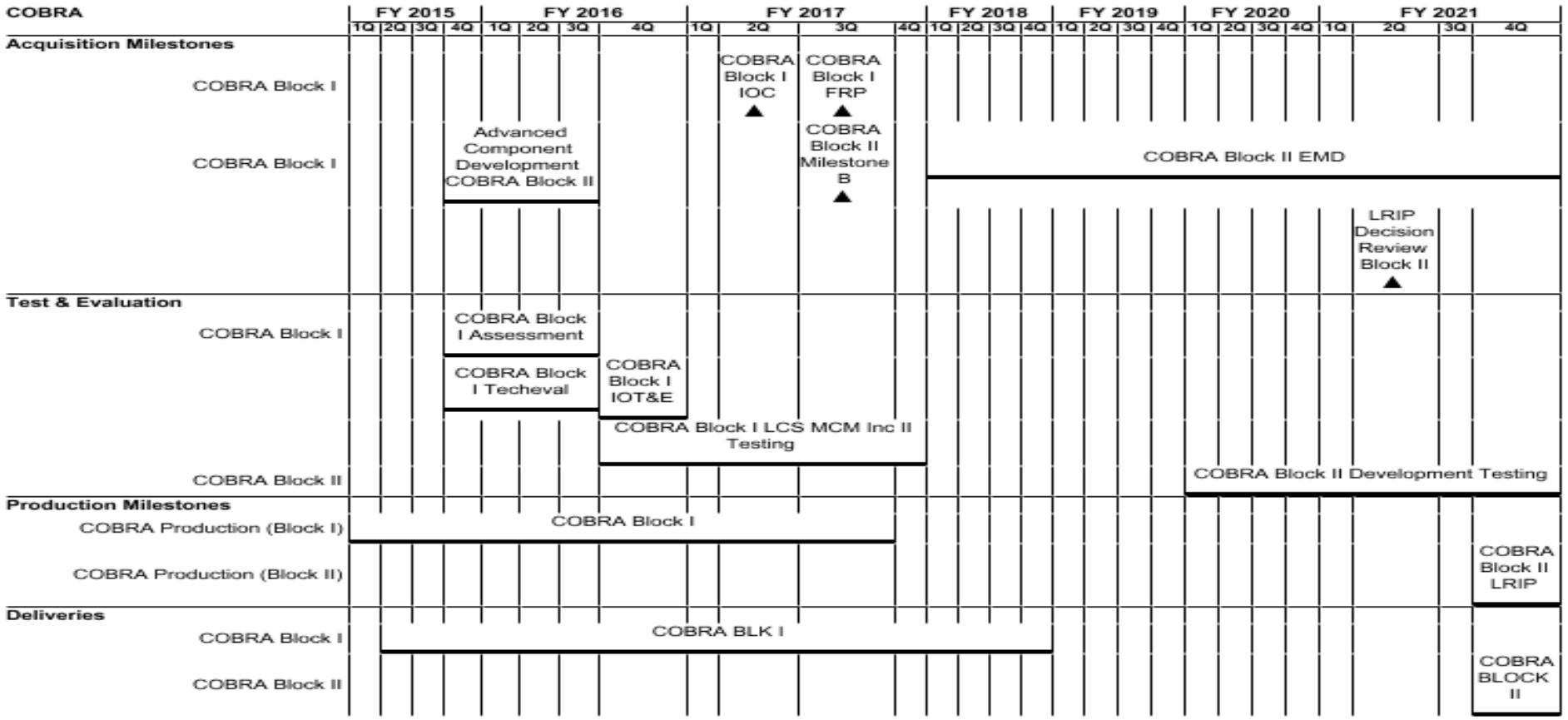
Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Contractor Engineering Support	C/CPFF	CACI, Norhtrup Grumman : DC, FL	10.695	0.120	Nov 2014	0.136	Nov 2015	0.125	Nov 2016	-		0.125	0.000	11.076	-
Government Engineering Support	WR	NSWC, IH : NDIAN HEAD, MD	35.091	0.488	Oct 2014	0.498	Nov 2015	0.509	Nov 2016	-		0.509	0.000	36.586	-
Program Management Support	WR	NSWC/ IH, PC : NDIAN HEAD, PANAMA CITY	24.775	0.441	Nov 2014	0.441	Nov 2015	0.451	Nov 2016	-		0.451	0.000	26.108	-
Travel	WR	NAVSEA : WNY, DC	1.583	0.070	Nov 2014	0.060	Nov 2015	0.050	Nov 2016	-		0.050	0.000	1.763	-
Assessment/BTR	C/CPAF	VARIOUS : VARIOUS	1.434	0.000		0.000		0.000		-		0.000	0.000	1.434	-
Acquisition Workforce	Various	VARIOUS : VARIOUS	0.211	0.000		0.000		0.000		-		0.000	0.000	0.211	-
		Subtotal	73.789	1.119		1.135		1.135		-		1.135	0.000	77.178	-

	Prior Years	FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	577.790	17.348		15.598		20.201		-		20.201	-	-	-

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603502N / *Surface & Shallow Water MCM*	**Project (Number/Name)** 2131 / *Assault Breaching System*



2017DON - 0603502N - 2131

Exhibit R-4A, RDT&E Schedule Details: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603502N / *Surface & Shallow Water MCM*	**Project (Number/Name)** 2131 / *Assault Breaching System*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
COBRA				
Acquisition Milestones: COBRA Block I: COBRA Block I IOC	2	2017	2	2017
Acquisition Milestones: COBRA Block I: COBRA Block I FRP	3	2017	3	2017
Acquisition Milestones: COBRA Block I: Advanced Component Development Block II	4	2015	3	2016
Acquisition Milestones: COBRA Block I: COBRA Block II EMD	1	2018	4	2021
Acquisition Milestones: COBRA Block I: COBRA Block II Milestone B	3	2017	3	2017
Acquisition Milestones: COBRA Block I: LRIP Decision Review Block II	2	2021	2	2021
Test & Evaluation: COBRA Block I: COBRA Block I Assessment	4	2015	3	2016
Test & Evaluation: COBRA Block I: COBRA Block I Techeval	4	2015	3	2016
Test & Evaluation: COBRA Block I: COBRA Block I IOT&E	4	2016	4	2016
Test & Evaluation: COBRA Block I: COBRA Block I LCS MCM Inc II Testing	4	2016	4	2017
Test & Evaluation: COBRA Block II: COBRA Block II Development Testing	1	2020	4	2021
Production Milestones: COBRA Production (Block I): COBRA Block I	1	2015	3	2017
Production Milestones: COBRA Production (Block II): COBRA Block II LRIP	4	2021	4	2021
Deliveries: COBRA Block I: Block I	2	2015	4	2018
Deliveries: COBRA Block II: Block II	4	2021	4	2021

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603502N / *Surface & Shallow Water MCM*	Project (Number/Name) 3123 / *SMCM UUV*	

COST ($ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
3123: *SMCM UUV*	102.998	17.609	15.392	11.557	-	11.557	25.239	16.945	20.990	21.842	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Knifefish Surface Mine Countermeasure Unmanned Undersea Vehicle (SMCM UUV) program develops Unmanned Underwater Vehicles to support clandestine mine detection capability against volume and bottom mines including buried mine detection. Equipment includes vehicles and associated systems support equipment. Potential P3I candidates to start in FY 2017 include communications upgrades, on-board sonar processing and target recognition, command and control improvements, and other smaller tasks.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Title: Knifefish SMCM UUV LFBB	17.609	15.392	11.557	0.000	11.557
Articles:	-	-	-	-	-
FY 2015 Accomplishments: Completed vehicle fabrication. Systems integration and environmental testing. Continued Engineering and Manufacturing Development (E&MD)phase. Performed initial contractor in-water trials.					
FY 2016 Plans: Continue Engineering and Manufacturing Development (E&MD)phase. Complete Developmental Testing/ Operational Assessment. Prepare Milestone C documentation.					
FY 2017 Base Plans: Conduct Operational Testing. Achieve Milestone C. Begin Pre-Planned Product Improvement (P3I) development efforts to increase sonar swath width sonar 6-10 times, add onboard data processing, and increase vehicle endurance 2.5 times.					
FY 2017 OCO Plans: N/A					
Accomplishments/Planned Programs Subtotals	17.609	15.392	11.557	0.000	11.557

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603502N / *Surface & Shallow Water MCM*	**Project (Number/Name)** 3123 / *SMCM UUV*

D. Acquisition Strategy

The Knifefish program was initiated in FY11 to develop Surface Mine Countermeasure Unmanned Undersea Vehicles (SMCM UUV) equipped with Low Frequency Broadband (LFBB) sonar that provides volume and bottom mine detection including buried mine detection capability. Initial procurement of the SMCM UUV with LFBB begins in FY 2017.

E. Performance Metrics

Successful Milestone C in Q2 FY 2017.
Reach Full Rate Production Decision in Q4 FY 2018.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603502N / *Surface & Shallow Water MCM*	Project (Number/Name) 3123 / *SMCM UUV*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
SMCM UOES Development	C/CPAF	BLUEFIN : CAMBRIDGE, MA	15.142	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Knifefish Development	C/CPIF	Various : Various	17.033	0.464	Dec 2014	0.000		0.000		-		0.000	0.000	17.497	-
Knifefish Development 2	C/CPIF	General Dynamics AIS : McLeansville, NC	43.510	14.749	Dec 2014	11.590	Dec 2015	4.369	Dec 2016	-		4.369	Continuing	Continuing	Continuing
Software Development	WR	NSWC, PC : PANAMA CITY, FL	0.805	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Knifefish P3I Contractor	C/CPIF	TBD : Unknown, Unknown	0.000	0.000		0.000		4.047	Dec 2016	-		4.047	0.000	4.047	-
		Subtotal	76.490	15.213		11.590		8.416		-		8.416	-	-	-

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Engineering Support 1	WR	NSWC, PC : PANAMA CITY, FL	13.962	0.875	Dec 2014	1.320	Dec 2015	0.508	Dec 2016	-		0.508	Continuing	Continuing	Continuing
Engineering Support 2	WR	NUWC, Newport : NEWPORT, RI	4.290	0.636	Dec 2014	0.542	Dec 2015	0.200	Dec 2016	-		0.200	Continuing	Continuing	Continuing
Engineering Support 3	WR	VARIOUS : VARIOUS	3.079	0.620	Dec 2014	0.946	Dec 2015	0.562	Dec 2016	-		0.562	Continuing	Continuing	Continuing
Engineering Support P3I	WR	NSWC, PC : PANAMA CITY, FL	0.000	0.000		0.000		0.211	Dec 2016	-		0.211	0.000	0.211	-
Engineering Support P3I	WR	NUWC, Newport : NEWPORT, RI	0.000	0.000		0.000		0.085	Dec 2016	-		0.085	0.000	0.085	-
Engineering Support P3I	WR	VARIOUS : VARIOUS	0.000	0.000		0.000		0.200	Dec 2016	-		0.200	0.000	0.200	-
		Subtotal	21.331	2.131		2.808		1.766		-		1.766	-	-	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603502N / *Surface & Shallow Water MCM*	Project (Number/Name) 3123 / *SMCM UUV*	

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation	WR	NOMWC : STENNIS, MS	0.526	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Government T&E Support	WR	VARIOUS : VARIOUS	1.213	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Test and Evaluation	WR	COMOPTEVFOR : NORFOLK, VA	0.481	0.000	Dec 2014	0.195	Dec 2015	0.280	Dec 2016	-		0.280	Continuing	Continuing	Continuing
Government T&E Support	WR	NSWC, PC : PANAMA CITY, FL	0.000	0.000	Dec 2014	0.449	Dec 2015	0.500	Dec 2016	-		0.500	0.000	0.949	-
		Subtotal	2.220	0.000		0.644		0.780		-		0.780	-	-	-

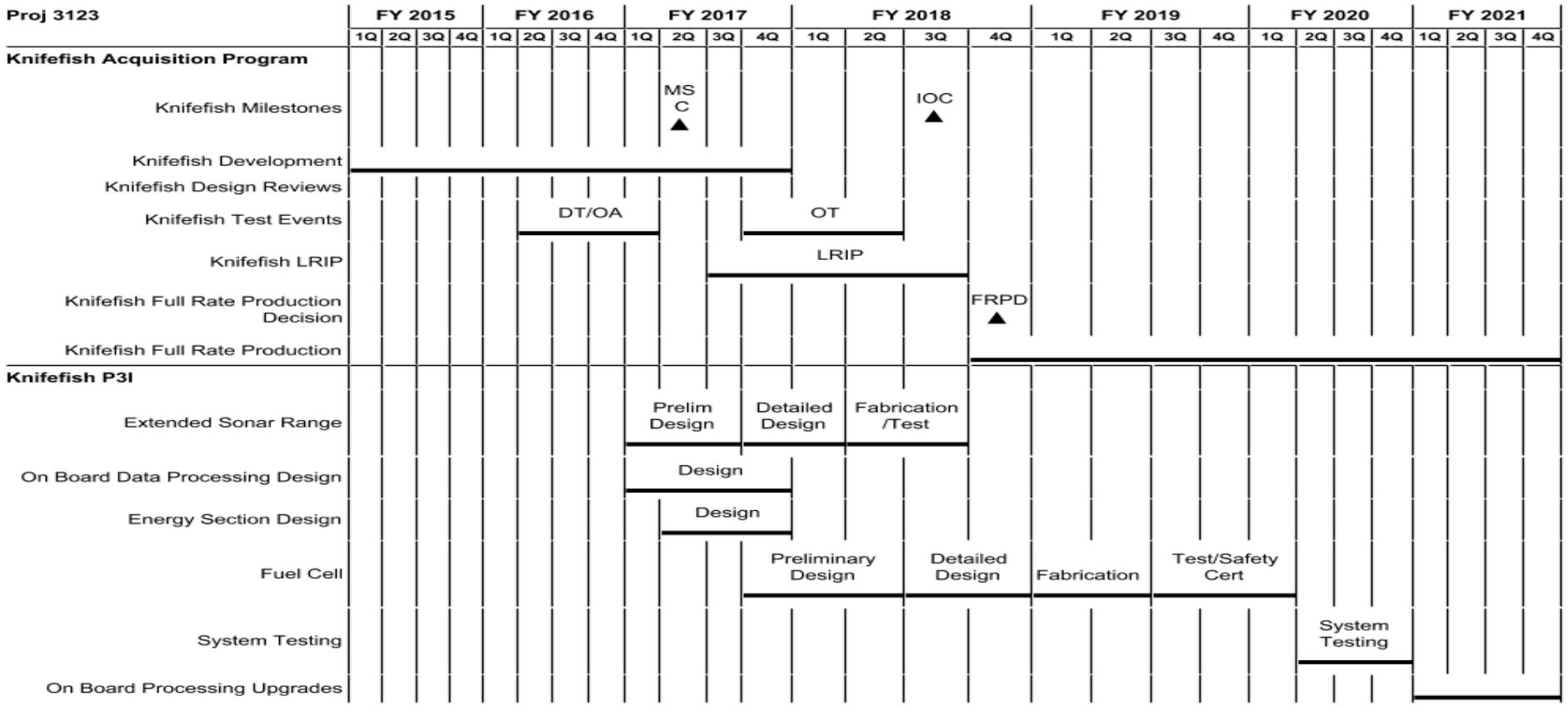
Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Need Item Text	C/BA	Not Specified : Not Specified	0.000	0.000		0.000		0.000		-		0.000	0.000	0.000	-
Program Management Support	C/CPFF	VARIOUS : WASHINGTON, DC	2.650	0.240	Jan 2015	0.300	Dec 2015	0.520	Dec 2016	-		0.520	Continuing	Continuing	Continuing
Travel	WR	NAVSEA : WNY, DC	0.260	0.025	Dec 2014	0.050	Dec 2015	0.075	Dec 2016	-		0.075	Continuing	Continuing	Continuing
Acquisition Workforce	WR	VARIOUS : VARIOUS	0.047	0.000		0.000		0.000		-		0.000	0.000	0.047	-
		Subtotal	2.957	0.265		0.350		0.595		-		0.595	-	-	-

	Prior Years	FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	102.998	17.609		15.392		11.557		-		11.557	-	-	-

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603502N / *Surface & Shallow Water MCM*	**Project (Number/Name)** 3123 / *SMCM UUV*



2017PB - 0603502N - 3123

Exhibit R-4A, RDT&E Schedule Details: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603502N / *Surface & Shallow Water MCM*	**Project (Number/Name)** 3123 / *SMCM UUV*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 3123				
Knifefish Acquisition Program: Knifefish Milestones: Milestone C	2	2017	2	2017
Knifefish Acquisition Program: Knifefish Milestones: IOC	3	2018	3	2018
Knifefish Acquisition Program: Knifefish Development:	1	2015	4	2017
Knifefish Acquisition Program: Knifefish Test Events: DT/OA	2	2016	1	2017
Knifefish Acquisition Program: Knifefish Test Events: OT	4	2017	2	2018
Knifefish Acquisition Program: Knifefish LRIP:	3	2017	3	2018
Knifefish Acquisition Program: Knifefish Full Rate Production Decision:	4	2018	4	2018
Knifefish Acquisition Program: Knifefish Full Rate Production:	4	2018	4	2021
Knifefish P3I: Extended Sonar Range: Extended Range Prelim Design	1	2017	3	2017
Knifefish P3I: Extended Sonar Range: Extended Range Detailed Design	4	2017	1	2018
Knifefish P3I: Extended Sonar Range: Extended Range Fabrication/Test	2	2018	3	2018
Knifefish P3I: On Board Data Processing Design:	1	2017	4	2017
Knifefish P3I: Energy Section Design: Energy Section Design	2	2017	4	2017
Knifefish P3I: Fuel Cell: Fuel Cell Prelim Design	4	2017	2	2018
Knifefish P3I: Fuel Cell: Fuel Cell Detailed Design	3	2018	4	2018
Knifefish P3I: Fuel Cell: Fuel Cell Fabrication	1	2019	2	2019
Knifefish P3I: Fuel Cell: Fuel Cell Test/Safety Cert	3	2019	1	2020
Knifefish P3I: System Testing: System Testing	2	2020	4	2020
Knifefish P3I: On Board Processing Upgrades: Upgrades	1	2021	4	2021

Exhibit R-2, RDT&E Budget Item Justification: PB 2017 Navy											Date: February 2016	
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 4: *Advanced Component Development & Prototypes (ACD&P)*					R-1 Program Element (Number/Name) PE 0603506N / *Surface Ship Torpedo Defense*							
COST ($ in Millions)	**Prior Years**	**FY 2015**	**FY 2016**	**FY 2017 Base**	**FY 2017 OCO**	**FY 2017 Total**	**FY 2018**	**FY 2019**	**FY 2020**	**FY 2021**	**Cost To Complete**	**Total Cost**
Total Program Element	553.061	56.802	71.300	87.066	-	87.066	80.573	83.597	44.127	52.167	Continuing	Continuing
0225: *Surface Ship Torpedo Defense (SSTD)*	553.061	56.802	71.300	87.066	-	87.066	80.573	83.597	44.127	52.167	Continuing	Continuing

A. Mission Description and Budget Item Justification

The growth between FY 2016 and FY 2017 funding requested is to enable the transition to production of the Anti-Torpedo Torpedo (ATT) to industry and to allow industry to demonstrate manufacturing processes to ensure delivery of a product within cost and schedule. During FY 2017, the CAT program will reach Milestone B and commence the Engineering and Manufacturing Development phase of the program. The TWS program will perform first article testing prior to the start of LRIP in FY 2018.

The Surface Ship Torpedo Defense (SSTD) program provides a detect-to-engage layered torpedo defense capability. The four major efforts that comprise SSTD and the AN/SLQ-25 (NIXIE) system, Torpedo Warning System (TWS), the Countermeasure Anti-Torpedo (CAT) and Acoustic Device Countermeasure (ADC MK2 Mod4). CAT and TWS are development programs. The CAT program develops a canisterized Anti-Torpedo Torpedo (ATT) and is anticipated to be an ACAT II program. The TWS develops the required torpedo detection, classification and localization (TDCL) ship systems and is an ACAT III program. The TWS and CAT systems make up the Anti-Torpedo Torpedo Defense System (ATTDS).

The program will develop and field six ATTDS Engineering Design Model (EDM) systems on CVNs. Each EDM system consists of one TWS and eight CATs. The systems were accelerated due to the lack of hard-kill torpedo defense on High Value Units (HVUs) which has been exacerbated by recent real-world events and evolving threats. The systems provide a hard-kill torpedo defense capability in advance of the IOC as part of the program of record. The program delivered one hybrid prototype system in FY13 on USS GHW BUSH. The next prototype was delivered in FY14; this system was delivered in a roll-on/roll-off (RO-RO) configuration and installed on USS Roosevelt. The program will build and install one additional RO-RO (USS Eisenhower) and one EDM (USS Truman)in FY15. The program will build and install two EDMs (USS Roosevelt (RO/RO to EDM) and USS NIMITZ) in FY16. In FY17 the ATTDS program will award a competitive contract to validate the CAT Technical Data Package which will lead to the production of the proof of manufacturing (POM) units in FY18. The program will also perform first article testing on the TWS system in FY17.

Overall, our program will continue to focus on first providing torpedo defense capability to High Value Units (HVU). For the Initial Operational Capability (IOC) the system will be installed on one CVN and one Combat Logistics Force (CLF) ship (both HVUs) with IOC in FY22.

Exhibit R-2, RDT&E Budget Item Justification: PB 2017 Navy					Date: February 2016
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 4: *Advanced Component Development & Prototypes (ACD&P)*		R-1 Program Element (Number/Name) PE 0603506N *I Surface Ship Torpedo Defense*			
B. Program Change Summary ($ in Millions)	**FY 2015**	**FY 2016**	**FY 2017 Base**	**FY 2017 OCO**	**FY 2017 Total**
Previous President's Budget	50.781	77.385	76.221	-	76.221
Current President's Budget	56.802	71.300	87.066	-	87.066
Total Adjustments	6.021	-6.085	10.845	-	10.845
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-6.085			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	7.100	0.000			
• SBIR/STTR Transfer	-1.079	0.000			
• Program Adjustments	0.000	0.000	12.215	-	12.215
• Rate/Misc Adjustments	0.000	0.000	-1.370	-	-1.370

Change Summary Explanation

The FY 2015 changes reflect a reduction of $1.079 million as a result of SBIR transfer and a $7.1M reprogramming for at sea integration testing.

The FY 2016 funding request reflects reduction of $6.085 million for In House Systems Engineering growth ($3.585 million) and Systems Development growth ($2.500 million).

The FY 2017 funding reflects an increase of $15.900 million to enable the transition to production of the ATT to industry and to allow industry to demonstrate manufacturing processes to ensure delivery of a product within cost and schedule. During FY 2017, the CAT program will reach Milestone B and commence the Engineering and Manufacturing Development phase of the program. The TWS program will perform first article testing prior to the start of LRIP in FY2018. Also, FY2017 reflects decreases of $1.370 million as a result of rates/miscellaneous adjustments and $3.685 million for the Department of the Navy to comply with the Bipartisan Budget Act of 2015.

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603506N / *Surface Ship Torpedo Defense*	Project (Number/Name) 0225 / *Surface Ship Torpedo Defense (SSTD)*	

COST ($ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
0225: *Surface Ship Torpedo Defense (SSTD)*	553.061	56.802	71.300	87.066	-	87.066	80.573	83.597	44.127	52.167	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Surface Ship Torpedo Defense (SSTD) program provides a layered torpedo defense capability with four efforts; two of which are currently in development. The Countermeasure Anti- Torpedo (CAT) program develops a canisterized Anti-Torpedo Torpedo (ATT). The Torpedo Warning System (TWS) develops the required TDCL systems. The Countermeasure TWS and CAT systems make up the Anti-Torpedo Torpedo Defense System (ATTDS)

The program will develop and field six ATTDS EDM systems on CVNs, two of which will be delivered in a RO-RO configuration and one hybrid prototype system on USS GHW BUSH. The program delivered one hybrid prototype EDM system in FY13 on USS GHW BUSH. The next system was delivered in FY14; this system was delivered in a roll-on/roll-off (RO-RO) configuration and installed on USS Roosevelt. The program installed one additional RO-RO (USS Eisenhower) and one EDM (USS Truman)in FY15. The program will build and install two EDMs (USS Roosevelt (RO/RO to EDM) and
USS NIMITZ) in FY16.

ATTDS system will be installed on one CVN and one Combat Logistics Force (CLF) ship (both HVUs) with IOC defined as FY22.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Title: Countermeasure Anti-Torpedo (CAT)	28.566	38.300	50.981	0.000	50.981
Articles:	12	-	25	-	25
FY 2015 Accomplishments: Continue land based and in-water testing of EDM-2 ATT thermal engine variant. Build CATs for FY15 EDM systems and procure long lead material for FY16 EDM systems. Conduct follow-on software development and testing for ATT SALVO capability.					
FY 2016 Plans: Complete land based software development and in-water testing of the EDM-2 thermal engine variant. Assemble and deliver CAT systems purchased in FY15. Complete follow-on software development and testing for ATT SALVO capability. Conduct two independent integrated in-water tests on CVNs with TWS systems for the development of the initial ATT SALVO Capability.					

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603506N / *Surface Ship Torpedo Defense*	**Project (Number/Name)** 0225 / *Surface Ship Torpedo Defense (SSTD)*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Deliver the initial ATT SALVO capability at the end of FY16.					
FY 2017 Base Plans: Assemble and deliver CAT systems purchased in FY16. Procure long lead material for FY18 Proof of Manufacturing (POM) systems. Continue ATT SALVO Capability testing and follow on software refinement. Conduct one ATT SALVO independent in-water test on a CVN, with an Installed TWS system. Start a phase delivery of the SALVO Software Capability to the fleet.					
FY 2017 OCO Plans: N/A					
Title: Torpedo Warning System (TWS)	28.236	33.000	36.085	0.000	36.085
Articles:	2	1	1	-	1
FY 2015 Accomplishments: Buy 2 EDM systems to install in FY16 and install 2 systems from FY14. Continue land based and in-water integration testing of TWS and CAT. Follow-on TWS active source software and hardware development and testing. Conduct software development for TWS SALVO capability.					
FY 2016 Plans: Install 2 EDM systems that were purchased in FY 15. Continue land based and in-water integration testing of the TWS and CAT systems. Continue TWS active source software and hardware development and testing. Accelerate TWS SALVO Capability. Conduct 2 independent integrated in-water tests on CVNs with the CAT systems for the development of the TWS initial SALVO capability. Deliver TWS initial SALVO capability at the end of FY16.					
FY 2017 Base Plans: Continue TWS SALVO software refinement. Continue TWS active source software and hardware development and testing. Conduct 1 independent integrated in-water test of TWS initial SALVO capability on a CVN with CAT systems. Conduct first article testing to validate performance and environmental requirements of the TWS Program of Record System Requirements Document. These tests will include qualification planning, testing, analysis, reporting and corrective action for all hardware, software, and integration functions. The first article qualification					

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603506N / *Surface Ship Torpedo Defense*	**Project (Number/Name)** 0225 / *Surface Ship Torpedo Defense (SSTD)*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
tests will include anti-tamper verification and validation tests and Environmental Qualification Tests including shock, vibration, temperature cycling, humidity, electromagnetic pulse, and electromagnetic Interference. ***FY 2017 OCO Plans:*** N/A					
Accomplishments/Planned Programs Subtotals	56.802	71.300	87.066	0.000	87.066

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
• OPN/221300: *SSTD*	10.653	8.396	7.225	-	7.225	25.417	32.467	43.992	42.057	Continuing	Continuing
• WPN/311300: *SSTD*	4.573	7.380	6.220	-	6.220	5.311	6.672	37.007	37.747	Continuing	Continuing

Remarks

D. Acquisition Strategy

CAT Program: In FY09 and FY10, the CAT project completed a Systems Requirements Review (SRR) and Preliminary Design Review (PDR) on the second Engineering Development Model (EDM-2) design. Applied Research Lab (ARL) will complete the EDM-2 design and hold a Critical Design Review (CDR) in FY18. ARL will fabricate test articles and 32 total EDM-2 CATS in support of the prototype rapid fielding. Integration testing began in FY13 and will continue through delivery of the prototype CATs. A complete Technical Data Package (TDP) will be prepared. The CAT program will enter Milestone B in FY17, with a milestone C decision in FY19. A competitive fixed price contract will be awarded to build low rate initial production (LRIP) units starting in FY20. These units will support on going developmental testing ending in FY20 with an FY22 IOC.

TWS Program: In FY09 and FY10, a towed sensor system specification was developed and two sea tests were conducted on Navy destroyers that demonstrated the ability of three different passive sonar ranging techniques and demonstrated the benefit of new torpedo detection sonar waveforms. Data from these tests is being applied to the HVU application, and the sensor specification is being modified to meet the increased capability required for HVU ships. Development and production of the new sensors is being conducted by 3Phoenix. A complete sensor set was delivered in 2nd QTR FY12 to support an at sea test in the 3rd QTR FY12. At the same time, a ready-stowage rack, and fire control systems are being developed by Pacific Engineering Incorporated (PEI) and In-Depth Engineering, respectively. All of these components were brought together for integration in FY13. This integration supported fabrication and fielding of the prototype systems. A Milestone C decision is planned for FY18. A contract will be awarded for TWS LRIP systems to support Developmental Testing beginning in FY19, with an FY22 IOC.

E. Performance Metrics

Torpedo Effectiveness for the CAT
Torpedo Detection Classification and Localization (TDCL) False Alert Rate

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603506N / *Surface Ship Torpedo Defense*	**Project (Number/Name)** 0225 / *Surface Ship Torpedo Defense (SSTD)*

TDCL probability of correct classification
TWS System Availability

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603506N / *Surface Ship Torpedo Defense*	Project (Number/Name) 0225 / *Surface Ship Torpedo Defense (SSTD)*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Systems Engineering	WR	NUWC : Newport, RI	39.770	2.400	Nov 2014	2.141	Nov 2015	2.411	Nov 2016	-		2.411	Continuing	Continuing	Continuing
Systems Engineering ATT Dev.	C/CPFF	PSU/ARL : State College, PA	234.018	25.851	Dec 2014	21.895	Dec 2015	14.670	Dec 2016	-		14.670	Continuing	Continuing	Continuing
Systems Engineering	C/CPFF	JHU/APL : Baltimore , MD	1.740	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Systems Engineering Warhead Dev.	WR	NSWC : Indian Head, MD	64.955	3.200	Nov 2014	5.545	Nov 2015	8.207	Nov 2016	-		8.207	Continuing	Continuing	Continuing
Systems Engineering	WR	NUWC : Keyport,WA	42.982	2.300	Nov 2014	8.700	Nov 2015	11.161	Nov 2016	-		11.161	Continuing	Continuing	Continuing
Systems Engineering TDCL	C/CPFF	Ultra : Braintree, MA	11.640	0.000		0.000		0.000		-		0.000	0.000	11.640	Continuing
Systems Engineering ATT	WR	ONR : Arlington, VA	1.680	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Systems Engineering TDCL	C/CPFF	AAC : Hauppage, NY	4.480	0.000		0.000		0.000		-		0.000	0.000	4.480	Continuing
Systems Engineering	WR	OPTEVFOR : Norfolk, VA	1.613	0.100	Feb 2015	0.377	Feb 2016	0.481	Feb 2017	-		0.481	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	9.547	0.141	Nov 2014	0.177	Nov 2015	0.380	Nov 2016	-		0.380	0.000	10.245	Continuing
Systems Engineering TDCL	WR	SPAWAR : San Diego, CA	8.387	0.600	Dec 2014	1.161	Dec 2015	1.076	Dec 2016	-		1.076	0.000	11.224	Continuing
Systems Engineering	C/CPFF	UT/ARL : Arlington, TX	0.600	0.000		0.000		0.000		-		0.000	0.000	0.600	Continuing
Systems Engineering	C/CPFF	Alion : Bridgeport, CT	12.141	1.600	Feb 2015	1.117	Dec 2015	2.860	Dec 2016	-		2.860	0.000	17.718	Continuing
Systems Engineering	WR	NUWC DET : Norfolk, VA	21.863	4.160	Dec 2014	7.158	Dec 2015	8.935	Dec 2016	-		8.935	0.000	42.116	-
Systems Development	C/CPFF	3 Phoenix : Fairfax, VA	72.194	13.100	Dec 2014	19.000	Dec 2015	16.344	Dec 2016	-		16.344	0.000	120.638	Continuing
Integrated Logistic Spt	WR	NSWC Crane : Crane, IN	0.834	0.100	Mar 2015	0.130	Dec 2015	0.260	Dec 2016	-		0.260	0.000	1.324	Continuing
Systems Engineering	C/CPFF	PEI : Roca, NE	2.594	0.300	Dec 2014	0.851	Dec 2015	1.395	Dec 2016	-		1.395	0.000	5.140	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603506N / *Surface Ship Torpedo Defense*	**Project (Number/Name)** 0225 / *Surface Ship Torpedo Defense (SSTD)*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Systems Engineering	WR	CARDEROCK : Bethesda, MD	0.977	0.100	Dec 2014	0.258	Dec 2015	0.263	Dec 2016	-		0.263	0.000	1.598	-
Systems Engineering	C/CPFF	CGI : Washington, DC	0.200	0.000		0.000		0.000		-		0.000	0.000	0.200	-
Systems Engineering	C/BA	Dam Neck : Virginia Beach, VA	0.022	0.000		0.000		0.000		-		0.000	0.000	0.022	-
Systems Engineering	C/BA	NSWC Panama City : Panama City, FL	0.255	0.000		0.000		0.000		-		0.000	0.000	0.255	-
Systems Engineering	C/BA	Devron 26 : Not Specified	0.139	0.000		0.000		0.000		-		0.000	0.000	0.139	-
CAT Proof of Manufacturing	C/CPFF	TBD : TBD	0.000	0.000		0.000		15.513	Mar 2017	-		15.513	0.000	15.513	-
Systems Engineering	WR	Puget Sounds : Norfolk, VA	0.000	0.200	Oct 2015	0.000		0.000		-		0.000	0.000	0.200	-
		Subtotal	533.431	54.152		68.510		83.956		-		83.956	-	-	-

Remarks

The key events driving the funding request in FY17 are: start of the Manufacturing Risk Reduction efforts with the purchase of the CAT Proof of Manufacturing (POM) units, conducts 1 independent integrated in-water test of TWS SALVO capability on a CVN with CAT systems, and the First Article Testing on the first TWS system to validate performance and environmental requirements of the TWS Program of Record System Requirements Document. The first article qualification tests will include anti-tamper verification and validation tests and Environmental Qualification Tests including shock, vibration, temperature cycling, humidity, electromagnetic pulse, and electromagnetic Interference.

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Earned Value Mgmt Spt	C/CPAF	Pioneer : Virigina	0.050	0.000		0.000		0.000		-		0.000	0.000	0.050	-
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	Various	Not Specified : Not Specified	0.237	0.000		0.000		0.000		-		0.000	0.000	0.237	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603506N / *Surface Ship Torpedo Defense*	**Project (Number/Name)** 0225 / *Surface Ship Torpedo Defense (SSTD)*

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Support	C/CPAF	Tech-Marine : Washington, DC	9.930	0.000		0.000		0.000		-		0.000	0.000	9.930	Continuing
Travel	Various	PMS 415 : Not Specified	0.844	0.100	Nov 2014	0.100	Nov 2015	0.180	Nov 2016	-		0.180	0.000	1.224	Continuing
Program Management Support	C/CPFF	SPA : Alexandria, VA	0.575	0.000		0.000		0.000		-		0.000	0.000	0.575	Continuing
Program Management Support	C/CPAF	Booz Allen : Washington, DC	4.748	2.550	Feb 2015	2.690	Feb 2016	2.930	Feb 2017	-		2.930	0.000	12.918	-
Program Management Support	C/CPAF	Alion : Washington, DC	0.400	0.000		0.000		0.000		-		0.000	0.000	0.400	-
		Subtotal	19.630	2.650		2.790		3.110		-		3.110	0.000	28.180	-

	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	553.061	56.802		71.300		87.066		-		87.066	-	-	-

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603506N / *Surface Ship Torpedo Defense*	**Project (Number/Name)** 0225 / *Surface Ship Torpedo Defense (SSTD)*

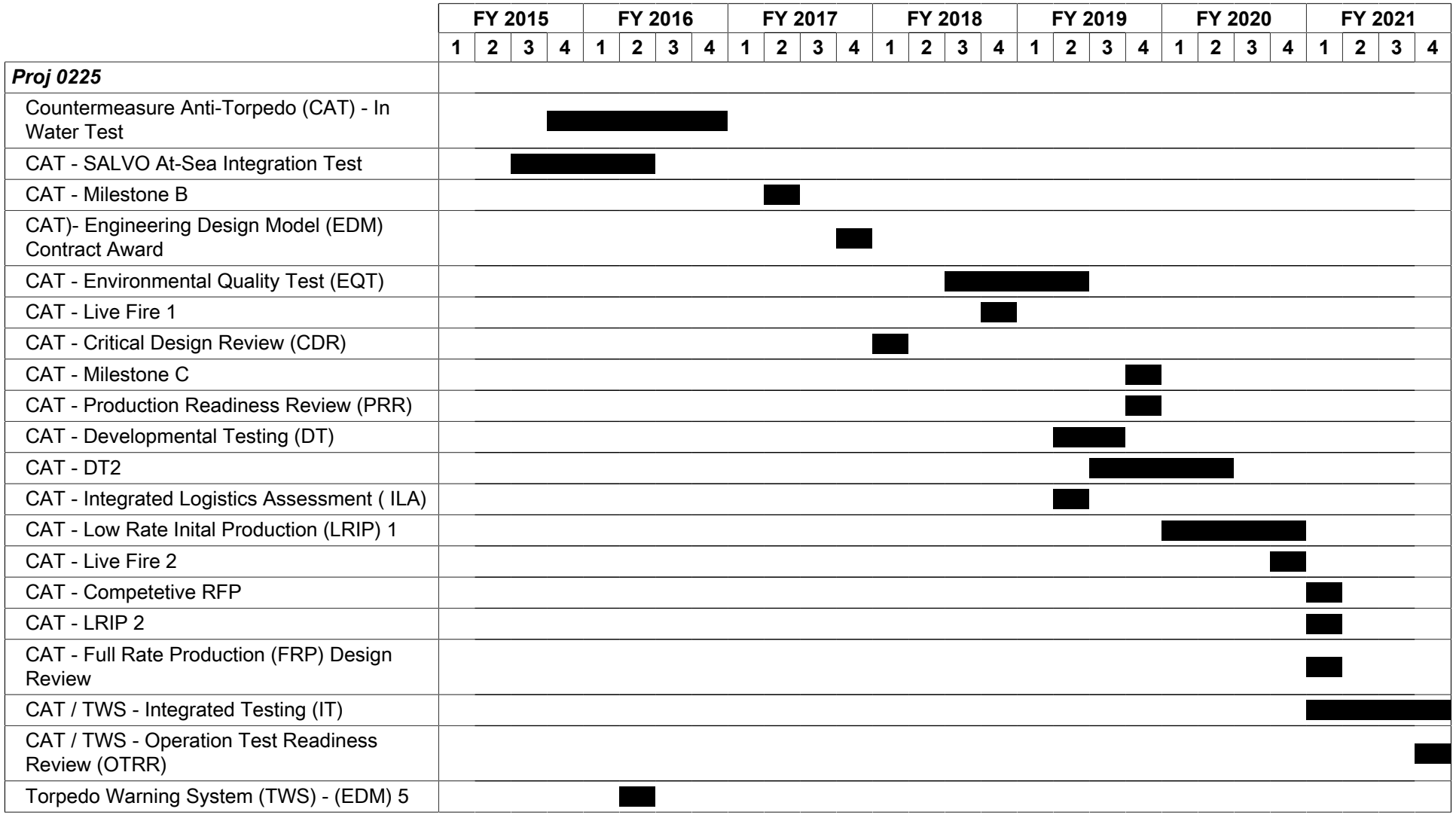


Exhibit R-4, RDT&E Schedule Profile: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603506N / *Surface Ship Torpedo Defense*	**Project (Number/Name)** 0225 / *Surface Ship Torpedo Defense (SSTD)*

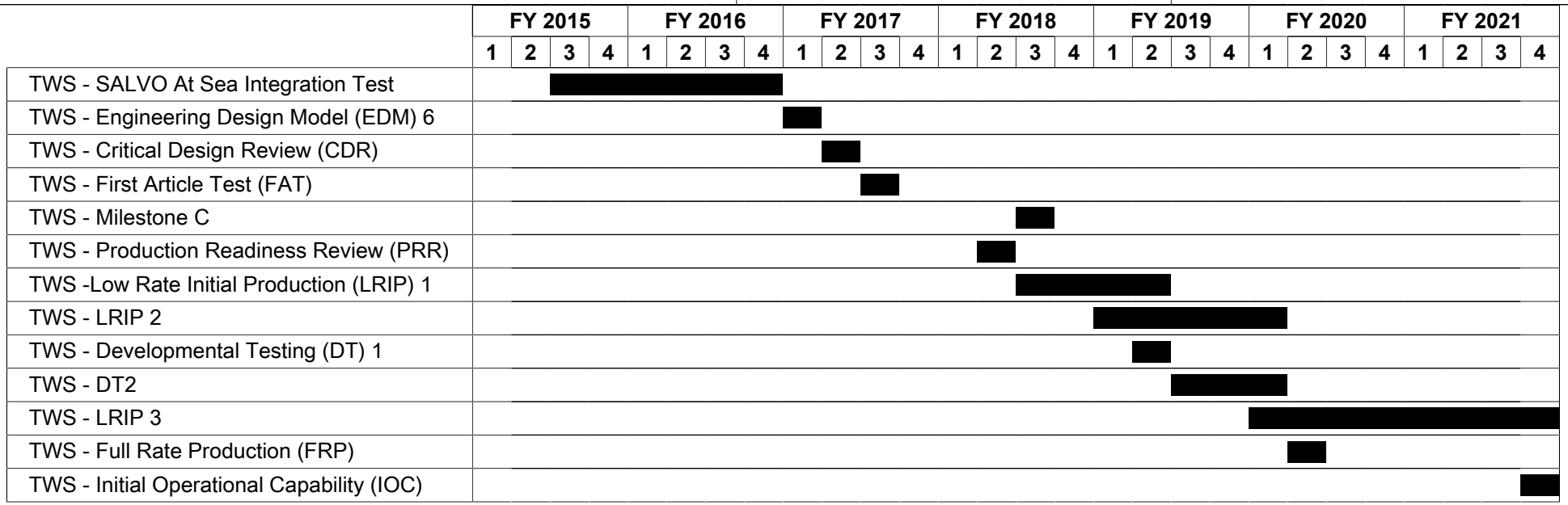


Exhibit R-4A, RDT&E Schedule Details: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603506N / *Surface Ship Torpedo Defense*	**Project (Number/Name)** 0225 / *Surface Ship Torpedo Defense (SSTD)*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 0225				
Countermeasure Anti-Torpedo (CAT) - In Water Test	4	2015	4	2016
CAT - SALVO At-Sea Integration Test	3	2015	2	2016
CAT - Milestone B	2	2017	2	2017
CAT)- Engineering Design Model (EDM) Contract Award	4	2017	4	2017
CAT - Environmental Quality Test (EQT)	3	2018	2	2019
CAT - Live Fire 1	4	2018	4	2018
CAT - Critical Design Review (CDR)	1	2018	1	2018
CAT - Milestone C	4	2019	4	2019
CAT - Production Readiness Review (PRR)	4	2019	4	2019
CAT - Developmental Testing (DT)	2	2019	3	2019
CAT - DT2	3	2019	2	2020
CAT - Integrated Logistics Assessment (ILA)	2	2019	2	2019
CAT - Low Rate Inital Production (LRIP) 1	1	2020	4	2020
CAT - Live Fire 2	4	2020	4	2020
CAT - Competetive RFP	1	2021	1	2021
CAT - LRIP 2	1	2021	1	2021
CAT - Full Rate Production (FRP) Design Review	1	2021	1	2021
CAT / TWS - Integrated Testing (IT)	1	2021	4	2021
CAT / TWS - Operation Test Readiness Review (OTRR)	4	2021	4	2021
Torpedo Warning System (TWS) - (EDM) 5	2	2016	2	2016
TWS - SALVO At Sea Integration Test	3	2015	4	2016

Exhibit R-4A, RDT&E Schedule Details: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603506N / *Surface Ship Torpedo Defense*	**Project (Number/Name)** 0225 / *Surface Ship Torpedo Defense (SSTD)*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
TWS - Engineering Design Model (EDM) 6	1	2017	1	2017
TWS - Critical Design Review (CDR)	2	2017	2	2017
TWS - First Article Test (FAT)	3	2017	3	2017
TWS - Milestone C	3	2018	3	2018
TWS - Production Readiness Review (PRR)	2	2018	2	2018
TWS -Low Rate Initial Production (LRIP) 1	3	2018	2	2019
TWS - LRIP 2	1	2019	1	2020
TWS - Developmental Testing (DT) 1	2	2019	2	2019
TWS - DT2	3	2019	1	2020
TWS - LRIP 3	1	2020	4	2021
TWS - Full Rate Production (FRP)	2	2020	2	2020
TWS - Initial Operational Capability (IOC)	4	2021	4	2021

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Exhibit R-2, RDT&E Budget Item Justification: PB 2017 Navy											Date: February 2016	
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 4: *Advanced Component Development & Prototypes (ACD&P)*					R-1 Program Element (Number/Name) PE 0603512N *I Carrier Systems Development*							
COST ($ in Millions)	**Prior Years**	**FY 2015**	**FY 2016**	**FY 2017 Base**	**FY 2017 OCO**	**FY 2017 Total**	**FY 2018**	**FY 2019**	**FY 2020**	**FY 2021**	**Cost To Complete**	**Total Cost**
Total Program Element	47.477	5.954	8.348	7.605	-	7.605	9.283	5.894	5.752	5.874	Continuing	Continuing
3216.: *Tactical Support Center-Integration*	26.673	4.180	6.131	7.032	-	7.032	7.629	4.331	4.423	4.516	Continuing	Continuing
4005: *In-Service Carrier Systems Development*	20.804	1.774	2.217	0.573	-	0.573	1.654	1.563	1.329	1.358	Continuing	Continuing

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:

- (3216) - The primary role of the AN/SQQ-34 Aircraft Carrier Tactical Support Center (CV-TSC) is fulfillment of Anti-Submarine Warfare (ASW) and Surface Warfare (SUW) coordination functions utilizing data received from multiple sources (including Off-Board Aircraft Sensor and Track Data, Local Platform ASW/SUW Sensors, Link-16 Track Data, Ship Self Defense System (SSDS) Platform Track Data, Global Command and Control System Over-the-Horizon Track Data, and Environmental and Threat Databases) to assess the threat and assist the Tactical Action Officer (TAO) and Composite Warfare Commander (CWC) in effectively applying available resources to support CVN self-defense. This includes the generation of real-time ASW/SUW information and recommendations, tactical planning and employment of ASW/SUW aircraft operating organically from the Aircraft Carrier or under the tactical control of the Carrier Strike Group (CSG), ASW/SUW sensor data processing and analysis, and distribution of tactically significant data to the appropriate decision makers. Aircraft supported include MH-60R/S, P-8, UCLASS, Triton, and future ASW/SUW aircraft.

Beginning in FY16, Project 3216 will support the design and development of a multi-application, cross-platform boundary defense capability as directed by the Chief of Naval Operations (CNO) and Assistant Secretary of the Navy Research, Development & Acquisition (ASN (RDA)) via the Task Force Cyber Awakening (TFCA) Advisory Board.

- (4005) - The In-Service Carrier Systems Development 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).

Exhibit R-2, RDT&E Budget Item Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 0603512N *I Carrier Systems Development*	

B. Program Change Summary ($ in Millions)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Previous President's Budget	5.959	8.348	7.539	-	7.539
Current President's Budget	5.954	8.348	7.605	-	7.605
Total Adjustments	-0.005	0.000	0.066	-	0.066
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.005	0.000			
• Program Adjustments	0.000	0.000	0.195	-	0.195
• Rate/Misc Adjustments	0.000	0.000	-0.129	-	-0.129

Change Summary Explanation

Funding: Decrease in Carrier Systems Development by $0.321 million in FY 17 as required for the Department of the Navy to comply with the Bipartisan Budget Act of 2015.

Funding: The FY 2017 funding request was reduced by $0.884 million to account for the availability of prior years execution balance.

Funding: Added FY 17 funding to support the design and development of a Boundary Defense Capability.

Schedule:
Changes in the availability of certification event venue impacted the Software Build Schedules.

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603512N / *Carrier Systems Development*	Project (Number/Name) 3216. / *Tactical Support Center-Integration*	

COST ($ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
3216.: *Tactical Support Center-Integration*	26.673	4.180	6.131	7.032	-	7.032	7.629	4.331	4.423	4.516	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The FY 16 to FY 17 increase is due to adding additional funding for cybersecurity efforts.

The primary role of the AN/SQQ-34 Aircraft Carrier Tactical Support Center (CV-TSC) is fulfillment of Anti-Submarine Warfare (ASW) and Surface Warfare (SUW) coordination functions utilizing data received from various sources (including Off-Board Aircraft Sensor and Track Data, Local Platform ASW/SUW Sensors, Link-16 Track Data, Ship Self Defense System (SSDS) Platform Track Data, Global Command and Control System Over-the-Horizon Track Data, and Environmental and Threat Databases) to assess the threat and assist the Tactical Action Officer (TAO) and Composite Warfare Commander (CWC) in effectively applying available resources to support CVN self-defense. This includes the generation of real-time ASW/SUW information and recommendations, tactical planning and employment of ASW/SUW aircraft operating organically from the Aircraft Carrier or under the tactical control of the Carrier Strike Group (CSG), ASW/SUW sensor data processing and analysis, and distribution of tactically significant data to the appropriate decision makers. Aircraft supported or to be supported include MH-60R/S, P-8, UCLASS, Triton, and future ASW/SUW aircraft.

CV-TSC functionality updates are implemented through an evolutionary acquisition approach, providing phased incremental builds that are developed, tested, certified and fielded. Functional improvements are accomplished through the following initiatives: 1) maintaining interoperability with the local CVN warfare systems through current and future interfaces; 2) continuing to support mission data exchange and tactical control with current and future ASW/SUW aircraft and their mission systems; 3) improving track and sensor processing and analysis techniques as new track and sensor data becomes available; 4) improving mission planning support for the ASW/SUW missions conducted from the CVN; 5) improving data recording, reconstruct, and distribution to meet the decreasing timelines associated with getting tactically significant data to other end users both on and off platform; and 6) improving embedded simulation and training capabilities to enable operator proficiencies.

This project also provides development of cybersecurity efforts. The purpose of this effort is to define and develop enterprise Combat System cybersecurity solutions that will provide a set of boundary defense capabilities for the Combat System, a set of centralized Combat Systems-level cybersecurity capabilities, and a set of element-level cybersecurity protections. The boundary defense capabilities will protect and detect threats entering and leaving the Combat System. The centralized Combat System-level cybersecurity capabilities will provide cyber situational awareness and management (e.g. malware detection, file integrity verification, etc.) of various cybersecurity protection and detection capabilities. Element-level cybersecurity protections will provide additional measures to ensure system integrity. Planning will also commence for the integration of the Combat System elements and sensors into the boundary defense and centralized cybersecurity capabilities.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Title: CV-TSC Development / Integration	4.180	4.131	3.780	0.000	3.780

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603512N / *Carrier Systems Development*	**Project (Number/Name)** 3216. / *Tactical Support Center-Integration*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Articles:	-	-	-	-	-
FY 2015 Accomplishments: - Continued development of CV-TSC Build 8.0 software version. - Conducted incremental software build reviews. - Conducted development testing with key interfacing systems. - Completed major system architectural modifications to support Combat System Product Line Architecture (PLA). - Conducted multiple Fleet Working Groups to provide input and feedback to functionality being developed. - Delivered engineering releases of software version to Combat Systems Test (CST) facilities to support early certification testing. ***FY 2016 Plans:*** - Complete development of initial release of CV-TSC Build 8.0 software version. - Complete certifications required for fielding CV-TSC Build 8.0 software version to include Information Assurance (IA) Accreditation, Integrated Shipboard Network System (ISNS) and Consolidated Afloat Networks and Enterprise Services (CANES) Certifications, PEO IWS Element Certification, and CST Certification. - Begin systems engineering efforts and development on software version 9.0 follow-on build. - Conduct incremental requirements, design, and test reviews. - Conduct CST events for CVN-72 (4Q16). ***FY 2017 Base Plans:*** - Continue systems engineering efforts and development on software version 9.0 follow-on build. - Conduct incremental requirements, design, and test reviews. ***FY 2017 OCO Plans:*** N/A					
Title: NAVSEA Boundary Defense Capability	0.000	2.000	3.252	0.000	3.252
Articles:	-	-	-	-	-
Description: The purpose of this effort is to define and develop enterprise Combat System cybersecurity solutions that will provide a set of boundary defense capabilities for the Combat System, a set of centralized Combat Systems-level cybersecurity capabilities, and a set of element-level cybersecurity protections. The boundary defense capabilities will protect and detect threats entering and leaving the Combat System. The centralized Combat System-level cybersecurity capabilities will provide cyber situational awareness and					

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603512N / *Carrier Systems Development*	**Project (Number/Name)** 3216. / *Tactical Support Center-Integration*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
management (e.g. malware detection, file integrity verification, etc.) of various cybersecurity protection and detection capabilities. Element-level cybersecurity protections will provide additional measures to ensure system integrity. Planning will also commence for the integration of the Combat System elements and sensors into the boundary defense and centralized cybersecurity capabilities. The development of a cyber-resilient Combat System security architecture will include the integration of cybersecurity into Combat System and element-level system engineering processes, to include developing and flowing Combat System cybersecurity requirements down to the individual elements and sensors to ensure a consistent cyber security posture across the entire Combat System. Development of enterprise Combat System risk management processes will occur, to include the following: a vulnerability management process across the Combat System to provide the flexibility for periodic cybersecurity updates once security capabilities are fielded; and system-of-systems risk assessment methodology to support Combat System execution of the Risk Management Framework. ***FY 2015 Accomplishments:*** N/A ***FY 2016 Plans:*** - Design and develop multi-application, cross-platform boundary defense equipment for control system enclaves, followed by engineering for CVN 68 Class integration. ***FY 2017 Base Plans:*** - Continue design and development of multi-application, cross-platform boundary defense equipment for control system enclaves, followed by engineering for CVN 68 Class integration. - Initiate non-recurring engineering efforts for Machinery and Combat Systems in surface platforms and cybersecurity for critical data transfer systems. ***FY 2017 OCO Plans:*** N/A					
Accomplishments/Planned Programs Subtotals	4.180	6.131	7.032	0.000	7.032

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603512N / *Carrier Systems Development*	**Project (Number/Name)** 3216. / *Tactical Support Center-Integration*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
• OPN/2176: *Undersea Warfare Support Equipment (N98/CV-TSC only)*	0.299	0.336	0.315	-	0.315	0.336	0.340	0.348	0.355	Continuing	Continuing

Remarks

D. Acquisition Strategy

CV-TSC Development/Integration:
CV-TSC utilizes an incremental development approach that aims to deliver frequent capability updates to the Fleet. This approach allows required capability to be delivered to address emerging Fleet needs and provides frequent opportunities to ensure interoperability is synchronized with the Ship Self Defense System (SSDS) Advanced Capability Builds (ACBs). The acquisition strategy places heavy emphasis on the use of open architecture best practices to ensure ease of upgrades and to make developed products available to other platforms.

NAVSEA Boundary Defense Capability:
Investigate, demonstrate, and implement multi-application, cross-platform boundary defense equipment for control system enclaves, followed by engineering for CVN 68 Class integration. Execute non-recurring engineering efforts for Machinery and Combat Systems in surface platforms and cybersecurity for critical data transfer systems.

E. Performance Metrics

CV-TSC Development/Integration:
- Achieve Configuration Control Board (CCB) certification for installation of CV-TSC Build 8.0 software version.
- Achieve Platform Information Technology (PIT) Information Assurance (IA) accreditation of CV-TSC Build 8.0 software version.
- Achieve Consolidate Afloat Network Enterprise System (CANES) interoperability certification of CV-TSC Build 8.0 software version.
- Achieve element certification of CV-TSC Build 8.0 software version.
- Achieve Combat System test certification of CV-TSC Build 8.0 software version.

NAVSEA Boundary Defense Capability:
- Define and develop cross-platform control system cybersecurity requirements.
- Define and develop cross-platform control system cybersecurity risk management processes.
- Define and develop a set of cross-platform control system cybersecurity boundary defense solutions.
- Define and develop a set of cross-platform, centralized, systems-level cybersecurity solutions.
- Define and develop a set of cross-platform, element-level cybersecurity protections.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603512N / *Carrier Systems Development*	**Project (Number/Name)** 3216. / *Tactical Support Center-Integration*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Engineering / H/W & S/W Devel / Integration	WR	NAWC/Pax River : MD	0.625	0.150	Jan 2015	0.100	Feb 2016	0.100	Nov 2016	-		0.100	Continuing	Continuing	Continuing
Engineering / H/W & S/W Devel / Integration	WR	NRL : DC	0.325	0.000		0.000		0.000		-		0.000	0.000	0.325	-
Engineering / H/W & S/W Devel / Integration	WR	NSWC/Carderock : MD	1.100	0.750	Jan 2015	0.400	Nov 2015	0.400	Nov 2016	-		0.400	Continuing	Continuing	Continuing
Engineering / H/W & S/W Devel / Integration	WR	NSWC/Dahlgren : VA	0.100	0.000		0.000		0.000		-		0.000	0.000	0.100	-
Engineering / H/W & S/W Devel / Integration	WR	NUWC/Keyport : WA	15.969	2.200	Nov 2014	2.601	Oct 2015	2.250	Nov 2016	-		2.250	Continuing	Continuing	Continuing
System Eng / S/W Development	C/CPFF	Adaptive Methods : VA	1.554	0.600	Jan 2015	0.500	Dec 2015	0.500	Dec 2016	-		0.500	Continuing	Continuing	Continuing
System Eng / S/W Development	C/CPFF	JHU/APL : MD	0.250	0.000		0.000		0.000		-		0.000	0.000	0.250	-
System Eng / S/W Development	WR	SPAWAR : CA	4.160	0.000		0.000		0.000		-		0.000	0.000	4.160	-
Engineering / H/W & S/W Development	C/CPFF	VAR* : VAR*	0.679	0.200	Feb 2015	0.250	Dec 2015	0.250	Dec 2016	-		0.250	Continuing	Continuing	Continuing
Boundary Defense Capability Design/ Development	WR	NSWC/Philadelphia : PA	0.000	0.000		2.000	Feb 2016	3.252	Dec 2016	-		3.252	Continuing	Continuing	Continuing
		Subtotal	24.762	3.900		5.851		6.752		-		6.752	-	-	-

Remarks

*Consists of multiple performing activities with funding for each not greater than $1M per year.

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Test and Certification	WR	NUWC//Keyport : WA	1.430	0.225	Nov 2014	0.225	Oct 2015	0.225	Nov 2016	-		0.225	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603512N / *Carrier Systems Development*	Project (Number/Name) 3216. / *Tactical Support Center-Integration*	

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Test and Certification	WR	NUWC/Newport : RI	0.125	0.000		0.000		0.000		-		0.000	0.000	0.125	-
		Subtotal	1.555	0.225		0.225		0.225		-		0.225	-	-	-

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Support	C/CPAF	BAE Systems : MD	0.356	0.055	Feb 2015	0.000		0.000		-		0.000	0.000	0.411	-
Program Management Support	C/CPIF	CGI Federal : VA	0.000	0.000		0.055	Dec 2015	0.055	Dec 2016	-		0.055	Continuing	Continuing	Continuing
		Subtotal	0.356	0.055		0.055		0.055		-		0.055	-	-	-

	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	26.673	4.180		6.131		7.032		-		7.032	-	-	-

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603512N / *Carrier Systems Development*	**Project (Number/Name)** 3216. / *Tactical Support Center-Integration*

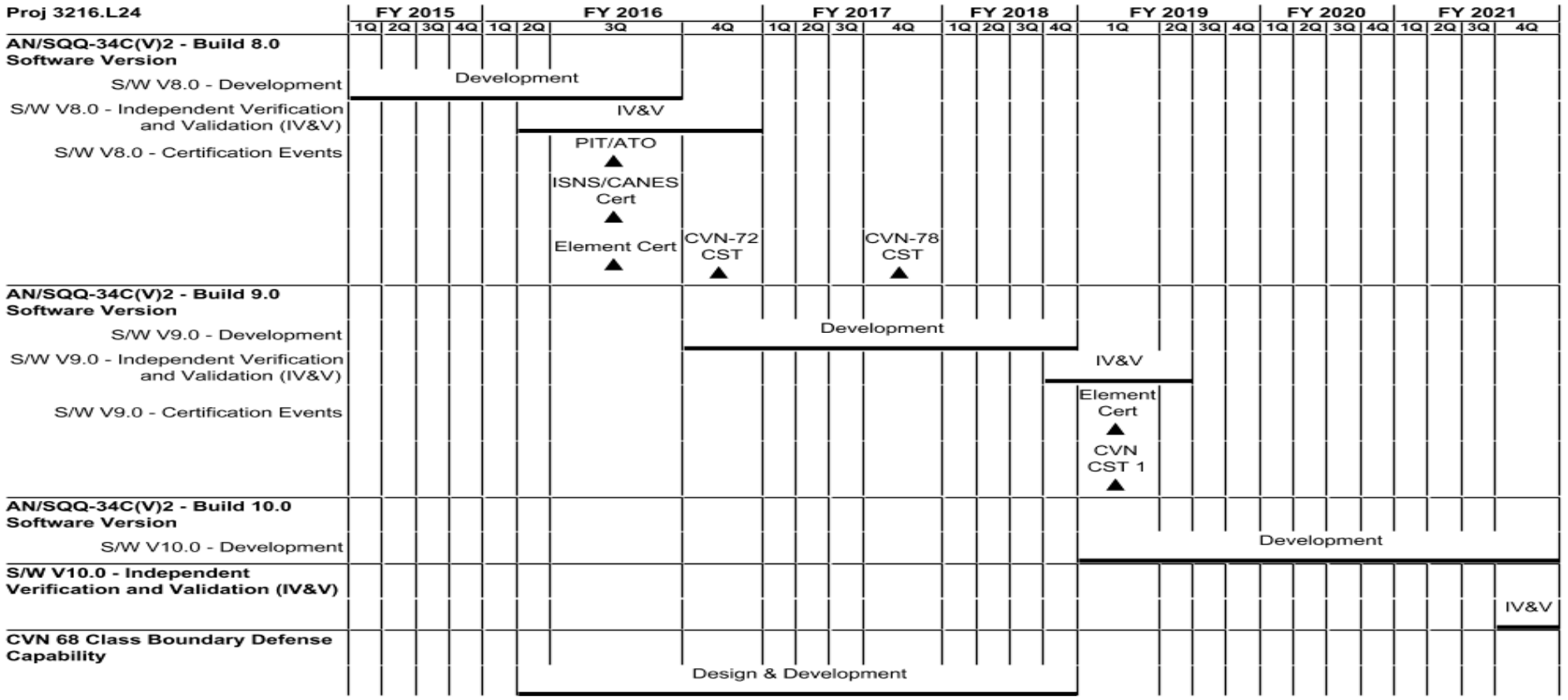

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Exhibit R-4A, RDT&E Schedule Details: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603512N / *Carrier Systems Development*	**Project (Number/Name)** 3216. / *Tactical Support Center-Integration*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 3216.L24				
AN/SQQ-34C(V)2 - Build 8.0 Software Version: S/W V8.0 - Development: S/W V8.0 - Development (continued)	1	2015	3	2016
AN/SQQ-34C(V)2 - Build 8.0 Software Version: S/W V8.0 - Independent Verification and Validation (IV&V): S/W V8.0 - IV&V	2	2016	4	2016
AN/SQQ-34C(V)2 - Build 8.0 Software Version: S/W V8.0 - Certification Events: S/W V8.0 - Platform IT/Authority to Operate (PIT/ATO) Certification	3	2016	3	2016
AN/SQQ-34C(V)2 - Build 8.0 Software Version: S/W V8.0 - Certification Events: S/W V8.0 - ISNS/CANES Certification	3	2016	3	2016
AN/SQQ-34C(V)2 - Build 8.0 Software Version: S/W V8.0 - Certification Events: S/W V8.0 - Element Certification	3	2016	3	2016
AN/SQQ-34C(V)2 - Build 8.0 Software Version: S/W V8.0 - Certification Events: S/W V8.0 - CVN-72 Combat System Test (CST)	4	2016	4	2016
AN/SQQ-34C(V)2 - Build 8.0 Software Version: S/W V8.0 - Certification Events: S/W V8.0 - CVN-78 Combat System Test (CST)	4	2017	4	2017
AN/SQQ-34C(V)2 - Build 9.0 Software Version: S/W V9.0 - Development: S/W V9.0 - Development	4	2016	4	2018
AN/SQQ-34C(V)2 - Build 9.0 Software Version: S/W V9.0 - Independent Verification and Validation (IV&V): S/W V9.0 - IV&V	4	2018	2	2019
AN/SQQ-34C(V)2 - Build 9.0 Software Version: S/W V9.0 - Certification Events: S/W V9.0 - Element Certification	1	2019	1	2019
AN/SQQ-34C(V)2 - Build 9.0 Software Version: S/W V9.0 - Certification Events: S/W V9.0 - CVN Combat System Test (CST) 1	1	2019	1	2019
AN/SQQ-34C(V)2 - Build 10.0 Software Version: S/W V10.0 - Development: S/W V10.0 - Development	1	2019	4	2021

Exhibit R-4A, RDT&E Schedule Details: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603512N / *Carrier Systems Development*	**Project (Number/Name)** 3216. / *Tactical Support Center-Integration*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
S/W V10.0 - Independent Verification and Validation (IV&V): S/W V10.0 - IV&V	4	2021	4	2021
CVN 68 Class Boundary Defense Capability: CVN 68 Class Boundary Defense Capability Design & Development	2	2016	4	2018

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603512N / *Carrier Systems Development*	Project (Number/Name) 4005 / *In-Service Carrier Systems Development*	

COST ($ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
4005: *In-Service Carrier Systems Development*	20.804	1.774	2.217	0.573	-	0.573	1.654	1.563	1.329	1.358	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The In-Service Carrier Systems 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 the Ship Control System Governor Software Development, Tank Preservation, Uninterruptible Power Supply (UPS) Replacements, Advanced Damage Control System (ADCS), Weapons Elevator Control Accumulator Replacement, the Integrated Condition Assessment System, the On-Machine I/O development for LPAPs and LPAP air end redesign, Modular Refrigeration Unit (MRU). Demonstration technologies include Advanced Damage Control System (ADCS) software improvements, Input/Output Controller (IOC) Replacement, Fleet Wireless Personal digital Assistant (PDA), Weapons Elevator Laser Positioning System, Legacy Steering Interface upgrades, CVN Integrated Topside Design (ITD) location option evaluation tools, Antenna to Antenna coupling analysis tools, and Passive countermeasures System (PCMS) alternate measurement capability. Wireless systems, smart sensors, lighting systems, 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 including the following: Integrated Bridge control Data Logger, C4I Network Performance Modeling and Analysis, Network Data Logger Device, Portable Communication System (PCS) proof of concept, Ship Control System (SCS) Onboard trainer, CVN 78 class platform support for Joint Strike Fighter Integration,

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Title: In-Service Carrier Systems Development	1.774	2.217	0.573	0.000	0.573
Articles:	-	-	-	-	-
FY 2015 Accomplishments: Fiscal Year 2015 plans included support to Aircraft Carrier technologies. Modifications, upgrades and development of systems and software ongoing in support of In-Service aircraft carrier modernization initiatives and TOC reduction initiatives. Specific projects completed include CVN Integrated Topside effort (awaiting final assessment report), Antenna to Antenna Effort (awaiting final assessment report), Integrated Bridge Control Data Logger, PCS proof of concept.					
FY 2016 Plans:					

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603512N / *Carrier Systems Development*	**Project (Number/Name)** 4005 / *In-Service Carrier Systems Development*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Fiscal Year 2016 plans include support to Aircraft Carrier technologies. Modifications, upgrades and development of systems and software will be ongoing in support of In-Service aircraft carrier modernization initiatives and TOC reduction initiatives. ***FY 2017 Base Plans:*** Fiscal Year 2017 plans include support to Aircraft Carrier technologies. Modifications, upgrades and development of systems and software will be ongoing in support of In-Service aircraft carrier modernization initiatives and TOC reduction initiatives. ***FY 2017 OCO Plans:*** N/A					
Accomplishments/Planned Programs Subtotals	1.774	2.217	0.573	0.000	0.573

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

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, Uninterruptible Power Supply (UPS) Replacements, Advanced Damage Control System (ADCS) Software Improvements, Automatic Fire Sensing and Suppression System/Flooding and Casualty Control Software (AFSSS/FCCS) Software Development Test, Input/Output Controller (IOC) replacement demonstration, Tank Preservation models, Weapons Elevator Laser Positioning demonstration, Legacy Steering Interface Upgrades, CVN Integrated Topside Design (ITD) location option evaluation tool development, Antenna to Antenna coupling analysis tool development, Universal Portable Command and Control Unit (PCCU) development, Ship Control System (SCS) Trainer, Integrated Bridge Control Data Logger, Weapons Elevator Control Accumulator Replacement, and C4I Network Performance Requirements Modeling and Analysis.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603512N / *Carrier Systems Development*	Project (Number/Name) 4005 / *In-Service Carrier Systems Development*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Ship Integration	WR	NAVSEA : Phil	1.649	0.270	Nov 2014	0.729	Nov 2015	0.215	Nov 2016	-		0.215	0.000	2.863	-
Ship Integration	WR	NAVSEA : Dahlgren	0.197	0.000		0.000		0.000		-		0.000	0.000	0.197	-
Ship Integration	WR	NAVSEA : Carderock	0.000	0.000		0.225	Nov 2015	0.000		-		0.000	0.000	0.225	-
		Subtotal	1.846	0.270		0.954		0.215		-		0.215	0.000	3.285	-

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Software Development	WR	NAVSEA : Phil	7.643	0.489	Nov 2014	0.150	Nov 2015	0.050	Nov 2016	-		0.050	0.000	8.332	-
Program Management Support	WR	NAVSEA : Phil	2.852	0.225	Nov 2014	0.150	Nov 2015	0.050	Nov 2016	-		0.050	0.000	3.277	-
Training Development	WR	NAVSEA : Phil	1.085	0.180	Nov 2014	0.100	Nov 2015	0.000	Nov 2016	-		0.000	0.000	1.365	-
Integrated Logistics Support	WR	NAVSEA : Phil	1.439	0.115	Nov 2014	0.050	Nov 2015	0.050	Nov 2016	-		0.050	0.000	1.654	-
Software Development	WR	NAVSEA : Dahlgren	0.308	0.000		0.000		0.000		-		0.000	0.000	0.308	-
Program Management Support	WR	NAVSEA : Dahlgren	0.317	0.000		0.000		0.000		-		0.000	0.000	0.317	-
Program Management Support	WR	NAVSEA : Carderock	0.000	0.000		0.050	Nov 2015	0.050	Nov 2016	-		0.050	0.000	0.100	-
		Subtotal	13.644	1.009		0.500		0.200		-		0.200	0.000	15.353	-

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation	WR	SPAWAR : Atlantic	0.214	0.000		0.000		0.000		-		0.000	0.000	0.214	-
Developmental Test & Evaluation	WR	NAVSEA : Carderock	0.000	0.000	Nov 2014	0.175	Nov 2015	0.050	Nov 2016	-		0.050	0.000	0.225	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603512N / *Carrier Systems Development*	Project (Number/Name) 4005 / *In-Service Carrier Systems Development*	

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation	WR	NAVSEA : Phil	4.831	0.495	Nov 2014	0.588	Nov 2015	0.108	Nov 2016	-		0.108	Continuing	Continuing	Continuing
Developmental Test & Evaluation	WR	NAVSEA : Dahlgren	0.261	0.000		0.000		0.000		-		0.000	0.000	0.261	-
		Subtotal	5.306	0.495		0.763		0.158		-		0.158	-	-	-

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
DAWF	Various	Various : Various	0.008	0.000		0.000		0.000		-		0.000	0.000	0.008	-
		Subtotal	0.008	0.000		0.000		0.000		-		0.000	0.000	0.008	-

	Prior Years	FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	20.804	1.774		2.217		0.573		-		0.573	-	-	-

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603512N / *Carrier Systems Development*	**Project (Number/Name)** 4005 / *In-Service Carrier Systems Development*

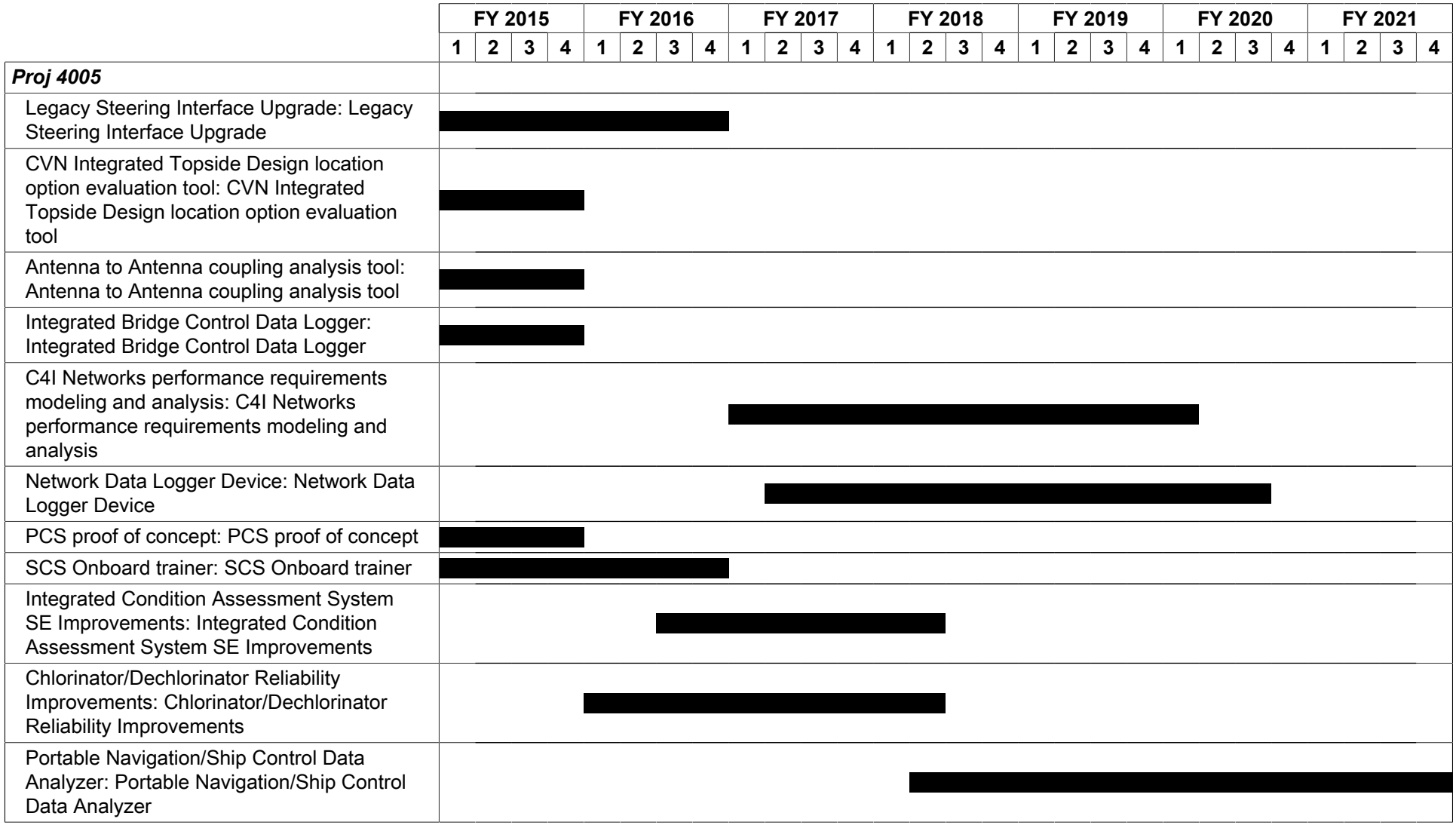

Exhibit R-4, RDT&E Schedule Profile: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603512N / *Carrier Systems Development*	**Project (Number/Name)** 4005 / *In-Service Carrier Systems Development*

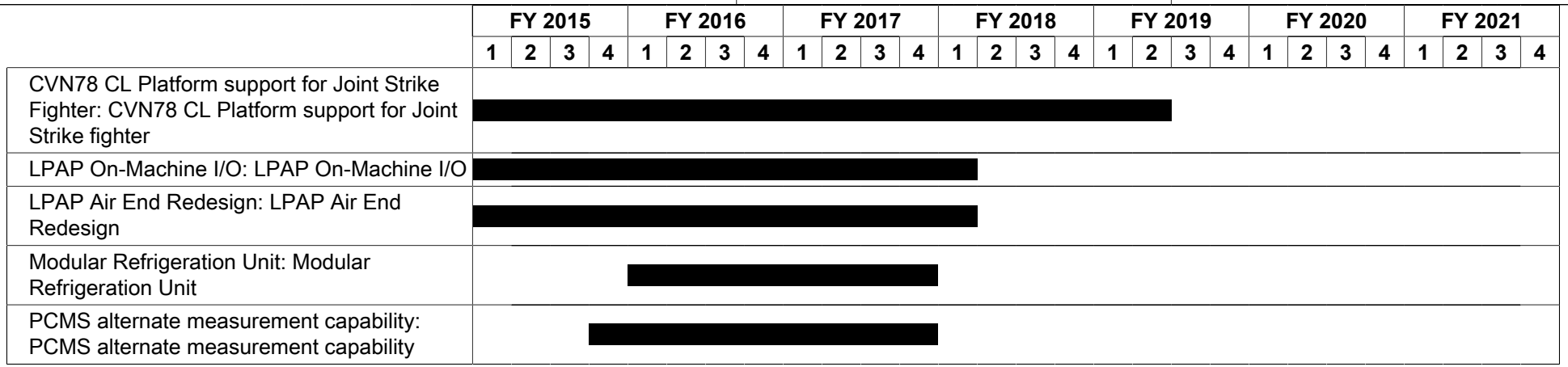

Exhibit R-4A, RDT&E Schedule Details: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603512N / *Carrier Systems Development*	**Project (Number/Name)** 4005 / *In-Service Carrier Systems Development*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 4005				
Legacy Steering Interface Upgrade: Legacy Steering Interface Upgrade	1	2015	4	2016
CVN Integrated Topside Design location option evaluation tool: CVN Integrated Topside Design location option evaluation tool	1	2015	4	2015
Antenna to Antenna coupling analysis tool: Antenna to Antenna coupling analysis tool	1	2015	4	2015
Integrated Bridge Control Data Logger: Integrated Bridge Control Data Logger	1	2015	4	2015
C4I Networks performance requirements modeling and analysis: C4I Networks performance requirements modeling and analysis	1	2017	1	2020
Network Data Logger Device: Network Data Logger Device	2	2017	3	2020
PCS proof of concept: PCS proof of concept	1	2015	4	2015
SCS Onboard trainer: SCS Onboard trainer	1	2015	4	2016
Integrated Condition Assessment System SE Improvements: Integrated Condition Assessment System SE Improvements	3	2016	2	2018
Chlorinator/Dechlorinator Reliability Improvements: Chlorinator/Dechlorinator Reliability Improvements	1	2016	2	2018
Portable Navigation/Ship Control Data Analyzer: Portable Navigation/Ship Control Data Analyzer	2	2018	4	2021
CVN78 CL Platform support for Joint Strike Fighter: CVN78 CL Platform support for Joint Strike fighter	1	2015	2	2019
LPAP On-Machine I/O: LPAP On-Machine I/O	1	2015	1	2018
LPAP Air End Redesign: LPAP Air End Redesign	1	2015	1	2018
Modular Refrigeration Unit: Modular Refrigeration Unit	1	2016	4	2017
PCMS alternate measurement capability: PCMS alternate measurement capability	4	2015	4	2017

Exhibit R-2, RDT&E Budget Item Justification: PB 2017 Navy	Date: February 2016
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 0603525N *I (U)PILOT FISH*

COST ($ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
Total Program Element	0.000	140.841	122.939	132.068	-	132.068	111.503	91.054	103.358	105.523	Continuing	Continuing
0428: *Pilot Fish*	0.000	140.841	122.939	132.068	-	132.068	111.503	91.054	103.358	105.523	Continuing	Continuing

A. Mission Description and Budget Item Justification

This program is reported in accordance with Title 10, United States Code, Section 119(a)(1) in the Special Access Program Annual Report to Congress.

B. Program Change Summary ($ in Millions)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Previous President's Budget	138.865	123.246	108.020	-	108.020
Current President's Budget	140.841	122.939	132.068	-	132.068
Total Adjustments	1.976	-0.307	24.048	-	24.048
• Congressional General Reductions	-	-0.307			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	6.000	0.000			
• SBIR/STTR Transfer	-4.024	0.000			
• Program Adjustments	0.000	0.000	4.287	-	4.287
• Rate/Misc Adjustments	0.000	0.000	19.761	-	19.761

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Exhibit R-2, RDT&E Budget Item Justification: PB 2017 Navy	Date: February 2016
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 0603527N *I (U)RETRACT LARCH*

COST ($ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
Total Program Element	0.000	29.725	28.803	14.546	3.907	18.453	7.699	7.935	8.173	8.339	Continuing	Continuing
2690: *Retract Larch*	0.000	29.725	28.803	14.546	3.907	18.453	7.699	7.935	8.173	8.339	Continuing	Continuing

A. Mission Description and Budget Item Justification

This program is reported in accordance with Title 10, United States Code, Section 119(a)(1) in the Special Access Program Annual Report to Congress.

B. Program Change Summary ($ in Millions)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Previous President's Budget	25.365	28.819	7.562	-	7.562
Current President's Budget	29.725	28.803	14.546	3.907	18.453
Total Adjustments	4.360	-0.016	6.984	3.907	10.891
• Congressional General Reductions	-	-0.016			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	4.953	0.000			
• SBIR/STTR Transfer	-0.593	0.000			
• Program Adjustments	0.000	0.000	6.970	-	6.970
• Rate/Misc Adjustments	0.000	0.000	0.014	3.907	3.921

Change Summary Explanation

Technical: Not applicable.

Schedule: Not applicable.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2017 Navy	Date: February 2016
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 0603536N *I (U)RETRACT JUNIPER*

COST ($ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
Total Program Element	0.000	79.059	112.604	115.435	-	115.435	123.264	119.785	105.008	107.165	Continuing	Continuing
4016: *Retract Sycamore*	0.000	79.059	112.604	115.435	-	115.435	123.264	119.785	105.008	107.165	Continuing	Continuing

A. Mission Description and Budget Item Justification

This program is reported in accordance with Title 10, United States Code, Section 119(a)(1) in the Special Access Program Annual Report to Congress.

B. Program Change Summary ($ in Millions)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Previous President's Budget	76.477	112.678	113.598	-	113.598
Current President's Budget	79.059	112.604	115.435	-	115.435
Total Adjustments	2.582	-0.074	1.837	-	1.837
• Congressional General Reductions	-	-0.074			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	4.700	0.000			
• SBIR/STTR Transfer	-2.118	0.000			
• Program Adjustments	0.000	0.000	4.500	-	4.500
• Rate/Misc Adjustments	0.000	0.000	-2.663	-	-2.663

Change Summary Explanation

Technical: Not applicable.

Schedule: Not applicable.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2017 Navy	Date: February 2016
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 0603542N *I Radiological Control*

COST ($ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
Total Program Element	15.593	0.667	0.710	0.702	-	0.702	0.737	0.754	0.769	0.786	Continuing	Continuing
1830: *RADIAC Development*	15.593	0.667	0.710	0.702	-	0.702	0.737	0.754	0.769	0.786	Continuing	Continuing

A. Mission Description and Budget Item Justification

Mission Description: The Radiation Detection, Indication and Computation (RADIAC) Program is responsible for providing radiation monitoring instruments that detect and measure ionizing radiation. These instruments are used on all Navy, Coast Guard and Military Sealift Command vessels, and at every Navy shore installation, in order to ensure the safety of personnel, continuity of operations in radiological contingencies, and protection of the environment.

Justification: Title 10 of the Code of Federal Regulations, Part 20 (10 CFR 20) requires RADIAC instruments be used to ensure the safety of personnel who work with or are exposed to radioactive materials in their work. Additionally, the Navy's mission requires personnel and ships to have the ability to operate in radiological environments and the ability to identify and interdict radiological Weapons of Mass Destruction (WMD). Navy programs that require RADIAC instruments for Occupational Safety & Health (OSH) reasons under the provisions of 10 CFR 20 include Naval Nuclear Propulsion, Nuclear Weapons, Medical, and Radiological Affairs Support. Non-OSH programs include Radiological Defense, Consequence Management, Training, Technical (RADIAC calibration, shielding evaluation, research, etc.) and Radiological Search (maritime interdiction and radiological search missions to locate or intercept WMD).

This budget item develops, tests and evaluates new, highly reliable, more easily calibrated, easy to care and maintain, light weight and modern RADIAC instruments in order to improve the effectiveness of radiation safety, to make instruments simpler to use, and to reduce life cycle costs. The ultimate goal is to replace old, bulky, costly to maintain and repair, unreliable and obsolete instrumentation with multifunction equipment that can be automatically calibrated at greatly reduced cost.

This budget item also provides for improvement to nuclear weapons intrinsic radiation (gamma and neutron) shielding calculations, mixed field (neutron and gamma) dosimetry, and in neutron measurement. The objective is to develop less costly and more effective integral shielding for better personnel protection and safety. Improvement in personnel dosimetry and neutron measurement is also a major emphasis.

Exhibit R-2, RDT&E Budget Item Justification: PB 2017 Navy					Date: February 2016
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 4: *Advanced Component Development & Prototypes (ACD&P)*		R-1 Program Element (Number/Name) PE 0603542N *I Radiological Control*			
B. Program Change Summary ($ in Millions)	**FY 2015**	**FY 2016**	**FY 2017 Base**	**FY 2017 OCO**	**FY 2017 Total**
Previous President's Budget	0.669	0.710	0.725	-	0.725
Current President's Budget	0.667	0.710	0.702	-	0.702
Total Adjustments	-0.002	0.000	-0.023	-	-0.023
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.002	0.000			
• Program Adjustments	0.000	0.000	-0.029	-	-0.029
• Rate/Misc Adjustments	0.000	0.000	0.006	-	0.006

Change Summary Explanation

Decrease in Radiological Control RDTE,N by $29K as required for the Department of the Navy to comply with the Bipartisan Budget Act of 2015.

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603542N / *Radiological Control*	Project (Number/Name) 1830 / *RADIAC Development*	

COST ($ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
1830: *RADIAC Development*	15.593	0.667	0.710	0.702	-	0.702	0.737	0.754	0.769	0.786	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

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 (10 CFR). 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 in terms of lowering the total ownership costs, and will also 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, Nuclear Weapons, Medical, Industrial Radiography, Radiological Defense 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.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Title: Naval Academy Midshipman Summer Internship	0.015	0.015	0.015	0.000	0.015
Articles:	-	-	-	-	-

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
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B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Description: 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 and Midshipman's travel expenses to present his/her findings to the annual Health Physics Society conference. ***FY 2015 Accomplishments:*** Accomplish study assigned by Naval Academy instructor. ***FY 2016 Plans:*** Accomplish study assigned by Naval Academy instructor. ***FY 2017 Base Plans:*** Accomplish study assigned by Naval Academy instructor. ***FY 2017 OCO Plans:*** N/A					
Title: Visit, Board, Search & Seizure	0.083	0.032	0.036	0.000	0.036
Articles:	3	-	-	-	-
Description: The Visit, Board, Search & Seizure (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 AN/PDX-1 RADIAC Set was fielded in response to a Joint Urgent Operational Needs Statement to meet this requirement. It contains several instruments that serve different purposes, including the search detector, isotope identifier, and personal dosimeter. 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 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 2015 Accomplishments:*** Purchase multiple units for test and evaluation. Evaluate new Radiation Isotope Identifiers (RIID) for gamma and neutron accuracy and precision, gamma and X-ray energy dependence and ability to correctly identify					

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
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B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
various types and quantities of radioisotopes. The test plan will be similar in size and scope to previous VBSS testing. ***FY 2016 Plans:*** Continue testing of previously purchased units. Continue market research on evolving technology applicable to VBSS, particularly in radioisotope identification. Develop a Technical Report on the latest VBSS technology based on the results from testing and evaluation to keep the Navy abreast of technological evolution in this area. ***FY 2017 Base Plans:*** Issue a technical report on the latest VBSS technology based on the testing and evaluations of the previous two years. ***FY 2017 OCO Plans:*** N/A					
Title: Radiological Shipboard Defense Monitor	0.063	0.069	0.088	0.000	0.088
Articles:	-	-	-	-	-
Description: All surface combatants require an instrument to detect and measure radiological activity in the event of a nuclear detonation in order for the ship to avoid the radiological danger and continue its mission. The AN/PDR-65, at over 40 years of age, was the instrument used for this purpose, but it is obsolete and has been de-fielded. An interim replacement has been fielded while OPNAV finalizes updating the Cold War requirements under which the AN/PDR-65 was designed in order to include radiological (terrorist "dirty bomb") threats. The interim replacement is the IM-265 Survey Meter, which is already in the Navy inventory, but it was not designed for this requirement and cannot measure radiation external to the ship and is therefore not suitable as the permanent replacement. In light of Operation Tomodachi this requirement has taken on more significance. ***FY 2015 Accomplishments:*** NSWCCD will initiate discussions with the Surface Warfare Enterprise to determine the necessary detection capabilities, types of radiation to be detected, locations to be monitored and shipboard networking capabilities. NSWCCD, in conjunction with OPNAV will coordinate ship visits to witness the existing infrastructure and obtain end user input on a new system. Information obtained during the ship visits will be submitted in a letter to NAVSEA 04ND with recommendations for next actions. Market research will be performed as requirements are provided by OPNAV and end users. ***FY 2016 Plans:***					

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B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Based on the information obtained during the discussions with OPNAV and ship visits, NSWCCD will formulate a preliminary system that meets the key requirements and features. The preliminary plan will be circulated to NAVSEA 04ND, OPNAV and end users for feedback. Additional ship visits may be necessary to clarify aspects of the preliminary system. A technical specification and implementation plan will be developed based on comments on the preliminary system. Market research will be performed as requirements are provided by OPNAV and end users. ***FY 2017 Base Plans:*** Based on the information obtained during the discussions with OPNAV and ship visits, NSWCCD will formulate a preliminary system that meets the key requirements and specifications. The preliminary plan will be circulated to NAVSEA 04ND, OPNAV and end users for feedback. Additional ship visits may be necessary to clarify aspects of the preliminary system. A technical specification and implementation plan will be developed based on comments on the preliminary system. Market research will be performed along the way as requirements are provided by OPNAV and end users. ***FY 2017 OCO Plans:*** N/A					
Title: Radiological Detection System	0.076	0.119	0.026	0.000	0.026
Articles:	-	-	-	-	-
Description: The Radiological Detection System (RDS) is a survey meter, its associated probes for detecting the various types of radiation, and ancillary equipment. This type of survey meter system has many applications and is the single most prevalent RADIAC instrument in the Navy inventory, utilized for every Navy end use but predominantly in the Naval Nuclear Propulsion Program (NNPP) and Radiological Defense (RD) end uses. The Joint Program Executive Office for Chemical, Biological and Nuclear Defense (JPEO-CBND) is currently developing an RDS for use by all the Services. If all the components could agree on a single system, it would lower the procurement cost for all the Services, and even more importantly enable Joint interoperability in the warfighter Radiological Defense arena that is currently lacking. However, the NNPP end use is unique amongst the Services, and while the Radiological Defense RDS solution should prove to be sufficient for all the Services, Navy must ensure the performance and specifications of a Joint solution would be sufficient for Naval Reactors and the NNPP application. ***FY 2015 Accomplishments:*** Continue to collaborate with JPEO and assist OPNAV in clarifying technical requirements. As the JPEO acquisition moves forward, NSWCCD will aid in the evaluation of the proposals and initial prototypes. NSWCCD					

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B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
will begin assessing the RDS capabilities in meeting the various end user needs. Product demonstration to the Navy end users will be given to the NNPP, RD and Radiological Affairs Support Office (RASO) end users. Information from NSWCCD evaluations and end user product demonstrations will be submitted in a technical memorandum to NAVSEA 04ND. ***FY 2016 Plans:*** Continue evaluating the RDS for Navy end uses. Additional product demonstrations will be provided as needed. Potential fielding strategies will be investigated for RASO and RD end users provided the RDS is acceptable. Additional research will be performed in assessing the RDS capability in meeting NNPP requirements. Site visits to the Corporate Radiation Health Branch at the Norfolk Naval Shipyard will aid in the NNPP assessment. ***FY 2017 Base Plans:*** Coordinate with the JPEO to ensure Navy requirements are addressed as the JPEO finalizes its procurement. ***FY 2017 OCO Plans:*** N/A					
Title: Air Particle Detector ***Articles:*** ***Description:*** The Surface Warfare Enterprise has requested an air sampling system be developed subsequent to the lessons learned from the Japanese Fukishima nuclear reactor accident. U.S. Navy ships sailed unknowingly into plumes of radioactive material released from the damaged nuclear reactors. The ships were widely contaminated and personnel were exposed to radioactive material. The Air Particle Detector (APD) would continuously monitor for airborne radioactive contaminants and provide a real-time measurement at designated locations on the ship with appropriate alarm indications when safe exposure thresholds have been surpassed. ***FY 2015 Accomplishments:*** Initiate discussions with Surface Warfare Enterprise to determine the necessary air sampling capabilities, locations to be monitored and shipboard networking capabilities. NSWCCD, in conjunction with OPNAV will coordinate ship visits to witness the possible installation locations and obtain end user input on the system. Information obtained during the ship visits will be submitted in a letter to NAVSEA 04ND with recommendations for next actions. Concurrently, NSWCCD will investigate retrofitting an air sampling system into the space where the AN/PDR-65 control unit had been installed on surface ships prior to its de-fielding due to obsolescence. Additional market research will be performed as requirements are provided by OPNAV and end users. ***FY 2016 Plans:***	0.101 1	0.220 1	0.245 1	0.000 -	0.245 1

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B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Based on the information obtained during the discussions with OPNAV and ship visits, NSWCCD will formulate a preliminary air sampling system that meets the key performance parameters. The preliminary plan, along with retrofitting information, will be circulated to NAVSEA 04ND, OPNAV and end users for feedback. Additional ship visits may be necessary to clarify aspects of the preliminary system. A technical specification and implementation plan will be developed based on comments on the preliminary system. Market research will be performed as requirements are provided by OPNAV and end users. ***FY 2017 Base Plans:*** Continue ship visits and gathering of end user feedback. Funds will be provided to a vendor to develop a more advanced prototype than the previous one. Compile and summarize all evaluation information into a technical report to provide a recommendation for procurement. ***FY 2017 OCO Plans:*** N/A					
Title: Calibrators	0.075	0.043	0.101	0.000	0.101
Articles:	-	-	-	-	-
Description: Calibrators (also called irradiators) are the basic tool used to calibrate all Navy radiological detection equipment. Essentially they consist of a high energy radiological source (Cs-137) in a shielded container that is located in a specially constructed room, or "range." A technician places the instrument to be calibrated at a specific calibration point in the range and remotely operates the calibrator by raising the source out of its container so that it irradiates the object instrument. The instrument's response to the radiation is measured so that it can be calibrated to specific tolerances. The current suite of AN/UDM-1B calibrators is over 20 years old and the natural decay of the strength of the radioactive source over time restricts calibration effectiveness by limiting the scale of calibration points below American National Standards Institute (ANSI) requirements that are followed in accordance with Navy policy. Also due to the age of the calibrators, there are several parts no longer supported by the manufacturer, and a malfunctioning calibrator poses a very high safety risk. COTS equipment will be surveyed to find the best solution with which to equip the Navy's seven RADIAC Calibration Laboratories with modern calibrators. ***FY 2015 Accomplishments:*** Evaluate the Hopewell GC-60 gamma irradiator for possible RADIAC calibration applicability. The NAVSEA 04ND RADIAC Calibrator Standardization Program (RCSP) will make two site visits to NSWCCD for the					

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
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B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
evaluation. Technical memorandum detailing the results of the evaluation will be submitted to NAVSEA 04ND at the completion of the evaluation. ***FY 2016 Plans:*** In addition to making site visits to NSWCCD, the RCSP will visit Hopewell Designs, Inc. to gain a detailed engineering understanding of the GC-60 irradiator. The information obtained during the site visits will aid in determining the feasibility of the GC-60 as a suitable irradiator for RADIAC calibration purposes. The RCSP will submit a technical memorandum detailing the work performed to date and recommend follow-on actions and/or procurement options. ***FY 2017 Base Plans:*** Finalize evaluation of the Hopewell GC-60 gamma irradiator for possible Navy application. Finalize a technical memorandum summarizing the evaluation effort and provide recommendations. ***FY 2017 OCO Plans:*** N/A					
Title: Primary Dosimetry	0.081	0.089	0.090	0.000	0.090
Articles:	1	20	-	-	-
Description: The need for primary dosimetry is inherent due to the Navy's operation of nuclear reactors and their emission of ionizing radiation. Title 10 of the Code of Federal Regulations, Part 20.1502, states "Each licensee shall monitor exposures to radiation and radioactive material at levels sufficient to demonstrate compliance with the occupational dose limits." A primary dosimeter must pass accreditation proficiency testing, allowing the reading obtained to become a part of an individual's permanent health record. This permanent record is used to protect the individual radiation worker's health, and also the Navy from future liability. The Navy's current primary device is the DT-702/PD, a Thermo Luminescence Dosimeter (TLD). Existing TLD and newer technologies, such as Optically Stimulated Luminescence (OSL), must be continually researched to determine on-going performance parameters, cost to field and cost to maintain. ***FY 2015 Accomplishments:*** Re-initiate tests (Fade Study, Linearity Test, Shallow Dose) of the OSL dosimetry system and compare results to the Navy's DT-702. To do this task correctly, the OSL system (Readers and Annealers) acquired by NSWCCD will have to be conditioned/calibrated by the manufacturer. In addition, NSWCCD will need to stay current on the					

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
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B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
latest dosimetry standards and technology. A Technical Memorandum will be developed and will be provided as a deliverable. ***FY 2016 Plans:*** Acquire a minimum 10 Instadose II Dosimeters and Reader. The Instadose II is the newest version of the Direct Ion Storage (DIS) Dosimeter that has the capability of detecting shallow dose and deep dose from photon (possibly neutrons). We would test this system to the ANSI-N13.11 Standard. The Instadose II would go through proficiency-type tests utilizing the sources located at NSWCCD. A Technical Memorandum will be developed and will be provided as a deliverable. In addition, will stay current on the latest dosimetry technology, such as the newly developed OSL crystal Beryllium Oxide. ***FY 2017 Base Plans:*** Finalize testing and reporting on OSL and Beryllium Oxide dosimetry technologies. Develop a recommendation for Navy dosimetry through a technical report. ***FY 2017 OCO Plans:*** N/A					
Title: Secondary Dosimetry	0.087	0.074	0.101	0.000	0.101
Articles:	20	18	-	-	-
Description: A secondary dosimeter provides an accurate, real-time readout of the radiation exposure being obtained in operational environments, and is utilized in conjunction with a primary dosimeter. The primary dosimeter does not provide real-time exposure information, so the secondary dosimeter is worn for that purpose. The Navy's secondary dosimeter is the Mk2 Electronic Personal Dosimeter (EPD). Evaluation of the current detector must be accomplished to establish a militarized environmental capability. Also, research is required to find a secondary dosimeter that can measure the type of radiation encountered with pulsed X-ray machines, and to see if this new capability can be incorporated into one device such as the existing Mk2. ***FY 2015 Accomplishments:*** Initiate and complete testing of new Electronic Personal Dosimeters (EPD) as a precursor to possible replacement of the Navy Mk2 EPD. Use NSWCCD radiological sources to test EPD units with continuous gamma and X-ray radiation along a broad energy range. Report on the energy dependence using the accuracy and precision of dose measurements taken at specific radiation energies. Compare the performance of the different EPDs tested and analyze which detection methods perform better than the others. ***FY 2016 Plans:***					

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
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B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Initiate and complete testing of extremity and lens secondary dosimetry. Research applications and end-users of this type of secondary dosimetry within the Navy. Test acquired dosimetry for dose accuracy, precision and energy dependence. Analyze applicability to Navy operations and the potential to militarize this type of dosimetry. ***FY 2017 Base Plans:*** Finalize reporting on Pulsed X-ray and electronic dosimetry. Begin market survey for supplementation or replacement of Navy's Mk2 EPD because the sole-source manufacturer will discontinue its production and replace it with a newer version. ***FY 2017 OCO Plans:*** N/A					
Title: Tritium Monitor ***Articles:*** ***Description:*** The AN/PDR-73 Tritium Monitor is used at nuclear weapons storage facilities and research laboratories to sample the air for the presence of Tritium. The current instrument is 30 years old and cannot be repaired due to obsolete components. At the current loss rate due to normal wear and tear there will be insufficient assets to meet operational requirements, so a replacement must be found. ***FY 2015 Accomplishments:*** Gather end user feedback from field testing. Perform an intercomparison in performance and specifications among the three units. Evaluate the pump design in each unit and determine life expectancy as compared to the existing AN/PDR-73. Continue coordination with the U.S. Air Force to leverage their development efforts for possible Joint procurement. Begin specification development. ***FY 2016 Plans:*** Finish gathering end user feedback and work with NAVSEA engineer staff to continue developing specification for procurement. Submit the specification to NAVSEA 04ND and Strategic Systems Program end user for concurrence. ***FY 2017 Base Plans:*** N/A ***FY 2017 OCO Plans:*** N/A	0.086 -	0.049 -	0.000 -	0.000 -	0.000 -
Accomplishments/Planned Programs Subtotals	0.667	0.710	0.702	0.000	0.702

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C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
• OPN 2920: *RADIAC*	5.153	8.294	9.558	-	9.558	10.177	0.000	0.000	0.000	Continuing	Continuing

Remarks

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 2017 Navy			Date: February 2016
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Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Primary Hardware Development	WR	NSWCCD : West Bethesda, MD	12.840	0.000		0.000		0.000		-		0.000	0.000	12.840	-
		Subtotal	12.840	0.000		0.000		0.000		-		0.000	0.000	12.840	-

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Development Support	WR	U.S. Naval Academy : Annapolis, MD	0.090	0.015	Mar 2015	0.015	Mar 2016	0.015	Jan 2017	-		0.015	Continuing	Continuing	Continuing
		Subtotal	0.090	0.015		0.015		0.015		-		0.015	-	-	-

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Test & Evaluation	WR	NSWCCD : West Bethesda, MD	2.543	0.481	Nov 2014	0.516	Nov 2015	0.555	Nov 2016	-		0.555	Continuing	Continuing	Continuing
VBSS	C/FFP	NSWCCD : West Bethesda, MD	0.000	0.059	Jun 2015	0.000		0.000		-		0.000	0.000	0.059	0.061
Primary Dosimetry	C/FFP	NSWCCD : West Bethesda, MD	0.000	0.003	Mar 2015	0.021	Mar 2016	0.000		-		0.000	0.000	0.024	0.024
Secondary Dosimetry	C/FFP	NSWCCD : West Bethesda, MD	0.002	0.009	Jul 2015	0.008	Jul 2016	0.000		-		0.000	0.000	0.019	0.019
Air Particle Detector	C/FFP	NSWCCD : West Behtesda, MD	0.000	0.100	Jun 2015	0.150	Jun 2016	0.132	Mar 2017	-		0.132	0.000	0.382	0.250
Tritium Monitors	C/FFP	NSWCCD : West Bethesda, MD	0.118	0.000		0.000		0.000		-		0.000	0.000	0.118	0.118
		Subtotal	2.663	0.652		0.695		0.687		-		0.687	-	-	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy			Date: February 2016
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	Prior Years	FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	15.593	0.667		0.710		0.702		-		0.702	-	-	-

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2017 Navy		Date: February 2016
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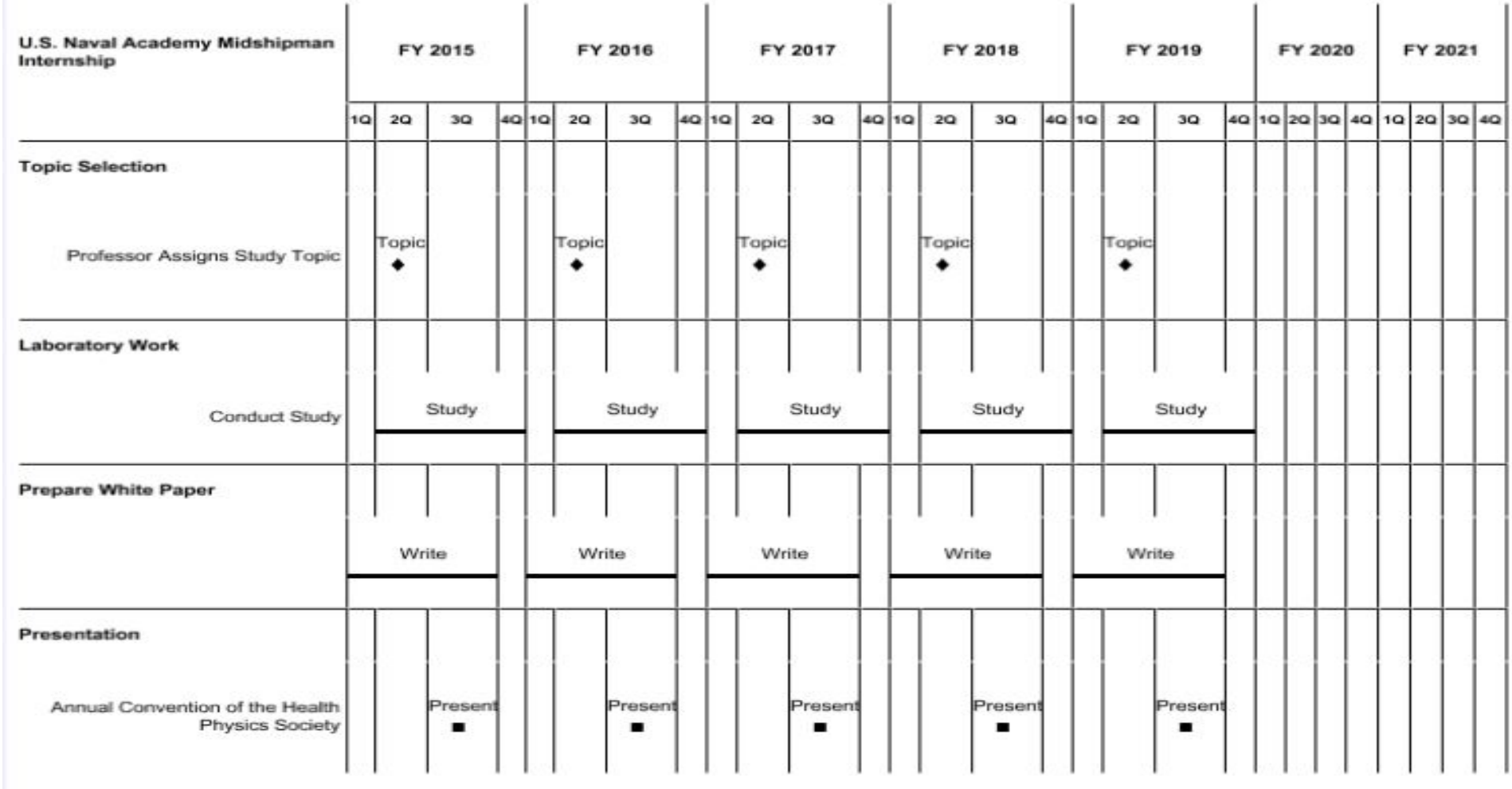

Exhibit R-4, RDT&E Schedule Profile: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603542N / *Radiological Control*	**Project (Number/Name)** 1830 / *RADIAC Development*

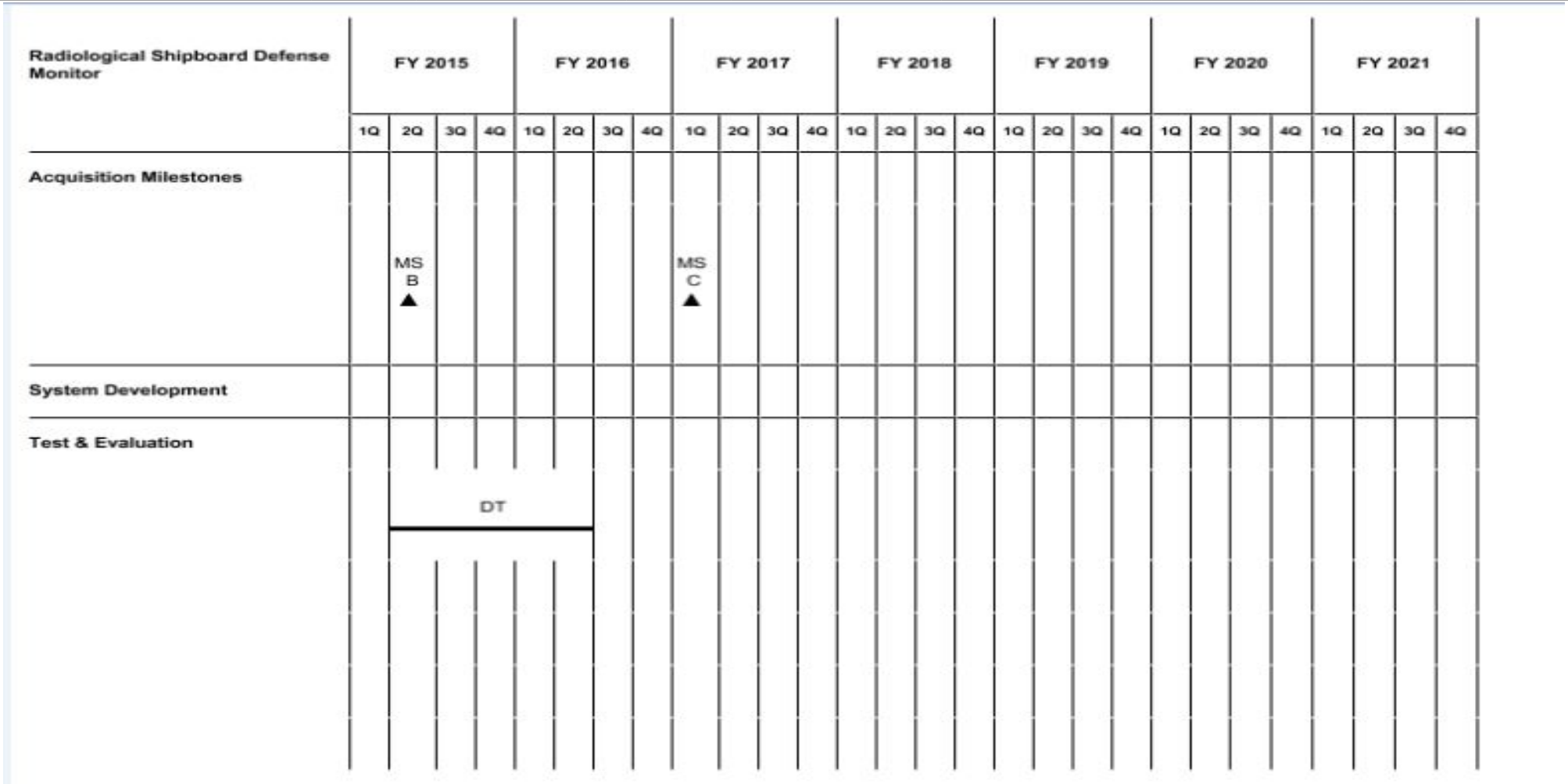

Exhibit R-4, RDT&E Schedule Profile: PB 2017 Navy		Date: February 2016
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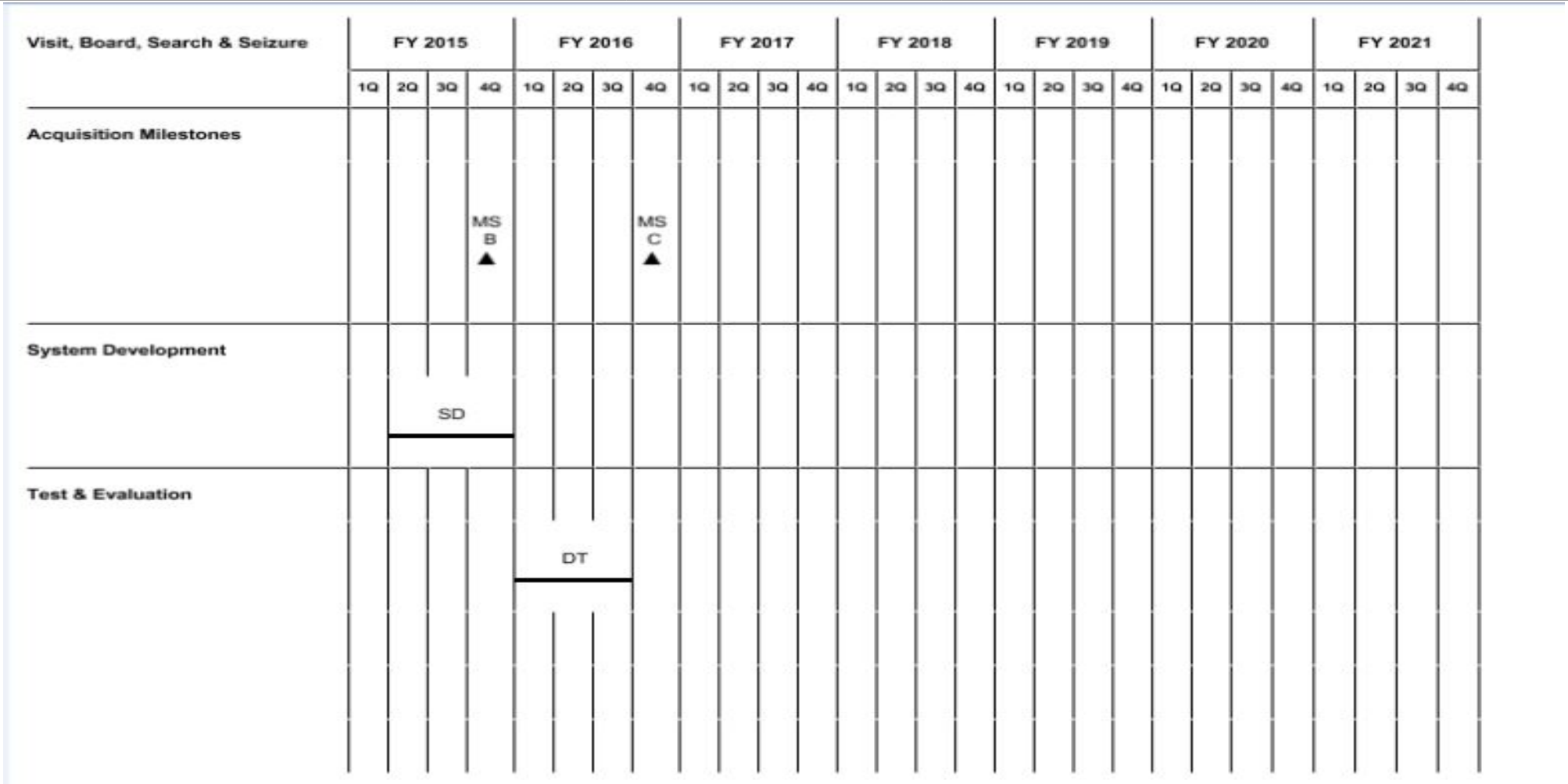

Exhibit R-4, RDT&E Schedule Profile: PB 2017 Navy		Date: February 2016
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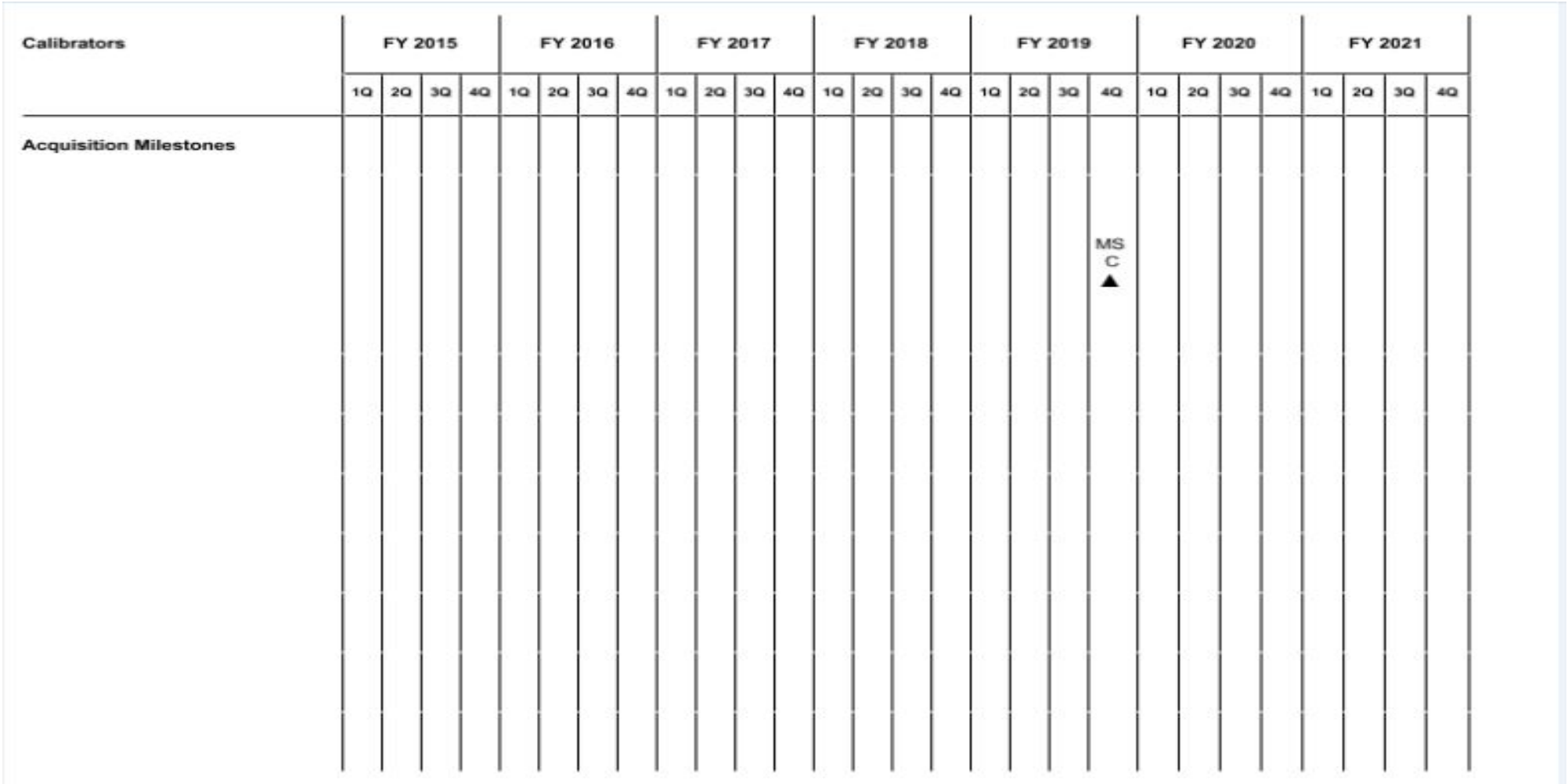

Exhibit R-4, RDT&E Schedule Profile: PB 2017 Navy		Date: February 2016
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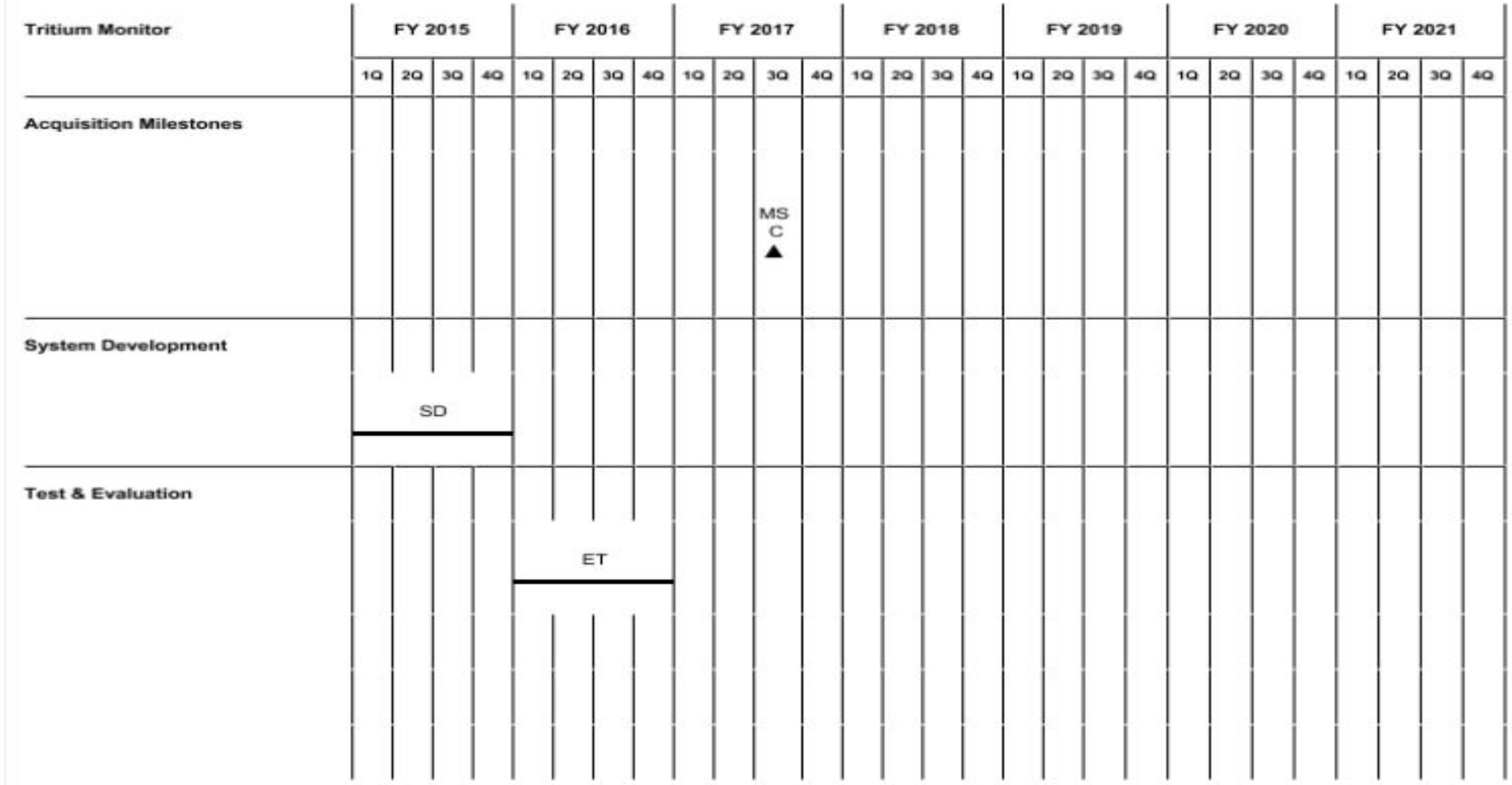

Exhibit R-4, RDT&E Schedule Profile: PB 2017 Navy		Date: February 2016
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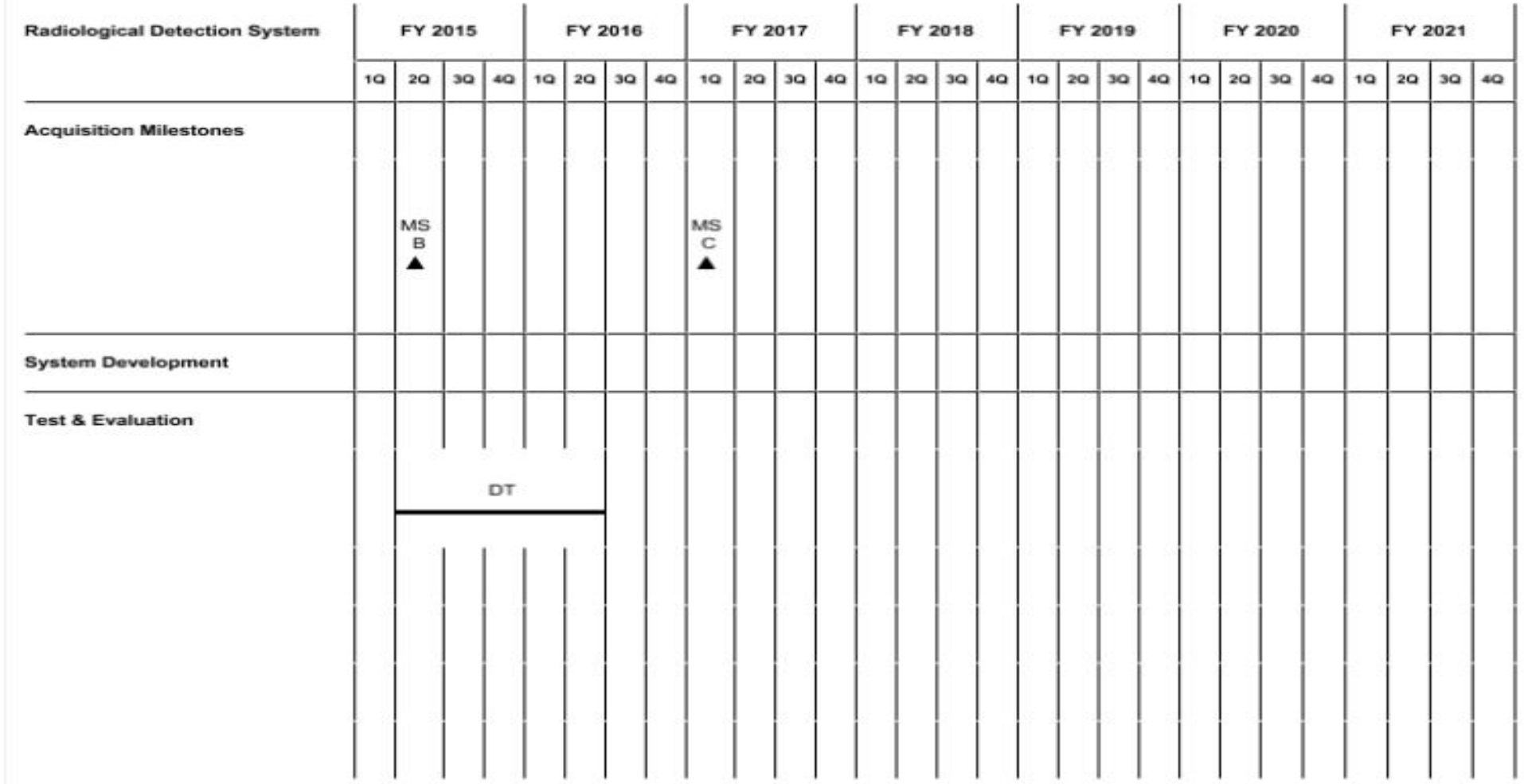

Exhibit R-4, RDT&E Schedule Profile: PB 2017 Navy		Date: February 2016
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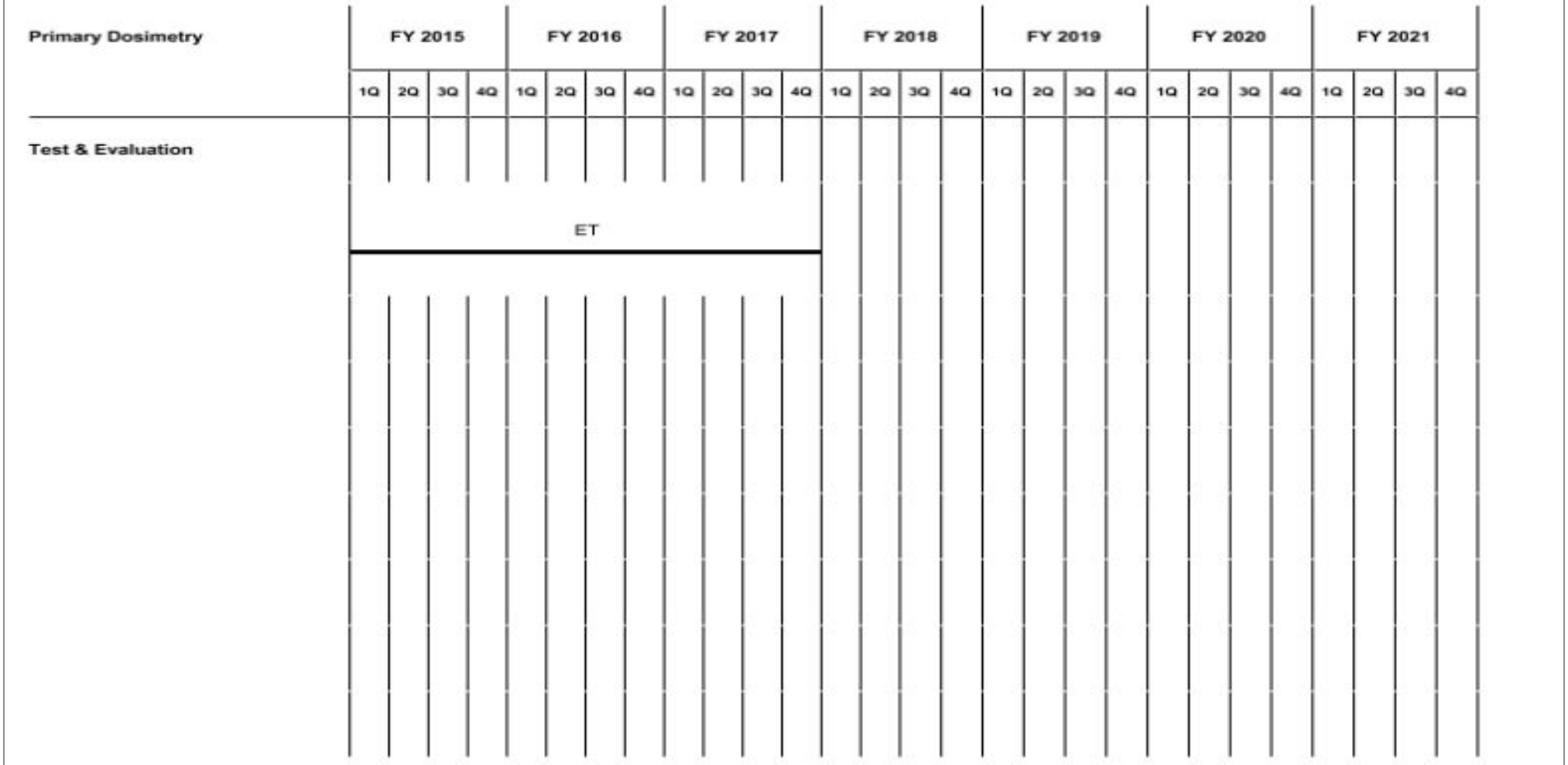


Exhibit R-4, RDT&E Schedule Profile: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603542N / *Radiological Control*	**Project (Number/Name)** 1830 / *RADIAC Development*

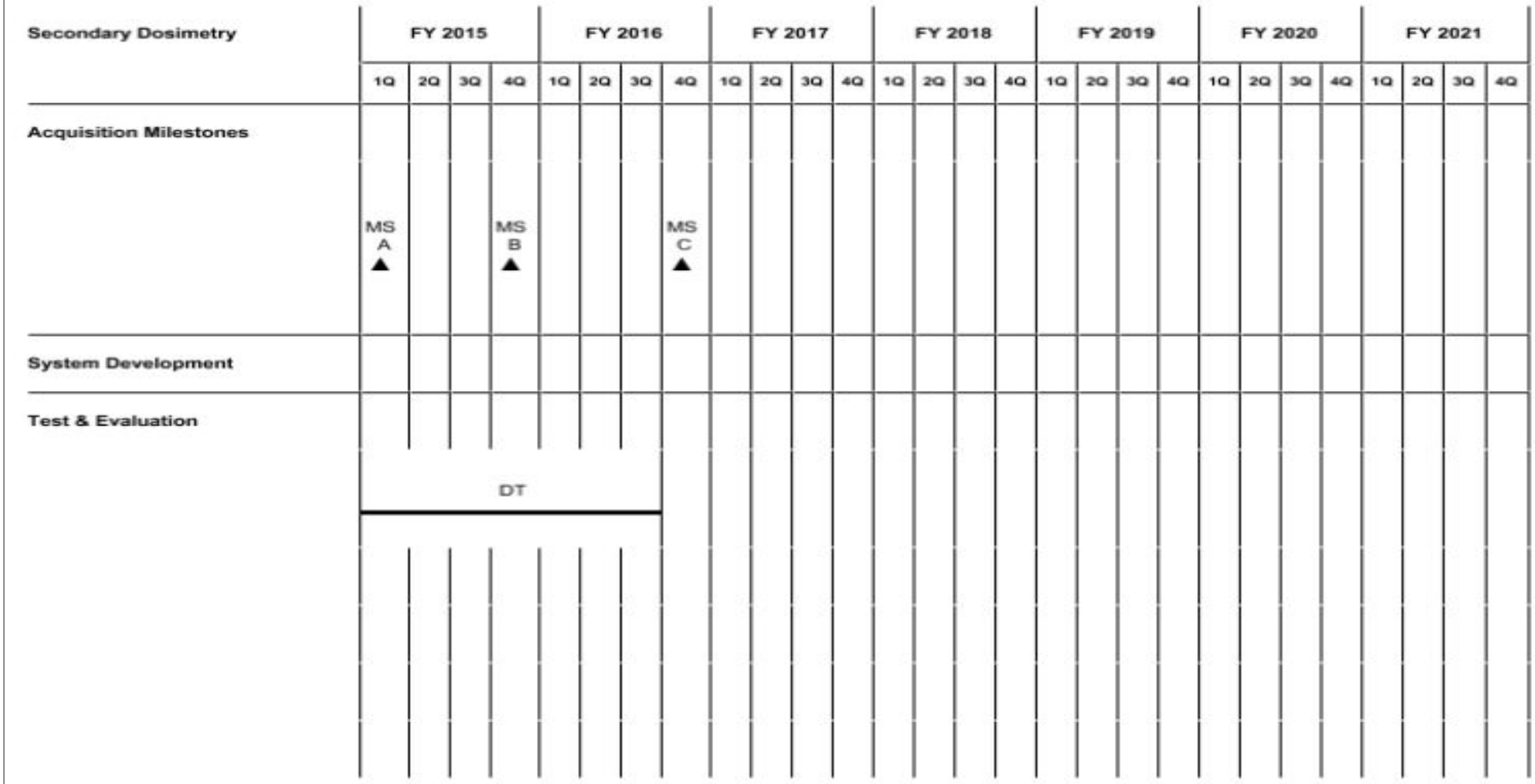


Exhibit R-4, RDT&E Schedule Profile: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603542N / *Radiological Control*	**Project (Number/Name)** 1830 / *RADIAC Development*

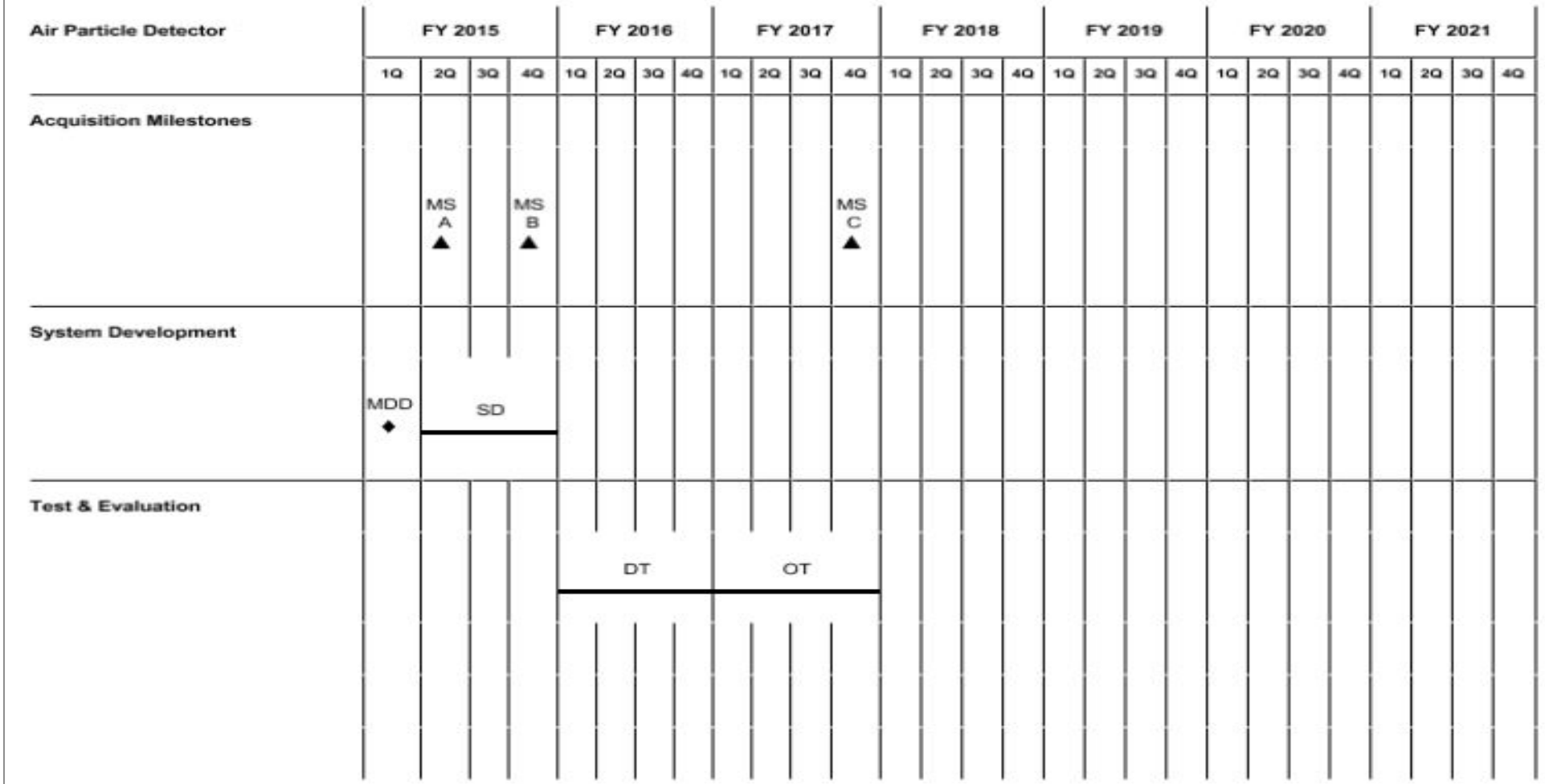


Exhibit R-4A, RDT&E Schedule Details: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603542N / *Radiological Control*	**Project (Number/Name)** 1830 / *RADIAC Development*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
U.S. Naval Academy Midshipman Internship				
Topic Selection: Professor Assigns Study Topic: Academic Year 2015-16	2	2015	2	2015
Topic Selection: Professor Assigns Study Topic: Academic Year 2016-17	2	2016	2	2016
Topic Selection: Professor Assigns Study Topic: Academic Year 2017-18	2	2017	2	2017
Topic Selection: Professor Assigns Study Topic: Academic Year 2018-19	2	2018	2	2018
Topic Selection: Professor Assigns Study Topic: Academic Year 2019-20	2	2019	2	2019
Laboratory Work: Conduct Study: Conduct laboratory study 2015	2	2015	4	2015
Laboratory Work: Conduct Study: Conduct laboratory study 2016	2	2016	4	2016
Laboratory Work: Conduct Study: Conduct laboratory study 2017	2	2017	4	2017
Laboratory Work: Conduct Study: Conduct laboratory study 2018	2	2018	4	2018
Laboratory Work: Conduct Study: Conduct laboratory study 2019	2	2019	4	2019
Prepare White Paper: Write up of study results 2014	1	2015	3	2015
Prepare White Paper: Write up of study results 2015	1	2016	3	2016
Prepare White Paper: Write up of study results 2016	1	2017	3	2017
Prepare White Paper: Write up of study results 2017	1	2018	3	2018
Prepare White Paper: Write up of study results 2018	1	2019	3	2019
Presentation: Annual Convention of the Health Physics Society: Present White Paper 2014	3	2015	3	2015
Presentation: Annual Convention of the Health Physics Society: Present White Paper 2015	3	2016	3	2016
Presentation: Annual Convention of the Health Physics Society: Present White Paper 2016	3	2017	3	2017
Presentation: Annual Convention of the Health Physics Society: Present White Paper 2017	3	2018	3	2018

Exhibit R-4A, RDT&E Schedule Details: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603542N / *Radiological Control*	**Project (Number/Name)** 1830 / *RADIAC Development*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Presentation: Annual Convention of the Health Physics Society: Present White Paper 2018	3	2019	3	2019
Radiological Shipboard Defense Monitor				
Acquisition Milestones: Milestone B	2	2015	2	2015
Acquisition Milestones: Milestone C	1	2017	1	2017
Test & Evaluation: Development Test	2	2015	2	2016
Visit, Board, Search & Seizure				
Acquisition Milestones: Milestone B	4	2015	4	2015
Acquisition Milestones: Milestone C	4	2016	4	2016
System Development: System Development	2	2015	4	2015
Test & Evaluation: Developmental Test	1	2016	3	2016
Calibrators				
Acquisition Milestones: Milestone C	4	2019	4	2019
Tritium Monitor				
Acquisition Milestones: Milestone C	3	2017	3	2017
System Development: System Development	1	2015	4	2015
Test & Evaluation: Evaluation Testing	1	2016	4	2016
Radiological Detection System				
Acquisition Milestones: Milestone B	2	2015	2	2015
Acquisition Milestones: Milestone C	1	2017	1	2017
Test & Evaluation: Development Test	2	2015	2	2016
Primary Dosimetry				
Test & Evaluation: Evaluation Testing	1	2015	4	2017
Secondary Dosimetry				
Acquisition Milestones: Milestone A	1	2015	1	2015
Acquisition Milestones: Milestone B	4	2015	4	2015

Exhibit R-4A, RDT&E Schedule Details: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603542N / *Radiological Control*	**Project (Number/Name)** 1830 / *RADIAC Development*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Acquisition Milestones: Milestone C	4	2016	4	2016
Test & Evaluation: Development Test	1	2015	3	2016
Air Particle Detector				
Acquisition Milestones: Milestone A	2	2015	2	2015
Acquisition Milestones: Milestone B	4	2015	4	2015
Acquisition Milestones: Milestone C	4	2017	4	2017
System Development: Material Development Decision	1	2015	1	2015
System Development: Specifications Development	2	2015	4	2015
Test & Evaluation: Development Test	1	2016	4	2016
Test & Evaluation: Operational Test	1	2017	4	2017

Exhibit R-2, RDT&E Budget Item Justification: PB 2017 Navy	Date: February 2016
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 0603553N *I Surface ASW*

COST ($ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
Total Program Element	183.785	1.020	1.096	1.081	-	1.081	1.148	1.174	1.198	1.222	Continuing	Continuing
1704.: *Undersea Warfare*	183.785	1.020	1.096	1.081	-	1.081	1.148	1.174	1.198	1.222	Continuing	Continuing

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 US 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.

B. Program Change Summary ($ in Millions)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Previous President's Budget	1.053	1.096	1.126	-	1.126
Current President's Budget	1.020	1.096	1.081	-	1.081
Total Adjustments	-0.033	0.000	-0.045	-	-0.045
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.033	0.000			
• Program Adjustments	0.000	0.000	-0.045	-	-0.045

Change Summary Explanation

Decrease in the Surface ASW program by $45K as required for the Department of the Navy to comply with the Bipartisan Budget Act of 2015.

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603553N / *Surface ASW*	Project (Number/Name) 1704. / *Undersea Warfare*	

COST ($ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
1704.: *Undersea Warfare*	183.785	1.020	1.096	1.081	-	1.081	1.148	1.174	1.198	1.222	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

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 US 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.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Title: CNO ASW Initiatives	1.020	1.096	1.081	0.000	1.081
Articles:	-	-	-	-	-
FY 2015 Accomplishments: Collected systems and performance data during select Fleet exercises and at-sea testing events. Analyzed and distributed collected data. Conducted studies and Analysis of Alternatives (AoA) in support of the CNO's ASW initiative. Awarded an advanced development contract to improve surface active sonar performance (4Q15).					
FY 2016 Plans: Collect systems and performance data during select Fleet exercises and at-sea testing events. Analyze and distribute collected data. Conduct studies and AoA in support of the CNO's ASW initiative.					
FY 2017 Base Plans: Collect systems and performance data during select Fleet exercises and at-sea testing events. Analyze and distribute collected data. Conduct studies and AoA in support of the CNO's ASW initiative. Award an advanced development contract to prototype promising new ASW concept(s).					
FY 2017 OCO Plans: N/A					
Accomplishments/Planned Programs Subtotals	1.020	1.096	1.081	0.000	1.081

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603553N / *Surface ASW*	**Project (Number/Name)** 1704. / *Undersea Warfare*

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

Use competitively awarded contracts from Broad Agency Announcement (BAA) solicitations and University Affiliated Research Centers (UARCs).

E. Performance Metrics

Investigate promising ASW technologies via annual at-sea experiments.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603553N / *Surface ASW*	Project (Number/Name) 1704. / *Undersea Warfare*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Technology Development	C/CPFF	AAC : NY	1.134	0.000		0.000		0.000		-		0.000	0.000	1.134	-
Technology Development	C/CPFF	Adaptive Methods : VA	3.788	0.000		0.000		0.000		-		0.000	0.000	3.788	-
Technology Development	C/CPFF	Alion Sciences : VA	8.000	0.000		0.000		0.000		-		0.000	0.000	8.000	-
Technology Development	C/CPAF	EG&G : VA	2.050	0.000		0.000		0.000		-		0.000	0.000	2.050	-
Technology Development	C/CPFF	In-Depth Engineering : VA	3.635	0.000		0.000		0.000		-		0.000	0.000	3.635	-
Technology Development	C/CPFF	JHU/APL : MD	25.333	0.000		0.000		0.000		-		0.000	0.000	25.333	-
Technology Development	C/CPFF	L-3 Communications : VA	3.000	0.000		0.000		0.000		-		0.000	0.000	3.000	-
Technology Development	C/CPFF	Lockheed Martin - ISS : NY	7.110	0.000		0.000		0.000		-		0.000	0.000	7.110	-
Technology Development	WR	NSWC/Carderock : MD	3.201	0.000		0.000		0.000		-		0.000	0.000	3.201	-
Technology Development	WR	NUWC/Keyport : WA	0.790	0.000		0.000		0.000		-		0.000	0.000	0.790	-
Technology Development	WR	NUWC/Newport : RI	33.260	0.000		0.000		0.000		-		0.000	0.000	33.260	-
Technology Development	C/CPFF	Northrop Grumman : VA	4.684	0.000		0.000		0.000		-		0.000	0.000	4.684	-
Technology Development	C/CPFF	UT/ARL : TX	4.908	0.000		0.000		0.000		-		0.000	0.000	4.908	-
Technology Development	C/CPFF	VAR : VAR*	4.694	0.000		0.000		0.000		-		0.000	0.000	4.694	-
Technology Development	WR	NFESC/PH : CA	5.350	0.000		0.000		0.000		-		0.000	0.000	5.350	-
Technology Development	MIPR	SSGC : MS	3.253	0.000		0.000		0.000		-		0.000	0.000	3.253	-
Detection/Classification Algorithms (LRS)	WR	NAWC/Pax River : MD	2.400	0.000		0.000		0.000		-		0.000	0.000	2.400	-
Detection/Classification Algorithms (LRS)	C/CPFF	VAR : VAR*	8.600	0.000		0.000		0.000		-		0.000	0.000	8.600	-
Technology Development (LRS)	WR	NRL : DC	2.500	0.000		0.000		0.000		-		0.000	0.000	2.500	-
Technology Development (LRS)	C/CPFF	VAR : VAR*	14.950	0.000		0.000		0.000		-		0.000	0.000	14.950	-
		Subtotal	142.640	0.000		0.000		0.000		-		0.000	0.000	142.640	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603553N / *Surface ASW*	Project (Number/Name) 1704. / *Undersea Warfare*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract

Remarks

*Consists of multiple performing activities with funding for each not greater than $1M per year.

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
At-Sea Test/Experiment	WR	ONR : VA	5.500	0.000		0.000		0.000		-		0.000	0.000	5.500	-
Developmental Test & Evaluation	C/CPFF	AAC : NY	1.067	0.000		0.000		0.000		-		0.000	0.000	1.067	-
Developmental Test & Evaluation	C/CPFF	JHU/APL : MD	2.105	0.630	Dec 2014	0.227	Mar 2016	0.211	Dec 2016	-		0.211	Continuing	Continuing	Continuing
Developmental Test & Evaluation	WR	NRL : DC	0.537	0.000		0.000		0.000		-		0.000	0.000	0.537	-
Developmental Test & Evaluation	WR	NSMA : VA	0.907	0.000		0.000		0.000		-		0.000	0.000	0.907	-
Developmental Test & Evaluation	WR	NSWC/Carderock : MD	1.172	0.000		0.000		0.000		-		0.000	0.000	1.172	-
Developmental Test & Evaluation	WR	NUWC/Newport : RI	11.453	0.000		0.000		0.000		-		0.000	0.000	11.453	-
Developmental Test & Evaluation	WR	SPAWAR : CA	0.277	0.000		0.000		0.000		-		0.000	0.000	0.277	-
Developmental Test & Evaluation	C/CPFF	UT/ARL : TX	1.844	0.000		0.000		0.000		-		0.000	0.000	1.844	-
Developmental Test & Evaluation	C/CPFF	VAR : VAR*	4.767	0.270	Feb 2015	0.749	Nov 2015	0.750	Dec 2016	-		0.750	Continuing	Continuing	Continuing
Enhanced Data Collection	C/CPFF	JHU/APL : MD	4.462	0.000		0.000		0.000		-		0.000	0.000	4.462	-
Enhanced Data Collection	C/CPFF	UT/ARL : TX	2.000	0.000		0.000		0.000		-		0.000	0.000	2.000	-
		Subtotal	36.091	0.900		0.976		0.961		-		0.961	-	-	-

Remarks

*Consists of multiple performing activities with funding for each not greater than $1M per year.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603553N / *Surface ASW*	Project (Number/Name) 1704. / *Undersea Warfare*	

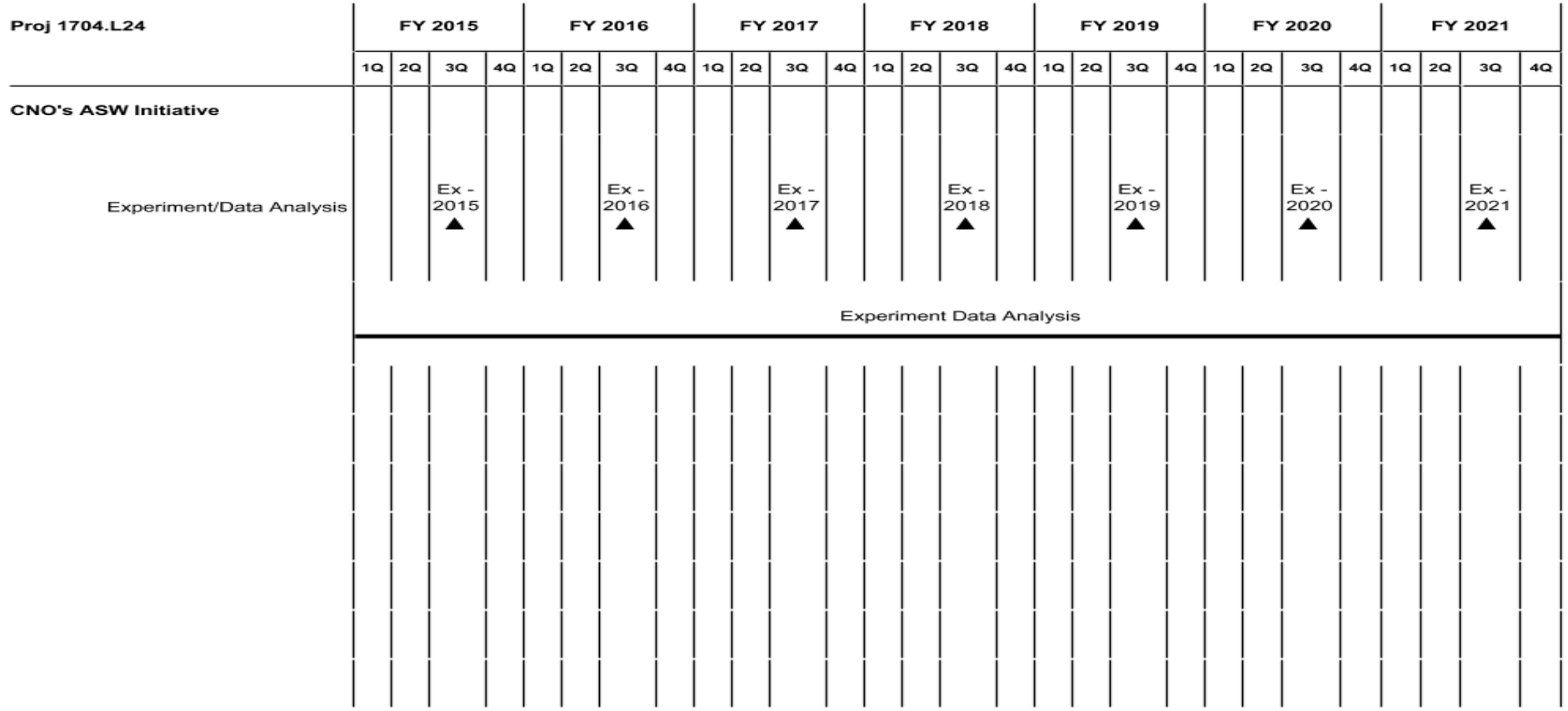
Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Support	C/CPAF	BAE Systems : MD	4.704	0.120	Nov 2014	0.000		0.000		-		0.000	0.000	4.824	-
Program Management Support	C/CPIF	CGI Federal : VA	0.000	0.000		0.120	Dec 2015	0.120	Dec 2016	-		0.120	Continuing	Continuing	Continuing
Travel	Allot	NAVSEA PEO IWS 5 : DC	0.300	0.000		0.000		0.000		-		0.000	0.000	0.300	-
Travel (LRS)	Allot	ONR : DC	0.050	0.000		0.000		0.000		-		0.000	0.000	0.050	-
		Subtotal	5.054	0.120		0.120		0.120		-		0.120	-	-	-

	Prior Years	FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	183.785	1.020		1.096		1.081		-		1.081	-	-	-

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603553N / *Surface ASW*	**Project (Number/Name)** 1704. / *Undersea Warfare*



2017PB - 0603553N - 1704.L24

Exhibit R-4A, RDT&E Schedule Details: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603553N / *Surface ASW*	**Project (Number/Name)** 1704. / *Undersea Warfare*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 1704.L24				
CNO's ASW Initiative: Experiment/Data Analysis: Conduct At-Sea Experiment (2015)	3	2015	3	2015
CNO's ASW Initiative: Experiment/Data Analysis: Conduct At-Sea Experiment (2016)	3	2016	3	2016
CNO's ASW Initiative: Experiment/Data Analysis: Conduct At-Sea Experiment (2017)	3	2017	3	2017
CNO's ASW Initiative: Experiment/Data Analysis: Conduct At-Sea Experiment (2018)	3	2018	3	2018
CNO's ASW Initiative: Experiment/Data Analysis: Conduct At-Sea Experiment (2019)	3	2019	3	2019
CNO's ASW Initiative: Experiment/Data Analysis: Conduct At-Sea Experiment (2020)	3	2020	3	2020
CNO's ASW Initiative: Experiment/Data Analysis: Conduct At-Sea Experiment (2021)	3	2021	3	2021
CNO's ASW Initiative: Experiment/Data Analysis: Analyze Experimental Data/Studies	1	2015	4	2021

Exhibit R-2, RDT&E Budget Item Justification: PB 2017 Navy											Date: February 2016	
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 4: *Advanced Component Development & Prototypes (ACD&P)*					R-1 Program Element (Number/Name) PE 0603561N *I Advanced Submarine System Development*							
COST ($ in Millions)	**Prior Years**	**FY 2015**	**FY 2016**	**FY 2017 Base**	**FY 2017 OCO**	**FY 2017 Total**	**FY 2018**	**FY 2019**	**FY 2020**	**FY 2021**	**Cost To Complete**	**Total Cost**
Total Program Element	858.377	65.913	85.834	100.565	-	100.565	94.556	115.328	109.357	106.469	Continuing	Continuing
0223: *Sub Combat System Improvement (ADV)*	415.027	33.734	38.337	42.296	-	42.296	41.175	51.621	50.902	51.952	Continuing	Continuing
2033: *Adv Submarine Systems Development*	443.350	32.179	37.497	49.877	-	49.877	44.434	43.368	44.285	45.199	Continuing	Continuing
2096: *Payload Delivery Development*	0.000	0.000	0.000	8.392	-	8.392	8.947	20.339	14.170	9.318	Continuing	Continuing
9999: *Congressional Adds*	0.000	0.000	10.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	10.000
Program MDAP/MAIS Code: P444												

A. Mission Description and Budget Item Justification

This program element supports innovative research and development in submarine Hull, Mechanical and Electrical (HM&E) 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), Independent Research and Development, and Small Business Innovation Research (SBIR) projects.

Project 0223:
The Submarine Combat System Improvement (Advanced) (Non-ACAT) Project supports Navy Submarine Acoustic Superiority and Technology Insertion Initiatives through the application of advanced development and testing of sensors and sensor processing systems supporting tactical control systems improvements. This Project transitions technologies developed by Navy technology bases, the private sector, Office of Naval Research (ONR), Future Naval Capabilities (FNC), 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. The focus of hardware systems will be the development and testing of advanced sensor technologies and large array configurations intended to support increased detection ranges and accuracy with increased reliability and lower life cycle costs. This Project is funded under demonstration and validation, as it develops and integrates hardware for experimental tests related to specific platform applications. The focus of software systems will be sensor processing technology efforts conducted under the Advanced Processing Build (APB) program that develops and demonstrates improvements to current and future sensor processing/combat control systems improving detection, localization, classification, decision support, counter-detection vulnerability, and other functions essential to mission success. Technologies and/or capabilities developed under this Project will be shared, as applicable, with surface and surveillance sensor processing/combat system development programs. In particular, development programs for surface ship sonar, Advanced Capability Build (ACB) and surveillance platforms, Advanced Surveillance Build (ASB), will work closely with the APB program to optimize software reuse. Beginning in FY 2015, all three programs (ACB, ASB and APB) are managed under a common development organization and process entitled AxB. While each platform retains its uniqueness and focus in functional domains essential to mission success, a premium is placed on development of

common capabilities and modular architecture technologies to maximize commonality and cost effectiveness. This Project will participate in, and take advantage of, the Tactical Advancements for the Next Generation (TANG) initiative that utilizes Commercial Industrial Design Thinking methodologies to engage the Fleet in generating innovative improvement concepts for Submarine, Surface and Surveillance systems.

Project 2033:
The Advanced Submarine Systems Development (ASSD) Program is a non-acquisition program that develops and matures technologies for successful integration into future and modernized submarine classes, thus lowering acquisition and life cycle program costs while improving mission capability. ASSD transitions Hull, Mechanical, and Electrical (HM&E) technologies and future naval concepts from Science & Technology (S&T) and Research and Development (R&D) to operational platforms; performs tests and demonstrates submarine design and naval architecture products destined for integration into future submarine classes or backfit into existing fleet assets; develops, initially integrates, and does test validation of leading payload concepts for submarine integration in support of the Design for Undersea Warfare; and operates unique R&D experimentation, modeling, testing and simulation facilities to enhance submarine stealth, maneuverability, capability, and affordability. The program also supports Small Business Innovation Research (SBIR), Small Business Technology Transfer (STTR), Office of Naval Research (ONR), Defense Advanced Research Projects Agency (DARPA) programs, and near and mid-term technology insertion to achieve future submarine class total ownership cost reductions, and influence future submarine concept designs and core technologies. 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 smarter technology selection decisions for potential incremental development. This program also supports Information Exchange Programs and joint Project Agreements (PA) with the United Kingdom, Canada, Australia and other international partners.

Project 2033 is comprised of three budget categories: Stealth, Payloads & Sensors, and Innovative Technology Transition/Concept Development.

The major developmental efforts include:
Sustainment of Vital Submarine Stealth R&D Capabilities
- Large Scale Vehicle (LSV)
- Intermediate Scale Measurement System (ISMS)
- Submarine Signature Management/Acoustic Superiority
- SSN/SSGN Survivability Program (S3P)
- Advanced Hull Coatings

Development of Technologies for Innovative Technology Transition/Concept Development
- Hydraulic Elimination through Electrification
- Advanced CO2 Scrubber (completes in FY16)
- Corrosion Control (Ionic Current Monitoring System (ICMS), Advanced Active Shaft Grounding System (A-ASGS), Sprayable Acoustic Damping System (SADS))
- Advanced Submarine Control (Secondary Propulsion System)
- Advanced Material Propeller (AMP) Technology
- SSN(X)
- Next Generation Propulsor

Exhibit R-2, RDT&E Budget Item Justification: PB 2017 Navy	Date: February 2016
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 0603561N *I Advanced Submarine System Development*

Improved Payload & Sensor Capabilities
- Next Generation Towed Array Handler System
- Towed Array Reliability
- Payload Integration (Advanced Weapons Enabled by Submarine UAS against Mobile targets (AWESUM), Universal Launch and Recovery Module (ULRM)) and Lithium Ion Battery Certification on an Unmanned Undersea Vehicle
- Integrated Autonomous Undersea Warfare Sensor (IAUWS)
- Speed to Fleet (S2F) (Lithium Ion Battery Certification on an Unmanned Vehicle and EW/ISR UUV
- Fleet Module Autonomous Underwater Vehicle (FMAUV)
- At-sea rapid prototyping and demonstration

Project 2096:
Project established in FY17. Efforts previously funded under 2033. The Universal Launch and Recovery Module (ULRM) supports the launch and recovery of the Large Diameter Unmanned Underwater Vehicle (LDUUV) from an SSGN for a large diameter open ocean interface.

B. Program Change Summary ($ in Millions)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Previous President's Budget	67.551	87.160	91.055	-	91.055
Current President's Budget	65.913	85.834	100.565	-	100.565
Total Adjustments	-1.638	-1.326	9.510	-	9.510
• Congressional General Reductions	-	-0.072			
• Congressional Directed Reductions	-	-11.254			
• Congressional Rescissions	-	-			
• Congressional Adds	-	10.000			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-1.638	0.000			
• Program Adjustments	0.000	0.000	10.407	-	10.407
• Rate/Misc Adjustments	0.000	0.000	-0.897	-	-0.897

Congressional Add Details ($ in Millions, and Includes General Reductions)	FY 2015	FY 2016
Project: 9999: *Congressional Adds*		
Congressional Add: *Adv Sub Sys Dev (Cong)*	0.000	10.000
Congressional Add Subtotals for Project: 9999	0.000	10.000
Congressional Add Totals for all Projects	0.000	10.000

Exhibit R-2, RDT&E Budget Item Justification: PB 2017 Navy	Date: February 2016
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 0603561N *I Advanced Submarine System Development*

Change Summary Explanation

Decrease in Advanced Submarine Systems Development RDTE,N by $4.186M as required for the Department of the Navy to comply with the Bipartisan Budget Act of 2015.

Project 0223: In FY16, -$3.0M Congressional Reduction for 'Advanced Processing Build (APB) Development Growth'.
FY16 to FY17 increase is due to the ramp-up of the development of Electronic Warfare (EW) improvements within APB efforts. EW develops ship vulnerability assessment tools to counter potential adversaries that are increasingly equipped with modern radars as well as non-Navy maritime traffic congesting littoral waters with high-end electronic signals. EW is a top priority in the CNO's Design for Maintaining Maritime Superiority (Jan-16).

Project 2033: In FY16, -$4.454M Congressional Reduction was applied for Stealth Programs.
In FY16, +$10M Congressional add was applied for Advanced Submarine Control. This add will develop, test and demonstrate numerous high risk advanced submarine control technologies associated with future submarine classes/design with advanced submarine payloads.
FY 2017 Program Adjustments support CNO Speed to Fleet Initiative for ISR/EW UUV and At-sea rapid prototyping, integration, and advanced submarine payloads demonstration. Additionally increase was programmed by CNO for design and procurement of materials for an advanced coatings demonstration as part of the Acoustic Superiority demonstrator (South Dakota Insertion Program - SSN 790).

Project 2096: In FY16, -$3.8M Congressional Reduction was applied for universal launch and recovery module unfunded out year tail.
In FY17, +$8.775M Program Adjustment was applied to fund Universal Launch and Recovery Module (ULRM). Funding was added for Non-Recurring Engineering, Operational Test and Evaluation(OT&E), and production of one Tactical ULRM.

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603561N / *Advanced Submarine System Development*	Project (Number/Name) 0223 / *Sub Combat System Improvement (ADV)*	

COST ($ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
0223: *Sub Combat System Improvement (ADV)*	415.027	33.734	38.337	42.296	-	42.296	41.175	51.621	50.902	51.952	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

FY16 to FY17 increase is due to the ramp-up of the development of Electronic Warfare (EW) improvements within APB efforts. EW develops ship vulnerability assessment tools to counter potential adversaries that are increasingly equipped with modern radars as well as non-Navy maritime traffic congesting littoral waters with high-end electronic signals. EW is a top priority in the CNO's Design for Maintaining Maritime Superiority (Jan-16).

The Submarine Combat System Improvement (Advanced) (Non-ACAT) Project supports Navy Submarine Acoustic Superiority and Technology Insertion initiatives by the application of advanced development and testing of sensor processing and tactical control systems improvements. This 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. These technologies, developed by Navy technology bases, the private sector, ONR, FNC, and DARPA are then transitioned. Prototype hardware/software systems are developed to demonstrate technologically promising system concepts in laboratory and at-sea submarine environments. The Advanced Sensor development program develops and tests new sensors and demonstrates large array configurations. Current efforts are directed at Towed Array sensor technologies, telemetry, and architecture, to improve reliability and performance while decreasing program life cycle costs. For large array configurations, Conformal Acoustic Velocity Sonar (CAVES), Wide Aperture Array (WAA), Large Vertical Aperture (LVA) and Large Flank Array (LFA) technologies are also being pursued. Light-Weight Low Cost Conformal Array (LWLCCA) is completing development and transition to fielding. The focus of sensor processing technology efforts through the APB program will address improvements in imaging, tactical control, Electronic Warfare (EW) and acoustics, including detection, localization, classification, ranging, tracking, situational awareness, tactical decision aides, command decision support tools and displays and other functions essential to mission success. Technologies and/or capabilities developed here are shared to optimize re-use and cost effectiveness with surface and surveillance programs under the AxB program management methodology. ACB, ASB and APB may co-develop capabilities and modular architecture technologies to maximize commonality and cost effectiveness. Development efforts may be augmented by innovative concepts generated through the TANG Design Thinking process that includes Fleet operational end-users in capability design.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Title: Advanced Processing Build (APB)	30.534	33.062	36.371	0.000	36.371
Articles:	-	-	-	-	-
FY 2015 Accomplishments: Continued the development of APB-15, integrated APB-15 for testing, and initiated the land-based testing of APB-15, including laboratory string testing. Initiated planning for APB-17 to include the establishment of the					

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603561N / *Advanced Submarine System Development*	**Project (Number/Name)** 0223 / *Sub Combat System Improvement (ADV)*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
tactical scenario to guide development focus; conducted a Watch Station Task Analysis (WSTA) gaps and seams test to inform system shortfalls in the context of the selected scenarios; and conducted an Industry Day and Broad Agency Announcement (BAA) solicitation to drive competition for future APB innovative technologies. Completed at-sea testing and the transition of APB-13. ***FY 2016 Plans:*** Use the product of FY15 Return on Investment (ROI), WSTA gaps and seams, and BAA evaluations along with direction from the Fleet/STRG/COMSUBFOR/N97 to establish content and continue the development of capabilities for APB-17. Initiate Electronic Warfare (EW) APB development program on PEO Submarines provided EW system. APB development will include the first two steps of the 4 Step APB process: Step 1 - algorithm assessment by peer review panels of Subject Matter Experts (SME) to down-select technologies and assist developers with technical guidance; Step 2 - algorithm/technology testing with open and closed data sets to further down-select and refine capabilities prior to integration and testing. Complete APB-15 land based testing and ROI and conduct at-sea testing and transition. Conduct a TANG event at the Theater ASW (TASW) level to inform and generate innovative concepts for APB-19. ***FY 2017 Base Plans:*** Continue the development of APB-17, integrate APB-17 for testing, and initiate the land-based testing of APB-17, including laboratory string testing. Continue EW APB development program on PEO Submarines provided EW system*. Initiate planning for APB-19 to include the establishment of the tactical scenario to guide development focus; conduct a WSTA gaps and seams test to inform system shortfalls in the context of the selected scenarios; and conduct an Industry Day and BAA solicitation to drive competition for future APB innovative technologies. Complete at-sea testing and the transition of APB-15. *EW is a top priority in the CNO's Design for Maintaining Maritime Superiority (Jan-16) and the FY16 to FY17 increase is due to the ramp-up of the development of EW improvements within APB. EW develops ship vulnerability assessment tools to counter potential adversaries that are increasingly equipped with modern radars as well as non-Navy maritime traffic congesting littoral waters with high-end electronic signals. ***FY 2017 OCO Plans:*** N/A					
Title: Flank Array Demonstration	0.000	1.675	2.125	0.000	2.125
Articles:	-	-	-	-	-
FY 2015 Accomplishments:					

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603561N / *Advanced Submarine System Development*	**Project (Number/Name)** 0223 / *Sub Combat System Improvement (ADV)*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
N/A ***FY 2016 Plans:*** Commence development of beamforming and signal processing improvements to maximize LFA capability as well as tactical/combat system updates making use of improved capabilities to perform target localization. Conduct at-sea testing and data analysis of the LVA-2 array on USS Maryland in support of Acoustic Superiority goals. ***FY 2017 Base Plans:*** Continue development of beamforming and signal processing improvements to maximize LFA capability as well as tactical/combat system updates making use of improved capabilities to perform target localization. Continue data analysis of the at-sea test of LVA-2 array on USS Maryland in support of Acoustic Superiority goals. ***FY 2017 OCO Plans:*** N/A					
Title: Advanced Sensors	3.200	3.600	3.800	0.000	3.800
Articles:	-	-	-	-	-
FY 2015 Accomplishments: Conducted at-sea testing of LWLCCA array with extension of technology to VA class submarines. Completed initial embedded sensor bench-top interface testing with prototype Towed Array (TA) Open Architecture Telemetry (OAT). Conducted environmental testing (pressure & temperature) of prototype embedded TA sensors. Continued development of TA vector sensors. ***FY 2016 Plans:*** Continue TA embedded sensor and open architecture telemetry development. Fabricate embedded sensor test module and conduct tow test to evaluate in-hose performance of embedded senor. Continue development of TA vector sensors. Initiate development of next generation towed array using open architecture and embedded sensor technology ***FY 2017 Base Plans:*** Continue embedded sensor and open architecture telemetry development. Complete open architecture component development and design and fabricate towed array modules to demonstrate high bandwidth operation and dual sample rate capability. ***FY 2017 OCO Plans:***					

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603561N / *Advanced Submarine System Development*	**Project (Number/Name)** 0223 / *Sub Combat System Improvement (ADV)*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
N/A					
Accomplishments/Planned Programs Subtotals	33.734	38.337	42.296	0.000	42.296

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

Use competitively awarded contracts from Broad BAA solicitations and SBIR initiatives. Integration to fielded systems performed under contracts awarded by the recipient production program within PEO Submarines.

E. Performance Metrics

- 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 (PEO Submarines) prior to delivery.
- Conducted LWLCCA Advanced Development Model (ADM) sea test.
- Deliver Next Generation TB-29(x) embedded sensor prototype evaluation report.
- Deliver Fat Line Vector Sensor Towed Array (VSTA) Lake Pend Oreille test reports.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603561N / *Advanced Submarine System Development*	Project (Number/Name) 0223 / *Sub Combat System Improvement (ADV)*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Product Development	C/CPFF	Adaptive Methods : VA	0.925	0.250	Feb 2015	0.000		0.000		-		0.000	0.000	1.175	Continuing
Product Development	C/CPFF	Alion Sciences : VA	3.267	0.000		0.000		0.000		-		0.000	0.000	3.267	Continuing
Product Development	C/CPFF	Arete : CA	0.150	0.400	Jan 2015	0.400	Feb 2016	0.400	Dec 2016	-		0.400	Continuing	Continuing	Continuing
Product Development	C/CPFF	Chesapeake Science (L-3) : MD	7.551	0.000		0.000		0.000		-		0.000	0.000	7.551	Continuing
Product Development	C/CPFF	Electric Boat : ME	1.765	0.000		0.050	Mar 2016	0.000		-		0.000	0.000	1.815	Continuing
Product Development	C/CPFF	General Dynamics : VA	18.097	2.000	Dec 2014	1.934	Dec 2015	2.500	Dec 2016	-		2.500	Continuing	Continuing	Continuing
Product Development	C/CPFF	GA Tech Research Institute : GA	2.966	0.050	Dec 2014	0.075	Feb 2016	0.050	Dec 2016	-		0.050	Continuing	Continuing	Continuing
Product Development	C/CPFF	In Depth Engineering : VA	4.500	0.200	Dec 2014	0.500	Dec 2015	0.500	Dec 2016	-		0.500	Continuing	Continuing	Continuing
Product Development	C/CPFF	JHU/APL : MD	78.833	7.322	Dec 2014	7.100	Nov 2015	7.600	Dec 2016	-		7.600	Continuing	Continuing	Continuing
Product Development	C/CPFF	Lockheed Martin : VA	47.777	7.581	Dec 2014	6.970	Jan 2016	8.935	Dec 2016	-		8.935	Continuing	Continuing	Continuing
Product Development	C/CPFF	Lockheed Martin : NY	9.564	0.000		0.000		0.000		-		0.000	0.000	9.564	Continuing
Product Development	C/CPFF	Metron : VA	4.658	0.715	Dec 2014	1.000	Dec 2015	1.000	Dec 2016	-		1.000	Continuing	Continuing	Continuing
Product Development	WR	NSWC/Carderock : MD	25.200	0.685	Nov 2014	1.064	Nov 2015	1.800	Nov 2016	-		1.800	Continuing	Continuing	Continuing
Product Development	WR	NUWC/Newport : RI	81.044	5.304	Nov 2014	6.475	Nov 2015	6.472	Nov 2016	-		6.472	Continuing	Continuing	Continuing
Product Development	C/CPAF	NSMA : VA	10.494	0.650	Jan 2015	0.650	Mar 2016	0.650	Dec 2016	-		0.650	Continuing	Continuing	Continuing
Product Development	WR	ONI : DC	2.295	0.000		0.000		0.000		-		0.000	0.000	2.295	Continuing
Product Development	WR	ONR : VA	2.725	0.000		0.000		0.000		-		0.000	0.000	2.725	Continuing
Product Development	C/CPFF	Progeny : VA	6.768	0.451	Dec 2014	1.295	Dec 2015	1.295	Dec 2016	-		1.295	Continuing	Continuing	Continuing
Product Development	C/CPFF	PSU/ARL : PA	8.480	0.600	Dec 2014	0.600	Dec 2015	1.200	Dec 2016	-		1.200	Continuing	Continuing	Continuing
Product Development	C/CPFF	SAIC : VA	3.555	0.000		0.000		0.000		-		0.000	0.000	3.555	Continuing
Product Development	C/CPFF	Sedna Digital : VA	9.364	1.400	Dec 2014	1.750	Nov 2015	2.050	Dec 2016	-		2.050	Continuing	Continuing	Continuing
Product Development	WR	SSC/San Diego : CA	1.813	0.150	Dec 2014	0.000		0.000		-		0.000	0.000	1.963	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603561N / *Advanced Submarine System Development*	Project (Number/Name) 0223 / *Sub Combat System Improvement (ADV)*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Product Development	MIPR	U.S. Army Research Lab : MD	1.700	0.000		0.000		0.000		-		0.000	0.000	1.700	Continuing
Product Development	MIPR	U.S. Army/MITRE : NJ	4.595	0.000		0.000		0.000		-		0.000	0.000	4.595	Continuing
Product Development	MIPR	U.S. Hanscom AFB/ MIT Lincoln Labs : MA	14.184	1.225	Jan 2015	1.680	Nov 2015	2.150	Dec 2016	-		2.150	Continuing	Continuing	Continuing
Product Development	C/CPFF	UT/ARL : TX	26.326	1.546	Feb 2015	1.125	Dec 2015	1.000	Dec 2016	-		1.000	Continuing	Continuing	Continuing
Product Development	C/CPFF	VAR : VAR*	19.866	2.135	Dec 2014	4.611	Dec 2015	3.636	Dec 2016	-		3.636	Continuing	Continuing	Continuing
		Subtotal	398.462	32.664		37.279		41.238		-		41.238	-	-	-

Remarks

*Consists of multiple performing activities with funding for each not greater than $1M per year.

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Support	C/CPAF	BAE Systems : MD	11.915	0.750	Nov 2014	0.000		0.000		-		0.000	0.000	12.665	Continuing
Program Management Support	C/CPIF	CGI Federal : VA	0.000	0.000		1.000	Dec 2015	1.000	Dec 2016	-		1.000	Continuing	Continuing	Continuing
Program Management Support	C/CPFF	EG&G (URS) : VA	4.030	0.261	Dec 2014	0.000		0.000		-		0.000	0.000	4.291	Continuing
Travel	Allot	NAVSEA PEO IWS5 : DC	0.620	0.059	Nov 2014	0.058	Oct 2015	0.058	Oct 2016	-		0.058	Continuing	Continuing	Continuing
		Subtotal	16.565	1.070		1.058		1.058		-		1.058	-	-	-

	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	415.027	33.734		38.337		42.296		-		42.296	-	-	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603561N / *Advanced Submarine System Development*	Project (Number/Name) 0223 / *Sub Combat System Improvement (ADV)*	

	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	Cost To Complete	Total Cost	Target Value of Contract

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603561N / *Advanced Submarine System Development*	**Project (Number/Name)** 0223 / *Sub Combat System Improvement (ADV)*

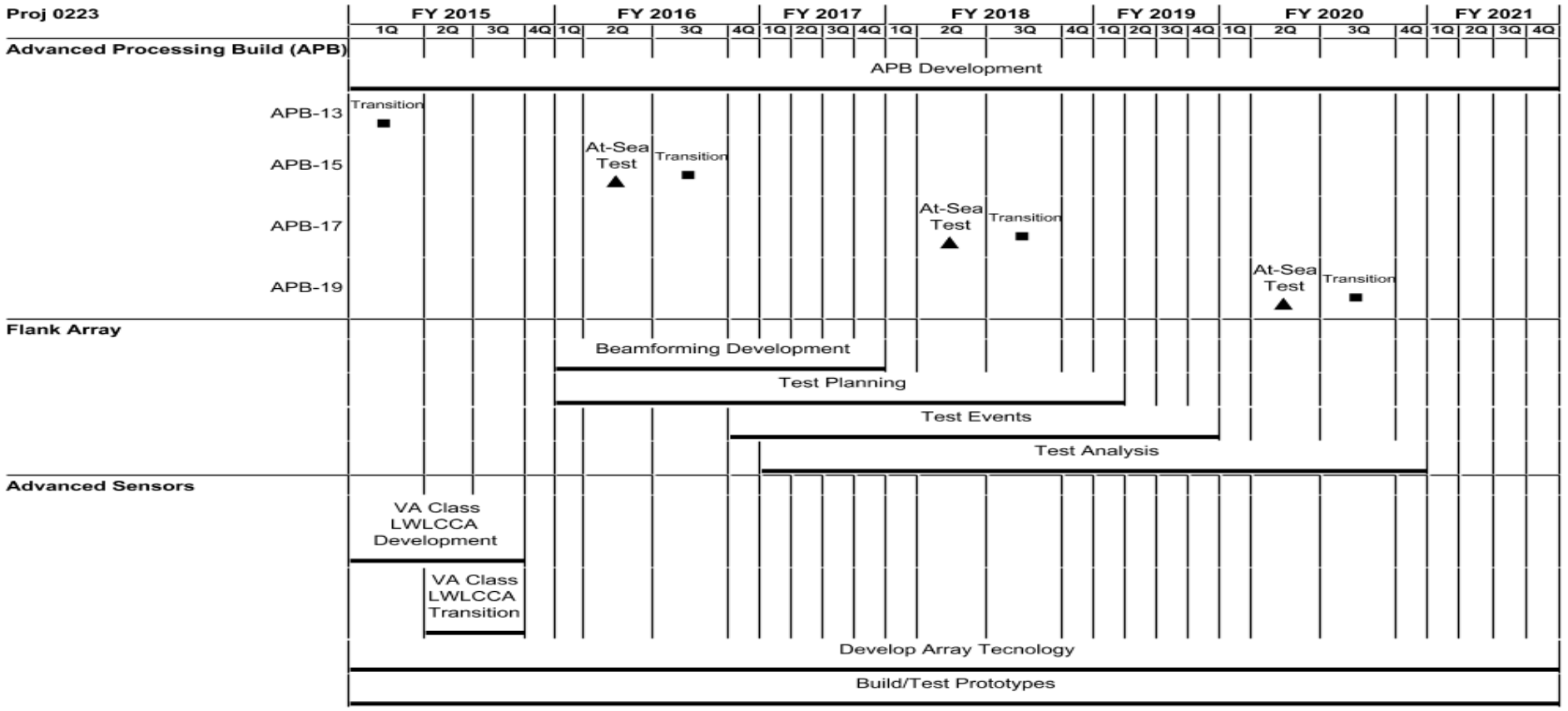


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Exhibit R-4A, RDT&E Schedule Details: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603561N / *Advanced Submarine System Development*	**Project (Number/Name)** 0223 / *Sub Combat System Improvement (ADV)*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 0223				
Advanced Processing Build (APB): APB Development (continued)	1	2015	4	2021
Advanced Processing Build (APB): APB-13: Transition APB-13 to PEO Submarines Production Programs	1	2015	1	2015
Advanced Processing Build (APB): APB-15: APB-15 At-Sea Test	2	2016	2	2016
Advanced Processing Build (APB): APB-15: Transition APB-15 to PEO Submarines Production Programs	3	2016	3	2016
Advanced Processing Build (APB): APB-17: APB-17 At-Sea Test	2	2018	2	2018
Advanced Processing Build (APB): APB-17: Transition APB-17 to PEO Submarines Production Programs	3	2018	3	2018
Advanced Processing Build (APB): APB-19: APB-19 At-Sea Test	2	2020	2	2020
Advanced Processing Build (APB): APB-19: Transition APB-19 to PEO Submarines Production Programs	3	2020	3	2020
Flank Array: Beamforming Development	1	2016	4	2017
Flank Array: Flank Array Test Planning	1	2016	1	2019
Flank Array: Flank Array Test Conduct	4	2016	4	2019
Flank Array: Flank Array Test Analysis	1	2017	4	2020
Advanced Sensors: VA Class LWLCCA Development Extension	1	2015	3	2015
Advanced Sensors: Transition LWLCCA to VA Class	2	2015	3	2015
Advanced Sensors: Develop Array Technologies (continued)	1	2015	4	2021
Advanced Sensors: Build & Test Prototype Arrays (continued)	1	2015	4	2021

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy										Date: February 2016		
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0603561N / *Advanced Submarine System Development*				Project (Number/Name) 2033 / *Adv Submarine Systems Development*			
COST ($ in Millions)	**Prior Years**	**FY 2015**	**FY 2016**	**FY 2017 Base**	**FY 2017 OCO**	**FY 2017 Total**	**FY 2018**	**FY 2019**	**FY 2020**	**FY 2021**	**Cost To Complete**	**Total Cost**
2033: *Adv Submarine Systems Development*	443.350	32.179	37.497	49.877	-	49.877	44.434	43.368	44.285	45.199	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The increase in funding from FY 2016 to FY 2017 is to support CNO Speed to Fleet Initiative for ISR/EW UUV and At-sea rapid prototyping, integration, and advanced submarine payloads demonstration. Additionally increase was programmed by CNO for design and procurement of materials for an advanced coatings demonstration as part of the Acoustic Superiority demonstrator (South Dakota Insertion Program - SSN 790).

The Advanced Submarine Systems Development (ASSD) Program is a non-acquisition program that develops and matures technologies for successful integration into future and modernized submarine classes, thus lowering acquisition and life cycle program costs while improving mission capability. ASSD transitions Hull, Mechanical, and Electrical (HM&E) technologies and future naval concepts from Science & Technology (S&T) and Research and Development (R&D) to operational platforms; performs tests and demonstrates submarine design and naval architecture products destined for integration into future submarine classes or backfit into existing fleet assets; develops, initially integrates, and does test validation of leading payload concepts for submarine integration in support of the Design for Undersea Warfare; and operates unique R&D experimentation, modeling, testing and simulation facilities to enhance submarine stealth, maneuverability, capability, and affordability. The program also supports Small Business Innovation Research (SBIR), Small Business Technology Transfer (STTR), Office of Secretary of Defense (OSD), Office of Naval Research (ONR), and Defense Advanced Research Projects Agency (DARPA), programs and near and mid-term technology insertion to achieve future submarine class total ownership cost reductions, and influence future submarine concept designs and core technologies. 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 smarter technology selection decisions for potential incremental development. This program also supports Information Exchange Programs and joint Project Agreements (PA) with the United Kingdom, Canada, Australia and other international partners.

Project 2033 is comprised of three budget categories: Stealth, Payloads & Sensors, and Innovative Technology Transition/Concept Development.

The major developmental efforts include:
Sustainment of Vital Submarine Stealth R&D Capabilities
- Large Scale Vehicle (LSV)
- Intermediate Scale Measurement System (ISMS)
- Submarine Signature Management/Acoustic Superiority
- SSN/SSGN Survivability Program (S3P)
- Advanced Hull Coatings

Development of Technologies for Innovative Technology Transition/Concept Development
- Hydraulic Elimination through Electrification

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- Advanced CO2 Scrubber (completes in FY16)
- Corrosion Control (Ionic Current Monitoring System (ICMS), Advanced Active Shaft Grounding System A-ASGS)
- Sprayable Acoustic Damping System (SADS))
- Advanced Submarine Control (Secondary Propulsion System)
- Advanced Material Propeller (AMP) Technology
- Next Generation Propulsor
- SSN(X)

Improved Payload & Sensor Capabilities

- Next Generation Towed Array Handler System
- Towed Array Reliability
- Payload Integration (Advanced Weapons Enabled by Submarine UAS against Mobile targets (AWESUM), Submarine Launched Decoy (SLD)
- Integrated Autonomous Undersea Warfare Surveillance (IAUWS)
- Speed to Fleet (S2F)(Lithium Ion Battery Certification on an Unmanned Undersea Vehicle and EW/ISR UUV
- Fleet Module Autonomous Underwater Vehicle (FMUAV)

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Title: Stealth/Subtotal Cost	16.035	25.892	35.210	0.000	35.210
Articles:	-	-	-	-	-
Description: Develop technologies and tools to increase the survivability of submarines by recognizing and mitigating sources of acoustic and non-acoustic vulnerabilities to ensure submarines can penetrate contested waters and remain undetected in the littorals. Develop technologies and Tactics, Techniques, and Procedures (TTPs) that facilitate new or enhance existing warfighting concepts. Sustain Navy R&D capability for continued operations of the Large Scale Vehicle (LSV 2) and the Intermediate Scale Measurement System (ISMS) test facility in support of VIRGINIA and OHIO Replacement Class Programs of Record (plus numerous other smaller programs) to conduct large scale model experiments for submarines focusing on stealth, maneuvering and control, affordability, and operational effectiveness. Stealth hosts the SSN/SSGN Survivability Program (S3P) which addresses gaps in stealth and the survivability for current and future SSN/SSGN force. S3P investigates, prioritizes, and validates survivability issues and then proposes and directs the development and validation of suitable countermeasures. S3P conducts operational and technical assessments in support of the current operations and submarine acquisition programs and will execute testing and analysis to address vulnerabilities associated with masts and communications, periscope depth operations, and acoustic sensors. Advanced coatings will develop methods to model and test existing US and UK coating materials as well as develop new coating materials for improved acoustic performance. New coatings' systems with high Technology Readiness Level (TRL) will be identified for near term implementation on VIRGINIA class platform will be supported.					

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B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
FY 2015 Accomplishments: Continued Electromagnetic Silencing Project Agreement (PA) with the UK executing the follow-on efforts for scale stress magnetization and electric model experiments. Developed program plan associated with proposed new Electromagnetic Silencing PA with the UK including further scale stress magnetization and electric model experiments as well as large/full-scale experiments. Completed technology and sensors refresh at ISMS range. Conducted LSV core systems maintenance, maintain crew qualification, maintain support systems, and operate and maintain LSV and ISMS acoustic test ranges. Continued supporting ship and system alterations to safely support OHIO Replacement signature and propulsor trials. Prepared for and conduct LSV program Independent Assessment. Conducted critical OHIO Replacement propulsor trials. Implement plan for long-term recapitalization of LSV2, including near-term electric drive system replacement design. Conduct advanced coating laboratory performance tests for US and UK materials. Defined requirements and initiate Treatment Configuration. S3P addressed four, high-priority fleet questions in stealth and survivability for current missions and addressed three technical questions regarding operational and acquisition stealth requirements for future SSN/SSGN force tactical and strategic operations. S3P accomplishments included research installation of a developmental vulnerability countermeasure (PELAGOS), final laboratory testing of a non-acoustic vulnerability countermeasure (ATOMS), field laboratory testing of submarine masts, and acoustic superiority analysis (specific details are classified). S3P completed one sea test, seven limited scope at-sea measurements, and one virtual exercise.					
FY 2016 Plans: Continue Electromagnetic Silencing PA with the UK executing the follow-on efforts for scale stress magnetization and electric model experiments. Conduct system upgrades on ISMS. Conduct LSV2 core ship systems maintenance, maintain crew qualification, ensure compliance with all LSVSAFE and general regulations, maintain and operate acoustic data systems and all required shore support systems. Conduct Independent Assessment and implement findings, operate and maintain ISMS acoustic test range underwater and shore-based facilities. Continue critical OHIO Replacement propulsor trials and conduct prop testing. Support ship and system alterations to safely support OHIO Replacement signature and propulsor trials, including replacement of LSV acoustic array and underwater tracking systems. Complete plan for long-term recapitalization of LSV2, including near-term electric drive system replacement design. Conduct advanced coating laboratory performance tests for US and UK materials. Commence risk reduction efforts associated demonstration of high TRL coating system on VA class platform. Commence the finalization of requirements and treatment configuration, procure materials and test. Define requirements and finalize program to transition ONR Future Naval Capability (FNC) coating concepts to future undersea platforms. S3P will address fleet questions in					

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B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
stealth and survivability for current missions as established by the Submarine Operations Group and Operations Review Group. S3P will also respond to technical questions related to operational and acquisition stealth requirements for future SSN/SSGN force. S3P accomplishments will include completion of an Operational Survivability Assessment, tactical installation and mission deployment and validation testing of development vulnerability countermeasure (PELAGOS), at-sea testing to characterizing VA Class mast vulnerabilities, analysis and testing of communication vulnerabilities, and acoustic superiority analysis and testing (details classified). Conduct three sea tests, two limited scope at-sea measurements, and two virtual exercises are planned. Additionally, four test windows are planned during the six-month operational deployment of PELAGOS. ***FY 2017 Base Plans:*** Perform laboratory stress magnetization and electric model experiments on joint US/UK models. Commence detailed planning associated with large-scale testing to perform underwater electric and magnetic signature testing utilizing UK asset(s) at US range facility. Complete system upgrades on ISMS. Conduct LSV2 core ship systems maintenance, maintain crew qualification, ensure compliance with all LSVSAFE and general regulations, maintain and operate acoustic data systems and all required shore support systems. Conduct Independent Assessment and implement findings, operate and maintain ISMS acoustic test range underwater and shore-based facilities. Continue critical OHIO Replacement propulsor trials. Support ship and system alterations to safely support OHIO Replacement signature and propulsor trials, including replacement of LSV acoustic array and underwater tracking systems. Conduct advanced coating laboratory performance tests for US and UK materials. Finalize requirements and treatment configuration, procure materials and test. Commence fabrication treatment and development of Operational Alteration (OPALT) package. Leverage lessons learned from VA class advanced hull treatment demonstration to initiate qualification testing associated with transition of ONR FNC treatment concepts for future platforms, Identify full-scale demonstration opportunities and initiate development of required Alteration data packages. S3P plans to address gaps in stealth and survivability for current and future SSN/SSGN force to include responding to fleet questions on current tactical vulnerabilities, completion of an annual Operational Survivability Assessment, final assessment of VA Block V acoustic superiority requirements, analysis of deployment data from vulnerability countermeasure (PELAGOS), determination of course of action for mast and antenna vulnerability countermeasures, continued communications vulnerability assessment, and other acoustic superiority countermeasure validation testing (details classified). Assesses PELAGOS transition to program of record in FY 17 and with follow-on VA Class testing. ***FY 2017 OCO Plans:***					

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B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
N/A					
Title: Payloads and Sensors/Subtotal Cost	10.660	6.671	9.035	0.000	9.035
Articles:	-	-	-	-	-

Description: Develop promising advanced technologies and/or concepts capable of revolutionizing submarine design, improving payload flexibility, increasing capability, reducing weight and space requirements, exploring alternative payload launch mechanisms. Develop rapid payload demonstrations targeted at improving flexible ocean interfaces, Intelligence, Surveillance, Reconnaissance (ISR) requirements and missions payload and launch retrieval methods from undersea platforms, and certification of next generation high-density energy systems for on-board submarine use. Conduct Navy and joint demonstrations in order to assess the operational value of the technologies and systems under consideration. Transition demonstrated high interest systems to the acquisition community. The experiments support examination and assessment of potential new Fleet capabilities.

FY 2015 Accomplishments:
Continued monitoring prototype Towed Array OA-9070B Tensioned Belt Drogue Deployer (TBDD) on the 688 class at-sea. Developing the towed array Dual Belted Diverter (DBD) to replace the guide tube roller boxes to assist the towed body around desired angles and turns. Continued the Towed Array Load Predicting Tool FNC to develop and validate towed array model hydrodynamic load predicting computational tool. Completed the full scale validation array prototype design and fabricated sensors which will be installed on a SSN 688 to provide in-situ loads on deployed towed array, allowing data collection which will provide validation of the FNC tool. Continued submarine integration and Concept of Operations (CONOPs) development in support of AWESUM. Payload completed a successful demonstration of the AWESUM JCTD and prepared a codified transition agreement with NAVAIR (PMW 770 and NAVSEA (PMS 425) program offices. Demonstrated submarine launch Unmanned Aerial System (UAS) capability in support of AWESUM. Performed initial design and analysis on tactical ULRM. Continued integration and testing of innovative payload concepts. Developed preliminary hazard analysis, design battery carriage and battery casualty testing for the Speed to Fleet Lithium Ion Battery certification. Continued Integrated Autonomous Undersea Warfare Surveillance (IAUWS), PA between US and Australia. Design, built vehicle mods, prepared for demonstration, and developed TEMPALT for Fleet Modular Autonomous Underwater Vehicle (FMAUV).

FY 2016 Plans:
Continued monitoring Towed Array OA-9070B TBDD and completion of at-sea demo of the TBDD. Complete development and perform landbased test on the Towed Array OA-9070B Dual Belted Diverter (DBD) and

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B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Tensioner. Transition to PMS 401. Continue Towed Array Predicting Tool FNC to develop and validate towed array load prediction tool. Conduct landbased and in-water test of the full scale instrumented tool validation array. Initiate UAS integration (AWESUM) collaboration with UK and Australia. Efforts will field the AWESUM system as a mission capability and further improve system reliability. Additionally efforts will mature the Submarine Launched Decoy (SLD) to a relevant configuration for at sea testing. Continue integration and testing of innovative payload concepts. Complete Lithium Ion Battery certification testing and establish follow-on plan for SAFECAP design and TEMPALT package for vehicle carriage. Conduct FMAUV at-sea trial and support transition planning. Additional development of solutions and capabilities to support high power and energy dense systems on submarines. ***FY 2017 Base Plans:*** Continue Towed Array Load Prediction Tool FNC to development and validation. Initiate efforts for submarine integration of advanced UAS payloads and a common communication architecture. Continue integration and testing of innovative payload concepts into off-hull platforms. Demonstrate an autonomous mission capability for Speed to Fleet ISR/EW. Commence Undersea Warfare Rapid Innovation/Prototyping to sustain dominance of USN submarines to include common UAS communications architecture. ***FY 2017 OCO Plans:*** N/A					
Title: Innovative Technology Transition/Concept Development	5.484	4.934	5.632	0.000	5.632
Articles:	-	-	-	-	-
Description: Develop submarine alternative propulsion, propeller designs, and stern configurations with potential to significantly reduce submarine acquisition costs while increasing performance. Demonstrate critical performance parameters through appropriate scale demonstration in realistic environmental conditions. Evaluate integration of technologies and approaches for cost reduction in future submarines. Develop understanding of ship concept studies and submarine cost drivers and model analysis. Develop and demonstrate technologies for future submarines in areas of hull and platform technologies, propulsors, propellers, corrosion control, ship control, electric actuation, sensors, and self-defense. Demonstrate technologies with potential to reduce total ownership costs of submarine systems by lowering construction costs, improving commonality of interfaces, extending the life of parts, and lowering life cycle maintenance requirements. This work will apply to future submarine concept formulation design, technology integration and capabilities studies.					

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B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
FY 2015 Accomplishments: Completed the TEMPALT removal of the Universal Modular Mast (UMM) and Ball Valve Electric Actuation System (EAS from the USS MISSOURI and restored the shipboard hydraulic service systems. Performed Ball Valve EAS data acquisition analysis and actuator tear down assessment. Continued data collection of the Advanced CO2 Removal Unit (ACRU) shipboard test cube on aboard SSBN platform. Planned and developed a TEMPALT to demonstrate Ionic Current Monitoring System (ICMS). Plan and develop one TEMPALT to demonstrate an Advanced Active Shaft Grounding System (AASGS) subsystem technology, Electronic Grounding Unit (EGU) with Grounding Datalog Unit (GDU)). Completed Advanced Active Shaft Grounding System (AASGS) subsystems (Shaft Current Sensor (SCS) and Contact Technologies (CT)) engineering design. Developed Sprayable Acoustics Damping System (SADS) Future Naval Capability (FNC) Business Case Analysis (BCA) for VIRGINIA and Ohio Replacement and finalize SADS formulation. Designed, fabricated and conducted component and system testing and commenced preliminary design of the Advanced Submarine Control (ASC) pump jet. Continue partnership with ONR on the Advanced Material Propeller (AMP) FNC program. Completed full scale Generation 0 (one AMP composite blade and metallic hub) fabrication and structure testing. Continued new concept development/system improvements. Continue to leverage products between Small Business and Independent Research and Development (IR&D) efforts. Develop an Augmented Reality (AR) Information Assurance (IA) plan to support the planned Low Cost Conformal Array (LCCA) installation alternation demonstration. Study concepts and technology options for the Next Generation (NG) Propulsor.					
FY 2016 Plans: Complete data collection of the Advanced CO2 Removal Unit (ACRU) shipboard test cube on aboard SSBN platform. Install ICMS TEMPALT on a VIRGINIA Class hull. Install the AASGS EGU with GDU TEMPALT on a VIRGINIA hull. Plan and develop the AASGS SCS and CT TEMPALTs for demonstration at sea. Complete the design, fabrication and component and system testing and preliminary design of the Advanced Submarine Control (ASC) pump jet. Build and perform the certification testing of the full scale Generation 2 AMP composite blades and metallic hub. Continue new concept development/system improvements. Continue to leverage products between Small Business and IR&D efforts. Commence technology and trade-studies roadmapping to determine potential long lead technology development areas required for future submarine classes. Continue to study concepts and technology options for a Next Generation (NG) Propulsor.					
FY 2017 Base Plans:					

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B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Remove the CO2 SSBN Shipyard test cube. Continue to monitor ICMS TEMPALT at-sea. Install the SCS and CT AASGS TEMPALTs on VA Class platform. Commence monitoring of TEMPALTs at-sea. Deliver full-scale AMP to the Royal Australian Navy for demonstration at-sea on a COLLINS class submarine. Commence design of a multi-material rotor for demonstration on the LSV. Continue new concept development/system improvements. Continue to leverage products between Small Business and Independent Research and Development (IR&D) efforts. Continue SSN(X) roadmapping to determine potential long lead technology development areas required for future submarine classes. Next Generation Propulsor team to evaluate the Defense Advanced Research Projects Agency (DARPA) Hybrid Multi-Material Rotor (HMMR) structural integrity effort and AMP testing the robustness of multi-materials for full scale use on a submarine. ***FY 2017 OCO Plans:*** N/A					
Accomplishments/Planned Programs Subtotals	32.179	37.497	49.877	0.000	49.877

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

F2033: Sole source Concept Formulation (CONFORM) contracts with the only two submarine design/construction shipyards, General Dynamics Electric Boat (GDEB) and Huntington Ingalls Industries (HII). Engagement with industry to build vendor base and support development of R&D products for enhanced submarine capability via competitively awarded Small Business Innovation Research (SBIR) and Broad Agency Agreement (BAA) contracts to support Hull Mechanical & Electrical (HM&E) and payload systems.

E. Performance Metrics

To enable transition of a minimum of three technology challenge solutions supporting emergent warfighter needs.
- Sustain critical one of a kind national Research and Development (R&D) hydroacoustic infrastructure enabling the design and assessment of VIRGINIA Class and OHIO Replacement designs.
- Deliver 2-3 Rapid Prototype projects evaluating future submarine payload concepts.
- Tactical deployment of AWESUM system.
- Assess as-built VIRGINIA and OHIO Class SSN/SSGN submarine for design drivers/design tools and model validation to define R&D needs for future submarine classes.
- Test innovative Towed Array Handler concept focused on improving system reliability and fleet operational availability.

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- Conduct in-depth assessment of SSN/SSGN Survivability for peacetime and wartime operations in anti-access area denial environment. Respond to emergent fleet tasking to assess real-world vulnerability concerns
- Completion of annual Operational Survivability Assessment for SSN/SSGN.
- Develop future coatings to enable continued acoustic superiority of VA Class design.

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Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Product Development	MIPR	DARPA : Arlington, VA	3.084	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Product Development	MIPR	CNA : Alex, VA	0.690	0.370	Apr 2015	0.500	Feb 2016	0.200	Feb 2017	-		0.200	0.000	1.760	-
Product Development	SS/CPFF	Lockheed Martin : Manassas, VA	1.500	0.000		0.000		0.000		-		0.000	0.000	1.500	-
Product Development	WR	NRL : Washington, DC	0.933	0.490	Apr 2015	0.000		0.000		-		0.000	0.000	1.423	-
Product Development	SS/CPFF	Rolls Royce, Marine North America : New Bedford, MA	1.760	0.820	Mar 2015	2.000	Mar 2016	0.000		-		0.000	0.000	4.580	-
Product Development	SS/CPFF	SupShips : Groton, CT	0.000	2.434	Aug 2015	0.000		0.000		-		0.000	0.000	2.434	-
Product Development	WR	NAVAIR : Pax River, MD	0.000	0.400	Apr 2015	0.000		0.000		-		0.000	0.000	0.400	-
Product Development	SS/CPFF	HII : Newport News, VA	7.641	0.939	Mar 2015	3.419	Apr 2016	4.730	Apr 2017	-		4.730	Continuing	Continuing	Continuing
Product Development	WR	NSWC : Dahlgren, VA	5.261	0.010	May 2015	0.000		0.000		-		0.000	0.000	5.271	5.241
Product Development	SS/CPFF	Kollmorgen : N. Hampton, MA	1.100	0.000		0.000		0.000		-		0.000	0.000	1.100	1.100
Product Development	SS/CPFF	Oceaneering : Chesapeake, VA	1.900	0.000		0.000		0.000		-		0.000	0.000	1.900	1.900
Product Development	SS/CPFF	Boeing : St. Louis, MO	0.925	0.000		0.000		0.000		-		0.000	0.000	0.925	Continuing
Product Development	SS/CPFF	EB : Groton, CT	52.578	5.548	Mar 2015	1.371	Apr 2016	17.104	Apr 2017	-		17.104	Continuing	Continuing	Continuing
Product Development	SS/CPFF	Raytheon : Portsmouth, RI	16.034	0.000		0.000		0.000		-		0.000	0.000	16.034	16.340
Product Development	WR	NSWC : Carderock, MD	83.011	2.458	Mar 2015	3.744	Apr 2016	5.705	Apr 2017	-		5.705	Continuing	Continuing	Continuing
Product Development	SS/CPFF	ARL/PSU : State College, PA	7.642	0.116	Feb 2015	0.566	Apr 2016	0.575	Apr 2017	-		0.575	Continuing	Continuing	Continuing
Product Development	SS/CPFF	UT/ARL : Austin, TX	6.300	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing

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Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Product Development	SS/CPFF	JHU/APL : Laurel, MD	17.298	1.624	May 2015	7.402	May 2016	1.200	Apr 2017	-		1.200	Continuing	Continuing	Continuing
Product Development	Various	Various : Various	34.259	1.662	Mar 2015	0.000		0.289	Apr 2017	-		0.289	Continuing	Continuing	Continuing
Product Development	WR	NUWC : Newport, RI	69.506	1.713	Feb 2015	1.769	Mar 2016	1.820	Mar 2017	-		1.820	Continuing	Continuing	Continuing
Product Development	WR	ONR : Arlington, VA	8.066	0.575	Mar 2015	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Product Development	SS/CPFF	Lockheed Martin : Bethesda, MD	12.783	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Product Development	WR	SPAWAR : San Diego, CA	5.850	0.290	May 2015	0.000		0.000		-		0.000	0.000	6.140	Continuing
Product Development	C/CPFF	Raytheon : TBD	0.627	0.000		0.000		0.000		-		0.000	0.000	0.627	-
Product Development	C/CPFF	Applied Mathematics : Gales Ferry CT	0.510	0.000		0.000		0.000		-		0.000	0.000	0.510	-
Product Development	SS/CPFF	Progeny : Manassas VA	0.337	0.283	Mar 2015	0.000		0.000		-		0.000	0.000	0.620	-
		Subtotal	339.595	19.732		20.771		31.623		-		31.623	-	-	-

Remarks

Various/VAR is used to group multiple activities with small funding levels.
Activities will be incrementally funded. The award dates reflect the latest incremental portion funds will obligate.

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Contractor Engineering Support	SS/CPFF	Various : Various	11.004	1.300	Jun 2015	1.313	Jun 2016	1.339	Jun 2017	-		1.339	Continuing	Continuing	Continuing
Government Engineering Support	WR	Various : Various	6.163	0.350	Mar 2015	0.350	Mar 2016	0.350	Mar 2017	-		0.350	Continuing	Continuing	Continuing
Travel	WR	NAVSEA HQ : Not Specified	0.759	0.100	Mar 2015	0.100	Apr 2016	0.100	Mar 2017	-		0.100	Continuing	Continuing	Continuing

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Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Acquisition Workforce	Various	Not Specified : Not Specified	0.293	0.000		0.000		0.000		-		0.000	0.000	0.293	0.293
		Subtotal	18.219	1.750		1.763		1.789		-		1.789	-	-	-

Remarks

Various/VAR is used to group multiple activities with small funding levels.
Activities will be incrementally funded. The award dates reflect the latest incremental portion funds will obligate.

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation	SS/CPFF	EB : Groton, CT	11.783	0.215	Jan 2015	1.700	Mar 2016	5.800	May 2017	-		5.800	Continuing	Continuing	Continuing
Developmental Test & Evaluation	SS/CPFF	Raytheon : Portsmouth, VA	9.104	0.000		0.000		0.000		-		0.000	0.000	9.104	9.104
Developmental Test & Evaluation	WR	NAVAIR : Patuxent, MD	2.593	0.000		0.000		0.000		-		0.000	0.000	2.593	2.593
Developmental Test & Evaluation	Various	Various : Various	6.922	0.465	Apr 2015	0.000		0.670	Apr 2017	-		0.670	0.000	8.057	6.372
Developmental Test & Evaluation	WR	NUWC : Newport, RI	20.883	0.000		2.000	Apr 2016	1.250	Apr 2017	-		1.250	Continuing	Continuing	Continuing
Developmental Test & Evaluation	WR	NSWC : Carderock, MD	27.112	7.517	Feb 2015	9.263	Apr 2016	6.745	Apr 2017	-		6.745	Continuing	Continuing	Continuing
Developmental Test & Evaluation	SS/CPFF	HII : Newport News, VA	3.294	2.500	Feb 2015	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Developmental Test & Evaluation	SS/CPFF	JHU/ARL : Laurel, MD	1.805	0.000		2.000	May 2016	2.000	Apr 2017	-		2.000	0.000	5.805	0.305
Developmental Test & Evaluation	SS/CPFF	ARL/PSU : State College, PA	0.720	0.000		0.000		0.000		-		0.000	0.000	0.720	0.720
Developmental Test & Evaluation	WR	NSWC : Dahlgren, VA	1.320	0.000		0.000		0.000		-		0.000	0.000	1.320	1.320

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603561N / *Advanced Submarine System Development*	Project (Number/Name) 2033 / *Adv Submarine Systems Development*	

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Subtotal			85.536	10.697		14.963		16.465		-		16.465	-	-	-

Remarks

Various/VAR is used to group multiple activities with small funding levels.
Activities will be incrementally funded. The award dates reflect the latest incremental portion funds will obligate.

	Prior Years	FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	443.350	32.179		37.497		49.877		-		49.877	-	-	-

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603561N / *Advanced Submarine System Development*	**Project (Number/Name)** 2033 / *Adv Submarine Systems Development*

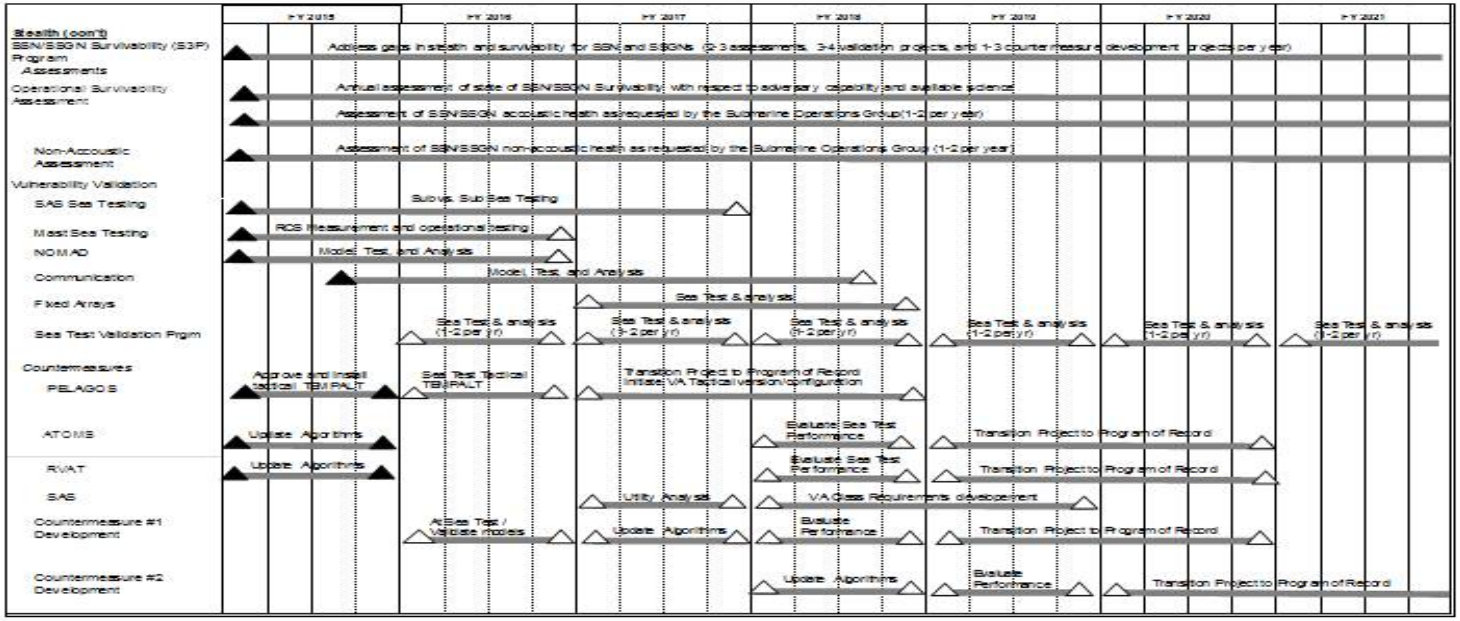
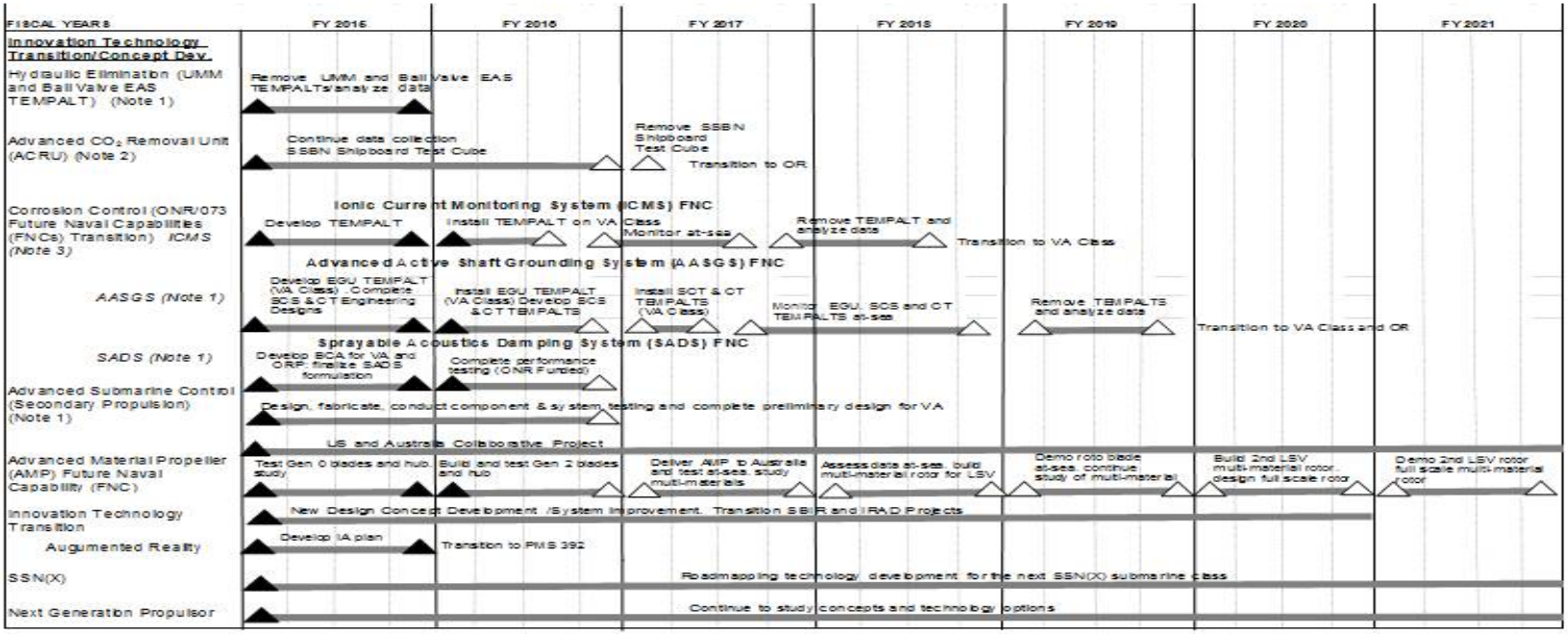


Exhibit R-4, RDT&E Schedule Profile: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603561N / *Advanced Submarine System Development*	**Project (Number/Name)** 2033 / *Adv Submarine Systems Development*



Note 1: Influence VA Class and OHIO Replacement (OR) Design
Note 2: Transitions to OR
Note 3: Transitions from ONR to SEA073

Exhibit R-4, RDT&E Schedule Profile: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603561N / *Advanced Submarine System Development*	**Project (Number/Name)** 2033 / *Adv Submarine Systems Development*

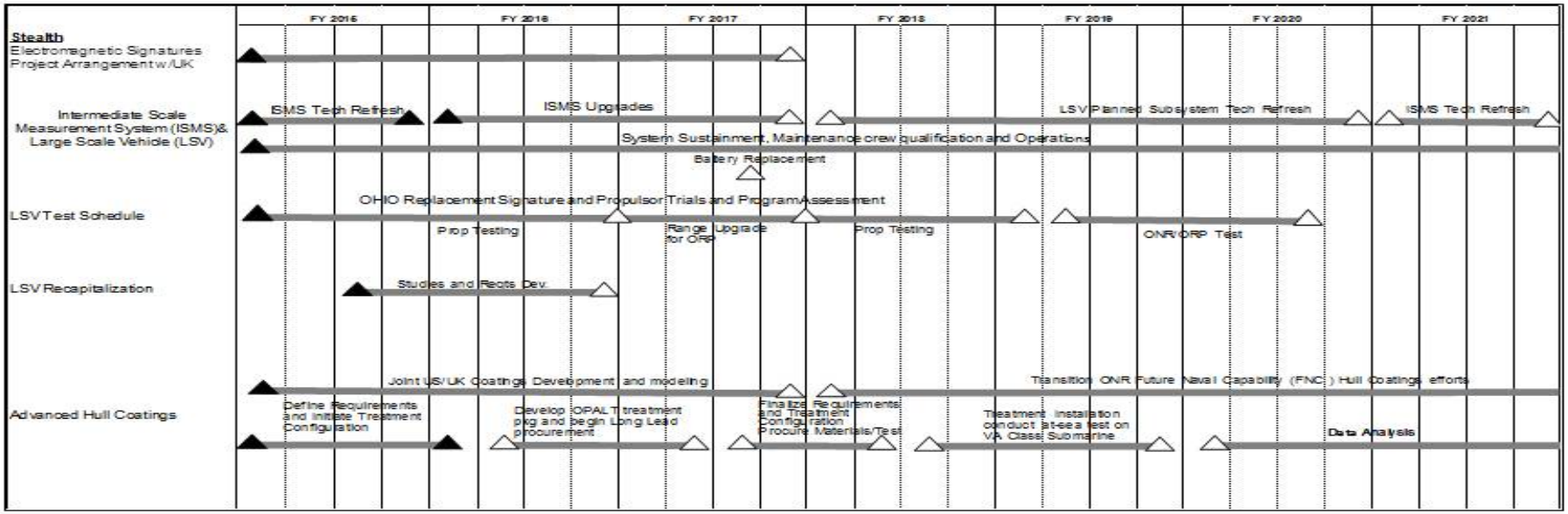


Exhibit R-4, RDT&E Schedule Profile: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603561N / *Advanced Submarine System Development*	**Project (Number/Name)** 2033 / *Adv Submarine Systems Development*

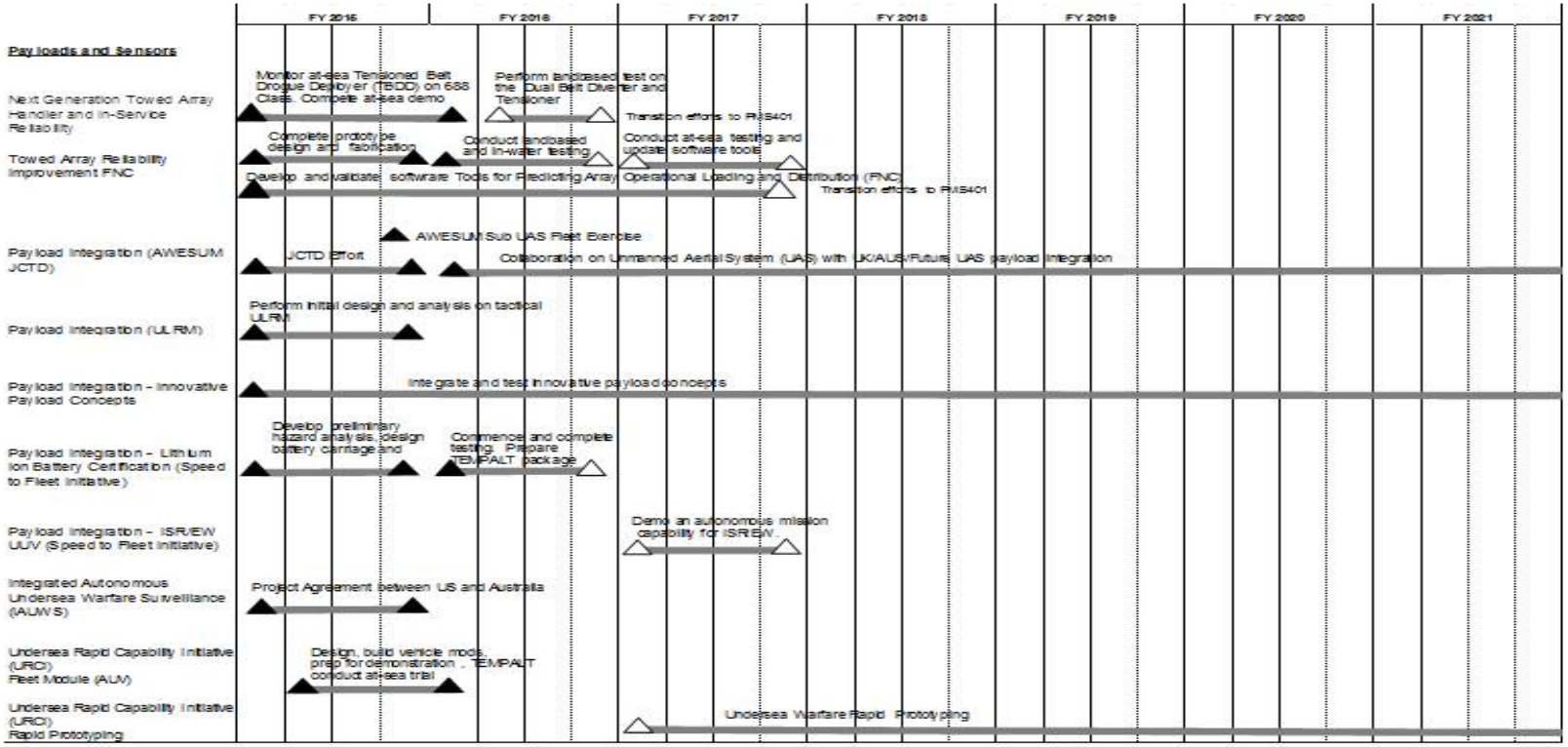


Exhibit R-4A, RDT&E Schedule Details: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603561N / *Advanced Submarine System Development*	**Project (Number/Name)** 2033 / *Adv Submarine Systems Development*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
STEALTH				
Electromagnetic Signatures Project Arrangement (PA) w/UK	1	2015	4	2017
Intermediate Scale Measurement System (ISMS)/Large Scale Vehicle (LSV) Tech Refresh	1	2015	4	2015
ISMS/LSV - ISMS Upgrades	1	2016	4	2017
ISMS /LSV Sustainment, Maintenance,Crew Qualification and Operations	1	2015	4	2021
ISMS/LSV Test Schedule OHIO Replacement Program Assessment, Signature and Propulsor Trials	1	2015	3	2020
LSV Recapitalization	3	2015	4	2016
Advanced Hull Coatings - Joint US/UK Coatings Development and Modeling	1	2015	1	2017
Advanced Hull Coatings - Transition ONR FNC Hull Coatings efforts	1	2018	4	2021
Advanced Hull Coatings - Define Requirements/Initiate Treatment Configuration	1	2015	1	2016
Advanced Hull Coatings - Develop OPALT treatment package and begin long lead material procurement	2	2016	2	2017
Advanced Hull Coatings -Finalize requirements and treatment configuration, procure materials and test	3	2017	2	2018
Advanced Hull Coatings - Treatment Installatiion/Conduct At-Sea test on VA Class Sub	3	2018	4	2019
Advanced Hull Coatings - Data Analysis	1	2020	4	2021
SSN/SSGN Survivability (S3P) - Addresses gaps in Stealth survivability for SSNs and SSGNs	1	2015	4	2021
SSN/SSGN Survivability (S3P) - Fleet Security Assessment - Annual Assessment of state of SSN/SSGN Survivability with respect to Adversary capability and available science	1	2015	4	2021

Exhibit R-4A, RDT&E Schedule Details: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603561N / *Advanced Submarine System Development*	**Project (Number/Name)** 2033 / *Adv Submarine Systems Development*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
SSN/SSGN Survivability (S3P) - Acoustic Assessment - Assessment of SSN/SSGN acoustic health as requested by the Submarine Operations Group (1-2 per year)	1	2015	4	2021
SSN/SSGN Survivability (S3P) - Non Acoustic Assessment - Assessment of SSN/ SSGN non-acoustic health as requested by the Submarine Operations Group (1-2 per year)	1	2015	4	2021
SSN/SSGN Survivability (S3P) - SAS Sea Testing - Sub vs Sub at-sea testing	1	2015	4	2017
SSN/SSGN Survivability (S3P) - Mast Sea Testing - RCS Measurement and Operational Testing	1	2015	4	2016
SSN/SSGN Survivability (S3P) - NOMAD - Model, test and Analysis	1	2015	4	2016
SSN/SSGN Survivability (S3P) - Communication - Model, Test and Analysis	3	2015	3	2018
SSN/SSGN Survivability (S3P) - Fixed Arrays - Sea Test and Analysis	1	2017	4	2018
SSN/SSGN Survivability (S3P) - Sea Test Validation Program - Sea Test and Analysis	1	2016	4	2021
SSN/SSGN Survivability (S3P) - PELAGOS - Approve and Install tactical TEMPALT	1	2015	4	2015
SSN/SSGN Survivability (S3P) - PELAGOS - Sea Test Tactical TEMPALT	1	2016	4	2016
SSN/SSGN Survivability (S3P) - PELAGOS - Transition Project Program of Record, Initiate VA Tactical version/config.	1	2017	4	2018
SSN/SSGN Survivability (S3P) - ATOMS - Update Algorithms	1	2015	4	2015
SSN/SSGN Survivability (S3P) - ATOMS - Evaluate Sea Test Performance	1	2018	4	2018
SSN/SSGN Survivability (S3P) - ATOMS - Transition Project to Program of Record	1	2019	4	2020
SSN/SSGN Survivability (S3P) - RVAT - Update Algorithms	1	2015	4	2015
SSN/SSGN Survivability (S3P) - RVAT - Evaluate Sea Test Performance	1	2018	4	2018
SSN/SSGN Survivability (S3P) - RVAT - Transition Project to Program of Record	1	2019	4	2020
SSN/SSGN Survivability (S3P) - SAS - Utility Analysis	1	2017	4	2017
SSN/SSGN Survivability (S3P) - SAS - VA Class Requirements Development	1	2018	4	2019
SSN/SSGN Survivability (S3P) - Countermeasure #1 Development - At-sea Test/ Validate Models	1	2016	4	2016

Exhibit R-4A, RDT&E Schedule Details: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603561N / *Advanced Submarine System Development*	**Project (Number/Name)** 2033 / *Adv Submarine Systems Development*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
SSN/SSGN Survivability (S3P) - Countermeasure #1 Development - Update Algorithms	1	2017	4	2017
SSN/SSGN Survivability (S3P) - Countermeasure #1 Development - Evaluate Performance	1	2018	4	2018
SSN/SSGN Survivability (S3P) - Countermeasure #1 Development - Transition to Program of Record	1	2019	4	2020
SSN/SSGN Survivability (S3P) - Countermeasure #2 Development - Update Algorithms	1	2018	4	2018
SSN/SSGN Survivability (S3P) - Countermeasure #2 Development - Evaluate Performance	1	2019	4	2019
SSN/SSGN Survivability (S3P) - Countermeasure #2 Development - Transition to Program of Record	1	2020	4	2021
PAYLOADS AND SENSORS: TAHS - Monitor at-sea Tensioned Belt Drogue Deployed (TBDD) on 688 Class. Compete at-sea demo	1	2015	1	2016
PAYLOADS AND SENSORS: TAHS - Perform landbased test on the Dual Belt Diverter and Tensioner. Transfer to PMS 401	2	2016	4	2016
PAYLOADS AND SENSORS: TAHS FNC - Complete prototype design and fabrication	1	2015	4	2015
PAYLOADS AND SENSORS: TAHS FNC - Conduct landbased and in-water testing	1	2016	4	2016
PAYLOADS AND SENSORS: TAHS FNC FNC - Conduct At-sea Testing and update software tools	1	2017	4	2017
PAYLOADS AND SENSORS: TAHS FNC - Develop and validate Towed Array Predicting Tool. Transition to PMS 401	1	2015	4	2017
PAYLOADS AND SENSORS: Payload Integration - AWESUM - Sub UAS Fleet Exercise	4	2015	4	2015
PAYLOADS AND SENSORS: Payload Integration - AWESUM - Concept Development (JCTD)	1	2015	4	2015
PAYLOADS AND SENSORS: Payload Integration - AWESUM - Collaboration on UAS with UK/Australia	1	2016	4	2021

Exhibit R-4A, RDT&E Schedule Details: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603561N / *Advanced Submarine System Development*	**Project (Number/Name)** 2033 / *Adv Submarine Systems Development*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
PAYLOADS AND SENSORS: Payload Integration - ULRM - Perform initial design and analysis on tactical ULRM	1	2015	4	2015
PAYLOADS AND SENSORS: Payload Integration - Innovative Payload Concepts	1	2015	4	2021
PAYLOADS AND SENSORS: Payload Integration - Lithium Ion Battery Certification - Develop preliminary hazard analysis, design battery carriage and casualty container (Speed to Fleet Initiative)	1	2015	4	2015
PAYLOADS AND SENSORS: Payload Integration - Lithium Ion Battery Certification - Commence and complete testing. Prepare TEMPALT package (Speed to Fleet Initiative)	1	2016	4	2016
PAYLOADS AND SENSORS: Payload Integration - ISR/EW UUV (Speed to Fleet Initiative) Demo an autonomous mission capability for ISR/EW	1	2017	4	2017
PAYLOADS AND SENSORS: Integrated Autonomous Undersea Warfare Surveillance (IAUWS) - Project Agreement between US and Australia	1	2015	4	2015
PAYLOADS AND SENSORS: Undersea Rapid Capability Initiative (URCI) - Fleet Module (AUV)	2	2015	1	2016
PAYLOADS AND SENSORS: Undersea Rapid Capability Initiative (URCI) - Rapid Prototyping	1	2017	4	2021
INNOVATION TECHNOLOGY TRANSITION/CONCEPT DEVELOPMENT: Hydraulic Elimination UMM and Ball Valve EAS TEMPALTs Removal/analyze data (Informs VA Class and ORP)	1	2015	4	2015
INNOVATION TECHNOLOGY TRANSITION/CONCEPT DEVELOPMENT: Advanced CO2 - Continue Data Collections on the SSBN Shipboard Test Cube	1	2015	4	2016
INNOVATION TECHNOLOGY TRANSITION/CONCEPT DEVELOPMENT: Remove SSBN Shipboard Test Cube - Transition to OR	1	2017	1	2017
INNOVATION TECHNOLOGY TRANSITION/CONCEPT DEVELOPMENT: ICMS - Develop TEMPALT	1	2015	4	2015
INNOVATION TECHNOLOGY TRANSITION/CONCEPT DEVELOPMENT: ICMS - Install TEMPALT on VA Class	1	2016	3	2016

Exhibit R-4A, RDT&E Schedule Details: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603561N / *Advanced Submarine System Development*	**Project (Number/Name)** 2033 / *Adv Submarine Systems Development*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
INNOVATION TECHNOLOGY TRANSITION/CONCEPT DEVELOPMENT: ICMS - Monitor At-Sea	4	2016	3	2017
INNOVATION TECHNOLOGY TRANSITION/CONCEPT DEVELOPMENT: ICMS - Remove TEMPALT and analyze data	4	2017	3	2018
INNOVATION TECHNOLOGY TRANSITION/CONCEPT DEVELOPMENT: AASGS - Develop 2 TEMPALTs (EGU and SCS) VA Class. Complete 3rd TEMPALT Engineering Design	1	2015	4	2015
INNOVATION TECHNOLOGY TRANSITION/CONCEPT DEVELOPMENT: AASGS - Install EGU TEMPALT on VA Class and Develop SCS and CT TEMPALTs	1	2016	4	2016
INNOVATION TECHNOLOGY TRANSITION/CONCEPT DEVELOPMENT: AASGS - Install SCT and CT TEMPALTs on VA Class	1	2017	2	2017
INNOVATION TECHNOLOGY TRANSITION/CONCEPT DEVELOPMENT: AASGS - Monitor TEMPALTS at-sea	3	2017	4	2018
INNOVATION TECHNOLOGY TRANSITION/CONCEPT DEVELOPMENT: AASGS - Remove TEMPALTS and analyze data	1	2019	4	2019
INNOVATION TECHNOLOGY TRANSITION/CONCEPT DEVELOPMENT: SADS - Develop BCA for VA and ORP, finalize SADS formulation	1	2015	4	2015
INNOVATION TECHNOLOGY TRANSITION/CONCEPT DEVELOPMENT: SADS - Complete performance testing	1	2016	4	2016
INNOVATION TECHNOLOGY TRANSITION/CONCEPT DEVELOPMENT: Advanced Submarine Control (Secondary Propulsion) - Design, Fab, Conduct Component/ System Testing and complete preliminary design	1	2015	4	2016
INNOVATION TECHNOLOGY TRANSITION/CONCEPT DEVELOPMENT: AMP - US and Australia Collaborative Project	1	2015	4	2021
INNOVATION TECHNOLOGY TRANSITION/CONCEPT DEVELOPMENT: AMP - Test Gen 0 blades and hub, study concept for Next Generation Propulsor	1	2015	4	2015
INNOVATION TECHNOLOGY TRANSITION/CONCEPT DEVELOPMENT: AMP - Build and Test Gen 2 blades and hub, study concepts for Next Generation Propulsor	1	2016	4	2016

Exhibit R-4A, RDT&E Schedule Details: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603561N / *Advanced Submarine System Development*	**Project (Number/Name)** 2033 / *Adv Submarine Systems Development*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
INNOVATION TECHNOLOGY TRANSITION/CONCEPT DEVELOPMENT: AMP - Deliver AMP to Australia and Test at-sea, study, multi-materials	1	2017	4	2021
INNOVATION TECHNOLOGY TRANSITION/CONCEPT DEVELOPMENT: AMP - Assess data at-sea, build multi-material rotor for LSV	1	2018	4	2018
INNOVATION TECHNOLOGY TRANSITION/CONCEPT DEVELOPMENT: AMP - Demo roto blade at-sea, continue study of multi-materials	1	2019	4	2019
INNOVATION TECHNOLOGY TRANSITION/CONCEPT DEVELOPMENT: AMP - Build 2nd LSV multi-material rotor, design full scale rotor	1	2020	4	2020
INNOVATION TECHNOLOGY TRANSITION/CONCEPT DEVELOPMENT: AMP - Demo 2nd LSV rotor full scale multi-material rotor	1	2021	4	2021
INNOVATION TECHNOLOGY TRANSITION/CONCEPT DEVELOPMENT: Innovation Technology Transition - New Design Concept/Dev and System Improvements	1	2015	4	2021
INNOVATION TECHNOLOGY TRANSITION/CONCEPT DEVELOPMENT: Innovation Technology Transition - Transitions SBIR and IRAD Projects	1	2015	4	2021
INNOVATION TECHNOLOGY TRANSITION/CONCEPT DEVELOPMENT: Augmented Reality (AR) - Develop Information Asurance (IA) Plan and sail mock up drawings	1	2015	4	2015
INNOVATION TECHNOLOGY TRANSITION/CONCEPT DEVELOPMENT: SSN(X) - Roadmaping technology development for the next SSN(X) submarine class	1	2016	4	2021
INNOVATION TECHNOLOGY TRANSITION/CONCEPT DEVELOPMENT: Next Generation Propulsor - Continue to study concepts and technology options	1	2015	1	2021

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603561N / *Advanced Submarine System Development*	Project (Number/Name) 2096 / *Payload Delivery Development*	

COST ($ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
2096: *Payload Delivery Development*	0.000	0.000	0.000	8.392	-	8.392	8.947	20.339	14.170	9.318	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

Note

Project established in FY17. Efforts previously funded under Project 2033.

A. Mission Description and Budget Item Justification

Universal Launch and Recovery Module (ULRM) is hardware/middleware for the integration of large deployable and retrievable payloads from submarines. RDT&EN funding will be used to design , manufacture, and field a payload launch and recovery system to be utilized from submarine large ocean interfaces to accommodate large diameter payloads such as the Navy's large diameter unmanned underwater vehicle (LDUUV).

ULRM enables launch and recovery of LDUUV from submarines (SSGN and VA Class VPM and beyond). Launch and recovery of large diameter payloads from submarines does not currently exist. ULRM provides the submarine force with the capability to launch and recover large payloads of various configurations, improving battle space awareness and extending war-fighting reach.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Title: Universal Launch and Recovery Module (ULRM)	0.000	0.000	8.392	0.000	8.392
Articles:	-	-	-	-	-
Description: New Project Unit commencing in FY17. Previous efforts were funded under Project 2033 (Payloads and Sensors).					
FY 2015 Accomplishments: N/A					
FY 2016 Plans: N/A					
FY 2017 Base Plans: Conduct non-recurring engineering design to include shock analysis, modeling, and simulation to support integration of Navy's LDUUV program into the Submarine force.					
FY 2017 OCO Plans:					

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603561N / *Advanced Submarine System Development*	**Project (Number/Name)** 2096 / *Payload Delivery Development*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
N/A					
Accomplishments/Planned Programs Subtotals	0.000	0.000	8.392	0.000	8.392

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

Design, manufacture, and test submarine hosted launch and recovery system. Design effort will be conducted in a program office led teaming arrangement with five different Government activities (NSWC PHIL, NSWC CD, NUWC NPT, NUWC KPT, and PSNS Code 120). Manufacturing will be completed utilizing existing government manufacturing capabilities in conjunction with various small vendor contracts. Testing will be conducted at government facilities and on government owned test ranges.

E. Performance Metrics

Commence design of tactical ULRM system.

- Performing shock analysis, modeling, and simulation at government labs to support design efforts

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603561N / *Advanced Submarine System Development*	**Project (Number/Name)** 2096 / *Payload Delivery Development*

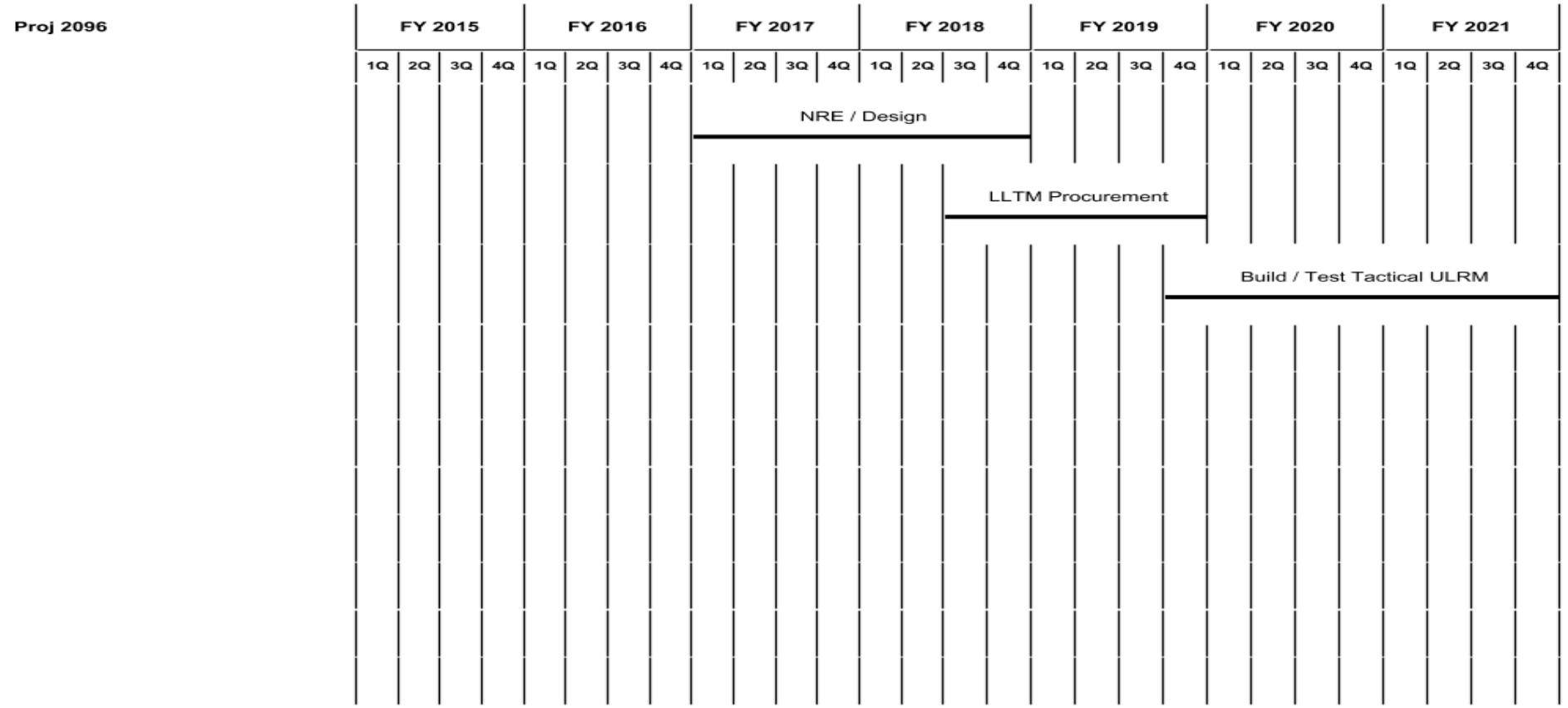
Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Product Development	WR	NUWC NPT : Newport, RI	0.000	0.000		0.000		2.414	Nov 2016	-		2.414	Continuing	Continuing	Continuing
Product Development	WR	NSWC PHIL : Philadelphia, PA	0.000	0.000		0.000		2.414	Nov 2016	-		2.414	Continuing	Continuing	Continuing
Product Development	WR	NUWC KPT : Keyport, WA	0.000	0.000		0.000		1.430	Nov 2016	-		1.430	Continuing	Continuing	Continuing
Product Development	WR	PSNS : Bremerton, WA	0.000	0.000		0.000		1.430	Nov 2016	-		1.430	Continuing	Continuing	Continuing
Product Development	WR	NSWC CD : West Bethesda, MD	0.000	0.000		0.000		0.704	Nov 2016	-		0.704	Continuing	Continuing	Continuing
		Subtotal	0.000	0.000		0.000		8.392		-		8.392	-	-	-

	Prior Years	FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	0.000		0.000		8.392		-		8.392	-	-	-

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603561N / *Advanced Submarine System Development*	**Project (Number/Name)** 2096 / *Payload Delivery Development*



2017PB - 0603561N - 2096

Exhibit R-4A, RDT&E Schedule Details: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603561N / *Advanced Submarine System Development*	**Project (Number/Name)** 2096 / *Payload Delivery Development*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 2096				
Non-Recurring Engineering (NRE) Design	1	2017	4	2018
Long-Lead Time Material procurement	3	2018	4	2019
Manufacture / Test Tactical ULRM	4	2019	4	2021

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603561N / *Advanced Submarine System Development*	Project (Number/Name) 9999 / *Congressional Adds*	

COST ($ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
9999: *Congressional Adds*	0.000	0.000	10.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	10.000
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Develop, test and demonstrate numerous high risk advanced submarine control technologies that will improve and/or provide new tactical operational capability at a reduced cost.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2015	FY 2016
Congressional Add: Adv Sub Sys Dev (Cong)	0.000	10.000
FY 2015 Accomplishments: N/A		
FY 2016 Plans: Design and develop advanced submarine stealth and controller components and related technologies to mitigate risks, perform hydrodynamic and hydroacoustic analysis on advanced submarine control systems to insure performance requirements are met, perform required land-based and in-water qualification testing (e.g., shock, pressure, EMI), and test and evaluate control system technologies used in external applications using innovative designs and materials to alleviate corrosion and signature issues.		
Congressional Adds Subtotals	0.000	10.000

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

E. Performance Metrics

Commence design of stealth and controller component technologies. Perform technical analysis, land-based and in-water qualification testing including shock, pressure and Electromagnetic Interference (EMI).

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603561N / *Advanced Submarine System Development*	**Project (Number/Name)** 9999 / *Congressional Adds*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Product Development	WR	NSWC/Carderock : Bethesda, MD	0.000	0.000		2.000	Apr 2016	0.000		-		0.000	0.000	2.000	-
Product Development	WR	NUWC/Newport : Newport, RI	0.000	0.000		0.500	Apr 2016	0.000		-		0.000	0.000	0.500	-
Product Development	WR	NSWC, Phila : Philadelphia, PA	0.000	0.000		0.500	Apr 2016	0.000		-		0.000	0.000	0.500	-
Product Development	WR	NRL : Washington, DC	0.000	0.000		0.500	Apr 2016	0.000		-		0.000	0.000	0.500	-
Product Development	SS/CPFF	Progeny : Manassas, VA	0.000	0.000		3.500	May 2016	0.000		-		0.000	0.000	3.500	-
Product Development	SS/CPFF	Electric Boat : Groton, CT	0.000	0.000		3.000	May 2016	0.000		-		0.000	0.000	3.000	-
		Subtotal	0.000	0.000		10.000		0.000		-		0.000	0.000	10.000	-

	Prior Years	FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	0.000		10.000		0.000		-		0.000	0.000	10.000	-

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603561N / *Advanced Submarine System Development*	**Project (Number/Name)** 9999 / *Congressional Adds*

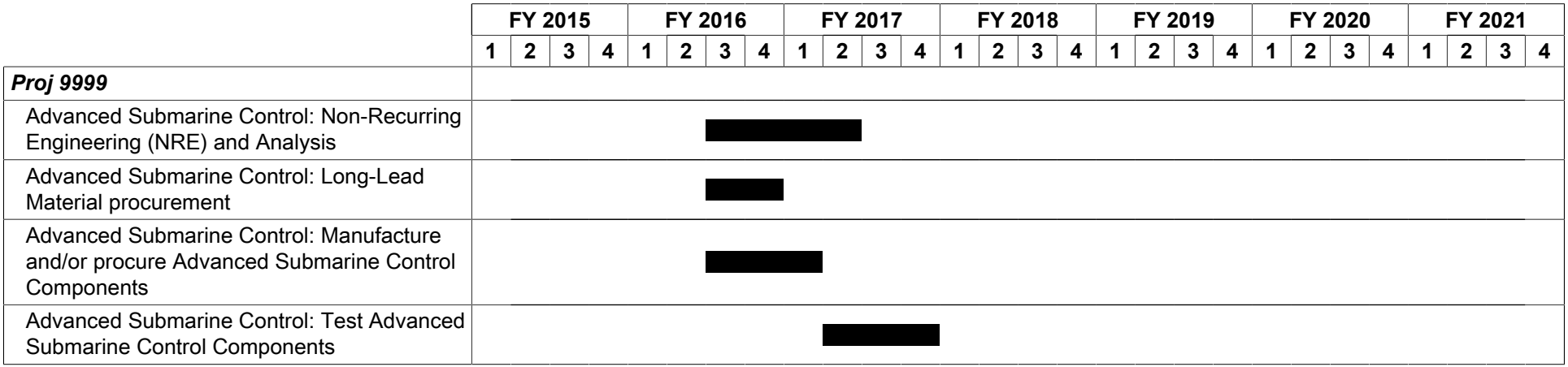


Exhibit R-4A, RDT&E Schedule Details: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603561N / *Advanced Submarine System Development*	**Project (Number/Name)** 9999 / *Congressional Adds*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 9999				
Advanced Submarine Control: Non-Recurring Engineering (NRE) and Analysis	3	2016	2	2017
Advanced Submarine Control: Long-Lead Material procurement	3	2016	4	2016
Advanced Submarine Control: Manufacture and/or procure Advanced Submarine Control Components	3	2016	1	2017
Advanced Submarine Control: Test Advanced Submarine Control Components	2	2017	4	2017

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Exhibit R-2, RDT&E Budget Item Justification: PB 2017 Navy											Date: February 2016	
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 4: *Advanced Component Development & Prototypes (ACD&P)*					R-1 Program Element (Number/Name) PE 0603562N *I Submarine Tactical Warfare Sys*							
COST ($ in Millions)	**Prior Years**	**FY 2015**	**FY 2016**	**FY 2017 Base**	**FY 2017 OCO**	**FY 2017 Total**	**FY 2018**	**FY 2019**	**FY 2020**	**FY 2021**	**Cost To Complete**	**Total Cost**
Total Program Element	62.138	7.986	10.371	8.782	-	8.782	13.863	9.602	11.526	11.770	Continuing	Continuing
0770: *Adv Sub Supp Equip Prog*	16.378	3.320	4.103	4.429	-	4.429	4.143	4.403	4.725	4.828	Continuing	Continuing
1739: *Submarine Arctic W/F Development*	45.760	4.666	6.268	4.353	-	4.353	9.720	5.199	6.801	6.942	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, 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 electro-optic infra-red vulnerability signature reduction technologies are supporting these needs.

The Submarine Arctic Warfare Development Project responds to the increased threat of naval activity in the Arctic regions while continuously supporting the Navy's strategic objective of Assured Access and Combat Credibility. The U.S. Navy Submarine Force (SUBFOR) demonstrates existing Arctic Warfare capabilities, operational and tactical proficiency while developing advanced submarine research and development technology in unique cold water environments, under-ice conditions, and ice-covered shallow water regions during Ice Exercises (ICEX). ICEXs are conducted biennially and require up front comprehensive planning and work-up training, as well as post exercise analysis and reporting. ICEXs provide the framework for various submarine research and development programs to conduct test and evaluation in Arctic regions or at periodic Ice Camps. Particular emphasis is placed on the areas of sonar operability, tactical surveillance, weapon utility, and other submarine support missions. Efforts include assessment of combat system effectiveness, development of Arctic specific improvements for existing sonar and weapons, development of class-specific Arctic operational guidelines, and the testing of ice-capable submarine support structures. This Project also provides SUBFOR a cadre of trained Arctic Operation Specialists (AOS) and an inventory of unique Arctic sensors to optimize submarine safety during under-ice operations.

Exhibit R-2, RDT&E Budget Item Justification: PB 2017 Navy					Date: February 2016
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 4: *Advanced Component Development & Prototypes (ACD&P)*		R-1 Program Element (Number/Name) PE 0603562N *I Submarine Tactical Warfare Sys*			
B. Program Change Summary ($ in Millions)	**FY 2015**	**FY 2016**	**FY 2017 Base**	**FY 2017 OCO**	**FY 2017 Total**
Previous President's Budget	8.044	10.371	9.958	-	9.958
Current President's Budget	7.986	10.371	8.782	-	8.782
Total Adjustments	-0.058	0.000	-1.176	-	-1.176
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.058	0.000			
• Program Adjustments	0.000	0.000	-1.056	-	-1.056
• Rate/Misc Adjustments	0.000	0.000	-0.120	-	-0.120

Change Summary Explanation

Cost/Funding:

Decrease in Submarine Tactical Warfare Sys RDTE,N by $369K as required for the Department of the Navy to comply with the Bipartisan Budget Act of 2015.

Project 0770: FY 2017 funding was added ($+.540M) to procure the Submarine Launched Decoy Project.
Project 1739: FY 2017 funding was decreased ($-1.000M) to realign Arctic Sub Lab funding to support Biennial Ice Exercises (ICEXs).
Project 1739: FY 2017 funding was reduced ($-0.289M) to account for the availability of prior year execution balances.

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603562N / *Submarine Tactical Warfare Sys*	Project (Number/Name) 0770 / *Adv Sub Supp Equip Prog*	

COST ($ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
0770: *Adv Sub Supp Equip Prog*	16.378	3.320	4.103	4.429	-	4.429	4.143	4.403	4.725	4.828	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

A continuing need exists to improve Imaging and Electronic Warfare support (EW) capabilities in view of the advancements in potential imaging counter detection 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 EW 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 mitigation of submarine masts, periscopes, and sensors to visual, radar, and infrared detection. Evaluation of state of the art technology to implement periscope/mast improvements via EW electromagnetic and electro-optic sensors results in improved capability. Engineering Demonstration Models (EDMs) are developed, evaluated, and validated in the lab and through at-sea testing.

The Advanced Imaging Project Development projects include the development of the Affordable Modular Panoramic Photonics Mast (AMPPM) which introduces several groundbreaking technologies such as individually replaceable capability modules (allowing a vast array of capability combinations without requiring redesign) as well as presenting live 360 degree High Definition video (greatly increasing situational awareness and reducing scope exposure time.) Also in support of the Advance Imaging Project Development are; Automatic Aircraft Cueing, RF Vulnerability Reduction (RAS), GPS Denied Navigation, Meteorological Sensors (METOC), Mast Test Vehicle (MTV) testing, Imaging Engineering Measurement Program, and a Project Arrangement (PA) with Australia covering Electromagnetic Spectrum Sensor System Simulation & Development for model-based mission planning and a Coalition Warfare Program (CWP) covering periscope vulnerability. The Advanced EW Development projects include the development of: EW Vulnerability Tool, Enhanced DeInterleavers, Low Probability of Intercept (LPI) Direction Finding (DF), High Speed Network, Embedded Built-in Test (BIT), EW on-Board Trainer (OBT), Multi-function Modular Mast (MMM) Payloads, Digital Precision Direction Finding, Multi-Functional Apertures, disposable decoy, ISR and tethered Buoys, Human Machine Interface (HMI)Improvements, and Next Generation EW Systems Algorithms and Applications. OPNAV direction provided for Next Generation EW in reference dated 17 June 12, SER N97/12U144401. New in FY17 is the acceleration of support for an EW Disposable Decoy Buoy capability addressing the U.S. Navy Submarine Force (SUBFOR) requirement to provide a Submarine Launched Decoy Buoy.

All programs funded in this project are non-Acquisition Category (ACAT) programs. The test articles identified consist of critical components that will be fully developed during Engineering Manufacturing and Development phase into EDMs.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Title: Advanced Imaging Project Development	1.887	2.464	2.756	0.000	2.756
Articles:	-	-	-	-	-

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603562N / *Submarine Tactical Warfare Sys*	**Project (Number/Name)** 0770 / *Adv Sub Supp Equip Prog*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
FY 2015 Accomplishments: 360 Imaging (ONR) - AMPPM - FNC Lab Demo Automatic Aircraft Cueing Continued Development GPS Denied Navigation Development Submarine METOC Development CWP Periscope Vulnerability - Development Imaging Engineering Measurement Program ***FY 2016 Plans:*** 360 Imaging (ONR) - AMPPM - FNC Pierside Testing RF Vulnerability Reduction (RAS) - Lab Test Automatic Aircraft Cueing - Lab Test GPS Denied Navigation Continued Development Submarine METOC Continued Development CWP Periscope Vulnerability - Lab Test/At-Sea Test PA Electromagnetic Spectrum Sensor System Simulation - Development Low Power Fiber Delivered Laser Range Finder - Development Reduced Cost Fabrication of Optical Sapphire Hyper-hemispheres - Development Imaging Engineering Measurement Program Continuation ***FY 2017 Base Plans:*** AMPPM Land Based ISIS Testing GPS Denied Navigation Test Meteorological Sensors Test Low Power Fiber Delivered Laser Range Finder - Continued development Reduced Cost Fabrication of Optical Sapphire Hyper-hemispheres - Continued development Imaging Engineering Measurement Program Continuation ***FY 2017 OCO Plans:*** N/A					
Title: Advanced Electronic Warfare Support (EW) Project Development	1.433	1.639	1.673	0.000	1.673
Articles:	-	-	-	-	-
FY 2015 Accomplishments:					

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603562N / *Submarine Tactical Warfare Sys*	**Project (Number/Name)** 0770 / *Adv Sub Supp Equip Prog*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
ES Vulnerability Tool / Tactical Decision Aid Lab Demo					
ES Server (Valkyrie) Lab Demo					
Enhanced DeInterleavers Lab Demo #1					
Low Probability of Intercept (LPI) Direction Finding (DF) / Localization Continued Development					
Embedded Built-in Test (BIT)					
Submarine EW Digital DF Development					
Hunan Machine Interface (HMI) Development					
ES On-Board Trainer (OBT) Development					
MMM Payload Coherent Electronic Attack for Submarines (CEAS) Development					
High Speed Backplane Lab Test					
FY 2016 Plans:					
Enhanced DeInterleavers Lab Demo #2					
LPI DF / Localization Lab Test					
Submarine EW Digital DF Continued Development					
Human Machine Interface (HMI) Continued Development					
Precision DF Development					
Multi-Functional Aperture (FNC Substar) Development					
Digital Early Warning Receiver Development					
Extremely Wideband Digital Receiver Development					
Disposable Buoy - Submarine Launched Decoy baseline Lab Test					
Disposable Buoy - Modular Expendable Decoy enhancements Development					
Disposable Buoy - Modular Expendable Intelligence Surveillance and Reconnaissance (ISR) Development					
Tethered Buoy - Modular Tethered Antenna Development					
Tethered Buoy - Radio Frequency over Fiber (RFoF) development					
FY 2017 Base Plans:					
ES OBT Test					
Enhanced DeInterleavers Pierside/MTV Test					
LPI DF/Localization Pierside / MTV Test					
MMM (CEAS) Lab Test					
Precision DF Lab Test					
CWP LPI Direction Finding Development					
Commence SEA Dragon Mast Development					

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603562N / *Submarine Tactical Warfare Sys*	**Project (Number/Name)** 0770 / *Adv Sub Supp Equip Prog*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Disposable Buoy - Submarine Launched Decoy Baseline Lab Test ***FY 2017 OCO Plans:*** N/A					
Accomplishments/Planned Programs Subtotals	3.320	4.103	4.429	0.000	4.429

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

This project optimizes technology insertion using a build-test-build approach to support EW and Imaging operational needs. Operational needs have been based on the tactical requirements identified in CNO letters, Serial N77/3U629212, dated 04 Sep 03, CNO ltr Ser N772/5U936037 dtd 13 JUN 2005, CNO ltr Ser N776/4U786103 dtd 1 APR 2004, COMSUBLANT/ COMSUBPAC, Virginia Class SSN Operational Requirements Documentation objectives, ORD for Photonics (ORD #365-87-94) [dtd JUL 1994], Operational Requirements Document (ORD) for ES (ORD # 570-77-00) [dtd 20 DEC 2000], ORD for ISIS (ORD #663-77-05) [dtd MAR 2005], Capability Development Document (CDD) for Submarine EW Systems (Ver-DRAFT), Common Submarine Imaging System (CSIS) (CDD# 849-87-11) dtd 22 Dec 2011 for Submarine Imaging Systems and JOINT COMMAND SUBMARINE FORCE/COMMANDER SUBMARINE FORCE ltr Ser# N00/00621 dtd 24 Oct 2011. Project efforts develop submarine unique improvements to mast, periscope, and EW electromagnetic spectrum and electro-optic sensors based on emerging technologies that are available from DoD Exploratory Development Programs, industry Independent Research and Development, and other sources. Engineering Demonstration Models (EDMs) 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 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603562N / *Submarine Tactical Warfare Sys*	Project (Number/Name) 0770 / *Adv Sub Supp Equip Prog*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Systems Engineering	WR	NUWC : RI	11.909	2.174	Oct 2014	3.218	Nov 2015	4.164	Nov 2016	-		4.164	Continuing	Continuing	Continuing
Systems Engineering	SS/FFP	JHU/ARL : MD	1.096	0.000		0.192	Jul 2016	0.178	Mar 2017	-		0.178	Continuing	Continuing	Continuing
Primary Hardware Development	WR	NSWC Philadelphia : PA	0.630	0.000		0.000		0.059	Nov 2016	-		0.059	0.000	0.689	-
Primary Hardware Development	C/CPFF	3 Phoenix : VA	1.829	0.027	Dec 2014	0.000		0.000		-		0.000	0.000	1.856	-
Primary Software Deveopment	WR	SSC PAC : CA	0.310	0.492	Oct 2014	0.505	Oct 2015	0.000		-		0.000	0.000	1.307	-
Primary Software Development	C/CPFF	Reserach Associates of Syracuse : NY	0.173	0.030	Dec 2014	0.000		0.000		-		0.000	0.000	0.203	-
Primary Hardware Development	C/CPFF	Northrop Grumman : VA	0.186	0.297	Dec 2014	0.000		0.000		-		0.000	0.000	0.483	-
Primary Software and Hardware Development	C/CPFF	Accipiter : PA	0.000	0.000		0.160	Mar 2016	0.000		-		0.000	0.000	0.160	-
Primary Hardware Development	WR	Naval Reserach Lab : DC	0.000	0.133	May 2015	0.000		0.000		-		0.000	0.000	0.133	-
Hardware	WR	US Army Special Programs Office : VA	0.000	0.139	May 2015	0.000		0.000		-		0.000	0.000	0.139	-
		Subtotal	16.133	3.292		4.075		4.401		-		4.401	-	-	-

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Travel	WR	NAVSEA : WNY	0.245	0.028	Oct 2014	0.028	Oct 2015	0.028	Nov 2016	-		0.028	Continuing	Continuing	Continuing
		Subtotal	0.245	0.028		0.028		0.028		-		0.028	-	-	-

	Prior Years	FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	16.378	3.320		4.103		4.429		-		4.429	-	-	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603562N / *Submarine Tactical Warfare Sys*	Project (Number/Name) 0770 / *Adv Sub Supp Equip Prog*	

	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	Cost To Complete	Total Cost	Target Value of Contract

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603562N / *Submarine Tactical Warfare Sys*	**Project (Number/Name)** 0770 / *Adv Sub Supp Equip Prog*

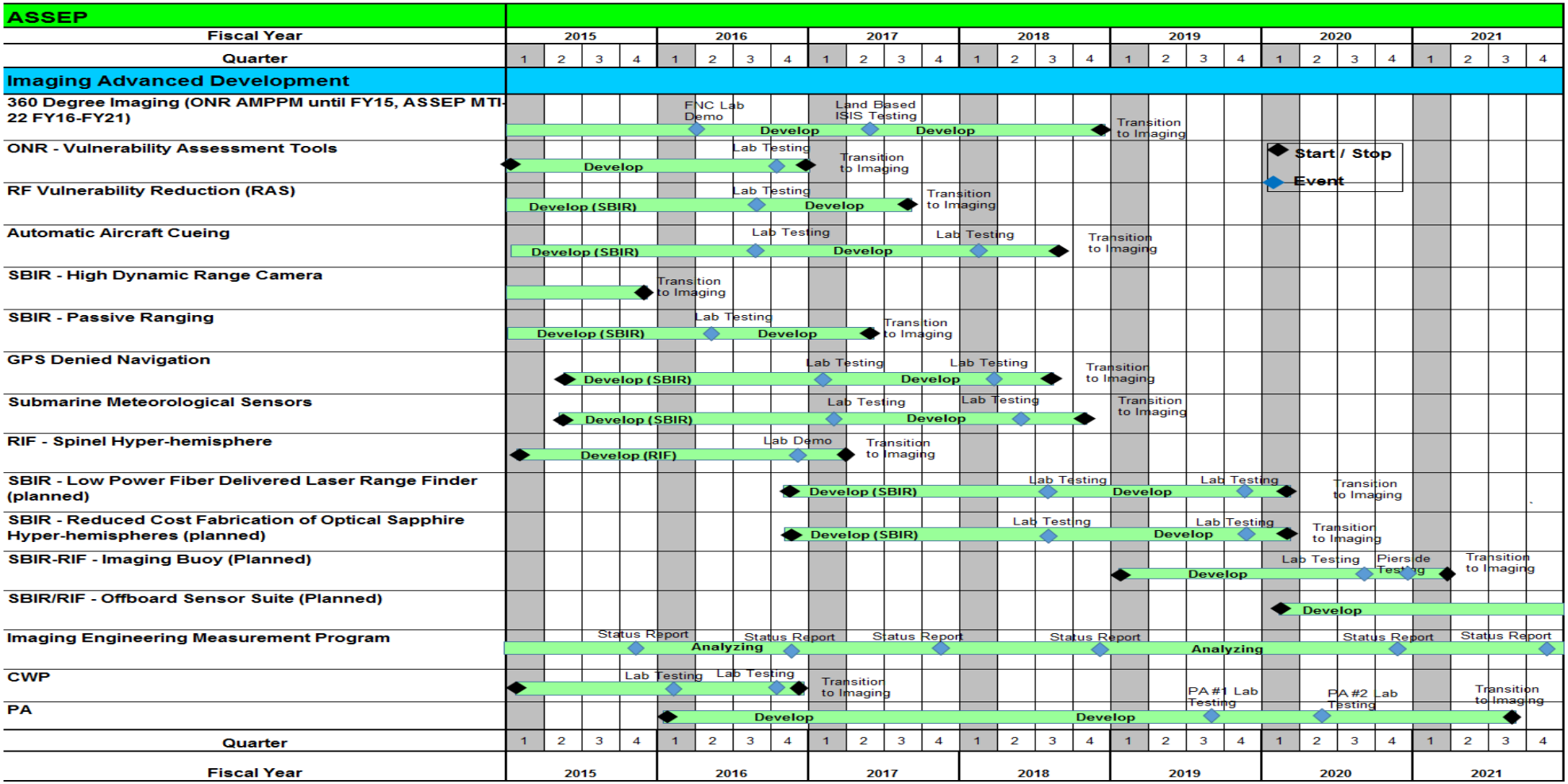


Exhibit R-4, RDT&E Schedule Profile: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603562N / *Submarine Tactical Warfare Sys*	**Project (Number/Name)** 0770 / *Adv Sub Supp Equip Prog*

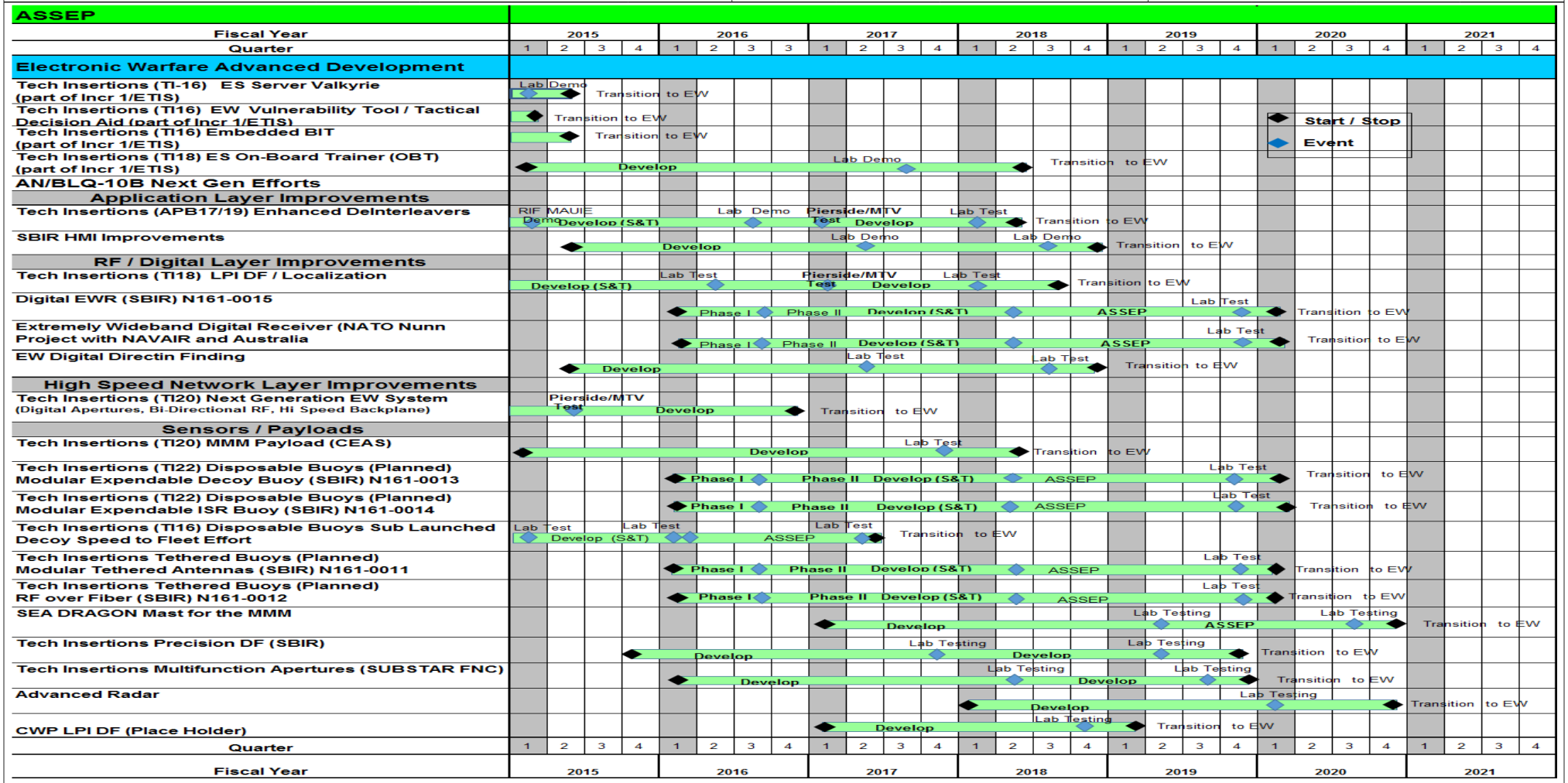


Exhibit R-4A, RDT&E Schedule Details: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603562N / *Submarine Tactical Warfare Sys*	**Project (Number/Name)** 0770 / *Adv Sub Supp Equip Prog*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 0770				
Imaging Advanced Development: 360 Degree Imaging (ONR) - AMPPM - FNC Lab Demo	3	2015	3	2015
Imaging Advanced Development: 360 Degree Imaging (ONR) - AMPPM - FNC Pierside Testing	1	2016	1	2016
Imaging Advanced Development: 360 Degree Imaging (ONR) - AMPPM - Land Based ISIS Testing	2	2017	2	2017
Imaging Advanced Development: 360 Degree Imaging (ONR) - AMPPM - Transition to Imaging	4	2018	4	2018
Imaging Advanced Development: ONR Vulnerability Reduction (RAS) Development	1	2015	4	2016
Imaging Advanced Development: ONR Vulnerability Reduction (RAS) Lab Testing	4	2016	4	2016
Imaging Advanced Development: ONR Vulnerability Reduction (RAS) Transition to Imaging	1	2017	1	2021
Imaging Advanced Development: RF Vulnerability Reduction (RAS) Development	1	2015	3	2017
Imaging Advanced Development: RF Vulnerability Reduction (RAS) Lab Testing	3	2016	3	2016
Imaging Advanced Development: RF Vulnerability Reduction (RAS) Transition to Imaging	3	2017	3	2017
Imaging Advanced Development: Automatic Aircraft Cueing - Develop	1	2015	3	2018
Imaging Advanced Development: Automatic Aircraft Cueing - Lab Testing	3	2016	3	2016
Imaging Advanced Development: Automatic Aircraft Cueing - Lab Testing #2	1	2018	1	2018
Imaging Advanced Development: Automatic Aircraft Cueing - Transition to Imaging	3	2018	3	2018
Imaging Advanced Development: SBIR - Passive Ranging Development	1	2015	1	2017
Imaging Advanced Development: SBIR - Passive Ranging Lab Testing	2	2016	2	2016
Imaging Advanced Development: SBIR - Passive Ranging Transition to Imaging	2	2017	2	2017

Exhibit R-4A, RDT&E Schedule Details: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603562N / *Submarine Tactical Warfare Sys*	**Project (Number/Name)** 0770 / *Adv Sub Supp Equip Prog*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Imaging Advanced Development: GPS Denied Navigation - Develop	2	2015	3	2018
Imaging Advanced Development: GPS Denied Navigation - Lab Testing	1	2017	1	2017
Imaging Advanced Development: GPS Denied Navigation - Lab Testing #2	1	2018	1	2018
Imaging Advanced Development: GPS Denied Navigation - Transition to Imaging	3	2018	3	2018
Imaging Advanced Development: Submarine Meteorological Sensors - Develop	2	2015	4	2018
Imaging Advanced Development: Submarine Meteorological Sensors - Lab Testing	1	2017	1	2017
Imaging Advanced Development: Submarine Meteorological Sensors - Lab Testing #2	2	2018	2	2018
Imaging Advanced Development: Submarine Meteorological Sensors - Transition to Imaging	4	2018	4	2018
Imaging Advanced Development: Spinel Hyper-Hemipshere Development	1	2015	1	2017
Imaging Advanced Development: Spinel Hyper-Hemipshere Lab Demo	4	2016	4	2016
Imaging Advanced Development: Spinel Hyper-Hemipshere Transition to Imaging	1	2017	1	2017
Imaging Advanced Development: Low Power Fiber Delivered Laser Range Finder Development	4	2016	1	2020
Imaging Advanced Development: Low Power Fiber Delivered Laser Range Finder Lab Testing	3	2018	3	2018
Imaging Advanced Development: Low Power Fiber Delivered Laser Range Finder Lab Testing #2	4	2019	4	2019
Imaging Advanced Development: Low Power Fiber Delivered Laser Range Finder Transition to Imaging	1	2020	1	2020
Imaging Advanced Development: Reduced Cost Fabrication of Optical Sapphire Hyper-Hemipshere Development	4	2016	1	2020
Imaging Advanced Development: Reduced Cost Fabrication of Optical Sapphire Hyper-Hemipshere Lab Testing	3	2018	3	2018
Imaging Advanced Development: Reduced Cost Fabrication of Optical Sapphire Hyper-Hemipshere Lab Testing #2	4	2019	4	2019

Exhibit R-4A, RDT&E Schedule Details: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603562N / *Submarine Tactical Warfare Sys*	**Project (Number/Name)** 0770 / *Adv Sub Supp Equip Prog*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Imaging Advanced Development: Reduced Cost Fabrication of Optical Sapphire Hyper-Hemipshere Transition to Imaging	1	2020	1	2020
Imaging Advanced Development: Imaging Buoy (Planned) - Develop	1	2019	1	2021
Imaging Advanced Development: Imaging Buoy (Planned) - Lab Demo	3	2020	3	2020
Imaging Advanced Development: Imaging Buoy (Planned) - Pierside Demo	4	2020	4	2020
Imaging Advanced Development: Offboard Sensor Suite (Planned) - Develop	1	2020	4	2020
Imaging Advanced Development: Imaging Engineering Measurement Program Analysis	1	2015	4	2020
Imaging Advanced Development: Imaging Engineering Measurement Program - Status Report #1	1	2015	1	2015
Imaging Advanced Development: Imaging Engineering Measurement Program - Status Report #2	4	2016	4	2016
Imaging Advanced Development: Imaging Engineering Measurement Program - Status Report #3	4	2017	4	2017
Imaging Advanced Development: Imaging Engineering Measurement Program - Status Report #4	4	2018	4	2018
Imaging Advanced Development: Imaging Engineering Measurement Program - Status Report #5	4	2019	4	2019
Imaging Advanced Development: Imaging Engineering Measurement Program - Status Report #6	4	2020	4	2020
Imaging Advanced Development: Imaging Engineering Measurement Program - Status Report #7	4	2021	4	2021
Imaging Advanced Development: CWP Periscope Vulnerability - Development	1	2015	4	2016
Imaging Advanced Development: CWP Periscope Vulnerability - Test	1	2016	1	2016
Imaging Advanced Development: CWP Periscope Vulnerability - Test #2	4	2016	4	2016
Imaging Advanced Development: CWP Periscope Vulnerability - Transition to Imaging	4	2016	4	2016
Imaging Advanced Development: PA Electromagnetic Spectrum Sensor System Simulation - Development	1	2016	3	2021

Exhibit R-4A, RDT&E Schedule Details: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603562N / *Submarine Tactical Warfare Sys*	**Project (Number/Name)** 0770 / *Adv Sub Supp Equip Prog*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Imaging Advanced Development: PA Electromagnetic Spectrum Sensor System Simulation - Lab Test #1	3	2019	3	2019
Imaging Advanced Development: PA Electromagnetic Spectrum Sensor System Simulation - Lab Test #2	2	2020	2	2020
Imaging Advanced Development: PA Electromagnetic Spectrum Sensor System Simulation - Transition to Imaging	3	2021	3	2021
Electronic Warfare Advance Development: TI-16 ES Server Valkyrie - Lab Demo	1	2015	1	2015
Electronic Warfare Advance Development: TI-16 ES Server Valkyrie - Transition to EW	2	2015	2	2015
Electronic Warfare Advance Development: TI-16 EW Vulnerability Tool/Tactical Decision Aid - Transition to EW	1	2015	1	2015
Electronic Warfare Advance Development: TI-16 Embedded BIT - Transition to EW	2	2015	2	2015
Electronic Warfare Advance Development: TI-18 ES On-Board Trainer - Develop	1	2015	2	2018
Electronic Warfare Advance Development: TI-18 ES On-Board Trainer - Lab Demo	3	2017	3	2017
Electronic Warfare Advance Development: TI-18 ES On-Board Trainer - Transition to EW	2	2018	2	2018
Electronic Warfare Advance Development: Technical Insertions (APB/17/19) Enhanced DeInterleavers Develop	1	2015	2	2018
Electronic Warfare Advance Development: Technical Insertions (APB/17/19) Enhanced DeInterleavers RIF MAUEI Demo	1	2015	1	2015
Electronic Warfare Advance Development: Technical Insertions (APB/17/19) Enhanced DeInterleavers Lab Test	3	2016	3	2016
Electronic Warfare Advance Development: Technical Insertions (APB/17/19) Enhanced DeInterleavers Pierside/MTV Test	1	2017	1	2017
Electronic Warfare Advance Development: Technical Insertions (APB/17/19) Enhanced DeInterleavers Lab Test #2	1	2018	1	2018
Electronic Warfare Advance Development: Technical Insertions (APB/17/19) Enhanced DeInterleavers Transition to EW	2	2018	2	2018

Exhibit R-4A, RDT&E Schedule Details: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603562N / *Submarine Tactical Warfare Sys*	**Project (Number/Name)** 0770 / *Adv Sub Supp Equip Prog*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Electronic Warfare Advance Development: Human Machine Interface (HMI) Development	2	2015	4	2018
Electronic Warfare Advance Development: HMI Lab Demo	2	2017	2	2017
Electronic Warfare Advance Development: HMI Lab Demo #2	3	2018	3	2018
Electronic Warfare Advance Development: HMI Transition to EW	4	2018	4	2018
Electronic Warfare Advance Development: Technical Insertions (TI-18) LPI DF / Localization - Develop	1	2015	2	2018
Electronic Warfare Advance Development: Technical Insertions (TI-18) LPI DF / Localization - Lab Test	3	2016	3	2016
Electronic Warfare Advance Development: Technical Insertions (TI-18) LPI DF / Localization -Pierside/MTV Test	1	2017	1	2017
Electronic Warfare Advance Development: Technical Insertions (TI-18) LPI DF / Localization - Lab Test #2	1	2018	1	2018
Electronic Warfare Advance Development: Technical Insertions (TI-18) LPI DF / Localization - Transition to EW	2	2018	2	2018
Electronic Warfare Advance Development: Digital Early Warning Receiver (EWR) Phase 1 Development	1	2016	3	2016
Electronic Warfare Advance Development: Digital Early Warning Receiver (EWR) Phase 2 Development	3	2016	2	2018
Electronic Warfare Advance Development: Digital Early Warning Receiver (EWR) Lab Test	4	2019	4	2019
Electronic Warfare Advance Development: Digital Early Warning Receiver (EWR) Transition to EW	1	2020	1	2020
Electronic Warfare Advance Development: Extremely Wideband Digital Receiver Phase 1 Development	1	2016	3	2016
Electronic Warfare Advance Development: Extremely Wideband Digital Receiver Phase 2 Development	3	2016	2	2018

Exhibit R-4A, RDT&E Schedule Details: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603562N / *Submarine Tactical Warfare Sys*	**Project (Number/Name)** 0770 / *Adv Sub Supp Equip Prog*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Electronic Warfare Advance Development: Extremely Wideband Digital Receiver Lab Test	4	2019	4	2019
Electronic Warfare Advance Development: Extremely Wideband Digital Receiver Transition to EW	1	2020	1	2020
Electronic Warfare Advance Development: EW Digital Direction Finding Development	2	2015	4	2018
Electronic Warfare Advance Development: EW Digital Direction Finding - Lab Test #1	2	2017	2	2017
Electronic Warfare Advance Development: EW Digital Direction Finding - Lab Test #2	3	2018	3	2018
Electronic Warfare Advance Development: EW Digital Direction Finding Transition to EW	4	2018	4	2018
Electronic Warfare Advance Development: TI-20 Next Generation EW System-Development	1	2015	3	2016
Electronic Warfare Advance Development: TI-20 Next Generation EW System-Pierside/MTV Test	2	2015	2	2015
Electronic Warfare Advance Development: TI-20 Next Generation EW System - Transition to EW	3	2016	3	2016
Electronic Warfare Advance Development: TI-20 MMM Payload - Development (CEAS)	1	2015	2	2018
Electronic Warfare Advance Development: TI-20 MMM Payload - Lab Test	4	2017	4	2017
Electronic Warfare Advance Development: TI-20 MMM Payload - Transition to EW	2	2018	2	2018
Electronic Warfare Advance Development: TI-22 Disposable Buoys Modular Expendable Decoy Buoy Enhancement Phase 1	1	2016	3	2016
Electronic Warfare Advance Development: TI-22 Disposable Buoys Modular Expendable Decoy Buoy Enhancement Phase 3	3	2016	4	2019
Electronic Warfare Advance Development: TI-22 Disposable Buoys Modular Expendable Decoy Buoy Enhancement - Lab Test	3	2019	3	2019
Electronic Warfare Advance Development: TI-22 Disposable Buoys Modular Expendable Decoy Buoy Enhancement - Transition to EW	4	2019	4	2019

Exhibit R-4A, RDT&E Schedule Details: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603562N / *Submarine Tactical Warfare Sys*	**Project (Number/Name)** 0770 / *Adv Sub Supp Equip Prog*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Electronic Warfare Advance Development: TI-22 Disposable Buoys Modular Expendable ISR Buoy- Phase 1	1	2016	3	2016
Electronic Warfare Advance Development: TI-22 Disposable Buoys Modular Expendable ISR Buoy- Phase 2	3	2016	1	2020
Electronic Warfare Advance Development: TI-22 Disposable Buoys Modular Expendable ISR Buoy - Lab Test	4	2019	4	2019
Electronic Warfare Advance Development: TI-22 Disposable Buoys Modular Expendable ISR Buoy - Transition to EW	1	2020	1	2020
Electronic Warfare Advance Development: TI-16 Disposable Buoys Sub Launched Decoy Speed to Fleet Development	1	2015	3	2017
Electronic Warfare Advance Development: TI-16 Disposable Buoys Sub Launched Decoy Speed to Fleet - Lab Test	1	2016	1	2016
Electronic Warfare Advance Development: TI-16 Disposable Buoys Sub Launched Decoy Speed to Fleet - Lab Test #2	2	2017	2	2017
Electronic Warfare Advance Development: TI-16 Disposable Buoys Sub Launched Decoy Speed to Fleet - Transition to EW	3	2017	3	2017
Electronic Warfare Advance Development: TI Tethered Buoys (Planned) Modular Tethered Antennas and RF Over Fiber- Phase 1	1	2016	3	2016
Electronic Warfare Advance Development: TI Tethered Buoys (Planned) Modular Tethered Antennas and RF Over Fiber- Phase 2	3	2016	1	2020
Electronic Warfare Advance Development: TI Tethered Buoys (Planned) Modular Tethered Antennas and RF Over Fiber - Lab Test	4	2019	4	2019
Electronic Warfare Advance Development: TI Tethered Buoys (Planned) Modular Tethered Antennas and RF Over Fiber - Transition to EW	1	2020	1	2020
Electronic Warfare Advance Development: SEA DRAGON Mast for MMM - Development	1	2017	4	2020
Electronic Warfare Advance Development: SEA DRAGON Mast for MMM - Lab Test	3	2020	3	2020
Electronic Warfare Advance Development: SEA DRAGON Mast for MMM - Transition to EW	4	2020	4	2020

Exhibit R-4A, RDT&E Schedule Details: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603562N / *Submarine Tactical Warfare Sys*	**Project (Number/Name)** 0770 / *Adv Sub Supp Equip Prog*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Electronic Warfare Advance Development: Technical Insertions Precision DF (Planned) - Develop	4	2015	4	2019
Electronic Warfare Advance Development: Technical Insertions Precision DF (Planned) - Lab Test	4	2017	4	2017
Electronic Warfare Advance Development: Technical Insertions Precision DF (Planned) - Lab Test #2	2	2019	2	2019
Electronic Warfare Advance Development: Technical Insertions Precision DF (Planned) - Transition to EW	4	2019	4	2019
Electronic Warfare Advance Development: Technical Insertions Multifunction Apertures (Planned) - Develop	1	2016	4	2019
Electronic Warfare Advance Development: Technical Insertions Multifunction Apertures (Planned) - Lab Test	2	2018	2	2018
Electronic Warfare Advance Development: Technical Insertions Multifunction Apertures (Planned) - Lab Test #2	4	2019	4	2019
Electronic Warfare Advance Development: Advanced Radar Development	1	2018	4	2020
Electronic Warfare Advance Development: Advanced Radar Lab Test	1	2020	1	2020
Electronic Warfare Advance Development: Advanced Radar Transition to EW	4	2020	4	2020
Electronic Warfare Advance Development: CWP LPI Direction Finding - Development	1	2017	1	2019
Electronic Warfare Advance Development: CWP LPI Direction Finding - Lab Test	4	2018	4	2018
Electronic Warfare Advance Development: CWP LPI Direction Finding - Transition to EW	1	2019	1	2019

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603562N / *Submarine Tactical Warfare Sys*	Project (Number/Name) 1739 / *Submarine Arctic W/F Development*	

COST ($ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
1739: *Submarine Arctic W/F Development*	45.760	4.666	6.268	4.353	-	4.353	9.720	5.199	6.801	6.942	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

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 (HF) 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 research and development programs to conduct test and evaluation in shallow water and Arctic regions.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Title: Conduct ICEX and Arctic Transit Mission, ICEX Workup and Training, Ice Camps	4.666	6.268	4.353	0.000	4.353
Articles:	-	-	-	-	-
FY 2015 Accomplishments: Initiated planning and support for ICEX mission 1-2016 and Ice Camp 1-2016. Supported Arctic deployments, including inter-Fleet transfers, as required by the SUBFOR Commanders. Investigated, researched, developed and deployed new systems for Arctic submarine support. Supported testing and tactical development required to improve submarine Arctic operability and warfighting. Developed Temporary Alteration (TEMPALT) design for High Frequency (HF) sonar on SSN 21 Class Submarines.					
FY 2016 Plans: Conduct Arctic work-up training, ICEX mission 1-2016, and Ice Camp 1-2016. Support Arctic deployments, including inter-Fleet transfers, as required by the SUBFOR 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.					
FY 2017 Base Plans: Conduct Arctic work-up training. Support Arctic deployments, including inter-Fleet transfers, as required by the SUBFOR Commanders. Investigate, research, develop and deploy new systems for Arctic submarine support.					

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603562N / *Submarine Tactical Warfare Sys*	**Project (Number/Name)** 1739 / *Submarine Arctic W/F Development*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Support testing and tactical development required to improve submarine Arctic operability and warfighting. Initiate planning for ICEX mission 1-2018 and Ice Camp 1-2018. ***FY 2017 OCO Plans:*** N/A					
Accomplishments/Planned Programs Subtotals	4.666	6.268	4.353	0.000	4.353

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

Use sole source and competitively awarded contracts through the Fleet Logistics Center (FLC) regional contracting office for equipment and technical services. The NAVSEA University Affiliated Research Center (UARC) omnibus contract is used for procurement of logistics support for Ice Camps.

E. Performance Metrics

Conduct and support Arctic deployments, including inter-Fleet transfers and biennial ICEXs, as required by the SUBFOR Commanders.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603562N / *Submarine Tactical Warfare Sys*	Project (Number/Name) 1739 / *Submarine Arctic W/F Development*	

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation	WR	COMSUBLANT : VA	0.000	0.000		2.372	Oct 2015	2.334	Nov 2016	-		2.334	Continuing	Continuing	Continuing
Developmental Test & Evaluation	WR	COMSUBPAC : CA	33.724	2.377	Nov 2014	0.000		0.000		-		0.000	0.000	36.101	Continuing
Developmental Test & Evaluation	WR	NUWC/Newport : RI	0.235	0.000		0.000		0.000		-		0.000	0.000	0.235	0.235
Developmental Test & Evaluation	C/CPFF	UT/ARL : TX	0.894	0.500	Feb 2015	0.408	Mar 2016	0.463	Dec 2016	-		0.463	Continuing	Continuing	Continuing
Developmental Test & Evaluation	C/CPFF	UW/APL : WA	9.528	1.729	Jan 2015	3.428	Dec 2015	1.496	Dec 2016	-		1.496	Continuing	Continuing	Continuing
		Subtotal	44.381	4.606		6.208		4.293		-		4.293	-	-	-

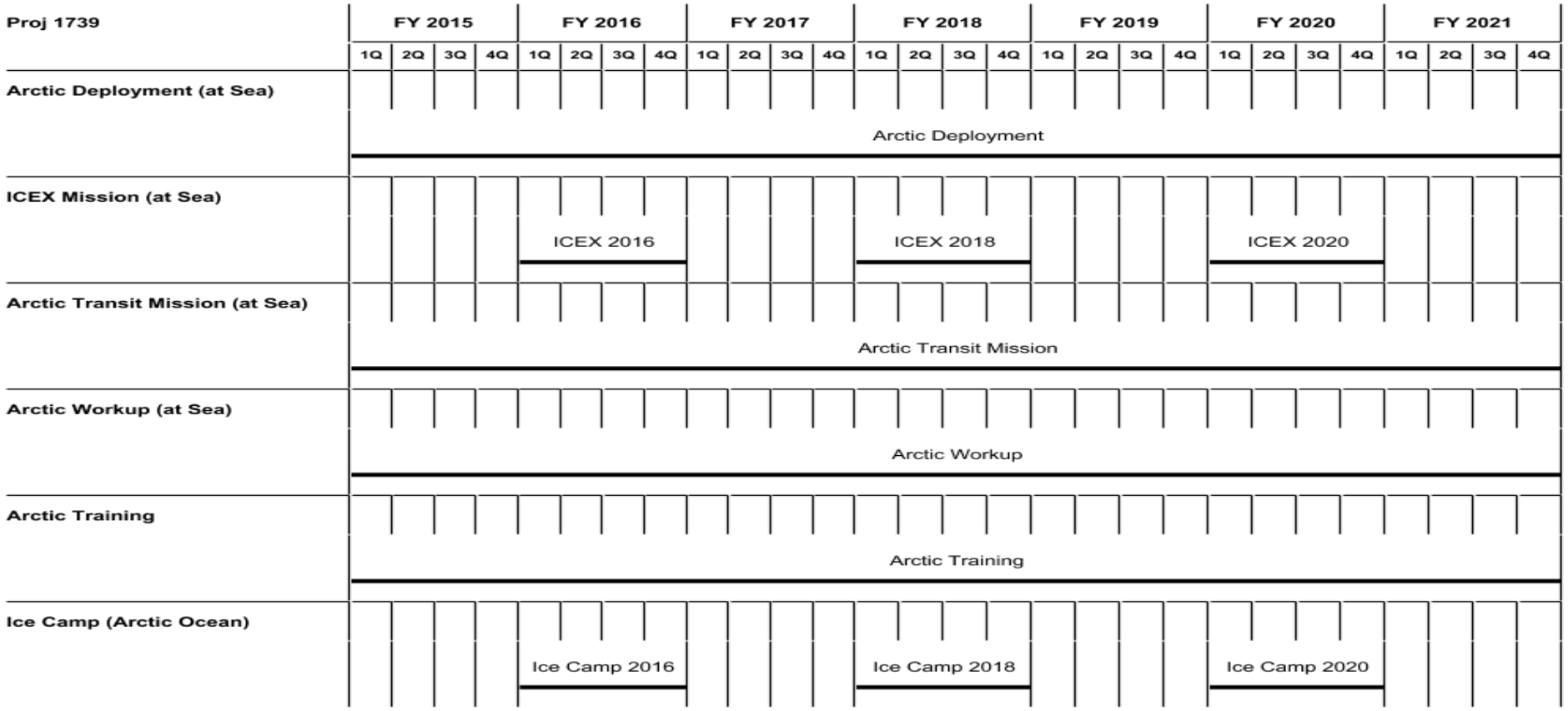
Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Support	C/CPAF	EG&G : VA	0.311	0.000		0.000		0.000		-		0.000	0.000	0.311	0.311
Program Management Support	C/CPAF	BAE SYSTEMS : MD	1.028	0.060	Nov 2014	0.000		0.000		-		0.000	0.000	1.088	Continuing
Program Management Support	C/CPIF	TMB : DC	0.000	0.000		0.060	Dec 2015	0.060	Dec 2016	-		0.060	Continuing	Continuing	Continuing
Travel	Allot	NAVSEA PEO IWS 5 : DC	0.040	0.000		0.000		0.000		-		0.000	0.000	0.040	Continuing
		Subtotal	1.379	0.060		0.060		0.060		-		0.060	-	-	-

	Prior Years	FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	45.760	4.666		6.268		4.353		-		4.353	-	-	-

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603562N / *Submarine Tactical Warfare Sys*	**Project (Number/Name)** 1739 / *Submarine Arctic W/F Development*



2017PB - 0603562N - 1739

Exhibit R-4A, RDT&E Schedule Details: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603562N / *Submarine Tactical Warfare Sys*	**Project (Number/Name)** 1739 / *Submarine Arctic W/F Development*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 1739				
Arctic Deployment (at Sea): Submarine Deployment as required by the Submarine Type Commander	1	2015	4	2021
ICEX Mission (at Sea): ICEX Mission (at Sea) 2016	1	2016	4	2016
ICEX Mission (at Sea): ICEX Mission (at Sea) 2018	1	2018	4	2018
ICEX Mission (at Sea): ICEX Mission (at Sea) 2020	1	2020	4	2020
Arctic Transit Mission (at Sea): Arctic Transit Mission (at Sea)	1	2015	4	2021
Arctic Workup (at Sea): Arctic Workup (at Sea)	1	2015	4	2021
Arctic Training: Arctic Training	1	2015	4	2021
Ice Camp (Arctic Ocean): Ice Camp (Arctic Ocean) 2016	1	2016	4	2016
Ice Camp (Arctic Ocean): Ice Camp (Arctic Ocean) 2018	1	2018	4	2018
Ice Camp (Arctic Ocean): Ice Camp (Arctic Ocean) 2020	1	2020	4	2020

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Exhibit R-2, RDT&E Budget Item Justification: PB 2017 Navy											Date: February 2016	
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 4: *Advanced Component Development & Prototypes (ACD&P)*					R-1 Program Element (Number/Name) PE 0603563N *I Ship Concept Advanced Design*							
COST ($ in Millions)	**Prior Years**	**FY 2015**	**FY 2016**	**FY 2017 Base**	**FY 2017 OCO**	**FY 2017 Total**	**FY 2018**	**FY 2019**	**FY 2020**	**FY 2021**	**Cost To Complete**	**Total Cost**
Total Program Element	162.324	17.831	10.459	14.590	-	14.590	17.274	12.067	10.914	10.555	Continuing	Continuing
2196: *Design, Tools, Plans and Concepts*	1.482	0.430	0.443	0.432	-	0.432	0.452	0.462	0.474	0.484	Continuing	Continuing
3161: *NAVSEA Tech Authority*	160.842	11.808	10.016	9.947	-	9.947	10.355	5.242	4.405	3.911	Continuing	Continuing
3376: *Strategic Sealift*	0.000	5.593	0.000	4.211	-	4.211	6.467	6.363	6.035	6.160	Continuing	Continuing

A. Mission Description and Budget Item Justification

Explore alternative surface and expeditionary ship force structures (encompassing amphibious warfare), advanced surface ship and unmanned surface vehicles concepts and 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 increased ship production capability; ships with reduced manning, 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 studies, ship & unmanned vehicle concept studies, and advanced design concept studies for the ships that may become part of the shipbuilding plan.

Project 2196 - This project supports the next step in the development of a transformed naval force by accomplishing pre milestone A (especially pre-concept) decision efforts for all potential surface ships. These efforts are the required first step in the definition and integration of total ship systems, including combat systems, weapons systems and Hull, Mechanical and Electrical (HM&E) systems. 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. Efforts include 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 is the only R&D effort (Government and commercial) that provides a coordinated, collaborative approach to the development of cross platform naval ship and weapon system design, as well as engineering capabilities in the areas of design tools, criteria and methods. This project funds a prioritized portfolio of time-sensitive initiatives through integrated efforts in Cross Platform Systems Development (CPSD), supporting Technical Authority through the development of support elements meeting relevant operational needs of the warfare community. The areas of exploration for CPSD include surface ship concept advanced development, next generation unmanned surface vehicle, high speed ships, tool integration and technical data exchange, cybersecurity, embedded interoperability engineering, and mission capability systems engineering. The research products developed by this project directly support and influence both immediate fleet requirements and future acquisition programs by providing a range of technically acceptable alternatives and evaluation of emerging technologies. While these prototypes, standards/specs, tools and processes and other efforts support concept exploration and mission needs assessment for potential future ship acquisition programs, they are not direct efforts for specific, authorized shipbuilding programs. Products from this project transition directly to early-stage ship design for Ship Preliminary Design and Feasibility Studies and other Program Executive Office (PEO) ship design programs.

Exhibit R-2, RDT&E Budget Item Justification: PB 2017 Navy	Date: February 2016
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 0603563N *I Ship Concept Advanced Design*

Tasks within this project continue to directly support interoperability testing and certification for Littoral Combat Ship (LCS) and other platforms in deploying battle groups, development and certification of Operator Guidance tools for surface combatants (CG 47, DDG 51, DDG 1000), Total Ownership Cost (TOC) pilot programs, future flexible and modular warship analyses, and development of specifications and processes to reduce production costs of platforms.

Tasks within this project continue to directly support the Test and Evaluation Master Plan (TEMP) execution for multiple ship classes including, LCS, JHSV, and DDG 1000 reducing Live Fire Test and Evaluation (LFT&E) costs, further validate hydrodynamic simulation tool supporting DDG 1000 Hull Form Plan (HFP), increase technology readiness level for aluminum combatants, develop tools to execute the CG 47 Cracking Task Force recommendations. This project supports NAVSEA's core mission and improves performance at reduced cost for current and future naval platforms.

Project 3376 - Strategic Sealift Research and Development - Develops new concepts and technologies which can be applied to or will enable future strategic sealift, and Seabasing systems. The technologies include ship configuration concepts, equipment to increase cargo handling and cargo loading/unloading rates (including commercial and merchant ship systems), improved man/machine interfaces, improved structural configurations and materials, and Logistics-Over-the-Shore (LOTS) equipment and system improvements. FY2016 and prior years (FY2014 and earlier) efforts were funded under NDSF BA 04 Project 3116 Strategic Sealift Research and Development.

B. Program Change Summary ($ in Millions)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Previous President's Budget	17.864	11.888	10.445	-	10.445
Current President's Budget	17.831	10.459	14.590	-	14.590
Total Adjustments	-0.033	-1.429	4.145	-	4.145
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-1.429			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.033	0.000			
• Program Adjustments	0.000	0.000	4.116	-	4.116
• Rate/Misc Adjustments	0.000	0.000	0.029	-	0.029

Change Summary Explanation

The FY 2017 funding request was reduced by $2.638 million to account for the availability of prior years execution balance.

Decrease in Ship Concept Advance Design RDTEN by $0.559 million as required for the Department of the Navy to comply with the Bipartisan Budget Act of 2015.

Programmatic:

Exhibit R-2, RDT&E Budget Item Justification: PB 2017 Navy	Date: February 2016
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 0603563N *I Ship Concept Advanced Design*

Project 3161: The Cross Platform Systems Development Program (CPSD) was adjusted based on reduced level of effort.

Financial: Beginning in FY 2017, efforts previously financed under the National Sealift Defense Fund (NDSF) BA 04, Project 3116 (Strategic Sealift Research and Development) are financed under this program element. FY 2016 NDSF BA 04 Project 3116 amount: $5.502M. This project is not a new start.

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603563N / *Ship Concept Advanced Design*	Project (Number/Name) 2196 / *Design, Tools, Plans and Concepts*	

COST ($ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
2196: *Design, Tools, Plans and Concepts*	1.482	0.430	0.443	0.432	-	0.432	0.452	0.462	0.474	0.484	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

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. 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 the greatest potential ship design advances never realized. Designs and technologies must consider how to meet the threat. This project supports this requirement.

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.

This project:

(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 war fighting/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.
(7) Supports development of Initial Capabilities Documents (ICD) and analogous early requirements documents for future ships.

These efforts are done to support 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 requirements.

These efforts supports and maintains naval ship design and engineering capabilities in the design phase of developing concept design tools, criteria and methods.

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603563N / *Ship Concept Advanced Design*	**Project (Number/Name)** 2196 / *Design, Tools, Plans and Concepts*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Title: Ship Concepts and Mission Need Analysis	0.430	0.443	0.432	0.000	0.432
Articles:	-	-	-	-	-
Description: Develop ship concepts and perform analysis for potential ships and Force Architecture 5-10 years out in shipbuilding plan. ***FY 2015 Accomplishments:*** Developed concepts of integrating unmanned vehicles aboard surface ships. Refined cost analyses of surface ship design and construction. Furthered improvements of surface ship design tools. Continued concept development efforts to explore flexible, modular surface combatants. ***FY 2016 Plans:*** Continue improving tools that relate ship costs to ship capabilities. Explore concepts of surface ships that can deploy swarms of unmanned autonomous systems, and react to such swarms deployed by the enemy. Analyze the impact of distributed high energy storage systems on ship design. ***FY 2017 Base Plans:*** Continue to participate in efforts to improve understanding of performance and mobility of high speed ships. ***FY 2017 OCO Plans:*** N/A					
Accomplishments/Planned Programs Subtotals	0.430	0.443	0.432	0.000	0.432

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
• RDTEN/0204202N: *DDG-1000*	196.987	103.179	45.642	-	45.642	19.279	15.617	19.721	0.000	0.000	1,538.428
• RDTEN/0603512N: *Carrier Systems Development*	5.954	8.348	7.605	-	7.605	9.283	5.894	5.752	5.874	Continuing	Continuing
• RDTEN/0603564N: *Ship Preliminary Design/Feasibility*	8.007	3.332	15.805	-	15.805	11.645	8.863	9.076	9.283	Continuing	Continuing
• RDTEN/0604567N: *Ship Contract Design/Live Fire T&E*	39.459	38.925	65.002	-	65.002	67.591	69.901	53.871	56.267	Continuing	Continuing
• RDTEN/0603582N: *Combat System Integration*	20.741	32.561	23.530	-	23.530	22.055	19.473	17.890	17.602	Continuing	Continuing

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603563N / *Ship Concept Advanced Design*	**Project (Number/Name)** 2196 / *Design, Tools, Plans and Concepts*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost

Remarks

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

Quarterly Program Reviews

Monthly Reviews

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603563N / *Ship Concept Advanced Design*	**Project (Number/Name)** 2196 / *Design, Tools, Plans and Concepts*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Systems Engineering	C/CPFF	Various Contractors : Various	0.490	0.094	Feb 2015	0.096	Apr 2016	0.097	Feb 2017	-		0.097	Continuing	Continuing	Continuing
Systems Engineering	WR	NSWC : Various	0.631	0.275	Nov 2014	0.277	Nov 2015	0.262	Nov 2016	-		0.262	Continuing	Continuing	Continuing
Engineering Development	C/CPFF	Various Contractors : Various	0.171	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Engineering Development	WR	NSWC : Various	0.136	0.061	Nov 2014	0.070	Nov 2015	0.073	Nov 2016	-		0.073	Continuing	Continuing	Continuing
Demonstration & Evaluation	C/CPFF	Various Contractors : Various	0.029	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Test & Evaluation	C/CPFF	Various Contractors : Various	0.020	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
		Subtotal	1.477	0.430		0.443		0.432		-		0.432	-	-	-

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Travel	Allot	NAVSEA HQ : Washington, DC	0.005	0.000		0.000		0.000		-		0.000	0.000	0.005	-
		Subtotal	0.005	0.000		0.000		0.000		-		0.000	0.000	0.005	-

	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	1.482	0.430		0.443		0.432		-		0.432	-	-	-

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603563N / *Ship Concept Advanced Design*	**Project (Number/Name)** 2196 / *Design, Tools, Plans and Concepts*

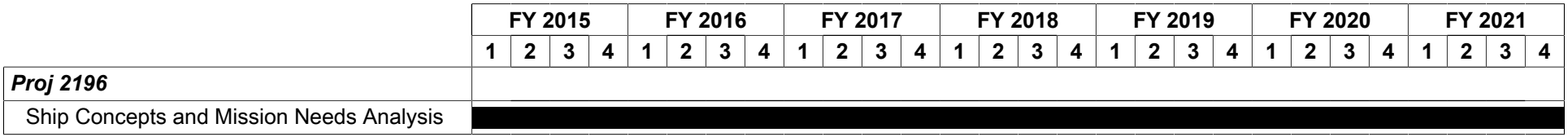


Exhibit R-4A, RDT&E Schedule Details: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603563N / *Ship Concept Advanced Design*	**Project (Number/Name)** 2196 / *Design, Tools, Plans and Concepts*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 2196				
Ship Concepts and Mission Needs Analysis	1	2015	4	2021

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603563N / *Ship Concept Advanced Design*	Project (Number/Name) 3161 / *NAVSEA Tech Authority*	

COST ($ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
3161: *NAVSEA Tech Authority*	160.842	11.808	10.016	9.947	-	9.947	10.355	5.242	4.405	3.911	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This project has been established to support NAVSEA Technical Authority through coordinated, collaborative, cross-platform systems development in advanced capabilities across business lines through development of processes, procedures, and tools necessary to develop future surface ship force structures; advanced surface ship and unmanned surface vehicle concepts; interoperability; and development of systems level engineering criteria and options to support the current fleet, future pre-acquisition and advanced concepts mission needs analysis, SCN, and R&D planning. The objective is the coordination of design and development efforts for cross-platform applicability to result in more affordable, mission-capable, and interoperable surface ship forces including ships that are less expensive to build and operate with reduced manning, reduced support costs, and greater utilization of emerging technology.

NAVSEA Tech Authority efforts under Project 3161, known as the Cross Platform Systems Development (CPSD) Program transition directly to early-stage ship design for Ship Preliminary Design and Feasibility Studies and other Program Executive Office (PEO) ship design programs. While these efforts support concept exploration and mission needs assessment for potential future ship acquisition programs, they also develop cross-program technology solutions and associated technical authority products. 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 and weapon system design, as well as 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 interoperability issues with new systems or platforms, or broad technology insertion topics.

The CPSD program is comprised of the following functional areas:

CPSD 1.0 - Platform Concept Advanced
CPSD 2.0 - Platform Design and Certification Tools/Engineering and Tech Data Exchange Development
CPSD 3.0 - Ship Systems Engineering/Modular Ship Systems Development.
CPSD 5.0 - High Speed Ships and Craft Engineering
CPSD 6.0 - Alternate Power Systems Engineering
CPSD 8.0 - Embedded Interoperability Engineering
CPSD 9.0 - Mission Capability Systems Engineering
CPSD 13.0 - Cybersecurity
CPSD 14.0 - Future Surface Combatant Study

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603563N / *Ship Concept Advanced Design*	**Project (Number/Name)** 3161 / *NAVSEA Tech Authority*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Title: Platform Concept Advanced Development (CPSD 1.0)	0.878	0.420	0.159	0.000	0.159
Articles:	-	-	-	-	-
Description: This effort directly supports the Navy's ability to understand risk and associated cost of surface and expeditionary warfare assets; unmanned surface vehicle (USV) design and analysis. ***FY 2015 Accomplishments:*** Explored concepts for flexible and modular surface ships that met Long Range Shipbuilding Strategy capability goals at reduced cost. Developed concepts for surface ship designs that optimized the use of unmanned vehicles. Investigated the feasibility of using mission modules across other surface ship platforms. ***FY 2016 Plans:*** Provide guidance to initial adopters of radically new manufacturing technology. ***FY 2017 Base Plans:*** Support the execution of cross platform aspects and specification development for modular future surface combatants. ***FY 2017 OCO Plans:*** N/A					
Title: Platform Design and Certification Tools/Engineering and Tech Data Exchange (CPSD 2.0)	0.898	0.431	0.244	0.000	0.244
Articles:	-	-	-	-	-
Description: This effort supports the development of validation tools to certify the safety and mission capability of platform concepts and subsequently ships and submarines; establishes the integrated NAVSEA suite. This effort advances platform design methods, design validation tools, cost tools, manpower tools, and tools to aid in rapid total platform definition. ***FY 2015 Accomplishments:*** Developed software suite tool to assess the performance of a hull array sonar after loss of one or more hydrophones. Refined ship design tools to better incorporate combat system capabilities. ***FY 2016 Plans:*** Validate the use of modeling and simulation to test hardware too big and powerful to safely test by conventional physical methods. ***FY 2017 Base Plans:***					

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603563N / *Ship Concept Advanced Design*	**Project (Number/Name)** 3161 / *NAVSEA Tech Authority*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Continue development of fleet architecture and force shaping tools to incorporate the future introduction of unmanned systems in large numbers. ***FY 2017 OCO Plans:*** N/A					
Title: Ship Systems Engineering /Modular Ship Systems Development (CPSD 3.0) ***Articles:*** ***Description:*** This effort supports Ship system development with a focus on technology transition, modularity, ship system technology integration, and design standards for new ship classes for pre-Analysis of Alternatives (AoA) studies and ongoing ship modernization. ***FY 2015 Accomplishments:*** Explored cross platform approaches to solving corrosion problems, techniques and applications not being developed by other programs. Developed the use of composite materials for use in more shipboard applications. Researched methods of extending propulsion shaft life through improved shaft coatings and couplings. ***FY 2016 Plans:*** Perform root cause analysis of aluminum plate cracking. Perform Sea Trial of insulation seam tape that replaces costly current process using hazardous materials. Determine if cold spray repair of aluminum will maintain waterfastness. ***FY 2017 Base Plans:*** Continue to analyze the logistical and engineering aspects of the application of 3D modeling and printing technology. Continue assessment of current state of technology of robotic methods of cleaning, welding, painting, and inspecting shipboard tank and void spaces. ***FY 2017 OCO Plans:*** N/A	1.596 -	1.138 -	0.252 -	0.000 -	0.252 -
Title: High Speed Ships and Craft Engineering (CPSD 5.0) ***Articles:*** ***Description:*** This effort supports the development of concepts for future high speed ships that promise improved mission effectiveness in mobility, survivability and warfare mission areas. ***FY 2015 Accomplishments:***	4.507 -	2.723 -	2.204 -	0.000 -	2.204 -

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603563N / *Ship Concept Advanced Design*	**Project (Number/Name)** 3161 / *NAVSEA Tech Authority*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Continued development of analytical tools for the generation of surface ship Operator Guidance products. Completed and delivered surface ship Heavy Weather Guidance (HWG). Continued Verification, Validation, and Accreditation (VV&A) of the simulation tool for characterizing ship motions in environments not within ability to test. Continued simulation runs of ship motions in prescribed environmental conditions required to develop the surface ship Operator Guidance. Continued to support the integration of capability on the ship and associated training guidance for the ship's crew. Participated in efforts to improve understanding of hydrodynamic performance of multi-hull ships. ***FY 2016 Plans:*** Continue the development of analytical tools for the generation of surface ship Operator Guidance products. Complete VV&A of the simulation tool for characterizing ship motions in environments not within ability to test. Continue simulation runs of ship motions in prescribed environmental conditions required to develop the surface ship Operator Guidance. Continue to support the integration of the Operator Guidance capability on the ship and associated training guidance for the ship's crew. Support the survivability of testing and analysis. ***FY 2017 Base Plans:*** Continue the development of analytical tools for the generation of surface ship Operator Guidance products. Complete and deliver an update of surface ship HWG. Complete simulation runs of ship motions in prescribed environmental conditions required to develop the surface ship Operator Guidance. Continue to support the integration of the Operator Guidance capability on the ship and associated training guidance for the ship's crew. Operator Guidance development and HWG updates are expected to extend into FY 2018 - FY 2020. ***FY 2017 OCO Plans:*** N/A					
Title: Alternative Power Systems Engineering (CPSD 6.0) ***Articles:*** ***Description:*** This effort investigates concepts for ships with alternative power/propulsion systems evaluating effectiveness in mobility, survivability, and in traditional and evolving warfare mission areas including operations in polar regions. ***FY 2015 Accomplishments:*** Evaluated pod propulsor for future ship concept design. ***FY 2016 Plans:***	0.444 -	0.000 -	0.158 -	0.000 -	0.158 -

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603563N / *Ship Concept Advanced Design*	**Project (Number/Name)** 3161 / *NAVSEA Tech Authority*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
N/A ***FY 2017 Base Plans:*** Evaluate energy harvesting technology for mobility and primary mission systems. Continue to investigate concepts supporting Forward Deployed Energy (FDE) techniques for refueling unmanned vehicles. ***FY 2017 OCO Plans:*** N/A					
Title: Embedded Interoperability (I/O) Engineering (CPSD 8.0)	0.337	0.304	0.084	0.000	0.084
Articles:	-	-	-	-	-
Description: This effort 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 war fighting capability. Focus on emerging Open Architecture warfare systems, including LCS Class. ***FY 2015 Accomplishments:*** Explored methods of further reducing costs of achieving certified interoperable systems. Researched ways to standardize and reduce the number of surface electro-optic and infrared systems and their interfaces. Further improved the generation of strike group interoperability and the generation of Capabilities and Limitations documents. ***FY 2016 Plans:*** Investigate and promote interoperability between Electro Optic and Infrared (EO/IR) Systems in fleet. ***FY 2017 Base Plans:*** Continue exploring methods of further reducing costs of achieving certified interoperable systems. Continue exploring ways to standardize and reduce the number of surface electro-optic and infrared systems and their interfaces. ***FY 2017 OCO Plans:*** N/A					
Title: Mission Capability Systems Engineering (CPSD 9.0)	3.148	0.000	0.538	0.000	0.538
Articles:	-	-	-	-	-

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603563N / *Ship Concept Advanced Design*	**Project (Number/Name)** 3161 / *NAVSEA Tech Authority*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Description: This effort supports the development of force-level systems engineering criteria and guidance at the Systems of Systems (SoS) and Family of Systems (FoS) level. This effort allows for the enhanced warfighter and system performance with reduced personnel costs with project cost savings. ***FY 2015 Accomplishments:*** Conducted a Capabilities Based Assessment to address future surface combatant force level operational and engineering requirements determination. ***FY 2016 Plans:*** N/A ***FY 2017 Base Plans:*** Study the concepts of modularity and open architecture in combat systems and propose parallel concepts for hull, mechanical, and electrical systems. ***FY 2017 OCO Plans:*** N/A					
Title: Cybersecurity Technologies (CPSD 13.0) ***Articles:*** ***Description:*** This supports the development and testing of cybersecurity solutions for shipboard HM&E Machinery Control Systems (MCS), Navigation Systems, Combat Systems, and other shipboard control systems. It also supports the development of specifications and standards for the cybersecurity of all Navy Control Systems (NCS) ***FY 2015 Accomplishments:*** N/A ***FY 2016 Plans:*** Research and develop various cross-platform cybersecurity solutions including but not limited to: Cyber Security Optimized Network Design, Secure System Startup methodologies, Automated Removable Media Control Techniques, and Operational indifference to malicious intent. Research new techniques or methodologies to ensure secure network traffic (authenticated and encrypted)for Navy Control Systems (NCS). Conduct test and	0.000 -	5.000 -	4.308 -	0.000 -	4.308 -

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603563N / *Ship Concept Advanced Design*	**Project (Number/Name)** 3161 / *NAVSEA Tech Authority*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
evaluation of cybersecurity technologies in an operational environment. Continue development of specifications and standards for cybersecurity of NCS. ***FY 2017 Base Plans:*** Continue research and develop various cross-platform cybersecurity solutions including but not limited to: Cyber Security Optimized Network Design, Secure System Startup methodologies, Automated Removable Media Control Techniques, and Operational indifference to malicious intent. Research new techniques or methodologies to ensure secure network traffic (authenticated and encrypted)for Navy Control Systems (NCS). Conduct test and evaluation of cybersecurity technologies in an operational environment. Continue development of specifications and standards for cybersecurity of NCS. ***FY 2017 OCO Plans:*** N/A					
Title: Future Surface Combatant Study (CPSD 14.0) ***Articles:*** ***Description:*** This effort will lay the analytic foundation for the development of the Future Surface Combatant post Capabilities Based Assessment. Ships produced from this effort will fill critical gaps in the fleet in the 2030 timeframe created by the decommissioning of CG 47, DDG 51, and LCS 1/2 ships. ***FY 2015 Accomplishments:*** N/A ***FY 2016 Plans:*** N/A ***FY 2017 Base Plans:*** Conduct study to lay analytic foundation to support the development Future Surface Combatants post Capabilities Based Assessment (CBA). ***FY 2017 OCO Plans:*** N/A	0.000 -	0.000 -	2.000 -	0.000 -	2.000 -
Accomplishments/Planned Programs Subtotals	11.808	10.016	9.947	0.000	9.947

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603563N / *Ship Concept Advanced Design*	**Project (Number/Name)** 3161 / *NAVSEA Tech Authority*	

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
• RDTEN/0204202N: *DDG-1000*	196.987	103.179	45.642	-	45.642	19.279	15.617	19.721	0.000	0.000	1,538.428
• RDTEN/0603512N: *Carrier Systems Development*	5.954	8.348	7.605	-	7.605	9.283	5.894	5.752	5.874	Continuing	Continuing
• RDTEN/0603564N: *Ship Preliminary Design/ Feasibility Studies*	8.007	3.332	15.805	-	15.805	11.645	8.863	9.076	9.283	Continuing	Continuing
• RDTEN/0604567N: *Ship Contract Design/Live Fire T&E*	39.459	38.925	65.002	-	65.002	67.591	69.901	53.871	56.267	Continuing	Continuing
• RDTEN/0603582N: *Combat System Integration*	20.741	32.561	23.530	-	23.530	22.055	19.473	17.890	17.602	Continuing	Continuing

Remarks

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. This program provides validated engineering tools, methods, and criteria for ship, and weapon system concept designs and assessments while fostering collaboration and coordination of efforts resulting in more effective use of funding.

E. Performance Metrics

Quarterly Program Reviews

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603563N / *Ship Concept Advanced Design*	**Project (Number/Name)** 3161 / *NAVSEA Tech Authority*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Systems Engineering	C/CPFF	Various Contractors : Various	17.066	1.370	Feb 2015	0.475	Feb 2016	1.236	Feb 2017	-		1.236	Continuing	Continuing	Continuing
Systems Engineering	WR	NSWC, NUWC, CDSA : Various	58.470	4.359	Dec 2014	0.711	Dec 2015	0.660	Dec 2016	-		0.660	Continuing	Continuing	Continuing
Engineering Development	C/CPFF	DRS : Stevensville, MD	3.213	0.036	Dec 2014	0.421	Dec 2015	0.329	Dec 2016	-		0.329	Continuing	Continuing	Continuing
Engineering Development	WR	NSWC, NUWC : Various	50.015	3.450	Dec 2014	2.952	Dec 2015	2.204	Dec 2016	-		2.204	Continuing	Continuing	Continuing
Demonstration & Evaluation	WR	NSWC : Various	18.776	1.268	Nov 2014	0.150	Nov 2015	0.235	Dec 2016	-		0.235	Continuing	Continuing	Continuing
Demonstration & Evaluation	WR	SPAWAR : Various	1.922	0.000	Mar 2015	0.000		0.161	Jan 2017	-		0.161	Continuing	Continuing	Continuing
Test and Evaluation	WR	NSWC : Various	10.605	1.305	Nov 2014	0.147	Nov 2015	0.815	Nov 2016	-		0.815	Continuing	Continuing	Continuing
Cybersecurity Technologies	WR	NSWC : Various	0.000	0.000		2.000	Dec 2015	1.723	Jan 2017	-		1.723	0.000	3.723	-
Test and Evaluation	C/CPFF	Various Contracts : Various	0.000	0.000		0.150	Feb 2016	0.000		-		0.000	0.000	0.150	-
Cybersecurity Technologies	C/CPFF	Various Contracts : Various	0.000	0.000		3.000	Dec 2015	2.584	Jan 2017	-		2.584	0.000	5.584	-
		Subtotal	160.067	11.788		10.006		9.947		-		9.947	-	-	-

Management Services ($ in Millions)

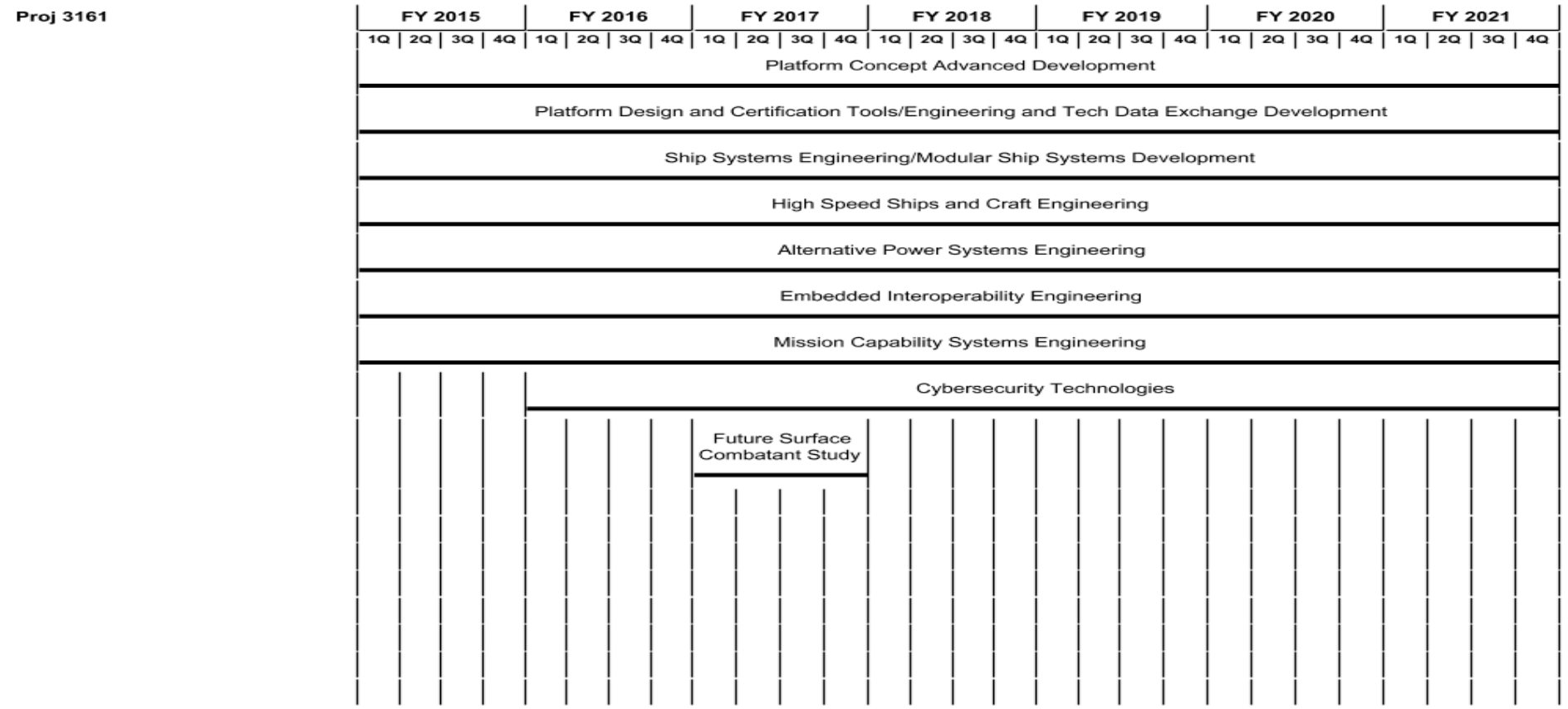
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
PM/Travel	Allot	NAVSEA HQ : Washington, DC	0.630	0.020	Oct 2014	0.010	Oct 2015	0.000		-		0.000	Continuing	Continuing	Continuing
DAWDF	Various	Not Specified : Not Specified	0.145	0.000		0.000		0.000		-		0.000	0.000	0.145	-
		Subtotal	0.775	0.020		0.010		0.000		-		0.000	-	-	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603563N / *Ship Concept Advanced Design*	Project (Number/Name) 3161 / *NAVSEA Tech Authority*	

	Prior Years	FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	160.842	11.808		10.016		9.947		-		9.947	-	-	-

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603563N / *Ship Concept Advanced Design*	**Project (Number/Name)** 3161 / *NAVSEA Tech Authority*



2017PB - 0603563N - 3161

Exhibit R-4A, RDT&E Schedule Details: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603563N / *Ship Concept Advanced Design*	**Project (Number/Name)** 3161 / *NAVSEA Tech Authority*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 3161				
Platform Concept Advanced Development	1	2015	4	2021
Platform Design and Certification Tools/Engineering and Tech Data Exchange Development	1	2015	4	2021
Ship Systems Engineering/Modular Ship Systems Development (PNA)	1	2015	4	2021
High Speed Ships and Craft Engineering (HFP)	1	2015	4	2021
Alternative Power Systems Engineering	1	2015	4	2021
Embedded Interoperability Engineering	1	2015	4	2021
Mission Capability Systems Engineering	1	2015	4	2021
Cybersecurity Technologies	1	2016	4	2021
Future Surface Combatant Study	1	2017	4	2017

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603563N / *Ship Concept Advanced Design*	Project (Number/Name) 3376 / *Strategic Sealift*	

COST ($ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
3376: *Strategic Sealift*	0.000	5.593	0.000	4.211	-	4.211	6.467	6.363	6.035	6.160	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Project 3376 - Strategic Sealift Research and Development - Develops new concepts and technologies which can be applied to or will enable future strategic sealift, and Seabasing systems. The technologies include ship configuration concepts, equipment to increase cargo handling and cargo loading/unloading rates (including commercial and merchant ship systems), improved man/machine interfaces, improved structural configurations and materials, and Logistics-Over-the-Shore (LOTS) equipment and system improvements. Beginning in FY 2017, efforts previously financed under the National Sealift Defense Fund (NDSF) BA 04, Project 3116 (Strategic Sealift Research and Development) are financed under this program element. FY 2016 NDSF BA 04 Project 3116 amount: $5.502M. This project is not a new start.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Title: Shipboard Crane Systems/Shipboard Cargo Systems	1.250	0.000	1.000	0.000	1.000
Articles:	-	-	-	-	-
FY 2015 Accomplishments: FY15 - Continued investigation and demonstration of shipboard crane/cargo systems improvements.					
FY 2016 Plans: N/A					
FY 2017 Base Plans: FY17 - Continue investigation and demonstration of shipboard crane/cargo systems improvements. Continue FY16 demonstration of UUV/USV handling interface with Sealift ships.					
FY 2017 OCO Plans: N/A					
Title: Sealift Concept Development	1.283	0.000	1.700	0.000	1.700
Articles:	-	-	-	-	-
FY 2015 Accomplishments: FY15 - Continued providing Advanced Planning, Sealift Research, and Technology development and program guidance.					
FY 2016 Plans:					

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603563N / *Ship Concept Advanced Design*	**Project (Number/Name)** 3376 / *Strategic Sealift*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
N/A ***FY 2017 Base Plans:*** FY17 - Continue providing Advanced Planning, Sealift Research, and Technology development and program guidance. Continue demonstrations of Adaptive Force Packages with Sealift ships. ***FY 2017 OCO Plans:*** N/A					
Title: Lighter/HSV Seabase to Shore Cargo Transfer	3.060	0.000	1.511	0.000	1.511
Articles:	-	-	-	-	-
FY 2015 Accomplishments: FY15 - Continued development and demonstration of at-sea vehicle transfer capability. ***FY 2016 Plans:*** N/A ***FY 2017 Base Plans:*** FY17 - Continue development and demonstration of at-sea vehicle transfer capability. ***FY 2017 OCO Plans:*** N/A					
Accomplishments/Planned Programs Subtotals	5.593	0.000	4.211	0.000	4.211

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
• NDSF/3116: *Strategic Sealift Research and Development*	0.000	5.502	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	58.831

Remarks

D. Acquisition Strategy

Not applicable for SEALIFT R&D efforts.

E. Performance Metrics

Annual Program Review.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603563N / *Ship Concept Advanced Design*	**Project (Number/Name)** 3376 / *Strategic Sealift*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Sealift Concept Development	WR	Various Contractors : Various	0.000	1.283	Jan 2015	0.000		1.700	Jan 2017	-		1.700	Continuing	Continuing	Continuing
Shipboard Crane Systems	WR	Various Contractors : Various	0.000	1.250	Jan 2015	0.000		1.000	Jan 2017	-		1.000	Continuing	Continuing	Continuing
Lighter/HSV Seabase to Shore Cargo Transfer	WR	Various Contractors : Various	0.000	3.060	Jan 2015	0.000		1.511	Jan 2017	-		1.511	Continuing	Continuing	Continuing
		Subtotal	0.000	5.593		0.000		4.211		-		4.211	-	-	-

Remarks

1. FY 2016, and prior years (FY14 and earlier) were funded under NDSF BA 04 Project 3116 Strategic Sealift Research and Development.

2. Award dates reflect initial date of incremental funding execution.

	Prior Years	FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	5.593		0.000		4.211		-		4.211	-	-	-

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603563N / *Ship Concept Advanced Design*	**Project (Number/Name)** 3376 / *Strategic Sealift*

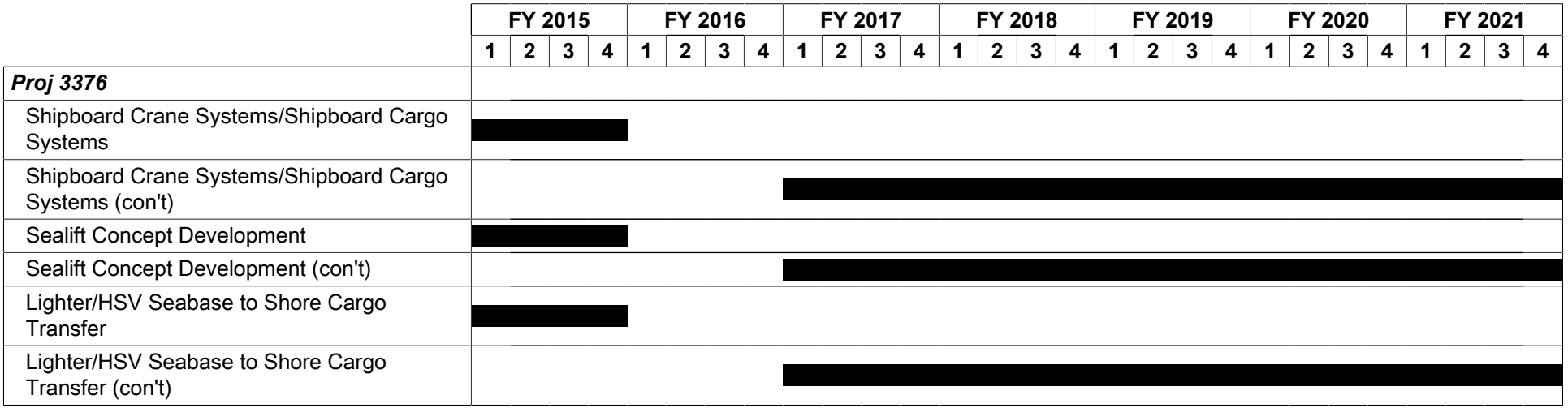


Exhibit R-4A, RDT&E Schedule Details: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603563N / *Ship Concept Advanced Design*	**Project (Number/Name)** 3376 / *Strategic Sealift*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 3376				
Shipboard Crane Systems/Shipboard Cargo Systems	1	2015	4	2015
Shipboard Crane Systems/Shipboard Cargo Systems (con't)	1	2017	4	2021
Sealift Concept Development	1	2015	4	2015
Sealift Concept Development (con't)	1	2017	4	2021
Lighter/HSV Seabase to Shore Cargo Transfer	1	2015	4	2015
Lighter/HSV Seabase to Shore Cargo Transfer (con't)	1	2017	4	2021

Exhibit R-2, RDT&E Budget Item Justification: PB 2017 Navy											Date: February 2016	
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 4: *Advanced Component Development & Prototypes (ACD&P)*					R-1 Program Element (Number/Name) PE 0603564N *I Ship Prel Design & Feasibility Studies*							
COST ($ in Millions)	**Prior Years**	**FY 2015**	**FY 2016**	**FY 2017 Base**	**FY 2017 OCO**	**FY 2017 Total**	**FY 2018**	**FY 2019**	**FY 2020**	**FY 2021**	**Cost To Complete**	**Total Cost**
Total Program Element	40.769	8.007	3.332	15.805	-	15.805	11.645	8.863	9.076	9.283	Continuing	Continuing
0409: *DDG-51 Flt III Concept Development*	40.769	3.007	2.332	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	46.108
3377: *T-ATS (X) Ship Concept Development*	0.000	5.000	1.000	0.962	-	0.962	0.000	0.000	0.000	0.000	0.000	6.962
3389: *OPLOG IPT Development*	0.000	0.000	0.000	14.843	-	14.843	11.645	8.863	9.076	9.283	Continuing	Continuing
Program MDAP/MAIS Code: 180												

A. Mission Description and Budget Item Justification

0409 - DDG 51 FLT III Concept Development - Develop Preliminary Analysis, Testing, and Design for introduction of DDG 51 FLT III in FY16.

3377 - The Navy requires ocean-going towing, salvage, and rescue capabilities to support Fleet operations. The Navy's current capabilities are provided by four T-ATF 166 class Fleet Tugs and four T-ARS 50 class Salvage ships which reach the end of their expected service lives starting in 2020 and 2025, respectively.
The T-ATF Fleet Tugs perform towing at sea, salvage, and diving operations; act as a support ship for portable deep-diving equipment and submarine rescue operations; provide fire-fighting assistance; and perform oil spill pollution abatement. The T-ARS Salvage Ships perform combat salvage, lifting, emergency repair, and rescue towing of combatant or support ships damaged, stranded, scuttled, distressed, or abandoned at sea to repair yards or safe havens.
The T-ATS(X) program will recapitalize the current Fleet Tugs and Salvage Ships with a common hull Towing, Salvage and Rescue Ship (T-ATS(X)) that is capable of performing the missions of the retiring T-ATF and T-ARS classes. RDT&E funding will provide for trade studies and program support leading to award of a Detail Design and Construction contract in FY17.

3389 - Naval Operational Logistics Integration (OPLOG) IPT Development - Develops enabling technologies for future and in-service afloat operational logistics and integrated supply force and combatant logistics requirements; and conducts cooperative initiatives with acquisition programs, program sponsors, engineering managers, the Navy science and technology community and Fleet customers. OPLOG develops integrated, cross-platform (i.e. applicable to more than one ship class/type) operational logistics and energy conservation technologies and capabilities as well as draft acquisition and operations policy ensuring future Naval systems leverage emerging logistic capabilities and technologies to provide operationally effective and energy efficient logistics delivery.

Exhibit R-2, RDT&E Budget Item Justification: PB 2017 Navy					Date: February 2016
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 4: *Advanced Component Development & Prototypes (ACD&P)*		R-1 Program Element (Number/Name) PE 0603564N *I Ship Prel Design & Feasibility Studies*			
B. Program Change Summary ($ in Millions)	**FY 2015**	**FY 2016**	**FY 2017 Base**	**FY 2017 OCO**	**FY 2017 Total**
Previous President's Budget	1.773	4.332	2.500	-	2.500
Current President's Budget	8.007	3.332	15.805	-	15.805
Total Adjustments	6.234	-1.000	13.305	-	13.305
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-1.000			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	6.255	0.000			
• SBIR/STTR Transfer	-0.021	0.000			
• Program Adjustments	0.000	0.000	14.298	-	14.298
• Rate/Misc Adjustments	0.000	0.000	-0.993	-	-0.993

Change Summary Explanation

Funding:

Decrease in Ship Preliminary Design and Feasibility Studies by $0.048 million as required for the Department of the Navy to comply with the Bipartisan Budget Act of 2015.

The Department moved FY17 and later funding from National Defense Sealift Fund (NDSF) PE 0408042N PRJ 3117 (Naval Operational Logistics Integration) to PE 0603564N PRJ 3389 (Naval Operational Logistics Integration IPT Development). FY 2015 amount (NDSF): $10.963M. FY 16 amount (NDSF): $17.927M. This project is not a new start.

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603564N / *Ship Prel Design & Feasibility Studies*	Project (Number/Name) 0409 / *DDG-51 Flt III Concept Development*	

COST ($ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
0409: *DDG-51 Flt III Concept Development*	40.769	3.007	2.332	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	46.108
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

DDG 51 FLT III Concept Development study - Funding provided to evaluate design options associated with FLT III cost and feasibility. The concepts were variants of the DDG 51 Flight IIA design and included incorporation of SPY-6 (AMDR).

DDG 51 FLT III Preliminary Design - Funding provided for preliminary design efforts associated with introduction of Flight III in FY16. Efforts included Finite Element Analysis (FEA) of the Deckhouse Structure, Electromagnetic Signatures, Electromagnetic Interference (EMI), Electromagnetic Pulse (EMP), and Radiation Hazard Analysis, Electrical Power capability increase and Distribution System analysis, Cooling Systems analysis, Topside Signature analysis, and Weight and Stability analysis.

DDG 51 FLT III Contract Design - Funding is provided beginning in FY 2013 to use the results from Preliminary Design to produce a technical package. This phase will develop contract drawings and specifications for the Detail Design and Construction contracts.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Title: Proj:0409 DDG-51 Flt III Concept Development	3.007	2.332	0.000	0.000	0.000
Articles:	-	-	-	-	-
FY 2015 Accomplishments: Developed functional design Government Furnished Information for combat systems. Continued technical data package development and system testing of High Efficiency Small-Compressor. Supported FLT III cost estimating.					
FY 2016 Plans: Incorporate SPY-6 Government Furnished Information updates. Incorporate HES-C Vendor Furnished Information updates. Complete modeling and analysis efforts.					
FY 2017 Base Plans: N/A					
FY 2017 OCO Plans:					

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603564N / *Ship Prel Design & Feasibility Studies*	**Project (Number/Name)** 0409 / *DDG-51 Flt III Concept Development*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
N/A					
Accomplishments/Planned Programs Subtotals	3.007	2.332	0.000	0.000	0.000

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
• SCN/2122: *DDG 51 Class*	2,924.381	4,207.664	3,211.292	-	3,211.292	3,427.566	3,508.166	3,595.403	3,665.113	Continuing	Continuing
• SCN/5300: *Completion of PY Shipbuilding Programs (DDG 51)*	0.000	0.000	15.959	-	15.959	105.343	37.747	0.000	0.000	0.000	159.049

Remarks

D. Acquisition Strategy

DDG 51 FLT III concept development provides technical assistance to develop a design package that supports the award of a Flight III ECP. The DDG 51 Acquisition Strategy reflects the competitive award of the FY13-17 Multi-Year Procurement in a Flight IIA configuration, and supports Flight III upgrades beginning with one of the FY16 ships.

E. Performance Metrics

None

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603564N / *Ship Prel Design & Feasibility Studies*	Project (Number/Name) 0409 / *DDG-51 Flt III Concept Development*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
DDG 51 FLT III Concept Study	WR	NSWC : Dahlgren, VA	2.920	0.000		0.000		0.000		-		0.000	0.000	2.920	-
DDG 51 FLT III Concept Study	WR	NSWC : Carderock, MD	3.076	0.000		0.000		0.000		-		0.000	0.000	3.076	-
DDG 51 FLT III Concept Study	WR	SPAWAR : Charleston, SC	0.285	0.000		0.000		0.000		-		0.000	0.000	0.285	-
DDG 51 FLT III Concept Study	FFRDC	JHU : Baltimore, MD	1.447	0.000		0.000		0.000		-		0.000	0.000	1.447	-
DDG 51 FLT III Concept Study	MIPR	CPSD : Columbia, SC	0.000	0.000		0.000		0.000		-		0.000	0.000	0.000	-
DDG 51 FLT III Concept Study	C/CPAF	BIW : Bath, ME	0.376	0.000		0.000		0.000		-		0.000	0.000	0.376	-
DDG 51 FLT III Concept Study	WR	NRL : Washington, DC	0.164	0.000		0.000		0.000		-		0.000	0.000	0.164	-
DDG 51 FLT III Concept Study	C/CPAF	Ingalls : Pascagoula, MS	0.214	0.000		0.000		0.000		-		0.000	0.000	0.214	-
DDG 51 FLT III Concept Study	C/CPAF	Seaport : Washington, DC	4.819	0.000		0.000		0.000		-		0.000	0.000	4.819	-
DDG 51 FLT III Concept Study	MIPR	DTIC : Ft. Belvoir, VA	0.002	0.000		0.000		0.000		-		0.000	0.000	0.002	-
DDG 51 FLT III Concept Study	Various	Various : Washington, DC	1.653	0.000		0.000		0.000		-		0.000	0.000	1.653	-
DDG 51 FLT III Concept Study	WR	SPAWAR : San Diego, CA	0.244	0.000		0.000		0.000		-		0.000	0.000	0.244	-
DDG 51 FLT III Concept Study	WR	NAWC : Pax River, MD	0.025	0.000		0.000		0.000		-		0.000	0.000	0.025	-
DDG 51 FLT III Preliminary Design	WR	NSWC : Carderock, MD	5.373	0.000		0.000		0.000		-		0.000	0.000	5.373	-
DDG 51 FLT III Preliminary Design	C/CPAF	Seaport : Washington, DC	6.675	0.000		0.000		0.000		-		0.000	0.000	6.675	-
DDG 51 FLT III Preliminary Design	WR	NSWC : Dahlgren, VA	2.281	0.000		0.000		0.000		-		0.000	0.000	2.281	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603564N / *Ship Prel Design & Feasibility Studies*	**Project (Number/Name)** 0409 / *DDG-51 Flt III Concept Development*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
DDG 51 FLT III Preliminary Design	C/CPAF	BIW : Bath, ME	0.630	0.000		0.000		0.000		-		0.000	0.000	0.630	-
DDG 51 FLT III Preliminary Design	C/CPAF	Ingalls : Pascagoula, MS	0.630	0.000		0.000		0.000		-		0.000	0.000	0.630	-
DDG 51 FLT III Contract Design	C/FFP	YORK : York, PA	2.281	0.812	Jan 2016	1.912	Mar 2016	0.000		-		0.000	0.000	5.005	-
DDG 51 FLT III Contract Design	WR	NSWC : Carderock, MD	2.094	0.000		0.420	Dec 2015	0.000		-		0.000	0.000	2.514	-
DDG 51 FLT III Contract Design	C/CPAF	Ingalls : Pascagoula, MS	0.205	0.000		0.000		0.000		-		0.000	0.000	0.205	-
DDG 51 FLT III Contract Design	C/CPAF	Seaport : Washington, DC	5.375	2.195	Feb 2015	0.000		0.000		-		0.000	0.000	7.570	-
		Subtotal	40.769	3.007		2.332		0.000		-		0.000	0.000	46.108	-

	Prior Years	FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	40.769	3.007		2.332		0.000		-		0.000	0.000	46.108	-

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603564N / *Ship Prel Design & Feasibility Studies*	**Project (Number/Name)** 0409 / *DDG-51 Flt III Concept Development*

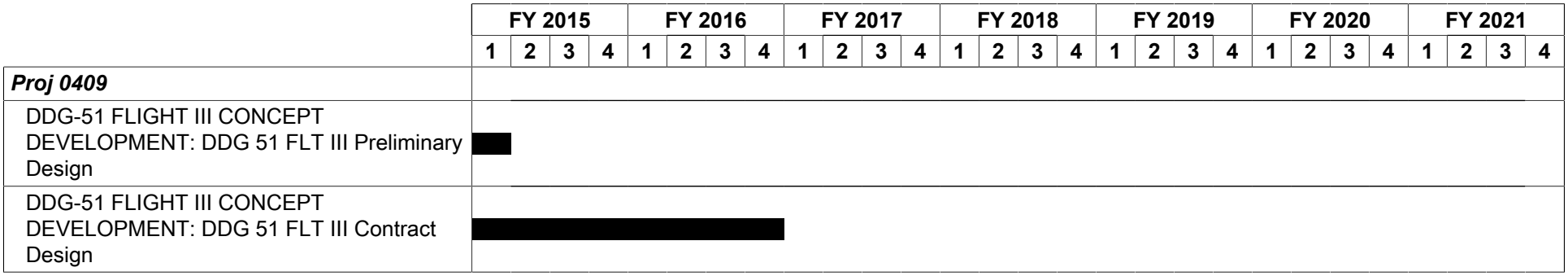


Exhibit R-4A, RDT&E Schedule Details: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603564N / *Ship Prel Design & Feasibility Studies*	**Project (Number/Name)** 0409 / *DDG-51 Flt III Concept Development*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 0409				
DDG-51 FLIGHT III CONCEPT DEVELOPMENT: DDG 51 FLT III Preliminary Design	1	2015	1	2015
DDG-51 FLIGHT III CONCEPT DEVELOPMENT: DDG 51 FLT III Contract Design	1	2015	4	2016

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603564N / *Ship Prel Design & Feasibility Studies*	Project (Number/Name) 3377 / *T-ATS (X) Ship Concept Development*	

COST ($ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
3377: *T-ATS (X) Ship Concept Development*	0.000	5.000	1.000	0.962	-	0.962	0.000	0.000	0.000	0.000	0.000	6.962
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

T-ATS(X) Design - Recapitalizes the existing T-ATF 166 Fleet Tug and T-ARS 50 Salvage Ship Classes with a common hull Towing, Salvage and Rescue Ship (T-ATS(X)) to support Fleet operations. The T-ATF Fleet Tugs perform towing at sea, salvage, and diving operations; act as a support ship for portable deep-diving equipment and submarine rescue operations; provide fire-fighting assistance; and perform oil spill pollution abatement. The T-ARS Salvage Ships perform combat salvage, lifting, emergency repair, and rescue towing of combatant or support ships damaged, stranded, scuttled, distressed, or abandoned at sea to repair yards or safe havens.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Title: Ship Concept Development	5.000	1.000	0.962	0.000	0.962
Articles:	-	-	-	-	-
Description: Ship Concept Development for future tug, salvage, and rescue mission capabilities.					
FY 2015 Accomplishments: Continued to provide engineering support for the T-ATS(X) design process and validation of requirements. Began Industry Design Studies RFP development. Coordinated efforts with NAVSEA, MSC, PEO Ships, CNO, ASN RD&A, OSD and Fleet.					
FY 2016 Plans: Complete source selection process, award multiple competitive Industry Studies, design contracts, oversee design phase, and begin preparation of Milestone B documentation. Coordinate efforts with NAVSEA, MSC, PEO Ships, CNO, ASN RD&A, OSD and Fleet.					
FY 2017 Base Plans: Finish documentation and conduct Milestone B. Issue Request for Proposal (RFP), conduct source selection, and award contract for Detail Design and Construction(DD&C) of the Lead Hull. Coordinate efforts with NAVSEA, MSC, PEO Ships, CNO, ASN RD&A, OSD and Fleet.					
FY 2017 OCO Plans:					

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603564N / *Ship Prel Design & Feasibility Studies*	**Project (Number/Name)** 3377 / *T-ATS (X) Ship Concept Development*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
N/A					
Accomplishments/Planned Programs Subtotals	5.000	1.000	0.962	0.000	0.962

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
• 5035: *T-ATS(X) Fleet Ocean Tug*	0.000	75.000	0.000	-	0.000	76.204	77.767	79.646	74.526	250.522	633.665

Remarks

D. Acquisition Strategy

The first T-ATS(X) will be awarded in FY17.

E. Performance Metrics

None.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603564N / *Ship Prel Design & Feasibility Studies*	**Project (Number/Name)** 3377 / *T-ATS (X) Ship Concept Development*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Engineering Support	Various	Alion/CSC/SPAWAR/ NAVAIR/NSWC : DC, DC, Charleston, SC	0.000	1.500	Jan 2016	0.550	Jun 2016	0.590	Jan 2017	-		0.590	0.000	2.640	-
Industry Design Studies	Various	Various : Various	0.000	1.600	Apr 2016	0.000	Apr 2016	0.000	Jun 2017	-		0.000	0.000	1.600	-
		Subtotal	0.000	3.100		0.550		0.590		-		0.590	0.000	4.240	-

Support ($ in Millions)

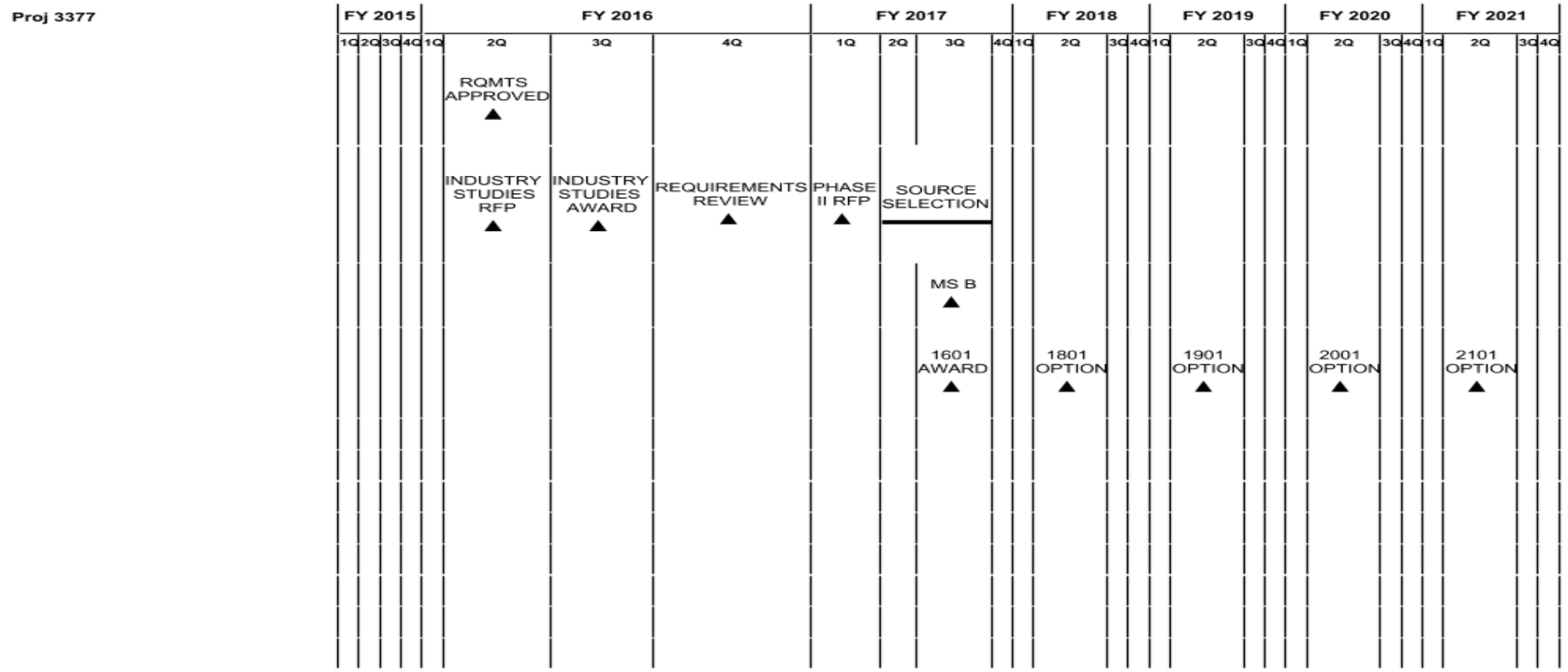
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Milestone Documention Support	C/FFP	CSC : DC	0.000	1.500	Jan 2016	0.100	Jan 2016	0.124	Jan 2017	-		0.124	0.000	1.724	-
RFP and Specification Development	Various	Alion/CSC/ SPAWAR : DC, DC, Charleston, SC	0.000	0.210	Mar 2016	0.250	Jan 2016	0.148	Jan 2017	-		0.148	0.000	0.608	-
Test & Evaluation Planning	Various	OPTAVFOR, CSC, ALION : DC, CA, SC	0.000	0.190	Mar 2016	0.100	Jan 2016	0.100	Jan 2017	-		0.100	0.000	0.390	-
		Subtotal	0.000	1.900		0.450		0.372		-		0.372	0.000	2.722	-

	Prior Years	FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	5.000		1.000		0.962		-		0.962	0.000	6.962	-

Remarks

$1M of FY 15 funding realigned to support T-AO(X) T&E efforts.

Exhibit R-4, RDT&E Schedule Profile: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603564N / *Ship Prel Design & Feasibility Studies*	**Project (Number/Name)** 3377 / *T-ATS (X) Ship Concept Development*



2017PB - 0603564N - 3377

Exhibit R-4A, RDT&E Schedule Details: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603564N / *Ship Prel Design & Feasibility Studies*	**Project (Number/Name)** 3377 / *T-ATS (X) Ship Concept Development*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 3377				
T-ATS(X) REQUIREMENTS APPROVED	2	2016	2	2016
T-ATS(X) RELEASE INDUSTRY STUDIES RFP	2	2016	2	2016
T-ATS(X) INDUSTRY STUDIES CONTRACT AWARD	3	2016	3	2016
T-ATS(X) RELEASE OF PHASE II RFP	1	2017	1	2017
POST-INDUSTRY STUDIES REQUIREMENTS REVIEW	4	2016	4	2016
T-ATS(X) SOURCE SELECTION	2	2017	3	2017
T-ATS(X) MILESTONE B	3	2017	3	2017
T-ATS(X) 1601 DD&C CONTRACT AWARD	3	2017	3	2017
T-ATS(X) 1801 OPTION AWARD	2	2018	2	2018
T-ATS(X) 1901 OPTION AWARD	2	2019	2	2019
T-ATS(X) 2001 OPTION AWARD	2	2020	2	2020
T-ATS(X) 2101 OPTION AWARD	2	2021	2	2021

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603564N / *Ship Prel Design & Feasibility Studies*	Project (Number/Name) 3389 / *OPLOG IPT Development*	

COST ($ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
3389: *OPLOG IPT Development*	0.000	0.000	0.000	14.843	-	14.843	11.645	8.863	9.076	9.283	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

Note

Prior to FY2017, Project 3389 was funded in PE 0408042N, National Defense Sealift Fund under Project 3117 Naval Operational Logistics Integration. This project is not a new start.

A. Mission Description and Budget Item Justification

Project 3389 - Develops enabling technologies for future and in-service afloat operational logistics and integrated supply systems; defines integrated combat logistics force and combatant logistics requirements; and conducts cooperative initiatives with acquisition programs, program sponsors, engineering managers, the Navy science and technology community, and Fleet customers. OPLOG develops integrated, cross-platform (i.e. applicable to more than one ship class/type) operational logistics and energy conservation technologies and capabilities as well as draft acquisition and operations policy ensuring future Naval systems leverage emerging logistic capabilities and technologies to provide operationally effective and energy efficient logistics delivery.

Though the operational logistics family of systems touches all aspects of Naval presence and power projection, operational logistics capability and system interfaces typically have been left to individual acquisition programs to develop and resolve. Technology development is necessary to mitigate technological and operational risk before ship acquisition programs accept new technologies. This project provides a foundation for the transition and systems development of science & technology initiatives evolving from the Office of Naval Research (ONR) Power & Energy Future Naval Capabilities (FNC), Enterprise and Platform Enablers FNC, Seabasing FNC, and from other enabling Government, industry and academia concepts to the acquisition community. Thus, this project resources continued research and development of appropriate technologies with applicability to multiple acquisition programs and defines and matures performance and interface requirements for those technologies. This project continues to identify, develop, integrate, demonstrate, and transition logistics technologies to improve the cost effectiveness of Fleet at sea logistics delivery through outreach, coordination and collaboration with industry, academia, Fleet, and Enterprise representatives.

This project will continue to develop improved shipboard replenishment, transfer, and handling systems and components as well as asset visibility and standardized packaging technologies. This project includes development of approaches to reduce operation and maintenance costs of the logistics Fleet. This integrated suite of developed capabilities will enable multiple ship types to leverage common technologies common across DoD (Joint) and commercial transportation networks providing a more affordable, energy efficient, mission capable force. These capabilities and system-of-systems approach will be applied to concept development of future auxiliary force
architectures.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Title: Advanced Systems	0.000	0.000	2.456	0.000	2.456

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603564N / *Ship Prel Design & Feasibility Studies*	**Project (Number/Name)** 3389 / *OPLOG IPT Development*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Articles:	-	-	-	-	-
FY 2015 Accomplishments: N/A ***FY 2016 Plans:*** N/A ***FY 2017 Base Plans:*** Continue land-based testing of fueling station. Complete design of hybrid STREAM system for legacy CLF ships. Purchase and testing of prototype components for land-based testing to prove approach for modernization of installed Navy Standard UNREP stations. ***FY 2017 OCO Plans:*** N/A					
Title: Logistics Architectures	0.000	0.000	0.050	0.000	0.050
Articles:	-	-	-	-	-
FY 2015 Accomplishments: N/A ***FY 2016 Plans:*** N/A ***FY 2017 Base Plans:*** Conduct combat logistics force data collection and operational studies. ***FY 2017 OCO Plans:*** N/A					
Title: Shipboard Energy Conservation	0.000	0.000	12.337	0.000	12.337
Articles:	-	-	-	-	-
FY 2015 Accomplishments: N/A ***FY 2016 Plans:***					

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603564N / *Ship Prel Design & Feasibility Studies*	**Project (Number/Name)** 3389 / *OPLOG IPT Development*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
N/A ***FY 2017 Base Plans:*** Continue energy management approach improvements, validation of energy savings from implementation of energy conservation measures, identification and evaluation of additional energy conservation concepts, transition of successful energy conservation measures to MSC, and coordination with other Navy energy conservation programs to leverage successful energy reduction approaches. Prototype purchase, installations, and testing planned for FY2017. ***FY 2017 OCO Plans:*** N/A					
Accomplishments/Planned Programs Subtotals	0.000	0.000	14.843	0.000	14.843

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

Not applicable for OPLOG R&D efforts

E. Performance Metrics

Annual Program Review

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603564N / *Ship Prel Design & Feasibility Studies*	**Project (Number/Name)** 3389 / *OPLOG IPT Development*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Primary Hardware Development	Various	VARIOUS : Various	0.000	0.000		0.000		3.450	Jan 2017	-		3.450	Continuing	Continuing	Continuing
Ancillary Hardware Development	Various	VARIOUS : Various	0.000	0.000		0.000		1.796	Jan 2017	-		1.796	Continuing	Continuing	Continuing
Ship Integration	Various	VAROUS : Various	0.000	0.000		0.000		1.700	Jan 2017	-		1.700	Continuing	Continuing	Continuing
Ship Suitability	Various	VARIOUS : Various	0.000	0.000		0.000		0.750	Jan 2017	-		0.750	Continuing	Continuing	Continuing
System Engineering	Various	VARIOUS : Various	0.000	0.000		0.000		1.500	Jan 2017	-		1.500	Continuing	Continuing	Continuing
		Subtotal	0.000	0.000		0.000		9.196		-		9.196	-	-	-

Remarks

Award dates reflect initial award of incremental execution.

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Development Suport	Various	VARIOUS : Various	0.000	0.000		0.000		1.000	Jan 2017	-		1.000	Continuing	Continuing	Continuing
Integrated Logistics Support	Various	VARIOUS : Various	0.000	0.000		0.000		0.300	Jan 2017	-		0.300	Continuing	Continuing	Continuing
Configuration Management	Various	VARIOUS : Various	0.000	0.000		0.000		0.500	Jan 2017	-		0.500	Continuing	Continuing	Continuing
Technical Data	Various	VAROUS : Various	0.000	0.000		0.000		0.800	Jan 2017	-		0.800	Continuing	Continuing	Continuing
Studies & Analysis	Various	VARIOUS : Various	0.000	0.000		0.000		0.400	Jan 2017	-		0.400	Continuing	Continuing	Continuing
		Subtotal	0.000	0.000		0.000		3.000		-		3.000	-	-	-

Remarks

Award dates reflect initial award of incremental execution.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603564N / *Ship Prel Design & Feasibility Studies*	Project (Number/Name) 3389 / *OPLOG IPT Development*	

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation	Various	VARIOUS : Various	0.000	0.000		0.000		1.297	Jan 2017	-		1.297	Continuing	Continuing	Continuing
Operational Test & Evaluation	Various	VARIOUS : Various	0.000	0.000		0.000		1.000	Jan 2017	-		1.000	Continuing	Continuing	Continuing
		Subtotal	0.000	0.000		0.000		2.297		-		2.297	-	-	-

Remarks

Award dates reflect initial award of incremental execution.

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Contractor Engineering Support	Various	VARIOUS : Various	0.000	0.000		0.000		0.100	Jan 2017	-		0.100	Continuing	Continuing	Continuing
Government Engineering Support	Various	VARIOUS : Various	0.000	0.000		0.000		0.250	Jan 2017	-		0.250	Continuing	Continuing	Continuing
		Subtotal	0.000	0.000		0.000		0.350		-		0.350	-	-	-

Remarks

Award dates reflect initial award of incremental execution.

	Prior Years	FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	0.000		0.000		14.843		-		14.843	-	-	-

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603564N / *Ship Prel Design & Feasibility Studies*	**Project (Number/Name)** 3389 / *OPLOG IPT Development*

Exhibit R-4, RDT&E Schedule Profile: PB17 Navy		Date: December 2015
Appropriation/Budget Activity 1319 / BA 04	**R-1 Program Element (Number/Name)** PE 0603654N / *Ship Preliminary Design and Feasibility Studies*	**Project (Number/Name)** 3389 / *OPLOG*

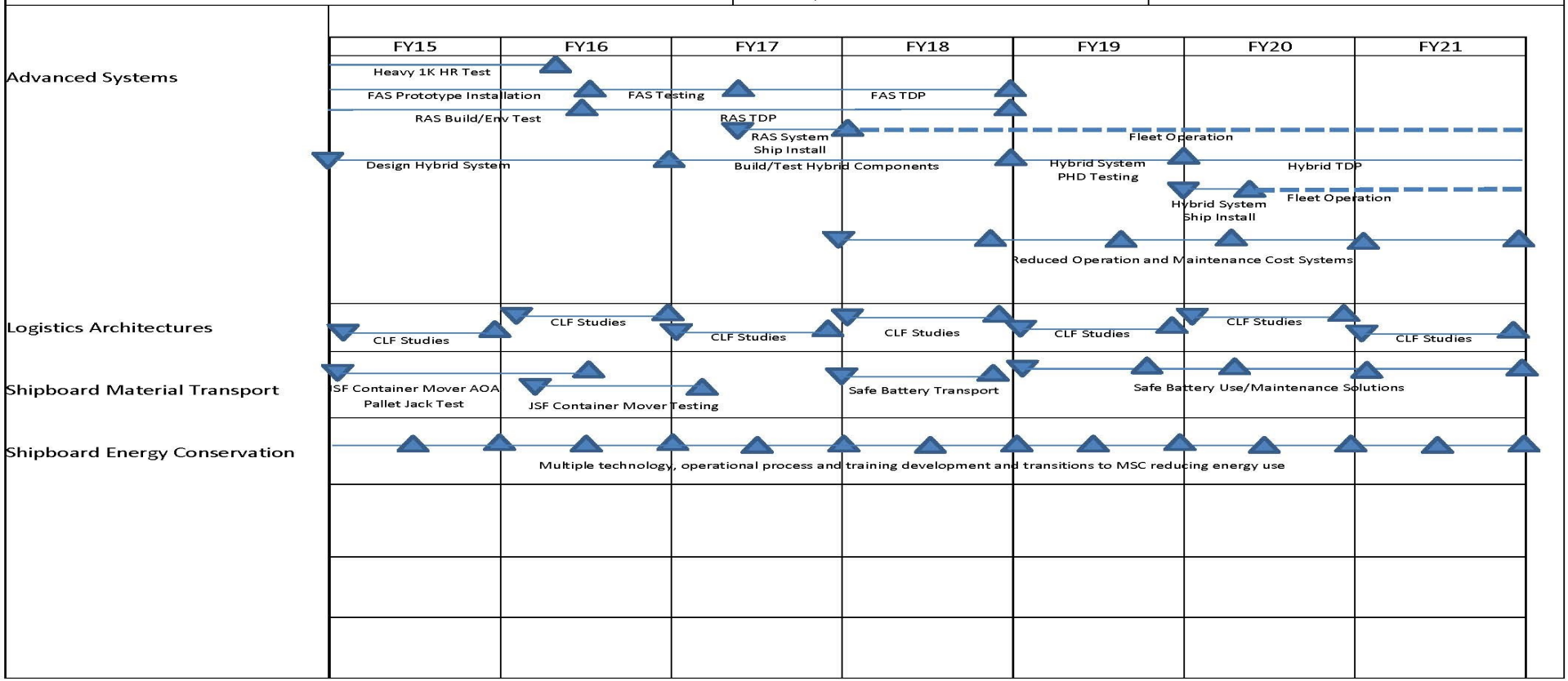


Exhibit R-4A, RDT&E Schedule Details: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603564N / *Ship Prel Design & Feasibility Studies*	**Project (Number/Name)** 3389 / *OPLOG IPT Development*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 3389				
Advanced Replenishment	1	2017	4	2021
Logistics Architectures	1	2017	4	2021
Shipboard Material Transport	1	2018	4	2021
Shipboard Energy Conservation	1	2017	4	2021

Exhibit R-2, RDT&E Budget Item Justification: PB 2017 Navy	Date: February 2016
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 0603570N *I Advanced Nuclear Power Systems*

COST ($ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
Total Program Element	0.000	499.961	482.040	453.313	-	453.313	453.317	347.257	337.737	218.803	Continuing	Continuing
1258: *Nuclear Technology Development*	0.000	65.204	62.767	62.987	-	62.987	64.038	66.039	67.646	69.103	Continuing	Continuing
2692: *CVN 21 Propulsion Plant Development*	0.000	60.459	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	60.459
3219: *SBSD Nuclear Technology Development*	0.000	369.964	419.273	390.326	-	390.326	389.279	281.218	270.091	149.700	Continuing	Continuing
3221: *Training Platform Replacement*	0.000	4.334	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	4.334

A. Mission Description and Budget Item Justification

The details of this program element are classified CONFIDENTIAL and are submitted annually to Congress in the classified budget justification books.

B. Program Change Summary ($ in Millions)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Previous President's Budget	499.961	482.040	472.203	-	472.203
Current President's Budget	499.961	482.040	453.313	-	453.313
Total Adjustments	0.000	0.000	-18.890	-	-18.890
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Program Adjustments	0.000	0.000	0.020	-	0.020
• Rate/Misc Adjustments	0.000	0.000	-18.910	-	-18.910

Change Summary Explanation

Technical: Not applicable.

Schedule: Not applicable.

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603570N / *Advanced Nuclear Power Systems*	Project (Number/Name) 1258 / *Nuclear Technology Development*	

COST ($ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
1258: *Nuclear Technology Development*	0.000	65.204	62.767	62.987	-	62.987	64.038	66.039	67.646	69.103	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The details of this program element are classified CONFIDENTIAL and are submitted annually to Congress in the classified budget justification books.

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603570N / *Advanced Nuclear Power Systems*	Project (Number/Name) 2692 / *CVN 21 Propulsion Plant Development*	

COST ($ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
2692: *CVN 21 Propulsion Plant Development*	0.000	60.459	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	60.459
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The details of this program element are classified CONFIDENTIAL and are submitted annually to Congress in the classified budget justification books.

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603570N / *Advanced Nuclear Power Systems*	Project (Number/Name) 3219 / *SBSD Nuclear Technology Development*	

COST ($ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
3219: *SBSD Nuclear Technology Development*	0.000	369.964	419.273	390.326	-	390.326	389.279	281.218	270.091	149.700	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The details of this program element are classified CONFIDENTIAL and are submitted annually to Congress in the classified budget justification books.

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603570N / *Advanced Nuclear Power Systems*	Project (Number/Name) 3221 / *Training Platform Replacement*	

COST ($ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
3221: *Training Platform Replacement*	0.000	4.334	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	4.334
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The details of this program element are classified CONFIDENTIAL and are submitted annually to Congress in the classified budget justification books.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2017 Navy											Date: February 2016	
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 4: *Advanced Component Development & Prototypes (ACD&P)*					R-1 Program Element (Number/Name) PE 0603573N *I Advanced Surface Machinery Sys*							
COST ($ in Millions)	**Prior Years**	**FY 2015**	**FY 2016**	**FY 2017 Base**	**FY 2017 OCO**	**FY 2017 Total**	**FY 2018**	**FY 2019**	**FY 2020**	**FY 2021**	**Cost To Complete**	**Total Cost**
Total Program Element	126.812	20.357	24.143	36.655	-	36.655	30.114	22.656	21.616	21.152	Continuing	Continuing
2471: *Integrated Power Systems (IPS)*	126.812	20.357	24.143	36.655	-	36.655	30.114	22.656	21.616	21.152	Continuing	Continuing

A. Mission Description and Budget Item Justification

FY0217 funding request reflects increase of $18 million for increased scope associated with Cybersecurity Boundary Defense Capability engineering for surface ship classes.

This PE includes the development of advanced surface ship hull, mechanical, and electrical (HM&E) components and systems for all future ships and back-fit ships where appropriate. This PE is managed by PMS 320, the Electric Ships Office, located organizationally within PEO SHIPS, with responsibility for developing Naval Power and Energy Systems that focus on energy efficiency, providing power to mission systems, and platform integration of those components and systems. The mission of PMS 320 is to develop and provide smaller, simpler, more affordable and more capable electric power systems for all Navy platforms and focus Navy and industry investments.

This PE is the bridge between Science and Technology (S&T) and ship platform and mission systems acquisition programs by identifying prospective applications for S&T research, advanced development, and performing additional product development and qualification when necessary to meet platform or mission system requirements. This PE also includes cybersecurity Boundary Defense Capability (BDC) development. BDC funds will be utilized for engineering tasks necessary to implement a cyber security boundary defense capability for the Hull, Mechanical and Electrical (H,M&E) control systems on surface ships. The H,M&E systems to be protected will include Machinery Control Systems, Electrical Power Systems, Damage Control and Firefighting, Auxiliary Machinery and Fluid Systems, Engines and Power Transmission Systems, Gas Turbine Systems, Video Systems, as well as other H,M&E systems. The intent of the total boundary defense capability will be to allow the ship to better protect, detect, respond, and recover from a cyber attack on the H,M&E enclave on surface ships.

In October 2009, SECNAV outlined a set of specific objectives supporting U.S. Navy energy reform including several aimed at significantly reducing Fleet fuel consumption and improving our energy security posture. PMS 320 supports the DON Energy Goals by employing an integrated approach to develop and transition more affordable technologies that satisfy increasing shipboard power demands and high operational tempo while improving energy efficiency, reducing fuel consumption, and reducing Total Ownership Cost.

Exhibit R-2, RDT&E Budget Item Justification: PB 2017 Navy					Date: February 2016
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 4: *Advanced Component Development & Prototypes (ACD&P)*			R-1 Program Element (Number/Name) PE 0603573N *I Advanced Surface Machinery Sys*		
B. Program Change Summary ($ in Millions)	**FY 2015**	**FY 2016**	**FY 2017 Base**	**FY 2017 OCO**	**FY 2017 Total**
Previous President's Budget	21.026	25.904	23.221	-	23.221
Current President's Budget	20.357	24.143	36.655	-	36.655
Total Adjustments	-0.669	-1.761	13.434	-	13.434
• Congressional General Reductions	-	-0.011			
• Congressional Directed Reductions	-	-1.750			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.669	0.000			
• Program Adjustments	0.000	0.000	-2.000	-	-2.000
• Rate/Misc Adjustments	0.000	0.000	15.434	-	15.434

Change Summary Explanation

FY 2015 funding request reflects a reduction of $0.669 million to account for SBIR/STTR Transfer.

FY 2016 funding request reflects congressional reductions of $1.750 million for program execution delays and $0.011 million for FFRDC.

FY 2017 funding request reflects reductions of $2 million in support of other program adjustments, $0.718 million to account for prior year available balances, $1.542 million for the Department of the Navy to comply with the Bipartisan Budget Act of 2015, and $0.306 million to account for rates/miscellaneous adjustments. FY0217 funding request also reflects an increase of $18 million for increased scope associated with cybersecurity boundary defense capability engineering for surface ship classes

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603573N / *Advanced Surface Machinery Sys*	Project (Number/Name) 2471 / *Integrated Power Systems (IPS)*	

COST ($ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
2471: *Integrated Power Systems (IPS)*	126.812	20.357	24.143	36.655	-	36.655	30.114	22.656	21.616	21.152	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The program increase between FY2016 & FY0217 funding request also reflects an increase of $18 million for increased scope associated with cybersecurity boundary defense capability engineering for surface ship classes.

This project supports the development and transition strategy of Navy Power and Energy Systems including power generation, power conversion, power distribution, energy storage, power utilization and automation and control functions for fully integrated electric propulsion (such as T-AKE -1 class or DDG1000 class), hybrid electric propulsion (such as LHD 8 and LHA(R) class), as well as legacy mechanical propulsion ships (such as DDG51 class). This project supports optimized integration of mission systems, appropriate component and system controls, integration of components and systems into future and current ships, and providing power and energy system solution alternatives to new and existing platforms.

Project developments are aligned with the Navy's 30 year shipbuilding plan via the Naval Power and Energy Systems Technology Development Roadmap, which outlines the way ahead for future developments and provides a basis for coordinated planning and investment by the Navy and private industry.

This project develops and transitions products that increase energy efficiency (and thereby create fewer greenhouse gas emissions and reduce dependence upon foreign petroleum sources), provide additional power to mission systems, integrates those components and systems into ship platforms, and defining cybersecurity capabilities that will be implemented on current in-service Hull, Mechanical and Electrical (HM&E) systems as well as future systems.

DON Energy Initiatives - Energy Storage Module (ESM) and Advanced Power Generation Module (APGM): This project supports the DON Energy Initiative designed to reduce ship energy consumption and increase mission effectiveness through longer time on station. The ESM will provide stable backup power to enable DDG51 Class single genertor operations (and significant fuel savings) when operational situations permit. The APGM includes back fit and forward fit developments including the AG9160RF, Twin Spool, and Gas Turbine (GT) efficiency upgrades. The AG9160RF Gas Turbine Generator (GTG) is an upgrade to the DDG1000 auxiliary gas turbine and will provide increased power to meet DDG51 Flight III requirements for advanced sensors and future weapons with reduction in life cycle costs through increased fuel efficiency over legacy gas turbine generator sets. Twin Spool GTGs will adapt an aero derivative fuel efficient gas turbine to improve fuel efficiency 12-15% over current single shaft gas turbines, reduce total ownership costs, and increase time on station. GT upgrades will provide operational readiness and fuel efficiency improvements to existing gas turbine engines for both backfit and new construction ships.

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603573N / *Advanced Surface Machinery Sys*	**Project (Number/Name)** 2471 / *Integrated Power Systems (IPS)*

Mission Power: Designs, develops, tests and integrates shipboard power systems to incorporate advanced sensors, Directed Energy and other advanced weapons. Design and testing includes Modeling and Simulation, as well as land based testing, to reduce risk and demonstrate readiness for shipboard use. Air Missile Defense Radar (AMDR) Power Conversion Module (PCM) provides power conversion from ship's 4160 VAC distribution systems to 1000 VDC to support AMDR Radar.

Cybersecurity Boundary Defense Capability (BDC): Develops an approach to implement a cybersecurity boundary defense capability for HM&E control systems on surface ships. HM&E systems to be protected will include Machinery Control Systems, Electrical Power Systems, Damage Control and Firefighting, Auxiliary Machinery and Fluid systems, Engines and Power Transmission Systems, Gas Turbine Systems, Video Systems as well as other HM&E systems. Design and technical data packages for software and hardware solutions will be developed. The intent of the total boundary defense capability will be to allow the ship to better protect, detect, respond, and recover from potential cyber attacks on the HM&E enclave on surface ships.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Title: Energy Efficiency	7.628	10.590	11.397	0.000	11.397
Articles:	-	-	-	-	-
FY 2015 Accomplishments: Completed studies to incorporate mission power support capabilities, in addition to Stable Backup Power (SBP), in the design of the Energy Storage Module (ESM). Completed preliminary design of ESM prototype and ordered remaining LLTM. Continued ESM land based test planning. Continued qualification testing of ESM battery sub-system. Completed design of DDG51 Flight III 4.2MW Advanced Power Generation Module (APGM) High Efficiency Plus (HE+) gas turbine engine featuring 2-3% fuel savings over predecessor DDG1000 engines, completed Preliminary Design (PD) of the generator set module, and entered into Detailed Design leading to Critical Design Review in FY16. Began procuring material required for build of APGM Generator Set. Developed comprehensive plan to support Future Surface Combatant power generation requirements featuring 4-10MW Twin Spool gas turbine powered generator sets having superior fuel savings over predecessor single shaft units. Continued planning for future gas turbine operational readiness and fuel efficiency upgrades.					
FY 2016 Plans: Complete design and begin manufacture of ESM prototype for mission system support. Prepare test plans and procedures for Factory Acceptance Testing (FAT) of ESM prototype. Continue qualification of ESM prototype battery sub-system in preparation for testing. Prepare Test Plans and Procedures for ESM prototype land based testing at Florida State University Center for Advanced Power Systems (FSU CAPS). ESM prototype will be					

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603573N / *Advanced Surface Machinery Sys*	**Project (Number/Name)** 2471 / *Integrated Power Systems (IPS)*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
tested at FSU CAPS and results will be exchanged with the United Kingdom (UK) Ministry of Defence (MOD) via the Advanced Electrical Power and Propulsion Project (AEP3) Project Arrangement and the Coalition Warfare Program (CWP) Directed Energy Power Systems (DEPS) project. Complete material procurement for the DDG51 Flight III 4.2MW Advanced Power Generation Module (APGM) generator set and commence manufacture of APGM. Continue Test Planning. Prepare Test Plans and Procedures. Continue planning for future gas turbine operational readiness and fuel efficiency upgrades. ***FY 2017 Base Plans:*** Complete Factory Acceptance Testing (FAT) and deliver ESM prototype to FSU CAPS. Complete Test Plans and Procedures and begin Controller Hardware In the Loop (CHIL) testing in preparation for Power Hardware In the Loop (PHIL) testing. Continue design of ESM SBP system. ESM prototype will be tested at FSU CAPS and results will be exchanged with the United Kingdom (UK) Ministry of Defence (MOD) via the Advanced Electrical Power and Propulsion Project (AEP3) Project Arrangement and the Coalition Warfare Program (CWP) Directed Energy Power Systems (DEPS) project. Complete manufacture of the DDG51 Flight III 4.2MW Advanced Power Generation Module (APGM) generator set, conduct Factory Acceptance Testing (FAT), and prepare for delivery to DDG51 Flight III electrical integration testing at the Naval Surface Warfare Center (NSWC) - Philadelphia, PA. Continue planning for future gas turbine operational readiness and fuel efficiency upgrades. Conduct feasibility studies and Cost Based Assessments; and, develop technical specifications and Interface Controls Document (ICD) for APGM Twin Spool engine in support of Future Surface Combatant power generation requirements. APGM Twin Spool gas turbine powered generator sets have superior fuel savings over predecessor single shaft units. ***FY 2017 OCO Plans:*** N/A					
Title: Mission Power	11.508	12.121	8.002	0.000	8.002
Articles:	-	-	-	-	-

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603573N / *Advanced Surface Machinery Sys*	**Project (Number/Name)** 2471 / *Integrated Power Systems (IPS)*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
FY 2015 Accomplishments: Completed design of DDG51 Flight III Air Missile Defense Radar (AMDR) Power Conversion Module (PCM) shipboard units and ordered Long Lead Time Material (LLTM) for four (4) Low Rate Initial Production (LRIP) units which will support DDG51 Flight III AMDR Developmental Testing (DT) at the Surface Combat System Center (SCSC) Wallops Island, VA and DDG51 Flight III electrical integration testing at the Naval Surface Warfare Center (NSWC) Philadelphia, PA. Commenced planning DDG51 Flight III AMDR PCM LRIP Factory Acceptance Test (FAT) and Environmental Qualification Tests (EQT). Commenced planning for the Power Hardware in the Loop (PHIL) testing at Florida State University. Continued to support the ship building program office planning for electrical system validation testing at the NSWC Philadelphia PA land based test site. Initiated planning for PCM / AMDR combat system integration testing in support of AMDR Developmental Testing (DT) at Wallops Island. Continued developing the concept of a modular, scalable intermediate power and energy system made of common building blocks to support multiple mission systems on various ships. This concept is known as Energy Magazine (EM). The EM can be utilized in back fit and forward fit applications with existing ship power systems and is expected to incorporate building blocks common with the ESM prototype and ESM SBP. Continued EM performance specification development and acquisition approach.					
FY 2016 Plans: Exercise contract options to Manufacture two (2) LRIP units. LRIP units will support DDG51 Flight III AMDR Developmental Testing (DT) at the Surface Combat System Center (SCSC) Wallops Island, VA. Commence Factory Acceptance Test. Continue planning for DDG51 Flight III AMDR PCM LRIP Factory Acceptance Test (FAT) and Environmental Qualification Tests (EQT). Continue planning and commence site modifications for the Power Hardware in the Loop (PHIL) testing at FSU CAPS. Continue planning for electrical system validation testing at the NSWC Philadelphia, PA land based test site, and continue to support the ship building program office planning for PCM / AMDR combat system integration testing in support of AMDR Developmental Testing (DT) at Wallops Island, VA. Continue developing the concept of a modular, scalable intermediate power and energy system made of common building blocks to support multiple mission systems on various ships. This concept is known as Energy Magazine (EM). The EM can be utilized in back fit and forward fit applications with existing ship power systems					

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603573N / *Advanced Surface Machinery Sys*	**Project (Number/Name)** 2471 / *Integrated Power Systems (IPS)*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
and is expected to incorporate building blocks common with the ESM prototype and ESM SBP. Continue EM performance specification development and acquisition approach. ***FY 2017 Base Plans:*** Conduct Factory Acceptance Test and Environmental Qualification Test (EQT) on AMDR PCM LRIP units. Conduct Power Hardware in the Loop (PHIL) testing at FSU CAPS. Continue to support the ship building program office planning for PCM / AMDR combat system integration testing in support of AMDR Developmental Testing (DT) and planning for electrical system validation testing at the NSWC Philadelphia, PA land based test site. Following successful completion of FAT, EQT, and PHIL testing, prepare LRIP units for delivery to DDG51 Flight III AMDR Developmental Testing (DT) at the Surface Combat System Center (SCSC) Wallops Island, VA. Validate mission system power interfaces within existing ship designs with ESM prototype testing. Begin preparation for simulations of advanced power system architectures for fully integrated power and energy systems for potential future surface combatants. Begin developing specifications and acquisition documentation in order to demonstrate at full scale a modular, scalable Energy Magazine to be incorporated into existing platform designs and satisfying the needs of multiple mission systems ready for ship installations. ***FY 2017 OCO Plans:*** N/A					
Title: Naval Power Technology Development / Platform Integration & Transition	1.221	1.432	1.104	0.000	1.104
Articles:	-	-	-	-	-
FY 2015 Accomplishments: Completed biennial update of the Naval Power and Energy Systems Technology Development Roadmap. Supported maturation and transition of ONR Future Naval Capabilities (FNC) products to meet TDR identified gaps. Continued to execute the Advanced Electric Power and Propulsion Project, Project Arrangement (short title AEP3 PA or PA) ref DoD-MOD-N-12-0001 which is an agreement between the US and UK Governments to cooperate on a scope of work associated with characterizing, developing, modeling, and de-risking electrical power and propulsion system architectures and equipment for future surface and submarine platforms to meet the needs of both Navies.					

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603573N / *Advanced Surface Machinery Sys*	**Project (Number/Name)** 2471 / *Integrated Power Systems (IPS)*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Continued to develop power and propulsion system configurations in support of future surface ship acquisition programs. Develop alternative power and propulsion solutions for future surface combatants and amphibious ships. Continue to improve baseline power system performance by performing analysis, modeling and simulation, life cycle cost analysis, producibility studies, module development, and ship integration studies and planning. Continued to analyze alternatives for supplying power to advanced radars, combat systems, and electric weapons power demands and potential interfaces to develop optimum alternative solutions. Continued assessments of Naval Power System alternate architectures to best meet emerging ship requirements. Continued Combat Power and Energy System Overarching Integrated Product Team (OIPT). Generated strategy, technology development plan and resource requirements for future surface combatant integrated power and energy system. ***FY 2016 Plans:*** Continue to execute the Advanced Electric Power and Propulsion Project, Project Arrangement (short title AEP3 PA or PA) ref DoD-MOD-N-12-0001 which is an agreement between the US and UK Governments to cooperate on a scope of work associated with characterizing, developing, modeling, and de-risking electrical power and propulsion system architectures and equipment for future surface and submarine platforms to meet the needs of both Navies. Commence execution of PA complimentary effort (Directed Energy Power Systems (DEPS)) under the Coalition Warfare Program (CWP). Continue to develop power and propulsion system configurations in support of future surface ship acquisition programs. Develop alternative power and propulsion solutions for future surface combatants and amphibious ships. Continue to improve baseline power system performance by performing analysis, modeling and simulation, life cycle cost analysis, producibility studies, module development, and ship integration studies and planning. Continue to analyze alternatives for supplying power to advanced radars, combat systems, and electric weapons power demands and potential interfaces to develop optimum alternative solutions. Continue assessments of Naval Power System alternate architectures to best meet emerging ship requirements. Commence biennial update of the Naval Power and Energy Systems Technology Development Roadmap. Continue to support maturation and transition of ONR Future Naval Capabilities (FNC) products to meet TDR identified gaps.					

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603573N / *Advanced Surface Machinery Sys*	**Project (Number/Name)** 2471 / *Integrated Power Systems (IPS)*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Continue Combat Power and Energy System Overarching Integrated Product Team (OIPT). Continue to generate strategy, technology development plan and resource requirements for future surface combatant integrated power and energy system.					
FY 2017 Base Plans: Continue to execute the Advanced Electric Power and Propulsion Project, Project Arrangement (short title AEP3 PA or PA) ref DoD-MOD-N-12-0001 which is an agreement between the US and UK Governments to cooperate on a scope of work associated with characterizing, developing, modeling, and de-risking electrical power and propulsion system architectures and equipment for future surface and submarine platforms to meet the needs of both Navies. Continued execution of PA complimentary effort (Directed Energy Power Systems (DEPS)) under the Coalition Warfare Program (CWP). Continue to develop power and propulsion system configurations in support of future surface ship acquisition programs. Develop alternative power and propulsion solutions for future surface combatants and amphibious ships. Continue to improve baseline power system performance by performing analysis, modeling and simulation, life cycle cost analysis, producibility studies, module development, and ship integration studies and planning. Continue to analyze alternatives for supplying power to advanced radars, combat systems, and electric weapons power demands and potential interfaces to develop optimum alternative solutions. Continue assessments of Naval Power System alternate architectures to best meet emerging ship requirements. Complete biennial update of the Naval Power and Energy Systems Technology Development Roadmap. Support maturation and transition of ONR Future Naval Capabilities (FNC) products to meet TDR identified gaps. Continue to support maturation and transition of ONR Future Naval Capabilities (FNC) products to meet TDR identified gaps. Continue Combat Power and Energy System Overarching Integrated Product Team (OIPT). Continue to generate strategy, technology development plan and resource requirements for future surface combatant integrated power and energy system.					
FY 2017 OCO Plans:					

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603573N / *Advanced Surface Machinery Sys*	**Project (Number/Name)** 2471 / *Integrated Power Systems (IPS)*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
N/A					
Title: Cybersecurity Boundary Defense Capability	0.000	0.000	16.152	0.000	16.152
Articles:	-	-	-	-	-
FY 2015 Accomplishments: Not Applicable					
FY 2016 Plans: Not Applicable					
FY 2017 Base Plans: Conduct the following studies: cybersecurity assessment of DDG 51 and CG 47 ship class Hull, Mechanical and Electrical (H,M&E) systems; analysis of inter-enclave interfaces; enhanced firewall application analysis; and, Boundary Defense Capability. Plan for future studies on intra-H,M&E enclave controls point, H,M&E cyber situational awareness tools, message authentication, intrusion detection system, Host level protection, and intrusion prevention systems.					
FY 2017 OCO Plans: N/A					
Accomplishments/Planned Programs Subtotals	20.357	24.143	36.655	0.000	36.655

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

This program develops and transitions higher performance and more affordable electric power and propulsion systems to both new construction and back fit ship applications using an evolutionary acquisition approach. For new contract awards, full and open competition is utilized to the maximum extent possible to provide maximum benefit to the Navy at the lowest possible cost to the taxpayer. When able to meet Navy requirements, commercial technology is leveraged to further minimize cost to the Navy. Cybersecurity efforts will maximize use of government field activity labs and already contracted HM&E equipment vendors.

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603573N / *Advanced Surface Machinery Sys*	**Project (Number/Name)** 2471 / *Integrated Power Systems (IPS)*

E. Performance Metrics

This project will execute 100% of the signed Technology Transition Agreements with ONR; complete 100% of the advanced developments currently planned for the Energy Storage Module and Power Generation Module; achieve up to 10% Specific Fuel Consumption (SFC) improvement for Advanced Power Generation Module; mature technology to Technology Readiness Level (TRL) 6 by milestone decisions for ship acquisition program; and, complete HM&E cybersecurity studies and production of a boundary defense capability architecture and implementation approach for HM&E systems on surface ships in alignment with the Task Force Cyber Awareness (TFCA) goals.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603573N / *Advanced Surface Machinery Sys*	**Project (Number/Name)** 2471 / *Integrated Power Systems (IPS)*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Product Development	SS/FFP	Rolls Royce : Walpole, MA	12.941	3.445	Feb 2015	8.465	Nov 2015	4.822	Oct 2016	-		4.822	Continuing	Continuing	Continuing
Product Development	SS/BOA	General Electric Company : Cincinatti, OH	3.560	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Product Development	C/FFP	DRS : DRS, Milwaukee WI	10.077	11.385	Mar 2015	9.945	Oct 2015	7.700	Oct 2016	-		7.700	Continuing	Continuing	Continuing
Product Development	C/CPFF	Various : Various	32.043	1.391	Nov 2014	1.372	Oct 2015	3.121	Oct 2016	-		3.121	Continuing	Continuing	Continuing
Product Development	WR	NSWCCD-SSES : Phila, PA	41.520	3.545	Oct 2014	3.531	Oct 2015	4.060	Oct 2016	-		4.060	Continuing	Continuing	Continuing
Cybersecurity BDC	WR	NSWCCD-SSES : Phila, PA	0.000	0.000		0.000		9.152	Feb 2017	-		9.152	Continuing	Continuing	Continuing
Cybersecurity BDC	WR	NSWCDD : Dahlgren, VA	0.000	0.000		0.000		2.000	Dec 2016	-		2.000	Continuing	Continuing	Continuing
Cybersecurity BDC	C/CPIF	Boeing : Huntington Beach, CA	0.000	0.000		0.000		2.500	Mar 2017	-		2.500	Continuing	Continuing	Continuing
Cybersecurity BDC	C/FP	Various HM&E Equipment Vendors : Various	0.000	0.000		0.000		2.000	Feb 2017	-		2.000	Continuing	Continuing	Continuing
Cybersecurity BDC	C/CPIF	Various : Various	0.000	0.000		0.000		0.500	Feb 2017	-		0.500	Continuing	Continuing	Continuing
		Subtotal	100.141	19.766		23.313		35.855		-		35.855	-	-	-

Remarks

Cybersecurity Boundary Defense Capability (BDC) scope is now included in this PE/PU which increases Product Development by ~$18M in FY17. Cybersecurity BDC engineering develops approaches to implement cybersecurity BDC for the Hull, Mechanical and Electrical (H,M&E) control systems on surface ships. The majority of funding will be executed by government field activities who will conduct several studies that identify cybersecurity solutions and a range of alternatives including technical and cost tradeoffs.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603573N / *Advanced Surface Machinery Sys*	Project (Number/Name) 2471 / *Integrated Power Systems (IPS)*	

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Test and Evaluation	WR	NSWCCD-SSES : Phila, PA	24.954	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
		Subtotal	24.954	0.000		0.000		0.000		-		0.000	-	-	-

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Management	C/CPFF	Herren Associates : Alexandria, VA	1.717	0.591	Oct 2014	0.830	Oct 2015	0.800	Oct 2016	-		0.800	Continuing	Continuing	Continuing
		Subtotal	1.717	0.591		0.830		0.800		-		0.800	-	-	-

	Prior Years	FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	126.812	20.357		24.143		36.655		-		36.655	-	-	-

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603573N / *Advanced Surface Machinery Sys*	**Project (Number/Name)** 2471 / *Integrated Power Systems (IPS)*

PE 0603573N

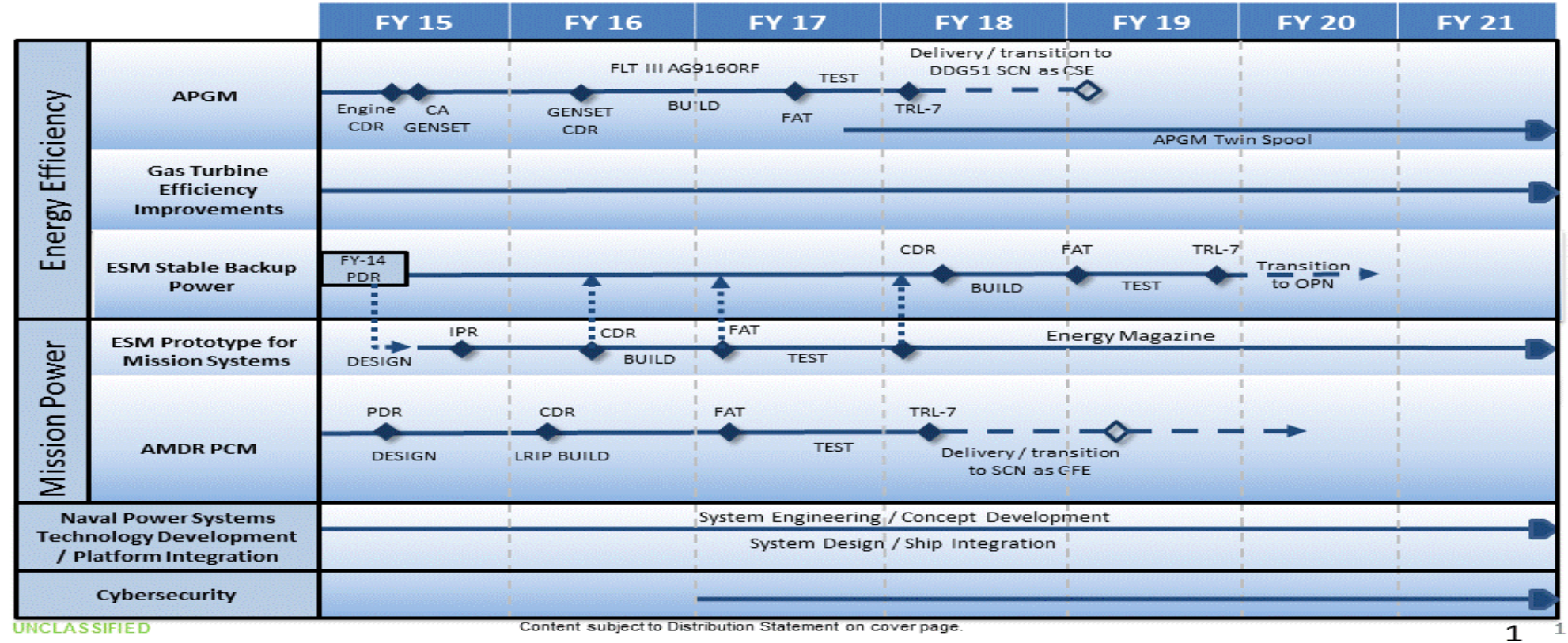

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Exhibit R-4A, RDT&E Schedule Details: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603573N / *Advanced Surface Machinery Sys*	**Project (Number/Name)** 2471 / *Integrated Power Systems (IPS)*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 2471				
Energy Efficiency	1	2015	4	2021
Mission Power	1	2015	4	2021
Naval Power Technology Development / Platforms Integration & transition	1	2015	4	2021
Cybersecurity BDC	1	2017	4	2021

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Exhibit R-2, RDT&E Budget Item Justification: PB 2017 Navy	Date: February 2016
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 0603576N *I (U)CHALK EAGLE*

COST ($ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
Total Program Element	0.000	529.885	511.651	367.016	-	367.016	127.270	15.001	23.476	30.243	Continuing	Continuing
0000: *UNDIST*	0.000	0.289	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	0.289
1578: *Chalk Eagle*	0.000	529.596	511.651	367.016	-	367.016	127.270	15.001	23.476	30.243	Continuing	Continuing

A. Mission Description and Budget Item Justification

This program is reported in accordance with Title 10, United States Code, Section 119(a)(1) in the Special Access Program Annual Report to Congress.

B. Program Change Summary ($ in Millions)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Previous President's Budget	542.415	511.802	263.746	-	263.746
Current President's Budget	529.885	511.651	367.016	-	367.016
Total Adjustments	-12.530	-0.151	103.270	-	103.270
• Congressional General Reductions	-	-0.151			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	5.800	0.000			
• SBIR/STTR Transfer	-18.330	0.000			
• Program Adjustments	0.000	0.000	42.840	-	42.840
• Rate/Misc Adjustments	0.000	0.000	60.430	-	60.430

Change Summary Explanation

Technical: Not applicable.

Schedule: Not applicable.

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603576N / *(U)CHALK EAGLE*	Project (Number/Name) 0000 / *UNDIST*	

COST ($ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
0000: *UNDIST*	0.000	0.289	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	0.289
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This program is reported in accordance with Title 10, United States Code, Section 119(a)(1) in the Special Access Program Annual Report to Congress.

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603576N / *(U)CHALK EAGLE*	Project (Number/Name) 1578 / *Chalk Eagle*	

COST ($ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
1578: *Chalk Eagle*	0.000	529.596	511.651	367.016	-	367.016	127.270	15.001	23.476	30.243	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This program is reported in accordance with Title 10, United States Code, Section 119(a)(1) in the Special Access Program Annual Report to Congress.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2017 Navy											Date: February 2016	
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 4: *Advanced Component Development & Prototypes (ACD&P)*					R-1 Program Element (Number/Name) PE 0603581N *I (U)LITTORAL COMBAT SHIP*							
COST ($ in Millions)	**Prior Years**	**FY 2015**	**FY 2016**	**FY 2017 Base**	**FY 2017 OCO**	**FY 2017 Total**	**FY 2018**	**FY 2019**	**FY 2020**	**FY 2021**	**Cost To Complete**	**Total Cost**
Total Program Element	1,114.963	80.199	91.416	51.630	-	51.630	40.844	34.092	10.523	6.079	Continuing	Continuing
3096: *Littoral Combat Ship*	1,114.963	80.199	68.209	28.906	-	28.906	20.772	15.955	9.763	5.276	Continuing	Continuing
4506: *LCS Training*	0.000	0.000	8.207	22.724	-	22.724	20.072	18.137	0.760	0.803	Continuing	Continuing
9999: *Congressional Adds*	0.000	0.000	15.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	15.000

Program MDAP/MAIS Code:
Project MDAP/MAIS Code(s): 374

A. Mission Description and Budget Item Justification

This Program Element (PE) provides funds for detailed design, development, construction, issue resolution, certification, integration, and testing of the Littoral Combat Ship (LCS). LCS operates with focused-mission packages that deploy manned and unmanned vehicles to execute a variety of missions, including anti-submarine warfare (ASW), surface warfare (SUW), and mine countermeasures (MCM). LCS also possesses inherent capabilities, regardless of the mission package installed, including intelligence, surveillance, and reconnaissance (ISR), maritime interdiction/interception operations (MIO), anti-terrorism/force protection (AT/FP), air warfare self-defense, joint littoral mobility, and logistic support for movement of personnel and supplies. This relatively small, shallow-draft, high-speed surface combatant complements the U.S. Navy's Surface Fleet by operating in environments where it is impossible or undesirable to employ larger deeper-draft, multi-mission ships. LCS can deploy independently to overseas littoral regions or remain on station for extended periods of time either with a battle group or through a forward-basing arrangement. LCS will operate with Carrier Strike Groups, Surface Action Groups, or independently as dictated by the mission and environment. Additionally, LCS can operate cooperatively with the U.S. Coast Guard and Allies.

B. Program Change Summary ($ in Millions)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Previous President's Budget	86.705	118.416	92.021	-	92.021
Current President's Budget	80.199	91.416	51.630	-	51.630
Total Adjustments	-6.506	-27.000	-40.391	-	-40.391
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-42.000			
• Congressional Rescissions	-	-			
• Congressional Adds	-	15.000			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-5.100	0.000			
• SBIR/STTR Transfer	-1.406	0.000			
• Program Adjustments	0.000	0.000	-37.031	-	-37.031
• Rate/Misc Adjustments	0.000	0.000	-3.360	-	-3.360

Exhibit R-2, RDT&E Budget Item Justification: PB 2017 Navy	Date: February 2016
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 0603581N *I (U)LITTORAL COMBAT SHIP*

Congressional Add Details ($ in Millions, and Includes General Reductions)	FY 2015	FY 2016
Project: 9999: *Congressional Adds*		
Congressional Add: *LCS Training Courseware*	0.000	15.000
Congressional Add Subtotals for Project: 9999	0.000	15.000
Congressional Add Totals for all Projects	0.000	15.000

Change Summary Explanation

In FY15, $5.1M was reprogrammed into PE 0604610N to support HAAWC efforts. $1.406M was reduced for SBIR.

In FY16, in project 3096, the program was reduced by $3M for system of systems engineering development growth, $6M for test and evaluation delays and $3M for support growth, totaling $12M.

In FY16, $15M was added for LCS Training Courseware reflected in project 9999 for Congressional Adds.

In FY16, $30M was transferred to PE 0603599N, project 3086, for Frigate efforts.

In FY17, numerous changes were made to the LCS program in light of the profile change for LCS/FF and the creation of a new Frigate PE. $39.9M was added to the Frigate project (3086) to the base of $45M for $84.9M for the Frigate effort. This $84.9M was transferred to PE 0603599N, Proj 3086 for the Frigate effort.

$9.6M was added for Train to Qualify/Train to Certify (T2Q/T2C) effort within project 4506.

Decrease in the LCS PE by $5.86M was required for the Department of the Navy to comply with the Bipartisan Budget Act of 2015.

The multitude of changes in FY17, left the PE with a net decrease of $37M.

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603581N / *(U)LITTORAL COMBAT SHIP*	Project (Number/Name) 3096 / *Littoral Combat Ship*	

COST ($ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
3096: *Littoral Combat Ship*	1,114.963	80.199	68.209	28.906	-	28.906	20.772	15.955	9.763	5.276	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

Project MDAP/MAIS Code: 374

A. Mission Description and Budget Item Justification

The RDT&E portion of the LCS Program is comprised of design and development efforts required to field the LCS Class Ships, including integration with the Mission Packages (MCM, ASW and SUW) activities both pre and post delivery. It includes the design and development effort required to support the introduction and deployment of a Flight 0+ baseline (LCS 3/4 and Follow) with incorporation of lessons learned from the design and construction of USS Freedom (LCS 1) and USS Independence (LCS 2). Additionally, it includes design, development, issue resolution, certification and testing efforts required to support the design baseline for the six year block buy in FY10-15. This baseline will include lessons learned from the LCS 1 through LCS 4.

The LCS design and development phases include platform design and development, experimentation, ship system design and integration, hull platform testing, development of Technical Data Packages (TDPs), total ship system engineering and integration, combat systems and warfare systems certification, and planning and conduct of system testing. These efforts include procurement of combat and warfare system elements and/or simulators to support production representative testing in support of design, development, and certification efforts and ordnance in support of testing.

The RDT&E portion of LCS funding is also comprised of formal Developmental and Operational Assessment testing of the LCS Ships and Mission Packages. Test and Evaluation (T&E) 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.

This program is under review by the Independent Review Team (IRT). The report will be briefed out when available.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Title: LCS System-of-Systems Development, Engineering & Experimentation	17.900	17.705	17.997	0.000	17.997
Articles:	-	-	-	-	-
Description: Provides for LCS Program systems engineering in support of Flight 0, Flight 0+, the FY10 Block Buy baseline design, and future procurement baseline design, development, certification, and production (including ship system design and integration); combat system and C4I design, integration, and test; aviation (manned and unmanned) integration; modular mine countermeasure (MCM), anti-submarine warfare (ASW), and					

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603581N / *(U)LITTORAL COMBAT SHIP*	**Project (Number/Name)** 3096 / *Littoral Combat Ship*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
surface warfare (SUW) mission package (MP) integration; logistics product development; and various systems engineering activities required to perform risk analyses of new design and production technology concepts.					
FY 2015 Accomplishments: Flight 0 Baseline: Provided systems engineering support for completion of Seaframe and MCM Technical Evaluation (TECHEVAL) and Initial Operational Test and Evaluation (IOT&E) on USS Independence. Continued systems engineering support for ASW capability integration on the USS Freedom variant. Flight 0+ and FY10 Block Buy Baselines: Provided systems engineering support for Seaframe and SUW MP DT, TECHEVAL, and IOT&E Phase I on LCS 4. Provided systems engineering support for Seaframe and MCM MP DT and TECHEVAL on LCS 2. Continued initial engineering support for planning TSST on LCS 4. Provided Seaframe and Mission Systems engineering support to investigate, design, and develop technical solutions for design on both Freedom and Independence Class Ships. Finalized technical and performance baseline for future ship procurements based on systems design and testing execution. Continued conducting studies in support of development of future technical and performance baseline design upgrades.					
FY 2016 Plans: Flight 0+ and FY10 Block Buy Baselines: Provide systems engineering support for FSST preparation, execution, and partial repair efforts on LCS 5 and LCS 6. Provide systems engineering support for TSST, and post-event analysis and engineering for Seaframe and SUW MP DT and Phase II IOT&E on LCS 4. Provide systems engineering support for Seaframe and MCM MP IOT&E on LCS 2. Provide systems engineering for Air Defense test planning for Self Defense Test Ship testing in support of PRA on the IND Variant. Provide Seaframe and Mission Systems engineering support to investigate, design, and develop technical solutions for design scope on both Freedom and Independence Class Ships. Provide Seaframe and Mission Systems engineering support to certify equipment to include oversight of design changes required for any re-certification. Update technical and performance baseline for future ship procurements based on systems					

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603581N / *(U)LITTORAL COMBAT SHIP*	**Project (Number/Name)** 3096 / *Littoral Combat Ship*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
design and testing execution. Continue conducting studies in support of development of future technical and performance baseline design upgrades. ***FY 2017 Base Plans:*** Flight 0+ and FY10 Block Buy Baselines: Provide systems engineering support for Seaframe DT on LCS 5 and LCS 6. Complete post-FSST analysis and implement changes based on findings. Provide systems engineering support for Seaframe and ASW MP DT on LCS 7. Provide systems engineering support for Seaframe and SUW MP Incr 3 DT, TECHEVAL, and OT on LCS 3. Provide systems engineering support for Air Defense test planning and execution on the Self Defense Test Ship in support of PRA on the IND Variant. Provide systems engineering support for Air Defense test planning on the Self Defense Test Ship in support of PRA on the FRE Variant. Provide systems engineering support for Air Defense test planning in support of Seaframe PRA testing on the IND Variant. Conduct VTUAV Dynamic Interface testing on LCS 7 and LCS 8. Provide Seaframe and Mission Systems engineering support to investigate, design, and develop technical solutions for design scope on both Freedom and Independence Class Ships. Provide Seaframe and Mission Systems engineering support to certify equipment to include oversight of design changes required for any re-certification. Finalize technical and performance baseline for future ship procurements based on systems design and testing execution. Continue conducting studies in support of development of future technical and performance baseline design upgrades. ***FY 2017 OCO Plans:*** N/A					
Title: LCS Total System Training Architecture ***Articles:*** ***Description:*** LCS is a minimally-manned ship, and the small crew size, combined with LCS's complex mission, does not allow adequate time for shipboard "on-the-job" training to achieve LCS operational availability. Consequently, LCS uses a Train-to-Qualify (T2Q)/Train- to-Certify (T2C) training process in an off-ship/shore-based virtual ship trainer environment, using simulators, and blended training solutions focused on both tactical and equipment operations and maintenance training. When completed, the LCS shore-based training capability will satisfy individual, team, unit, and force training, with an objective of meeting Capability Development Document (CDD) T2Q Key Performance Parameter (KPP) requirements.	19.230 -	0.000 -	0.000 -	0.000 -	0.000 -

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603581N / *(U)LITTORAL COMBAT SHIP*	**Project (Number/Name)** 3096 / *Littoral Combat Ship*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
FY 2015 Accomplishments: RDTE funding for NAWCTSD was provided for Contracting, Research and Engineering, Test and Evaluation, Logistics and Industrial Ops, and Finance management support and travel requirements as the LCS Training System Executive Agent. Funding was provided to continue development and oversight of Immersive Virtual Ship Environment (IVSE) Virtual Reality (VR) Engineering Plant Technician (EPT), Readiness Control Officer (RCO), and Deck courseware for the LCS; and for continued Virtual Ship Training System (VSTS) network and virtual reality lab (VRL) development to support San Diego and Mayport. CSCS was funded as the Training Support Agent (TSA) for fielding LCS 1 and LCS 2 Integrated Tactical Trainers (ITTs) and delivery of instruction. Delivery of instruction tasks included: oversight/management, curriculum maintenance, and oversight of simulator maintenance. Funding was provided for continued LCS training Facility (LTF) in San Diego DoD Information Assurance Certification and Accreditation Package (DIACAP) development/management; and NAVFAC efforts preparing for additional LCS homeports required by the Strategic Laydown Plan. ***FY 2016 Plans:*** N/A ***FY 2017 Base Plans:*** N/A ***FY 2017 OCO Plans:*** N/A					
Title: LCS Test & Evaluation ***Articles:*** ***Description:*** Execute formal LCS Developmental Testing and Operational Testing (DT/OT), including Live Fire Test and Evaluation (LFT&E), and procurement of T&E Ordnance. Execute DT and C4I integration and testing; aviation (manned and unmanned) integration; and modular mine countermeasure (MCM), anti-submarine warfare (ASW), and surface warfare (SUW) mission package (MP) integration. ***FY 2015 Accomplishments:*** Flight 0 Baseline: Completed DT/Rough Water Trials on USS Freedom. Conducted TECHEVAL testing on USS Independence with the MCM MP.	43.069 -	50.504 -	10.909 -	0.000 -	10.909 -

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603581N / *(U)LITTORAL COMBAT SHIP*	**Project (Number/Name)** 3096 / *Littoral Combat Ship*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Flight 0+ Baseline: Completed SUW MP DT, TECHEVAL Phase I, and IOT&E Phase I on LCS 4 with the SUW MP. Completed MCM MP DT and TECHEVAL on LCS 2. Continued planning for Full Ship Shock Trial (FSST) on LCS 5 and LCS 6. Completed Total Ship Survivability Trial (TSST) on LCS 3. Continued planning for TSST on LCS 4. Completed Phase 1 of Multi-Compartment Surrogate testing. Continued planning for Phase 2 of Multi-Compartment Surrogate testing. Continued developing Detailed Design Integrated Survivability Assessment Report (DDISAR) for LCS Freedom and LCS Independence variants. Continued Air Defense test planning for Self Defense Test Ship testing in support of PRA on the IND Variant. ***FY 2016 Plans:*** Flight 0+ Baseline: Conduct LCS 4 TSST. Conduct SUW Phase II DT, TECHEVAL and IOT&E on LCS 4. Start Air Defense test execution for Self Defense Test Ship testing in support of PRA on the IND Variant. Plan for and execute LCS 5 and LCS 6 FSST. Complete Phase 2 of Multi-Compartment Surrogate testing. Complete Detailed Design Integrated Survivability Assessment Report (DDISAR) for LCS Freedom variant. Continue developing DDISAR for LCS Independence variant. Begin developing the final Survivability Assessment Report (SAR). ***FY 2017 Base Plans:*** Flight 0+ Baseline: Complete Air Defense test execution for Self Defense Test Ship testing in support of PRA on the IND Variant. Start Air Defense test planning on the Self Defense Test Ship in support of PRA on the FRE Variant. Start Air Defense test planning in support of Seaframe PRA testing on the IND Variant. Conduct Vertical Take-off and Landing Unmanned Aerial Vehicle (VTUAV) Dynamic Interface testing on LCS 7 and LCS 8. Complete Seaframe and SUW MP Incr 3 DT, TECHEVAL, and OT on LCS 3. Complete post FSST availability on LCS 5 and LCS 6. Complete ASW DT on LCS 7. Complete DDISAR for LCS Independence variant. Continue developing the final Survivability Assessment Report (SAR). ***FY 2017 OCO Plans:*** N/A					
Accomplishments/Planned Programs Subtotals	80.199	68.209	28.906	0.000	28.906

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603581N / *(U)LITTORAL COMBAT SHIP*	**Project (Number/Name)** 3096 / *Littoral Combat Ship*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
• 2127: *Littoral Combat Ship*	1,584.094	1,414.265	1,211.625	-	1,211.625	669.275	906.182	773.697	1,416.067	Continuing	Continuing
• 1600: *LCS Common Mission Modules Equipment*	30.938	23.061	27.840	-	27.840	39.682	23.387	16.504	22.384	718.179	1,252.024
• 5110: *Outfitting/Post Delivery*	105.869	200.370	178.996	-	178.996	192.624	219.437	122.539	124.989	1,506.200	2,802.689
• 1320: *LCS Training Equipment*	9.630	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	75.667
• 0944: *LCS Class Support Equipment*	25.742	39.349	54.518	-	54.518	72.716	63.189	64.349	65.629	0.000	438.961
• 1601: *LCS MCM Mission Modules*	15.270	67.451	57.146	-	57.146	161.605	197.738	103.496	203.284	1,002.735	1,875.439
• 1603: *LCS SUW Mission Modules*	14.750	35.228	22.466	-	22.466	43.885	40.384	41.306	42.130	322.137	612.068
• 1605: *Remote Minehunting System (RMS)*	0.000	53.077	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	53.077
• 3129: *LCS Mission Modules*	172.602	203.143	160.058	-	160.058	72.820	54.940	43.170	30.956	Continuing	Continuing
• 1602: *LCS ASW Mission Modules*	0.000	0.000	31.952	-	31.952	53.465	53.722	54.717	55.812	375.415	625.083
• 1604: *LCS In-Service Modernization*	0.000	0.000	0.000	-	0.000	51.637	25.518	0.000	0.000	0.000	77.155

Remarks

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 distinctly different LCS designs. The decision produced two flights with a vessel from each design: Flight 0 (LCS 1 and LCS 2); and Flight 0+ (LCS 3 and out). The Flight 0+ baseline incorporates lessons learned from the design, construction, and testing of the Flight 0 ships. The Navy conducted a limited competition amongst the existing LCS industry teams or team participants for the award of a contract for the construction of a block buy of up to ten (10) LCS Flight 0+ Class ships, with an objective of competitively awarding a single contract to a single industry team.

By Acquisition Decision Memorandum of December 23, 2010, the USD (AT&L) authorized execution of an alternative acquisition strategy for the FY 2010 through FY 2015 procurement of 20 seaframes through two ten-ship block buy contracts. On December 29, 2010, the Navy awarded two contracts for block buys of up to ten ships, beginning with the award to each contractor of one FY 2010 ship and associated non-recurring engineering, the development of the Technical Data Package (TDP), core class services, and associated data. This was followed by the contractual funding of one ship to each contractor in FY 2011 and two ships each funded in FY 2012 through FY 2014.

On October 17, 2014 USD(AT&L) approved the Navy's plan to procure three ships in FY 2015 and three ships in FY 2016 by modifying the current block buy contracts. The modification to each of the block buy contracts will complete the previously approved 20 ship block buy and add options for the remaining two FY 2016 ships for

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
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a total of 26 LCS. The Navy is developing an FY17 Follow-on Acquisition Strategy. The Navy is currently developing an Acquisition Strategy to support design and procurement of Modified LCSs. The PB 17 procurement profile was changed to reduce the procurement in FY17 to two ships, FY18 to one ship, FY19 to one ship, and FY20 to one ship.

E. Performance Metrics

The LCS Program achieved Milestone A and Program Initiation in May 2004 and Milestone B in February 2011. The LCS program conducts annual Defense Acquisition Board In-Process Reviews (DAB IPRs). The first Seaframe and Mission Module integrated program DAB IPR was conducted in January 2013 and is held in September thereafter.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603581N / *(U)LITTORAL COMBAT SHIP*	Project (Number/Name) 3096 / *Littoral Combat Ship*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
LCS 1 & 2 Shore Trainers	C/CPAF	LM, BIW : Various	56.536	0.000		0.000		0.000		-		0.000	0.000	56.536	-
Program Office Support	Various	Various : Various	19.700	0.840	Mar 2015	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Training Development - Support	WR	NAWC TSD : Orlando, FL	16.031	7.143	Feb 2015	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
LCS1 & LCS2 Bridge Part Task Trainers	SS/FFP	Computer Sciences Corp. (CSC) : Falls Church, VA	4.578	0.000		0.000		0.000		-		0.000	0.000	4.578	-
LCS1 & LCS2 TAO Trainers	C/CPFF	Northrop Grumman Corp. : Falls Church, VA	6.204	0.000		0.000		0.000		-		0.000	0.000	6.204	-
LCS Mission Bay Trainer	C/FFP	Cubic Corp : Orlando, FL	28.283	0.000		0.000		0.000		-		0.000	0.000	28.283	-
Training Development - Support	WR	Various : Various	13.261	0.210	Nov 2014	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Training Development - Industry	C/CPAF	Lockheed Martin : Various	13.300	0.000		0.000		0.000		-		0.000	0.000	13.300	-
Training Operations	WR	NSWC DD/CSCS : Various	5.590	0.420	Nov 2014	0.000		0.000		-		0.000	0.000	6.010	-
Distance Support	WR	NAWC TSD : Orlando, FL	4.900	0.000		0.000		0.000		-		0.000	0.000	4.900	-
Virtual Ship Training System (VSTS)	C/FFP	TBD : TBD	9.475	1.100	Mar 2015	0.000		0.000		-		0.000	0.000	10.575	-
Deck IVSE	C/FFP	TBD : TBD	0.000	8.317	Mar 2015	0.000		0.000		-		0.000	0.000	8.317	-
Combat Systems IVSE	C/FFP	TBD : TBD	0.000	0.000		0.000		0.000		-		0.000	0.000	0.000	-
Readiness Control Officer LCS 1 IVSE	C/FFP	Cubic Corp : Orlando, FL	2.472	0.300	Aug 2015	0.000		0.000		-		0.000	0.000	2.772	-
Readiness Control Officer LCS 2 IVSE	C/FFP	Cubic Corp : Orlando, FL	2.503	0.300	Aug 2015	0.000		0.000		-		0.000	0.000	2.803	-
Mission Bay Trainer Haptics IVSE	C/FFP	Cubic Corp : Orlando, FL	4.596	0.000		0.000		0.000		-		0.000	0.000	4.596	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy			Date: February 2016
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Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Engineering Plant Technician (EPT) LCS 1 IVSE	C/FFP	Cubic Corp : Orlando, FL	15.483	0.250	Dec 2014	0.000		0.000		-		0.000	0.000	15.733	-
Engineering Plant Technician (EPT) LCS 2 IVSE	C/FFP	Cubic Corp : Orlando, FL	15.174	0.350	Dec 2014	0.000		0.000		-		0.000	0.000	15.524	-
Class Design Services	SS/CPAF	LM, GD : Various	48.340	0.000		0.000		0.000		-		0.000	0.000	48.340	-
Final Design(Flight 0)	C/CPAF	LM, BIW : Various	175.263	0.000		0.000		0.000		-		0.000	0.000	175.263	-
Flight 0 C41	WR	PEO C41 : Various	5.506	0.000		0.000		0.000		-		0.000	0.000	5.506	-
SH-60B Datalink	C/CPAF	LM, BIW : Various	2.435	0.000		0.000		0.000		-		0.000	0.000	2.435	-
		Subtotal	449.630	19.230		0.000		0.000		-		0.000	-	-	-

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Government Engineering Support	WR	NSWC/DD : Dahlgren, VA	59.519	5.221	Nov 2014	2.892	Feb 2016	3.441	Nov 2016	-		3.441	Continuing	Continuing	Continuing
Government Engineering Support	WR	NSWC/PC : Panama City, FL	27.536	0.451	Feb 2015	0.132	Feb 2016	0.303	Nov 2016	-		0.303	Continuing	Continuing	Continuing
Government Engineering Support	WR	NUWC : Newport, RI	9.576	0.098	Feb 2015	0.030	Feb 2016	0.376	Nov 2016	-		0.376	Continuing	Continuing	Continuing
Government Engineering Support	WR	NAWC AD : Pax River, MD	23.989	1.073	Feb 2015	0.000		0.618	Nov 2016	-		0.618	Continuing	Continuing	Continuing
Government Engineering Support	WR	NSWC/CR : Crane, IN	17.401	0.321	Feb 2015	0.000		0.100	Nov 2016	-		0.100	Continuing	Continuing	Continuing
Government Engineering Support	WR	NSWC/PD : Philadelphia, PA	65.788	1.120	Feb 2015	1.093	Feb 2016	1.482	Nov 2016	-		1.482	Continuing	Continuing	Continuing
Government Engineering Support	Various	Government Activities : Various	42.494	5.526	Nov 2014	3.874	Feb 2016	5.366	Nov 2016	-		5.366	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603581N / *(U)LITTORAL COMBAT SHIP*	Project (Number/Name) 3096 / *Littoral Combat Ship*	

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Contractor Engineering Support	C/CPAF	Alion/CSC : Arlington, VA	47.213	1.210	Feb 2015	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Contractor Engineering Support	C/CPAF	Various : Various	18.473	0.000		3.768	Mar 2016	2.500	Feb 2017	-		2.500	Continuing	Continuing	Continuing
Government Engineering Support	WR	NSWC/CD : Bethesda, MD	0.000	2.880	Feb 2015	1.372	Mar 2016	3.811	Nov 2016	-		3.811	0.000	8.063	-
Government Engineering Support	WR	PEO IWS : Various	0.000	0.000		2.886	Mar 2016	0.000		-		0.000	0.000	2.886	-
Government Engineering Support	WR	Various : Various	0.000	0.000		1.658	Dec 2015	0.000		-		0.000	0.000	1.658	-
		Subtotal	311.989	17.900		17.705		17.997		-		17.997	-	-	-

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Test & Evaluation	C/CPAF	Alion/CSC : Arlington, VA	30.221	1.623	Feb 2015	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Test & Evaluation	WR	NSWC/PHD : Port Hueneme, CA	51.093	4.285	Oct 2014	1.150	Feb 2016	0.900	Nov 2016	-		0.900	Continuing	Continuing	Continuing
Test & Evaluation	WR	NSWC/PD : Philadelphia, PA	55.901	3.327	Feb 2015	5.684	Feb 2016	1.310	Nov 2016	-		1.310	Continuing	Continuing	Continuing
Test & Evaluation	WR	NSWC/PC : Panama City, FL	15.853	0.475	Oct 2014	0.042	Feb 2016	0.000		-		0.000	Continuing	Continuing	Continuing
Test & Evaluation	WR	COMOPTEVFOR : Norfolk, VA	12.856	1.278	Nov 2014	0.489	Feb 2016	0.640	Nov 2016	-		0.640	Continuing	Continuing	Continuing
Test & Evaluation	WR	NSWC/COR : Corona, CA	13.787	3.203	Feb 2015	0.426	Feb 2016	0.642	Nov 2016	-		0.642	Continuing	Continuing	Continuing
Test & Evaluation	WR	Government Activities : Various	63.372	5.404	Oct 2014	0.384	Feb 2016	0.000		-		0.000	Continuing	Continuing	Continuing
Test & Evaluation	C/CPAF	LM/GD/Austal : Various	56.321	7.949	Apr 2015	14.105	May 2016	0.400	Feb 2017	-		0.400	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603581N / *(U)LITTORAL COMBAT SHIP*	Project (Number/Name) 3096 / *Littoral Combat Ship*	

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Test & Evaluation	WR	PEO C4I : Charleston, SC	11.562	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
T&E Ordnance/ Ammunition	WR	PEO IWS : Various	7.537	8.970	Oct 2014	3.047	Mar 2016	2.029	Nov 2016	-		2.029	Continuing	Continuing	Continuing
Test & Evaluation	WR	NAVAIR : Patuxent River, MD	0.000	0.000		2.612	Feb 2016	0.000		-		0.000	0.000	2.612	-
Test & Evaluation	WR	Various : Various	0.000	0.000		6.376	Dec 2015	0.000		-		0.000	0.000	6.376	-
Test & Evaluation	C/CPAF	Austal : Mobile, AL	0.000	0.000		3.294	Dec 2015	0.000		-		0.000	0.000	3.294	-
Test & Evaluation	WR	NAWC/WD : Pt. Mugu, CA	0.000	0.000		1.471	Mar 2016	1.620	Nov 2016	-		1.620	0.000	3.091	-
Test & Evaluation	WR	NSWC/CD : Bethesda, MD	0.000	6.555	Mar 2015	11.424	Mar 2016	3.368	Nov 2016	-		3.368	0.000	21.347	-
		Subtotal	318.503	43.069		50.504		10.909		-		10.909	-	-	-

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Support- SEAPORT	C/CPAF	Alion/CSC : Arlington, VA	20.593	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Program Management Support	Various	Various : Various	12.212	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Program Management Support - Design	C/CPAF	Various : Arlington, VA	2.036	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
		Subtotal	34.841	0.000		0.000		0.000		-		0.000	-	-	-

	Prior Years	FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	1,114.963	80.199		68.209		28.906		-		28.906	-	-	-

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603581N / *(U)LITTORAL COMBAT SHIP*	**Project (Number/Name)** 3096 / *Littoral Combat Ship*

Littoral Combat Ship Program Schedule

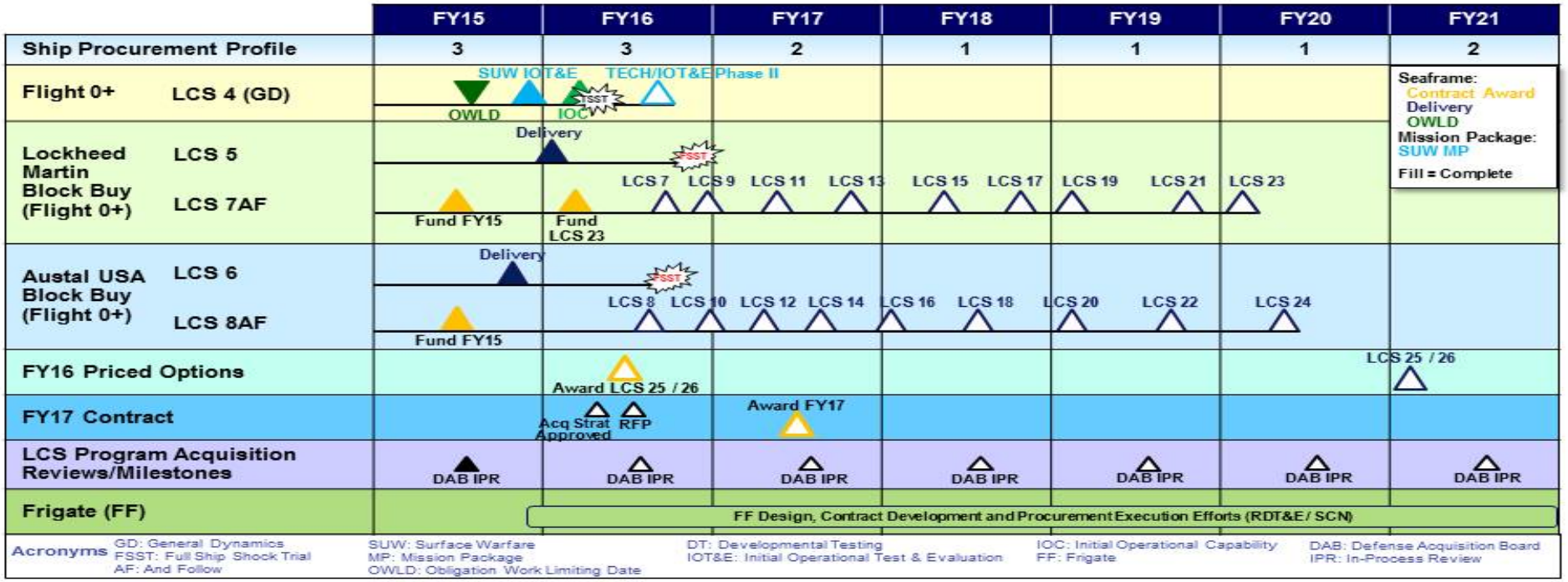

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Exhibit R-4A, RDT&E Schedule Details: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603581N / *(U)LITTORAL COMBAT SHIP*	**Project (Number/Name)** 3096 / *Littoral Combat Ship*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 3096				
TECHEVAL- LCS 2: Flight 0: Technical Evaluation(TECHEVAL) with MCM MP	3	2015	4	2015
TECHEVAL Phase I - LCS 4: Flight 0: Technical Evaluation(TECHEVAL) Phase I with SUW MP	4	2015	4	2015
IOT&E Phase I - LCS 4: Flight 0: Initial Operational Test and Evaluation (IOT&E) Phase I with SUW MP	4	2015	4	2015
Post Delivery DT 4- LCS 2: Post Delivery Developmental Testing (DT)	1	2015	1	2015
TSST - LCS 4: Total Ship Survivability Trial (TSST) LCS 4	2	2016	2	2016
FSST - LCS 5: LCS 5 FSST	4	2016	4	2016
FSST - LCS 6: LCS 6 FSST	3	2016	4	2016
DDISAR - Freedom: Detailed Design Integrated Survivability Assessment Report (DDISAR) - Freedom	1	2016	3	2016
DDISAR - Independence: Detailed Design Integrated Survivability Assessment Report (DDISAR) - Independence	3	2016	1	2017
ASW DT - LCS 7: Anti-Submarine Warfare (ASW) Developmental Test (DT) - LCS 7	4	2017	1	2018
TECHEVAL Phase II - LCS 4: Technical Evaluation (TECHEVAL) Phase II with SUW MP	2	2016	3	2016
IOT&E Phase II - LCS 4: Initial Operational Test and Evaluation (IOT&E) Phase II with SUW MP	2	2016	3	2016
SDTS Testing for PRA - IND: Self Defense Test Ship (SDTS) Testing - IND	4	2016	4	2017
LCS SAR: LCS Survivability Assessment Report (SAR)	1	2017	1	2018
Multi-Compartment Surrogate Test: LFT&E Testing	4	2015	4	2016
STDS Testing for PRA - FRE: Self Defense Test Ship (SDTS) Testing - FRE	4	2017	2	2018
Seaframe PRA Testing (IND): Seaframe Probability of Raid Annihilation (PRA) Testing	4	2017	1	2018

Exhibit R-4A, RDT&E Schedule Details: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603581N / *(U)LITTORAL COMBAT SHIP*	**Project (Number/Name)** 3096 / *Littoral Combat Ship*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
VTUAV Dynamic Interface Testing - LCS 7 & 8: Vertical Take-off and Landing Unmanned Aerial Vehicle (VTUAV) Dynamic Interface Testing	2	2017	2	2017
TECHEVAL Incr 3 - LCS 3: Technical Evaluation (TECHEVAL) Incr 3 with SUW MP - LCS 3	2	2017	4	2017
IOT&E Incr 3 - LCS 3: Initial Operational Test and Evaluation (IOT&E) Incr 3 with SUW MP - LCS 3	2	2017	4	2017

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603581N / *(U)LITTORAL COMBAT SHIP*	Project (Number/Name) 4506 / *LCS Training*	

COST ($ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
4506: *LCS Training*	0.000	0.000	8.207	22.724	-	22.724	20.072	18.137	0.760	0.803	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

LCS is a minimally-manned ship, and the small crew does not contain trainee sailors to receive on-the-job training. Consequently, LCS uses a Train-to-Qualify (T2Q)/ Train-to-Certify (T2C) training process in an off-ship/shore-based virtual ship trainer environment, using simulators and blended training solutions focused on tactical, equipment operations, and maintenance training. When completely developed and procured, the LCS shore-based training capability will satisfy individual, team, unit, and force training, with an objective of meeting Capability Development Document (CDD) T2Q Key Performance Parameter (KPP) requirements.

RDT&E funds are used to develop advanced Immersive Virtual Ship Environments (IVSE), or Virtual Reality (VR) courseware and associated simulators to achieve the training objectives. Additionally, after fielding these systems and courseware, RDTE funds will be utilized to upgrade training to maintain conformity with LCS configurations and approved operational technical manuals and procedures. RDTE funds are also used to test and evaluate training devices to verify compliance with requirements.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Title: LCS Total System Training Architecture	0.000	8.207	22.724	0.000	22.724
Articles:	-	-	-	-	-
Description: LCS is a minimally-manned ship, and the small crew does not contain trainee sailors to receive on-the-job training. Consequently, LCS uses a Train-to-Qualify (T2Q)/Train-to-Certify (T2C) training process in an off-ship/shore-based virtual ship trainer environment, using simulators and blended training solutions focused on tactical, equipment operations, and maintenance training. When completely developed and procured, the LCS shore-based training capability will satisfy individual, team, unit, and force training, with an objective of meeting Capability Development Document (CDD) T2Q Key Performance Parameter (KPP) requirements. RDT&E funds are used to develop advanced Immersive Virtual Ship Environments (IVSE), or Virtual Reality (VR) courseware and associated simulators to achieve the training objectives. Additionally, after fielding these systems and courseware, RDTE funds will be utilized to upgrade training to maintain conformity with LCS configurations and approved operational technical manuals and procedures. RDTE funds are also used to test and evaluate training devices to verify compliance with requirements.					
FY 2015 Accomplishments:					

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603581N / *(U)LITTORAL COMBAT SHIP*	**Project (Number/Name)** 4506 / *LCS Training*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
FY2015 Plans entered in Project Unit 3096. ***FY 2016 Plans:*** RDTE funding provided to Naval Air Warfare Center Training Systems Division (NAWCTSD) supports program management, contracting, research and engineering, test and evaluation, logistics and industrial ops, finance management support and travel requirements, as the LCS Training System Executive Agent. Funding is provided to develop and oversee IVSE courseware for LCS EPT, RCO, and deck operations; and complete Mission Bay Trainer and VSTS development. This funding ensures support of the LTF San Diego DoD Information Assurance Certification and Accreditation Package (DIACAP), as well as NAVFAC efforts preparing for additional LCS homeports required by the Strategic Laydown Plan. ***FY 2017 Base Plans:*** FY16 to FY17 funding increase directly supports the development and completion of various training courseware to provide the fleet with these needed training capabilities as LCS hull deliveries increase. RDTE funding provides Naval Air Warfare Center Training Systems Division (NAWCTSD) program management, contracting, research and engineering, test and evaluation, logistics and industrial ops, finance management support and travel requirements, as the LCS Training System Executive Agent. Funding is provided to oversee completion of IVSE courseware development for LCS deck operations and phase two of IVSE combat systems courseware and VTUAV/MH-60 courseware, oversee performance of the development effort, and provide other functions in support of the LCS Fleet Introduction Program Office (PMS 505). Phase two of IVSE combat system includes the development of 4 courses: Navigation Systems, Radio Communications Subsystem, Search Radar, and Weapon Systems. This funding also supports continued NAVFAC efforts preparing for additional LCS homeports required by the Strategic Laydown plan. ***FY 2017 OCO Plans:*** N/A					
Accomplishments/Planned Programs Subtotals	0.000	8.207	22.724	0.000	22.724

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
• 1320: *LCS Training*	0.000	54.851	0.000	-	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603581N / *(U)LITTORAL COMBAT SHIP*	**Project (Number/Name)** 4506 / *LCS Training*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
• 5664: *Surface Training Equipment*	0.000	0.000	19.136	19.136	38.272	7.410	23.729	18.369	0.000	Continuing	Continuing

Remarks

D. Acquisition Strategy

Per the combined LCS Navy Training System Plan (NTSP), the LCS core crew training concept will meet Train to Qualify and Train to Certify requirements incrementally, with expected completion in FY19. In the interim, individual qualifications for LCS crew members will be accomplished through a combination of vendor training, existing Navy training, new LCS courses and trainers that are presently online, and Under Instruction (U/I) time aboard LCS ships, prior to reporting for duty. Shore-based training requirements cannot be fully met with the interim LCS training strategy. Full realization will be achieved with the completed standup of the San Diego LCS Training Facility (LTF), which includes the Integrated Tactical Trainers, Bridge, Readiness Control Officer (RCO), Combat Systems and Mission Package Training System (MPTS) part-task trainers, the Common Mission Package Trainer (CMPT), Mission Bay trainer and Virtual Reality Labs to support the Train to Qualify operations and maintenance pipeline courses.

E. Performance Metrics

T2Q will succeed and support mission accomplishment in the long run only if commanders have confidence that the output is valid, reliable, and standardized. To justify that confidence, training outcomes must mirror, and therefore predict, critical mission outcomes. To achieve that result a set of objective, performance-based measures, metrics, and standards is being developed for each watch station and billet requirement. For qualifications to be truly predictive, they must be guaranteed by the application of objective measures that vary little between evaluators. New courses such as the Surface Warfare Officers School (SWOS) LCS Officer of the Deck (OOD), Junior Officer of the Deck (JOOD) and the LCS Shore-Based Trainer Capstone courses have been designed to meet T2Q standards. Ultimately, success of the training acquisition strategy will be objectively validated by accomplishment of PQS by the sailors as determined by the IVSE and achievement of all requirements in the LCS Training Manual (TRAMAN) as assessed by LCS Squadrons and appropriate Afloat Training Groups (ATG).

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603581N / *(U)LITTORAL COMBAT SHIP*	Project (Number/Name) 4506 / *LCS Training*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Deck/Mission Bay Courseware	C/FFP	Cubic : Orlando, FL	0.000	0.000		2.000	Feb 2016	5.000	Feb 2017	-		5.000	0.000	7.000	-
Combat Systems Courseware	C/FFP	Cubic : Orlando, FL	0.000	0.000		0.000		8.800	May 2017	-		8.800	7.800	16.600	-
VSTS	C/FFP	Triton JV, LLC : Orlando, FL	0.000	0.000		0.600	Feb 2016	0.700	Feb 2017	-		0.700	0.000	1.300	-
Training Development - Support	WR	NAWC/TSD : Orlando, FL	0.000	0.000		4.547	Nov 2015	4.901	Nov 2016	-		4.901	Continuing	Continuing	Continuing
VTUAV/MH60	C/FFP	TBD : TBD	0.000	0.000		0.000		1.343	May 2017	-		1.343	6.270	7.613	-
		Subtotal	0.000	0.000		7.147		20.744		-		20.744	-	-	-

Remarks

Years prior to FY2016 are reflected in 3096 Project Unit.

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Human Systems Integration	WR	NSWC, DD : Dahlgren Virginia	0.000	0.000		0.320	Nov 2016	0.260	Nov 2016	-		0.260	Continuing	Continuing	Continuing
Information Assurance	TBD	TBD : TBD	0.000	0.000		0.400	Feb 2016	0.620	Feb 2017	-		0.620	Continuing	Continuing	Continuing
Fleet Support	TBD	TBD : TBD	0.000	0.000		0.200	Feb 2016	0.000		-		0.000	Continuing	Continuing	Continuing
Warfare Center SME	WR	NAVFAC : Washington, DC	0.000	0.000		0.000		0.800	Mar 2017	-		0.800	Continuing	Continuing	Continuing
		Subtotal	0.000	0.000		0.920		1.680		-		1.680	-	-	-

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Office Support	C/CPAF	Various : Various	0.000	0.000		0.140	Mar 2016	0.300	Mar 2017	-		0.300	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603581N / *(U)LITTORAL COMBAT SHIP*	Project (Number/Name) 4506 / *LCS Training*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Subtotal			0.000	0.000		0.140		0.300		-		0.300	-	-	-

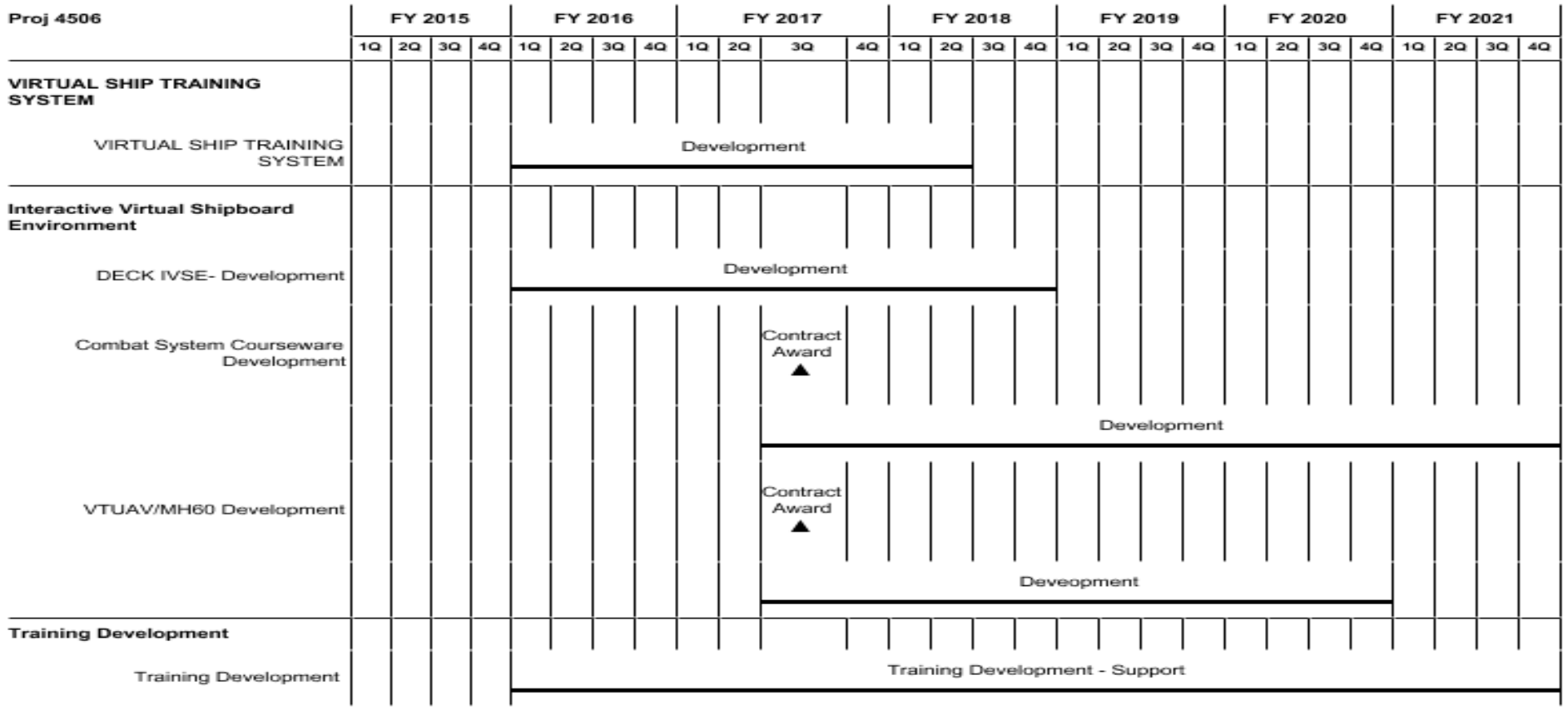
Remarks

Years prior to FY2016 are reflected in 3096 Project Unit.

	Prior Years	FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	0.000		8.207		22.724		-		22.724	-	-	-

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603581N / *(U)LITTORAL COMBAT SHIP*	**Project (Number/Name)** 4506 / *LCS Training*



2017OSD - 0603581N - 4506

Exhibit R-4A, RDT&E Schedule Details: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603581N / *(U)LITTORAL COMBAT SHIP*	**Project (Number/Name)** 4506 / *LCS Training*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 4506				
VIRTUAL SHIP TRAINING SYSTEM: VIRTUAL SHIP TRAINING SYSTEM: VSTS Development	1	2016	2	2018
Interactive Virtual Shipboard Environment: DECK IVSE- Development: DECK IVSE-Development	1	2016	4	2018
Interactive Virtual Shipboard Environment: Combat System Courseware Development: Combat System Courseware Contract Award	3	2017	3	2017
Interactive Virtual Shipboard Environment: Combat System Courseware Development: Combat System Courseware Development	3	2017	4	2021
Interactive Virtual Shipboard Environment: VTUAV/MH60 Development: VTUAV/MH60 Contract Award	3	2017	3	2017
Interactive Virtual Shipboard Environment: VTUAV/MH60 Development: VTUAV/MH60 Development	3	2017	4	2020
Training Development: Training Development: Training Development - Support	1	2016	4	2021

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603581N / *(U)LITTORAL COMBAT SHIP*	Project (Number/Name) 9999 / *Congressional Adds*	

COST ($ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
9999: *Congressional Adds*	0.000	0.000	15.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	15.000
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

LCS is a minimally-manned ship, and the small crew does not contain trainee sailors to receive on-the-job training. Consequently, LCS uses a Train-to-Qualify (T2Q)/ Train-to-Certify (T2C) training process in an off-ship/shore-based virtual ship trainer environment, using simulators and blended training solutions focused on tactical, equipment operations, and maintenance training. When completely developed and procured, the LCS shore-based training capability will satisfy individual, team, unit, and force training, with an objective of meeting Capability Development Document (CDD) T2Q Key Performance Parameter (KPP) requirements.

RDT&E funds are used to develop advanced Immersive Virtual Ship Environments (IVSE) courseware and associated simulators to achieve the training objectives. Additionally, after fielding these systems and courseware, RDTE funds will be utilized to upgrade training to maintain conformity with LCS.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2015	FY 2016
Congressional Add: LCS Training Courseware	0.000	15.000
FY 2015 Accomplishments: N/A		
FY 2016 Plans: RDTE funding provided to Cubic Corporation via Naval Air Warfare Center Training Systems Division (NAWCTSD) in support of research and engineering, test and evaluation, logistics and industrial ops. Funding is provided to complete student and instructor guides, instructor IVSE system support guides, and phase one of IVSE combat system courseware development. Phase one includes the development of four courses: Command & Control Systems, Electronic Warfare Subsystems (EWS), Global Command & Control Systems (GCCS) and Total Ships Computing Environment (TSCE).		
Congressional Adds Subtotals	0.000	15.000

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
• 1320: *LCS Training*	0.000	54.851	0.000	-	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
• 5664: *Surface Training Equipment*	0.000	0.000	19.136	19.136	38.272	7.410	23.279	19.369	0.000	Continuing	Continuing

Remarks

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603581N / *(U)LITTORAL COMBAT SHIP*	**Project (Number/Name)** 9999 / *Congressional Adds*

D. Acquisition Strategy

T2Q will succeed and support mission accomplishment in the long run only if commanders have confidence that the output is valid, reliable, and standardized. To justify that confidence, training outcomes must mirror, and therefore predict, critical mission outcomes. To achieve that result a set of objective, performance-based measures, metrics, and standards is being developed for each watch station and billet requirement. For qualifications to be truly predictive, they must be guaranteed by the application of objective measures that vary little between evaluators. New courses such as the Surface Warfare Officers School (SWOS) LCS Officer of the Deck (OOD), Junior Officer of the Deck (JOOD) and the LCS Shore-Based Trainer Capstone courses have been designed to meet T2Q standards. Ultimately, success of the training acquisition strategy will be objectively validated by accomplishment of PQS by the sailors as determined by the IVSE and achievement of all requirements in the LCS Training Manual (TRAMAN) as assessed by LCS Squadrons and appropriate Afloat Training Groups (ATG).

E. Performance Metrics

T2Q will succeed and support mission accomplishment in the long run only if commanders have confidence that the output is valid, reliable, and standardized. To justify that confidence, training outcomes must mirror, and therefore predict, critical mission outcomes. To achieve that result a set of objective, performance-based measures, metrics, and standards is being developed for each watch station and billet requirement. For qualifications to be truly predictive, they must be guaranteed by the application of objective measures that vary little between evaluators. New courses such as the Surface Warfare Officers School (SWOS) LCS Officer of the Deck (OOD), Junior Officer of the Deck (JOOD) and the LCS Shore-Based Trainer Capstone courses have been designed to meet T2Q standards. Ultimately, success of the training acquisition strategy will be objectively validated by accomplishment of PQS by the sailors as determined by the IVSE and achievement of all requirements in the LCS Training Manual (TRAMAN) as assessed by LCS Squadrons and appropriate Afloat Training Groups (ATG).

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603581N / *(U)LITTORAL COMBAT SHIP*	Project (Number/Name) 9999 / *Congressional Adds*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Combat Systems Courseware	C/FFP	CUBIC : Orlando, FL	0.000	0.000		13.500	May 2016	0.000		-		0.000	0.000	13.500	-
Training Development Support	WR	NAWC/TSD : Orlando, FL	0.000	0.000		1.300	May 2016	0.000		-		0.000	0.000	1.300	-
		Subtotal	0.000	0.000		14.800		0.000		-		0.000	0.000	14.800	-

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Office Support	C/CPAF	Various : Various	0.000	0.000		0.200	May 2016	0.000		-		0.000	0.000	0.200	-
		Subtotal	0.000	0.000		0.200		0.000		-		0.000	0.000	0.200	-

	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	0.000		15.000		0.000		-		0.000	0.000	15.000	-

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603581N / *(U)LITTORAL COMBAT SHIP*	**Project (Number/Name)** 9999 / *Congressional Adds*

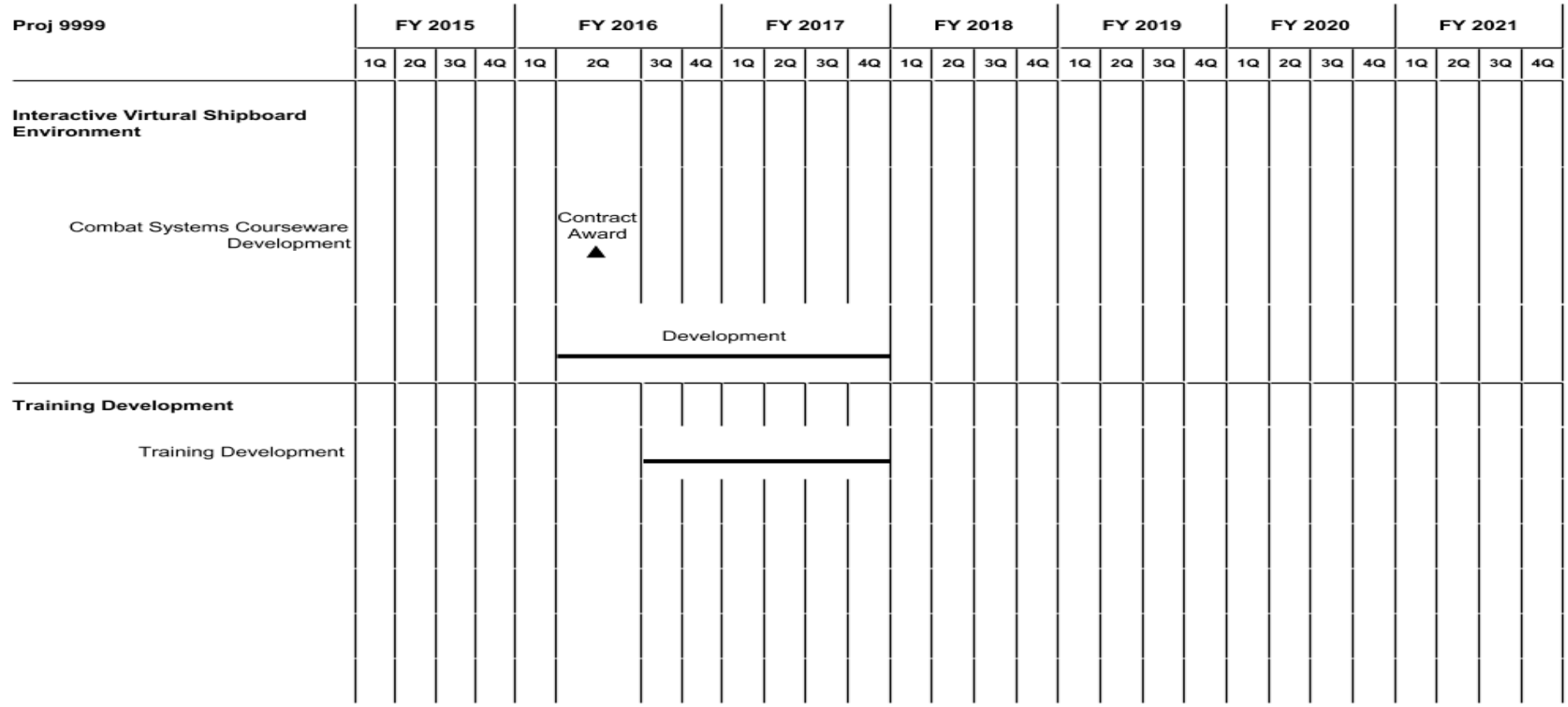


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Exhibit R-4A, RDT&E Schedule Details: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603581N / *(U)LITTORAL COMBAT SHIP*	**Project (Number/Name)** 9999 / *Congressional Adds*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 9999				
Interactive Virtural Shipboard Environment: Combat Systems Courseware Development: Combat Systems Courseware Development Contract Award	2	2016	2	2016
Interactive Virtural Shipboard Environment: Combat Systems Courseware Development: Combat Systems Courseware Development	2	2016	4	2017
Training Development: Training Development: Training Development - Support	3	2016	4	2017

Exhibit R-2, RDT&E Budget Item Justification: PB 2017 Navy											Date: February 2016	
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 4: *Advanced Component Development & Prototypes (ACD&P)*					R-1 Program Element (Number/Name) PE 0603582N *I Combat System Integration*							
COST ($ in Millions)	**Prior Years**	**FY 2015**	**FY 2016**	**FY 2017 Base**	**FY 2017 OCO**	**FY 2017 Total**	**FY 2018**	**FY 2019**	**FY 2020**	**FY 2021**	**Cost To Complete**	**Total Cost**
Total Program Element	364.712	20.741	32.561	23.530	-	23.530	22.055	19.473	17.890	17.602	Continuing	Continuing
0164: *Combat System Integration*	350.151	11.509	23.688	23.530	-	23.530	22.055	19.473	17.890	17.602	Continuing	Continuing
3312: *MTMD-Maritime Theater Missile Defense Forum*	14.561	9.232	8.873	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	32.666

A. Mission Description and Budget Item Justification

Chief of Naval Operations (CNO) created the Navy's Strike Force Interoperability (SFI) Program in 1998 in response to critical shortfalls in the introduction of integrated and interoperable system of systems to deploying Strike Forces. Naval Sea Systems Command (NAVSEA) acts as management lead for Joint System Command (SYSCOM) system certification policy and guidance and certifies platforms for interoperability within the platform and throughout the enterprise, in accordance with Commander, US Fleet Forces Command/Commander, Pacific Fleet (COMUSFLTFORCOM/COMPACFLT) Inst. 4720.3B (OCT 2008), C5ISR Modernization Policy. COMUSFLTFORCOM/COMPACFLT Inst. 4720.3B also requires that NAVSEA act as administrative agent for COMNAVNETWARCOM Command and Control, Communications, Computers, and Combat Systems Integration
Modernization Process (C5IMP) and execution agent for Navy Command and Control, Communications, Computers, and Combat Systems Integration (C5I) Modernization Conferences (NCMC). This program conducts Interoperability Assessments that are required to certify Aircraft Carriers, Amphibious Assault Ships, and Surface Combatants in accordance with the Naval Warfare System Certification Policy (NWSCP), NAVSEAINST 9410.2A, NAVAIR 5230.20, SPAWAR 5234.1.

The SFI Program ensures overall strike force interoperability is characterized and assessed. NAVSEA is assigned central United States Navy (USN) responsibility for interoperability, directing the development of policy and architecture for Strike Force warfare systems engineering and implementation of common warfare systems engineering processes. There are three priorities within the Strike Force Interoperability Program: 1) Support Fleet "as-is" state which includes Navigation System Certification (NAVCERT), Interoperability Capabilities & Limitations, and Interoperability Tactical Information Coordinator Technical Aids (TIC TECHAIDs); 2) Ship's system modernization (non-HME) including warfighting capability & other C5I upgrades including C5IMP Baseline Management; and 3) Ship Warfare System Certification & Force Level Assessments. This includes Warfare Systems Certification, Interoperability Certification, Force Level Interoperability Analysis, & Assessments, Cybersecurity Assessments and recommendations for improvements to the program offices for implementation at the systems level.

In addition to these core efforts, this program also engages in efforts designed to ensure the U.S. Navy is interoperable with Joint and Coalition forces through the Maritime Theater Missile Defense (MTMD) and other bilateral/multilateral maritime integrated air and missile defense related efforts.

Project 0164 Combat System Integration:

This project consists of five key pillars executed within the SFI program: 1) Command & Control, Communications, Computer, Combat Systems, and Intelligence Modernization Process (C5IMP) and Fleet Readiness. The C5IMP validates the introduction of new systems into the Fleet and ensures system maturity prior to

installation, thereby reducing risk and enhancing readiness and effectiveness of deploying ship and strike groups; 2) Warfare Systems Certification, which is essential to validating the maturity and operational performance of warfare systems prior to fleet delivery and deployment; 3) Navigation Certification (NAVCERT) and Electronic Charting and Display System - Navy (ECDIS-N) certification, which certifies ship electronic charting and certifies ship electronic charting capability and certifies the accurate transmission of navigation data to combat and weapons systems; and 4) Interoperability Certification and Assessment, the independent assessment of Strike Group Warfare Systems operational performance. Interoperability Assessment examine force level engagement threads, aircraft control, air battle management, and operational displays. Assessments of deploying ships in Strike Force configurations are accomplished through the utilization of the Navy's Distributed Integration & Interoperability Assessment Capability (DIIAC) Concept which will support the Deputy Assistant Secretary of the Navy (DASN) shift to the left policy by providing early interoperability testing in the acquisition lifecycle. It is a U.S. Fleet Forces Command and Commander in Chief, U.S. Pacific Fleet (COMPACFLT) requirement that all Strike Forces undergo Interoperability Assessment testing in the DEP prior to deployment. Interoperability Certification results are used to develop fleet tactical tools (Capabilities & Limitations (C&L) and Tactical Information Coordinator Technical Aids (TIC TECHAIDs)), which ensure that operators understand the interoperability capabilities and limitations of their combat systems and have the watch station tools necessary for the performance of their tactical responsibilities; 5) Cybersecurity assessment, the assessment of cybersecurity, as directed by OPNAV Memorandum 5400 Ser N2N6/4U1119089, including compliance with DoDI 8500.01 for each warfare system element, identifies vulnerabilities at both the system element and enclave level, and assesses ship's cyber posture in support of Warfare System Certification per NAVSEAINST 9410.2.

Project 3312 Maritime Theater Missile Defense Forum (MTMD):
This project funds participation in Maritime Integrated Air and Missile Defense projects with other nations. Included is participation in the Maritime Missile Defense Projects Framework Memorandum of Understanding of 2004 (as amended 2009). Known as the Maritime Theater Missile Defense (MTMD) forum, it promotes interoperability with the Navies of ten participating nations (Australia, Canada, France, Germany, Italy, Netherlands, Norway, Spain, United Kingdom and the United States). This project funds participation in several Project Arrangements and includes maritime contribution to the NATO Active Layered Theater Ballistic Missile Defense (ALTBMD) project, now known as NATO Ballistic Missile Defense (BMD). Engineering analysis and recommendations from MTMD activities are provided to European, Pacific and Central Combatant Commands to influence present day operations. Specifically, the MTMD Forum is addressing challenges with "Maritime Allied Air Defense in Support of Ballistic Missile Defense Operations" that face the Combatant Commanders during present day operations.

The MTMD forum provides protection against the proliferation of short, medium and long-range Ballistic Missile (BM) and Advanced Anti-Ship Cruise Missile (ASCM) threats through the creation of an interoperable sea-based Integrated Air and Missile Defense (IAMD) capability among coalition nations. This includes protection across the full spectrum of these threats through the enhanced utilization of existing sea-based systems to protect against current threats while progressively improving and developing systems and system-of- systems to effectively counter evolving threats.
This project supports USN participation in several Maritime IAMD related Project Arrangements and Working Groups including:
(1) Battle Management Command, Control, Communications, Computers, and Intelligence (BMC4I) to define and develop architectures as well as to perform engineering to addresscoalition capability gaps.
(2) Modeling & Simulation (M&S) to establish and maintain a maritime coalition M&S testbed and to perform legacy and future systems simulation testing.
(3) Coalition Distributed Engineering Plant (CDEP) to establish and maintain a maritime coalition Hardware-in-the-Loop Testbed and to conduct CDEP testing.
(4) Open Architecture (OA) to develop Interface Standards and Data Models.
(5) Test Planning and Execution (TPEX) to develop Test Plans, oversee exercise participation and conduct post event data analysis and reporting.

Exhibit R-2, RDT&E Budget Item Justification: PB 2017 Navy	Date: February 2016
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 0603582N *I Combat System Integration*

(6) Operational Requirements (OR) to develop a Coalition Maritime Missile Defense Operational Concept Document and to identify operational constraints and tactical constructssurrounding coalition maritime missile defense activities.
(7) Reciprocal Use of Test Facilities agreements with other nations to support Maritime IAMD and MTMD related demonstrations.

Starting in FY17 and through the out-years, the MTMD project moves to Program Element 0605853N under Project Unit 3312: MTMD-Maritime Theater Missile Defense Forum.

B. Program Change Summary ($ in Millions)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Previous President's Budget	20.881	35.901	35.213	-	35.213
Current President's Budget	20.741	32.561	23.530	-	23.530
Total Adjustments	-0.140	-3.340	-11.683	-	-11.683
• Congressional General Reductions	-	-0.027			
• Congressional Directed Reductions	-	-3.313			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.140	0.000			
• Program Adjustments	0.000	0.000	-11.544	-	-11.544
• Rate/Misc Adjustments	0.000	0.000	-0.139	-	-0.139

Change Summary Explanation

SFI, Project Unit 0164: In FY16, a reduction of $3.313 is applied due to interoperability and assessment delays.

SFI, Project Unit 0164: In FY17, a reduction of $1.259M is applied to transfer funds from the RDT&E,N appropriation to the Military Personnel, Navy (MP,N) appropriation to support nine Strike Force Integration Officers.

MTMD, Project Unit 3312: Reduction in funding in FY17 of $9.303M and through the out-years due to the MTMD project moving to Program Element 0605853N under Project Unit 3312: MTMD-Maritime Theater Missile Defense Forum.

Decrease in Combat Systems Integration by $.982M as required for the Department of the Navy to comply with the Bipartisan Budget Act of 2015.

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603582N / *Combat System Integration*	Project (Number/Name) 0164 / *Combat System Integration*	

COST ($ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
0164: *Combat System Integration*	350.151	11.509	23.688	23.530	-	23.530	22.055	19.473	17.890	17.602	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Project 0164: Combat System Integration:

This project funds the Strike Force Interoperability Program through the following pillars: 1) Command & Control, Communications, Computer, Combat Systems, and Intelligence Modernization Process (C5IMP) and Fleet Readiness. The C5IMP validates the introduction of new systems into the Fleet and ensures system maturity prior to installation, thereby reducing risk and enhancing readiness and effectiveness of deploying ships and strike groups; 2) Warfare Systems Certification, which is essential to validating the maturity and operational performance of warfare systems prior to fleet delivery and deployment; 3) Navigation Certification (NAVCERT) and Electronic Charting and Display System - Navy (ECDIS-N) certification, which certifies ship electronic charting capability and certifies the accurate transmission of navigation data to combat and weapons systems; and 4) Interoperability Certification and Assessment, the independent assessment of Strike Group Warfare Systems operational performance. Interoperability Assessment examine force level engagement threads, aircraft control, air battle management, and operational displays. Assessments of deploying ships in Strike Force configurations are accomplished through the utilization of the Joint Mission Environment Test Capability (JMETC) network, which is the cornerstone for the Distributed Integration & Interoperability Assessment Capability (DIIAC) Concept which will support the DASN (RDA) shift to the left policy by providing early interoperability tesing in the acquisition lifecycle. It is a U.S. Fleet Forces Command and Commander in Chief, U.S. Pacific Fleet (COMPACFLT) requirement that all Strike Forces undergo Interoperability Assessment testing prior to deployment. Interoperability Certification results are used to develop fleet tactical tools (Capabilities & Limitations (C&L) and Tactical Information Coordinator Technical Aids (TIC TECHAIDs)), which ensure that operators understand the interoperability capabilities and limitations of their combat systems and have the tactical guidance necessary to perform their task of operating the data links and 5) Cybersecurity assessment, the assessment of cybersecurity, as directed by OPNAV Memorandum 5400 Ser N2N6/4U1119089, including compliance with DoDI 8500.01 for each warfare system element, identifies vulnerabilities at both the system element and enclave level, and assesses ship's cyber posture in support of Warfare System Certification per NAVSEAINST 9410.2.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Title: Navigation System Certification (NAVCERT)	1.143	1.824	1.583	0.000	1.583
Articles:	-	-	-	-	-
Description: The Navigation Certification (NAVCERT) program provides assurance to the ship, Immediate Superior in Command (ISIC) and Type Commander that the ships integrated navigation suite operates as intended and meets performance requirements for safe and reliable navigation and system operation. This project funds assessments in support of new capability upgrades and modernization funded by the cognizant program office. This program verifies the accuracy of the data originating from sensors and validates its receipt					

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603582N / *Combat System Integration*	**Project (Number/Name)** 0164 / *Combat System Integration*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
by all users including Aircraft Inertial Alignment System, and Integrated Warfare Systems. Certification is required after five years, Chief of Naval Operations Availabilities Greater than six months, or in support of Precision Approach and Landing System (PALS). The scope of the certification includes all inertial navigation system equipment as well as the Electronic Charting and Display System Navy (ECDIS- N). This program meets OPNAV ECDIS-N and Operational Safety and Assurance certification requirements in SECNAVINST 5400.15C, and OPNAVINST 9420.2 and in the current draft of OPNAVINST 9420.1. ***FY 2015 Accomplishments:*** Performed 23 NAVCERTs on cruisers, destroyers, carriers, and amphibs. Initiated update of NAVSEA Instruction 9420.4A to incorporate new program requirements, fleet input and lessons learned. ***FY 2016 Plans:*** Continuing critical NAVCERT efforts to include performing 30 NAVCERTs on cruisers, destroyers, carriers, and amphibs. ***FY 2017 Base Plans:*** Plans are to perform 26 NAVCERTs on cruisers, destroyers, carriers, and amphibs. Issue update of NAVSEA Instruction 9420.4A. ***FY 2017 OCO Plans:*** N/A					
Title: Command, Control, Communications, Computer, Combat Systems, and Intelligence Modernization Process (C5IMP) and Fleet Readiness (C5ISR) ***Articles:*** ***Description:*** This project is required to support the fleet C5I Modernization Policy (per COMUSFLTFORCOM/ COMPACFLT Inst. 4720.3B), to manage operational risks associated with C5I Surveillance and Reconnaissance (C5ISR) modernization in both afloat and ashore units ensuring deploying units receive improved, interoperable, and certified warfighting capabilities in order to meet theater operational requirements. This project funds engineering assessments of proposed C5I capability modernizations to determine maturity for installation and risk associated with installs of equipment outside of normal modernization windows. The deliverables of this project is accomplished by determining the maturity, through engineering analysis, of the critical linchpins needed to achieve interoperability for each proposed C5IMP capability improvement item to be installed in a ships baseline (Baseline Change), developing installation recommendations of C5I system upgrades for the Fleet Commanders, and researching and analyzing installation or operating problems. Failure to achieve required maturity can break the warfare system package installed on a ship and impact strike group capabilities.	1.660 -	1.780 -	2.003 -	0.000 -	2.003 -

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603582N / *Combat System Integration*	**Project (Number/Name)** 0164 / *Combat System Integration*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
There is close coordination with the FLTCDRs and TYCOMs as well as other members of the C5IMP community to address, coordinate, and resolve C5IMP modernization issues thereby reducing risk and enhancing readiness and effectiveness of deploying ships and strike groups. Strike Group Engineers (SGEs) analyze planned C5I configurations of ships and Strike Groups; identify and analyze capability, interoperability, and modernization issues in a Strike Group context; assess impacts against requirements; and provide recommendations for resolution. ***FY 2015 Accomplishments:*** Facilitated review of critical C5IMP efforts to include facilitating review, assessment, and execution of 2500 C5I installations during CNO Availabilities in FY14. ***FY 2016 Plans:*** Facilitate review, assessment, and execution of C5I installations during approximately 83 CNO Availabilities in FY15. The number of CNO Availabilities decreased from the PB2016 budget exhibit because ship schedules are very fluid and maintenance periods change as national tasking and other exigent circumstances arise. This project also plans to support two NCMCs and 12 monthly baseline events and 12 monthly Planned but Not Authorized (PNA) reviews. ***FY 2017 Base Plans:*** Facilitate review, assessment, and execution of C5I installations during approximately 84 CNO Availabilities in FY16. Support two NCMCs and 12 monthly baseline events and 12 monthly Planned but Not Authorized (PNA) reviews. ***FY 2017 OCO Plans:*** N/A					
Title: Interoperability Certification and Assessment	5.912	8.973	12.952	0.000	12.952
Articles:	-	-	-	-	-
Description: This project funds Interoperability assessments via the Distributed Integration & Interoperability Assessment Capability (DIIAC), the technical assessment of interoperable systems to meet mission requirements, the updating of Strike Group Capabilities and Limitations (C&L) and the updating of the Tactical Information Coordinator Technical Aids (TIC TECHAIDs). Efforts of the project ensure NAVSEA/PEOs are delivering mature and interoperable warfare systems at the platform and strike group level, NAVSEA provides strike force interoperability certification and assessments. This program focuses on new systems and platforms under development. Interoperability Assessments of deploying ships in Strike Force configurations is accomplished through the utilization of the Navy's DIIAC, which provides operational configurations for all					

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603582N / *Combat System Integration*	**Project (Number/Name)** 0164 / *Combat System Integration*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total

naval combat systems located at multiple Navy land-based sites located across the country and connected via networking technology. It is a U.S. Fleet Forces Command requirement that all Strike Forces undergo Interoperability Assessment testing in the DIIAC prior to deployment. The DIIAC 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. Further, the DIIAC provides the mechanism to support the surface Navy's participation in the Joint testing environments as well as the Maritime Theater Missile Defense (MTMD) Coalition forces interoperability testing. The result of DIIAC testing is fed into the development of fleet tactical tools: Capabilities & Limitations (C&L) and Tactical Information Coordinator Technical Aids (TIC TECHAIDs), which ensure that operators understand the interoperability capabilities and limitations of their combat systems. C&Ls are delivered for Strike Groups and their Coalition and Joint partners. TIC TECHAIDS are delivered to deploying Strike Group ships prior to workups and then a final copy prior to deployment. C&L and TIC TECHAIDS are the final report-out to the Fleet operators of the acquisition community's efforts. They are used on a daily basis in every operational theater as well as in every Navy and Joint schoolhouse.

FY 2015 Accomplishments:

Conducted DIIAC testing, supported the Naval Warfare Systems Certification Policy (NWSCP) and produced Objective Quality Evidence (OQE) used in Warfare Systems Certification Installation Assessment (WSIA) and Warfare System Certification Decision (WSCD). Conducted one Interoperability certification event and completed three interoperability assessment reports of SSDS/AEGIS AMIIP. Provided C&L documents for 23 deploying Strike Groups (from a database containing 168 US surface ships), 43 Coalition ships, and 9 Naval Air Squadrons (covering F/A-18s, E-2C/Ds, MH-60R/Ss, EA-6Bs, EA-18Gs, P-3Cs and P-8As). TIC TECHAIDs delivered for 30 CSG ships, 4 ARG's, 28 BMD ships, 22 independent deploying ships, 4 FASCFAC sites and 6 MOC sites.

FY 2016 Plans:

Continuing critical Interoperability Certification and Assessment efforts to include limited Interoperability Testing for CVN-78; one (1) Certification Test for AEGIS BL 9C1, and support two (2) Interoperability Development Tests for AEGIS 9A CPM and SSDS 10.10 . Conduct two (2) Interoperability Certification Assessments to support warfare system certification of AEGIS 9C1, and SSDS 09.08.01 (EU1-4), to provide Objective Quality Evidence (OQE) for Warfare Systems Certification Events on those systems. Conduct evaluation and provide required updates to Interoperability C&L for 25 Deploying Strike Group Ships (from a database containing 163 U.S. Surface Ships), and 10 Naval Air Squadrons (covering F/A-18s, E-2Cs (only), MH-60Ss (only), EA-6Bs, EA-18Gs, P-3Cs and P-8As). Provide annual deliveries of TIC TECHAIDS for 30 Carrier Strike Group (CSG)

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603582N / *Combat System Integration*	**Project (Number/Name)** 0164 / *Combat System Integration*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Ships, 4 Amphibious Ready Group (ARG) Ships, 30 BMD Ships, 22 Independent Deploying Ships, 10 Littoral Combat Ships (LCS), 2 AEGIS Ashore Sites, 4 Fleet Area Control and Surveillance Facility (FACSFAC) sites and 6 Maritime Operations Center (MOC) sites. ***FY 2017 Base Plans:*** Increase in funding from FY16 to FY17 is a result of an increase in testing planned in FY17. Planning to conduct three (3) Interoperability Tests; two (2) Certification Tests for SSDS 09.08.04, and SSDS 10.10; and support one (1) Interoperability Development Test for AEGIS Baseline 9C2. Conduct two (2) Interoperability Certification Assessments for two (2) SSDS Baselines to provide OQE for Warfare Systems Certification. Conduct evaluation and provide required updates to Interoperability CAPS&LIMS documents on the C&L Website for 25 deploying Strike Group Ships from a database containing 178 U.S. Surface Ships), and 10 Naval Air Squadrons (covering F/A-18s, E-2C/Ds, MH-60R/Ss, EA-6Bs, EA-18Gs, P-3Cs and P-8As). Provide annual deliveries of TIC TECHAIDS for 30 Carrier Strike Group (CSG) ships, 4 Amphibious Ready Group (ARG) ships, 12 Forward-Deployed Naval Force (FDNF) ships with 2 deliveries, 32 BMD Ships, 22 Independent Deploying Ships, 15 Littoral Combat Ships (LCS), 2 AEGIS Ashore Sites, 4 Fleet Area Control and Surveillance Facility (FACSFAC) sites and 6 Maritime Operations Center (MOC) sites ***FY 2017 OCO Plans:*** N/A					
Title: Warfare Systems Certification ***Articles:*** ***Description:*** This project provides operational risk assessments to the Fleet Commanders using Objective Quality Evidence (OQE) against set criteria to ensure installation readiness and deployment readiness of warfare systems and Navy surface ships. As directed by COMUSFLTFORCOM/COMPACFLT Inst. 4720.3B, C5ISR Modernization Policy, and in accordance with NAVSEAINST 9410.2, Naval Warfare System Certification Policy (NWSCP), NAVSEA performs these assessments based on OQE obtained through testimony of subordinate activities and independent modeling, simulation or testing both for initial assessments and certifications. NAVSEA engineering analyses and risk assessments are developed and staffed for criteria not met. NAVSEA accomplishes these efforts through Warfare Systems Certification Readiness Reviews (WSCRR), Warfare Systems Installation Assessment (WSIA), and Warfare Systems Certification Decisions (WSCD) to support the installation and deployment of warfare systems in Navy surface platforms. The purpose of the WSCRR is to review and approve the Warfare System Certification Plan (WSCP), monitor warfare systems against the WSCP and monitor satisfaction of established criteria to facilitate a WSIA and WSCD. The purpose of the WSIA is to provide the Fleet with an early assessment of risk and characterization of the warfare systems maturity and	2.794 -	8.111 -	4.019 -	0.000 -	4.019 -

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603582N / *Combat System Integration*	**Project (Number/Name)** 0164 / *Combat System Integration*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
readiness to support sail-away and any shipboard test and training events for New Construction (NC) phase, Refueling Complex Overhaul (RCOH) or lead ships that are test platforms for major modernization effort and/ or an assessment to support an authorization for installation of the warfare system(s) for in-service platforms. This allows the Fleet to make informed installation, testing/exercise, and training decisions. The purpose of the WSCD is to provide warfare systems certification including an assessment of risk and characterization of the warfare systems maturity and readiness to support deployment. A NAVSEA certification decision message is released following the WSCD event. An operational risk assessment characterizing warfare systems maturity and readiness to support the subject ship's deployment is developed from OQE gathered from NWSCP criteria for each decision point meeting/panel. This pillar also ensures that aggregate deficiencies and workarounds do not render the operator ineffective by conducting modeling, simulation, or testing and analysis of all work-arounds documented in Tactics, Techniques and Procedures (TTPs), Capabilities & Limitations (C&L), and Trouble Reports (TR). ***FY 2015 Accomplishments:*** Conducted Warfare Systems Certification Events for a subset of the 20 criteria for 60 ships (WSCRRs, WSIAs, and WSCDs) and three Warfare Systems Certification Plans (WSCPs), involving CG 47, DDG 51, CVN 68/78, LHA 1/6, LHD 1, LPD 17, LSD 41/49 LCS Ship Classes and amphibious assault ships. ***FY 2016 Plans:*** Continuing Warfare Systems Certification for the subset of the 20 criteria for 212 ships (e.g. aggregate deficiencies and workload analysis) efforts to for 163 Warfare Systems Certification Events (WSCRRs, WSIAs and WSCDs) and 9 WSCPs for above ship classes. ***FY 2017 Base Plans:*** Support the Naval Warfare Systems Certification Policy (NWSCP) by conducting approximately 135 Warfare Systems Certification Events (WSCRRs, WSIAs and WSCDs) and 32 WSCPs for the CG-47, DDG-51, CVN-68/78, LHA-1/6, LHD-1, LPD-17, LSD-41/49, LCS and amphibious assault ship classes for all 20 NWSCP Criteria, including those criteria that require modeling or simulation or testing. Update the NWSCP and implement the revised Policy. ***FY 2017 OCO Plans:*** N/A					
Title: Warfare Systems Cybersecurity	0.000	3.000	2.973	0.000	2.973
Articles:	-	-	-	-	-

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
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B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Description: The required assessment and characterization of aggregate levels of risk for Ships is required at the Warfare Systems System of Systems (SoS) level and will be required for the Naval Warfare Systems Certification of Navy Carriers and Combatants. Cybersecurity assessment activities begins in FY16. Cybersecurity Assessment at the SoS level will entail: 1.) establishing and collecting metrics to characterize Warfare Systems ability to protect, detect, react, and restore capabilities, as well as analyze the mission effects induced by the cyber threat activity; 2.) start the development of the methodologies, tools, and techniques used to conduct such risk assessments appropriate to ship warfare systems baselines and representative strike group interoperability requirements; 3.) conduct an assessment of developmental and operational warfare systems. ***FY 2015 Accomplishments:*** N/A ***FY 2016 Plans:*** Develop Cybersecurity metrics, methodologies and support Warfare Systems Certifications by providing cybersecurity assessments in support of WSIAs and WSCDs. Conduct Cybersecurity Assessments on 92 Ships. Develop five (5) Ship Cybersecurity Certification Plans ***FY 2017 Base Plans:*** Refine and align Cybersecurity metrics and assessment methodologies in support of the Naval Warfare Systems Certification Program. Execute cybersecurity assessment methodology through modeling, simulation or testing in support of the Warfare Systems Certification events. Develop approximately 12 Ship Cybersecurity Plans, Installation Decisions or Certifications. Finalize development of Cybersecurity Assessment Scorecards (CSA) in support of scheduled Warfare Systems Certification WSIA/WSCD Events. Initiate the development of Guidebooks for drafting Cyber Capabilities and Limitations (CAPS&LIMS) and Technical Aids (TECHAIDS) enabling follow-on development of Tactics, Techniques and Procedures (TTPs) that incorporate effective Cyber Pre-Planned Responses to known/emerging threats. Integrate Cyber Information Assurance Assessments into C5IMP Baseline Lock Events. ***FY 2017 OCO Plans:*** N/A					
Accomplishments/Planned Programs Subtotals	11.509	23.688	23.530	0.000	23.530

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
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C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
• OPN 2960: *ICSTF: Integrated Combat System Test Facility*	4.016	14.419	8.777	-	8.777	8.972	9.186	9.379	9.567	Continuing	Continuing

Remarks

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 do 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.

E. Performance Metrics

Quarterly Program Reviews and Baseline Assessments

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603582N / *Combat System Integration*	Project (Number/Name) 0164 / *Combat System Integration*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
SF Requirements Engineering & Analysis	WR	NSWCs : DN/PHD/ Corona	5.157	0.000		0.000		0.000		-		0.000	0.000	5.157	-
SF Requirements Engineering & Analysis	WR	Non-NSWCs : Various	5.295	0.000		0.000		0.000		-		0.000	0.000	5.295	-
Platform/Strike Force Certification	WR	NSWCs : DD/ICSTD/ DN/Corona	39.732	0.000		0.000		0.000		-		0.000	0.000	39.732	-
Platform/Strike Force Certification	WR	Non-NSWCs : Various	27.843	0.000		0.000		0.000		-		0.000	0.000	27.843	-
Fleet Response Plan (FRP)	WR	NSWCs : DD/PHD/ DN	27.030	0.000		0.000		0.000		-		0.000	0.000	27.030	-
Fleet Response Plan (FRP)	WR	Non-NSWCs : Various	3.793	0.000		0.000		0.000		-		0.000	0.000	3.793	-
Combat Systems Cert ISO Platform Cert	WR	NSWCs : DN/DD/ PHD/Corona	24.640	0.000		0.000		0.000		-		0.000	0.000	24.640	-
Combat Systems Cert ISO Platform Cert	WR	Non-NSWCs : Various	1.853	0.000		0.000		0.000		-		0.000	0.000	1.853	-
C5IMP & Fleet Readiness	WR	NSWCs : PHD	4.577	1.660	Oct 2014	3.175	Nov 2015	3.252	Nov 2016	-		3.252	Continuing	Continuing	Continuing
C5IMP & Fleet Readiness	WR	Non-NSWCs : Various	0.000	0.000		0.000		0.000		-		0.000	0.000	0.000	-
Warfare Systems Certification	WR	NSWCs : DD/Crane	16.154	0.376	Nov 2014	0.883	Nov 2015	0.719	Nov 2016	-		0.719	Continuing	Continuing	Continuing
Warfare Systems Certification	WR	Non-NSWCs : Various	3.500	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
CNI/Design Agent	SS/CPAF	General Dynamics : Not Specified	47.926	0.000		0.000		0.000		-		0.000	0.000	47.926	-
CNI/Software Engineering	WR	NSWC : Dahlgren	8.383	0.000		0.000		0.000		-		0.000	0.000	8.383	-
CNI/Test and Evaluation	WR	CDSA : Not Specified	3.922	0.000		0.000		0.000		-		0.000	0.000	3.922	-
CNI/Systems Engineering	WR	NSWC : PHD	2.645	0.000		0.000		0.000		-		0.000	0.000	2.645	-
CNI/Miscellaneous	WR	Various : Various	7.529	0.000		0.000		0.000		-		0.000	0.000	7.529	-
OA Automated Test and Retest	WR	NSWCs : Various	17.500	0.000		0.000		0.000		-		0.000	0.000	17.500	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603582N / *Combat System Integration*	Project (Number/Name) 0164 / *Combat System Integration*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Contract Engineering Support	C/CPFF	Gryphon Technology : VA	22.159	2.913	Dec 2014	5.819	Jan 2016	5.393	Jan 2017	-		5.393	Continuing	Continuing	Continuing
Contract Program Management Support	C/CPFF	Delta Resources Inc. : VA	8.141	0.000		0.000		0.000		-		0.000	0.000	8.141	-
Travel	Allot	NAVSEA HQ : Washington, DC	2.290	0.012	Jan 2015	0.028	Jan 2016	0.021	Jan 2017	-		0.021	0.000	2.351	-
Interoperability Fixes	WR	NSWCs : Various	1.500	0.000		0.000		0.000		-		0.000	0.000	1.500	-
TIC TECHAIDS	WR	CSC : VA	0.000	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Warfare Systems Cybersecurity	WR	NSWCs : Various	0.000	0.000		3.000	Jan 2016	3.111	Jan 2017	-		3.111	0.000	6.111	-
Capabilities & Limitations	WR	NSWCs : PHD	0.000	2.696	Nov 2014	2.597	Nov 2015	3.332	Nov 2016	-		3.332	0.000	8.625	-
		Subtotal	281.569	7.657		15.502		15.828		-		15.828	-	-	-

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Combat System Integration Testing (CSIT)	WR	NSWCs : DD/ICSTF	5.736	0.000		0.000		0.000		-		0.000	0.000	5.736	-
Interoperability Certification Assessment	WR	NSWCs : DD/ SPAWAR/San Diego	26.804	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Navigation System Certification	WR	SPAWAR : Charleston, SC	6.290	1.143	Nov 2014	1.824	Nov 2015	1.657	Nov 2016	-		1.657	0.000	10.914	-
DIIAC Engineering and Operations	WR	NSWCs : DD/DN/ SPAWAR	17.129	0.954	Oct 2014	2.240	Jan 2016	2.196	Jan 2017	-		2.196	Continuing	Continuing	Continuing
DEP Engineering and Operations	WR	NSWCs : Various	12.623	0.000		0.000		0.000		-		0.000	0.000	12.623	-
Interoperability Cert Assessment	WR	NSWCs : DD/DN/ Corona	0.000	1.242	Oct 2014	2.917	Nov 2015	2.724	Nov 2016	-		2.724	0.000	6.883	-
Interoperability Cert Assessment	C/CPFF	Non-NSWCS : CNA	0.000	0.373	Dec 2014	0.876	Jan 2016	0.818	Jan 2017	-		0.818	0.000	2.067	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy			Date: February 2016
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Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Interoperability Cert Assessment	C/CPFF	CSC : Washington, DC	0.000	0.140	Dec 2014	0.329	Jan 2016	0.307	Jan 2017	-		0.307	0.000	0.776	-
		Subtotal	68.582	3.852		8.186		7.702		-		7.702	-	-	-

	Prior Years	FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	350.151	11.509		23.688		23.530		-		23.530	-	-	-

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603582N / *Combat System Integration*	**Project (Number/Name)** 0164 / *Combat System Integration*

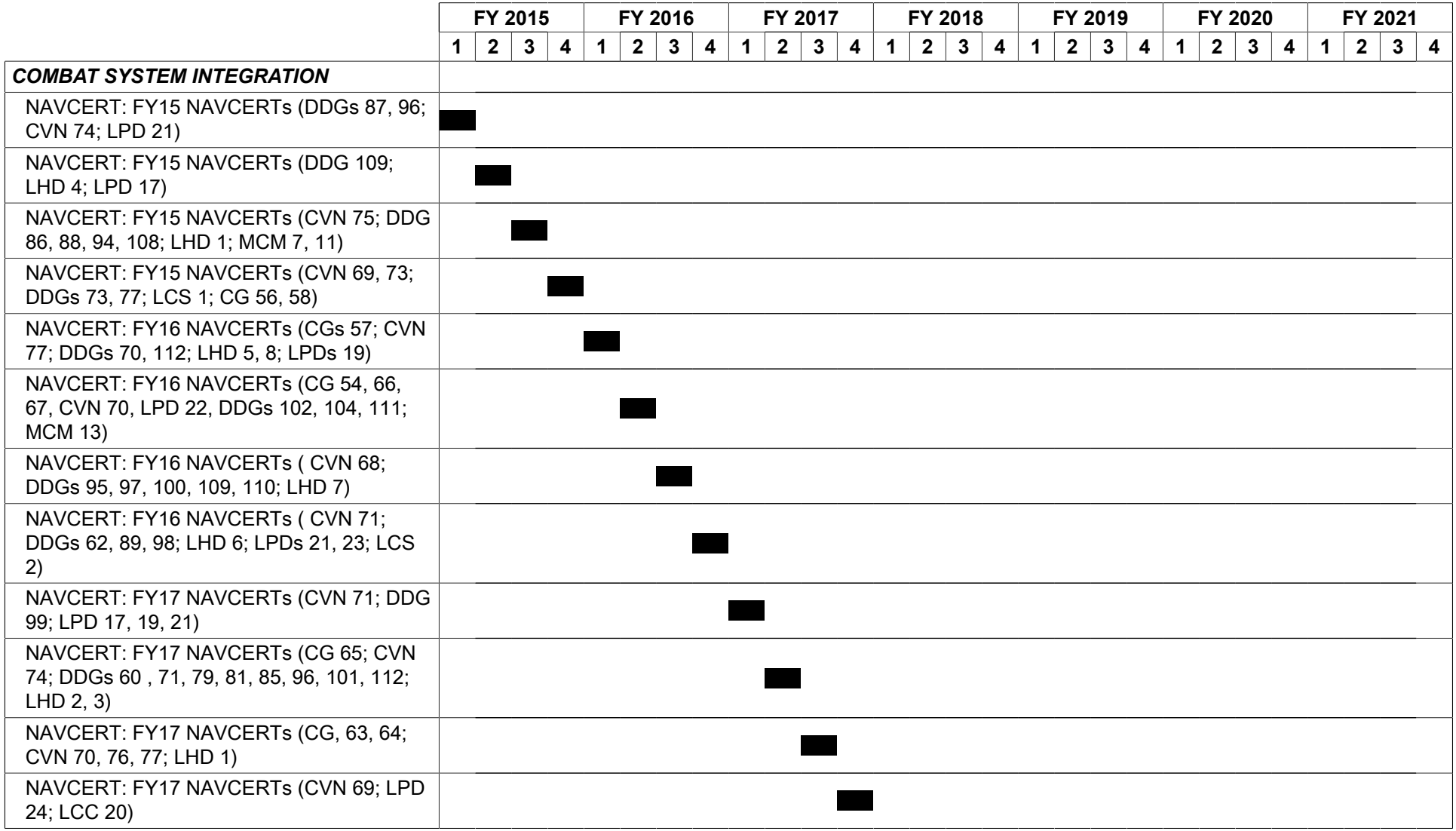

Exhibit R-4, RDT&E Schedule Profile: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603582N / *Combat System Integration*	**Project (Number/Name)** 0164 / *Combat System Integration*

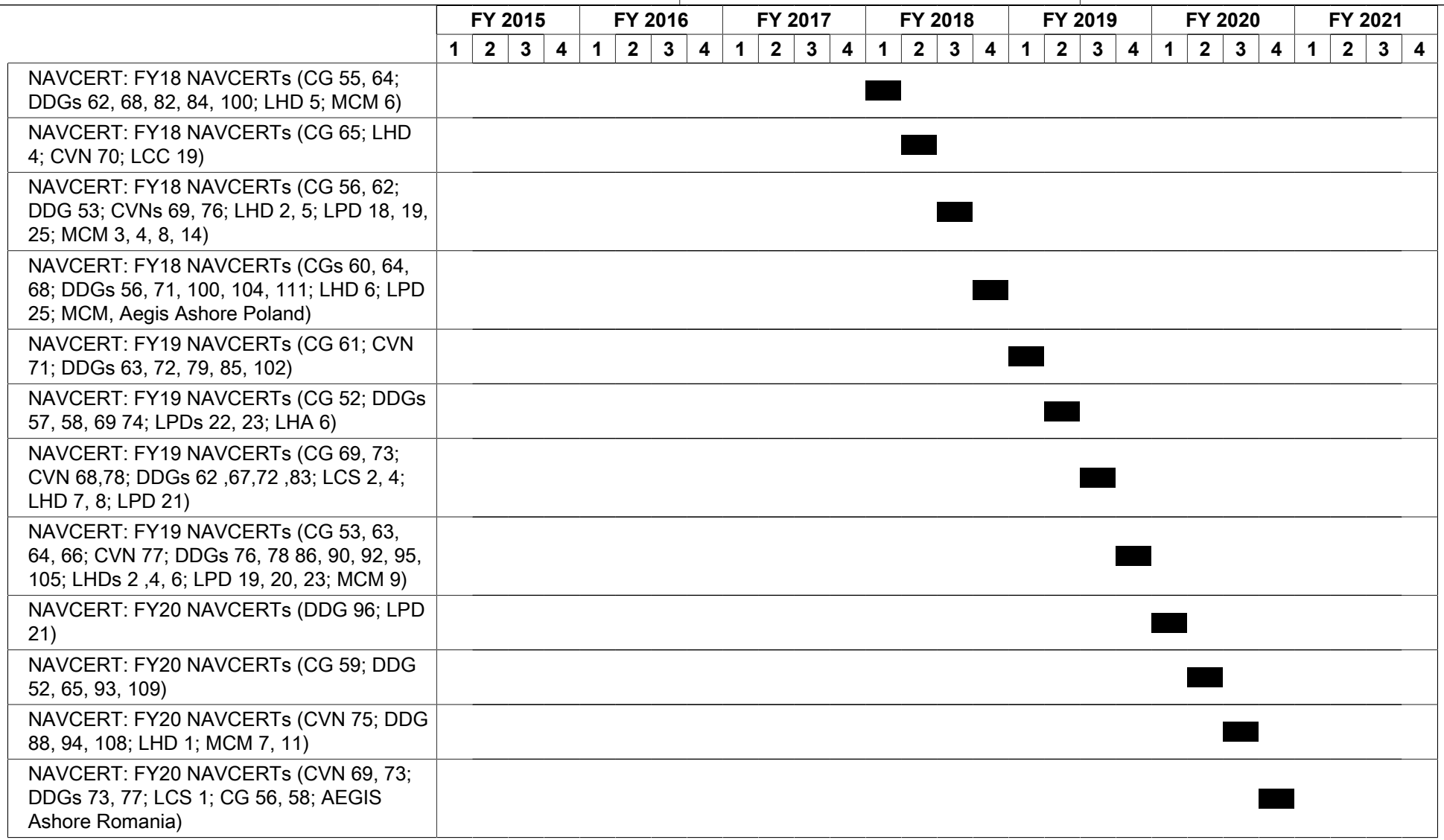

Exhibit R-4, RDT&E Schedule Profile: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603582N / *Combat System Integration*	**Project (Number/Name)** 0164 / *Combat System Integration*

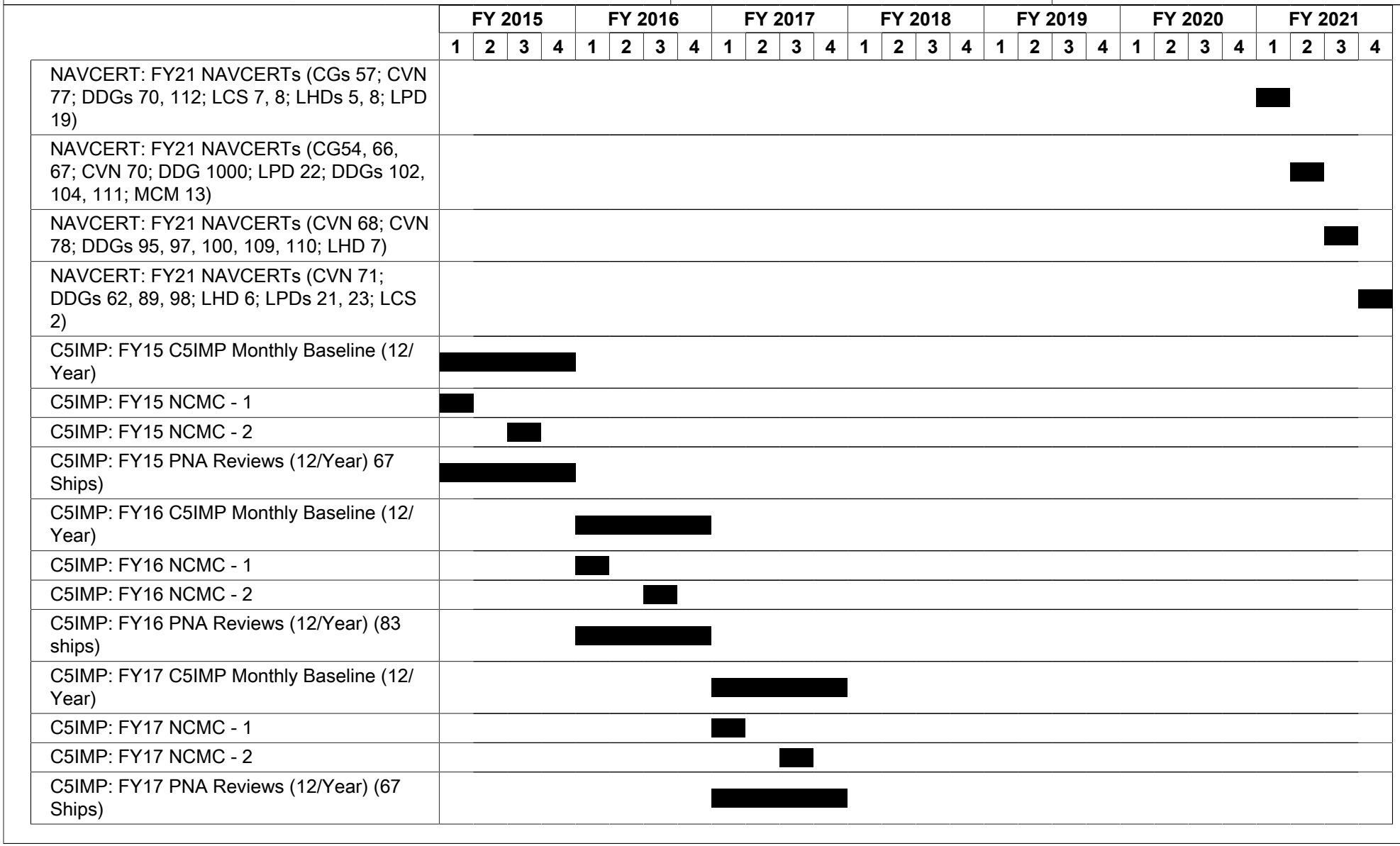

Exhibit R-4, RDT&E Schedule Profile: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603582N / *Combat System Integration*	**Project (Number/Name)** 0164 / *Combat System Integration*

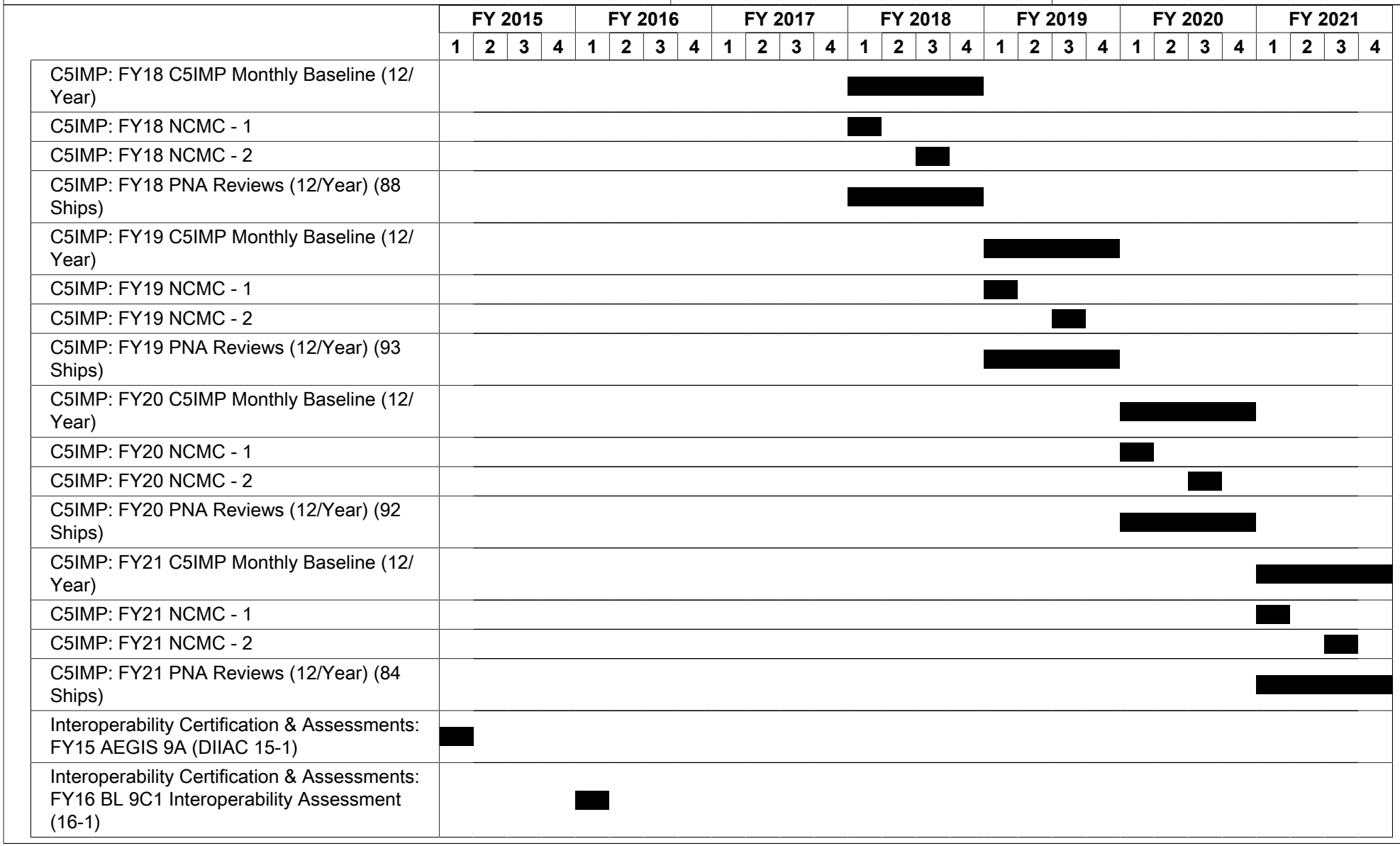

Exhibit R-4, RDT&E Schedule Profile: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603582N / *Combat System Integration*	**Project (Number/Name)** 0164 / *Combat System Integration*

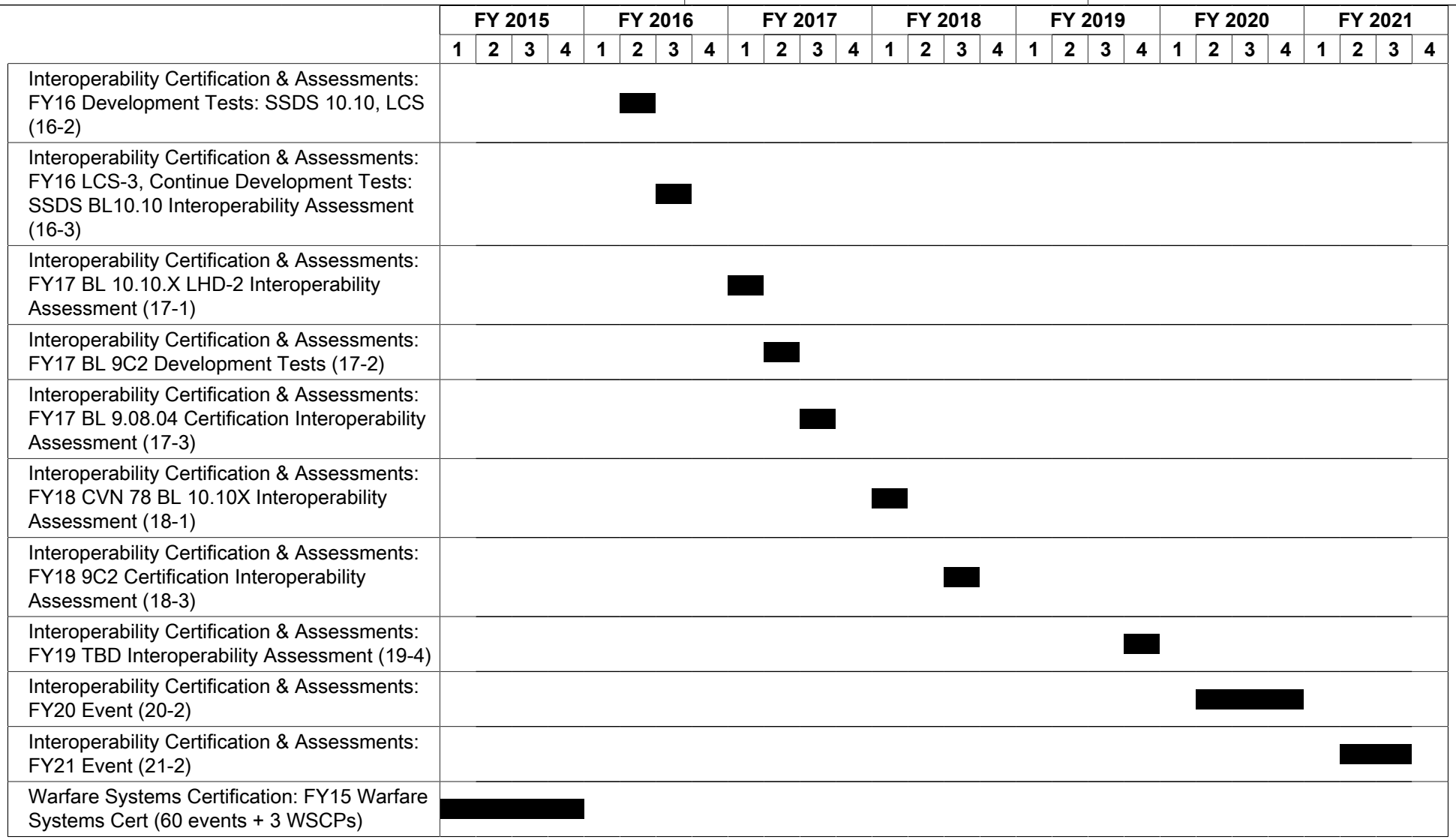

Exhibit R-4, RDT&E Schedule Profile: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603582N / *Combat System Integration*	**Project (Number/Name)** 0164 / *Combat System Integration*

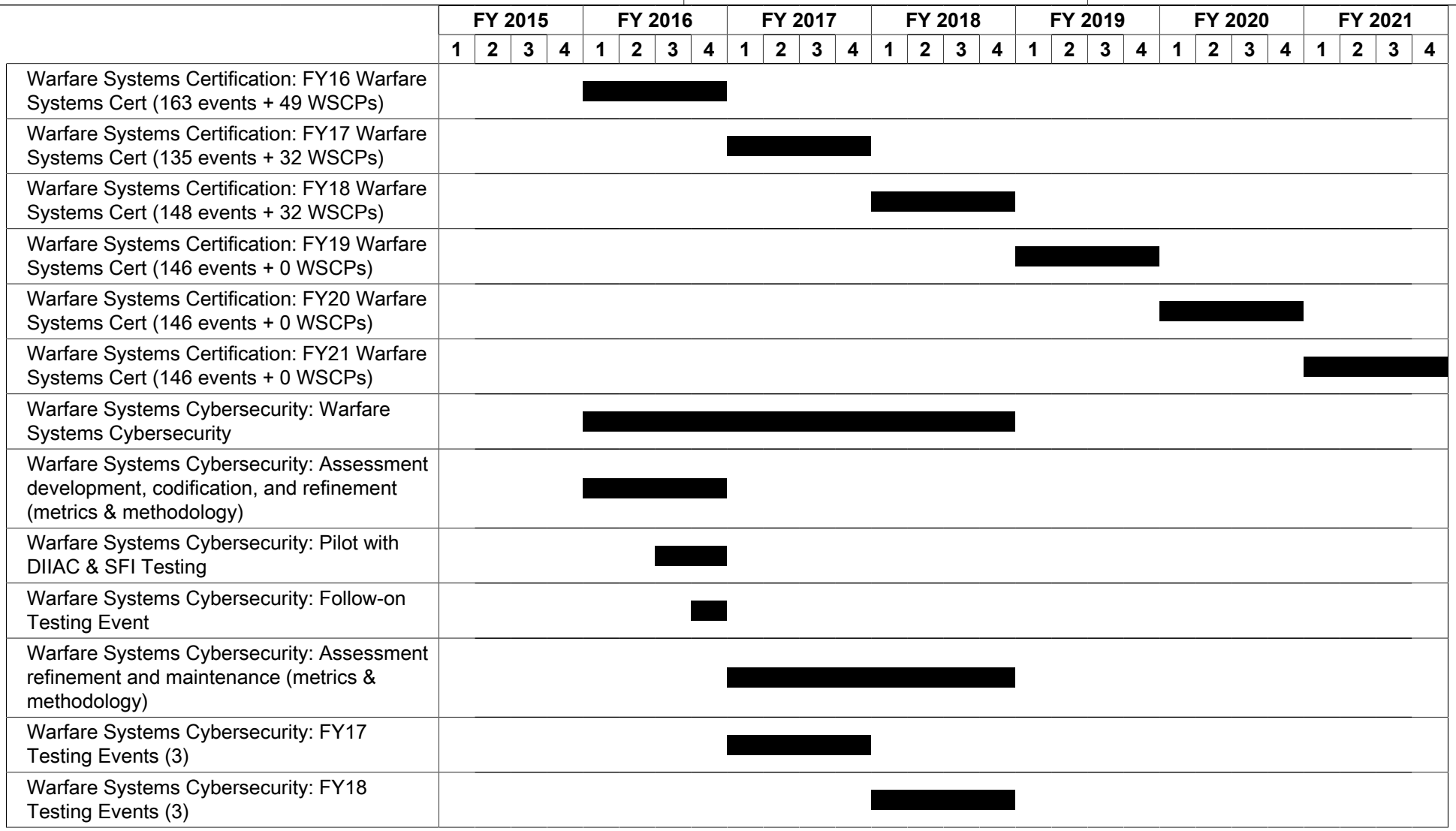

Exhibit R-4A, RDT&E Schedule Details: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603582N / *Combat System Integration*	**Project (Number/Name)** 0164 / *Combat System Integration*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
COMBAT SYSTEM INTEGRATION				
NAVCERT: FY15 NAVCERTs (DDGs 87, 96; CVN 74; LPD 21)	1	2015	1	2015
NAVCERT: FY15 NAVCERTs (DDG 109; LHD 4; LPD 17)	2	2015	2	2015
NAVCERT: FY15 NAVCERTs (CVN 75; DDG 86, 88, 94, 108; LHD 1; MCM 7, 11)	3	2015	3	2015
NAVCERT: FY15 NAVCERTs (CVN 69, 73; DDGs 73, 77; LCS 1; CG 56, 58)	4	2015	4	2015
NAVCERT: FY16 NAVCERTs (CGs 57; CVN 77; DDGs 70, 112; LHD 5, 8; LPDs 19)	1	2016	1	2016
NAVCERT: FY16 NAVCERTs (CG 54, 66, 67, CVN 70, LPD 22, DDGs 102, 104, 111; MCM 13)	2	2016	2	2016
NAVCERT: FY16 NAVCERTs (CVN 68; DDGs 95, 97, 100, 109, 110; LHD 7)	3	2016	3	2016
NAVCERT: FY16 NAVCERTs (CVN 71; DDGs 62, 89, 98; LHD 6; LPDs 21, 23; LCS 2)	4	2016	4	2016
NAVCERT: FY17 NAVCERTs (CVN 71; DDG 99; LPD 17, 19, 21)	1	2017	1	2017
NAVCERT: FY17 NAVCERTs (CG 65; CVN 74; DDGs 60 , 71, 79, 81, 85, 96, 101, 112; LHD 2, 3)	2	2017	2	2017
NAVCERT: FY17 NAVCERTs (CG, 63, 64; CVN 70, 76, 77; LHD 1)	3	2017	3	2017
NAVCERT: FY17 NAVCERTs (CVN 69; LPD 24; LCC 20)	4	2017	4	2017
NAVCERT: FY18 NAVCERTs (CG 55, 64; DDGs 62, 68, 82, 84, 100; LHD 5; MCM 6)	1	2018	1	2018
NAVCERT: FY18 NAVCERTs (CG 65; LHD 4; CVN 70; LCC 19)	2	2018	2	2018
NAVCERT: FY18 NAVCERTs (CG 56, 62; DDG 53; CVNs 69, 76; LHD 2, 5; LPD 18, 19, 25; MCM 3, 4, 8, 14)	3	2018	3	2018
NAVCERT: FY18 NAVCERTs (CGs 60, 64, 68; DDGs 56, 71, 100, 104, 111; LHD 6; LPD 25; MCM, Aegis Ashore Poland)	4	2018	4	2018
NAVCERT: FY19 NAVCERTs (CG 61; CVN 71; DDGs 63, 72, 79, 85, 102)	1	2019	1	2019
NAVCERT: FY19 NAVCERTs (CG 52; DDGs 57, 58, 69 74; LPDs 22, 23; LHA 6)	2	2019	2	2019

Exhibit R-4A, RDT&E Schedule Details: PB 2017 Navy		Date: February 2016
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	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
NAVCERT: FY19 NAVCERTs (CG 69, 73; CVN 68,78; DDGs 62 ,67,72 ,83; LCS 2, 4; LHD 7, 8; LPD 21)	3	2019	3	2019
NAVCERT: FY19 NAVCERTs (CG 53, 63, 64, 66; CVN 77; DDGs 76, 78 86, 90, 92, 95, 105; LHDs 2 ,4, 6; LPD 19, 20, 23; MCM 9)	4	2019	4	2019
NAVCERT: FY20 NAVCERTs (DDG 96; LPD 21)	1	2020	1	2020
NAVCERT: FY20 NAVCERTs (CG 59; DDG 52, 65, 93, 109)	2	2020	2	2020
NAVCERT: FY20 NAVCERTs (CVN 75; DDG 88, 94, 108; LHD 1; MCM 7, 11)	3	2020	3	2020
NAVCERT: FY20 NAVCERTs (CVN 69, 73; DDGs 73, 77; LCS 1; CG 56, 58; AEGIS Ashore Romania)	4	2020	4	2020
NAVCERT: FY21 NAVCERTs (CGs 57; CVN 77; DDGs 70, 112; LCS 7, 8; LHDs 5, 8; LPD 19)	1	2021	1	2021
NAVCERT: FY21 NAVCERTs (CG54, 66, 67; CVN 70; DDG 1000; LPD 22; DDGs 102, 104, 111; MCM 13)	2	2021	2	2021
NAVCERT: FY21 NAVCERTs (CVN 68; CVN 78; DDGs 95, 97, 100, 109, 110; LHD 7)	3	2021	3	2021
NAVCERT: FY21 NAVCERTs (CVN 71; DDGs 62, 89, 98; LHD 6; LPDs 21, 23; LCS 2)	4	2021	4	2021
C5IMP: FY15 C5IMP Monthly Baseline (12/Year)	1	2015	4	2015
C5IMP: FY15 NCMC - 1	1	2015	1	2015
C5IMP: FY15 NCMC - 2	3	2015	3	2015
C5IMP: FY15 PNA Reviews (12/Year) 67 Ships)	1	2015	4	2015
C5IMP: FY16 C5IMP Monthly Baseline (12/Year)	1	2016	4	2016
C5IMP: FY16 NCMC - 1	1	2016	1	2016
C5IMP: FY16 NCMC - 2	3	2016	3	2016
C5IMP: FY16 PNA Reviews (12/Year) (83 ships)	1	2016	4	2016
C5IMP: FY17 C5IMP Monthly Baseline (12/Year)	1	2017	4	2017
C5IMP: FY17 NCMC - 1	1	2017	1	2017
C5IMP: FY17 NCMC - 2	3	2017	3	2017
C5IMP: FY17 PNA Reviews (12/Year) (67 Ships)	1	2017	4	2017

Exhibit R-4A, RDT&E Schedule Details: PB 2017 Navy		Date: February 2016
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	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
C5IMP: FY18 C5IMP Monthly Baseline (12/Year)	1	2018	4	2018
C5IMP: FY18 NCMC - 1	1	2018	1	2018
C5IMP: FY18 NCMC - 2	3	2018	3	2018
C5IMP: FY18 PNA Reviews (12/Year) (88 Ships)	1	2018	4	2018
C5IMP: FY19 C5IMP Monthly Baseline (12/Year)	1	2019	4	2019
C5IMP: FY19 NCMC - 1	1	2019	1	2019
C5IMP: FY19 NCMC - 2	3	2019	3	2019
C5IMP: FY19 PNA Reviews (12/Year) (93 Ships)	1	2019	4	2019
C5IMP: FY20 C5IMP Monthly Baseline (12/Year)	1	2020	4	2020
C5IMP: FY20 NCMC - 1	1	2020	1	2020
C5IMP: FY20 NCMC - 2	3	2020	3	2020
C5IMP: FY20 PNA Reviews (12/Year) (92 Ships)	1	2020	4	2020
C5IMP: FY21 C5IMP Monthly Baseline (12/Year)	1	2021	4	2021
C5IMP: FY21 NCMC - 1	1	2021	1	2021
C5IMP: FY21 NCMC - 2	3	2021	3	2021
C5IMP: FY21 PNA Reviews (12/Year) (84 Ships)	1	2021	4	2021
Interoperability Certification & Assessments: FY15 AEGIS 9A (DIIAC 15-1)	1	2015	1	2015
Interoperability Certification & Assessments: FY16 BL 9C1 Interoperability Assessment (16-1)	1	2016	1	2016
Interoperability Certification & Assessments: FY16 Development Tests: SSDS 10.10, LCS (16-2)	2	2016	2	2016
Interoperability Certification & Assessments: FY16 LCS-3, Continue Development Tests: SSDS BL10.10 Interoperability Assessment (16-3)	3	2016	3	2016
Interoperability Certification & Assessments: FY17 BL 10.10.X LHD-2 Interoperability Assessment (17-1)	1	2017	1	2017
Interoperability Certification & Assessments: FY17 BL 9C2 Development Tests (17-2)	2	2017	2	2017

Exhibit R-4A, RDT&E Schedule Details: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603582N / *Combat System Integration*	**Project (Number/Name)** 0164 / *Combat System Integration*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Interoperability Certification & Assessments: FY17 BL 9.08.04 Certification Interoperability Assessment (17-3)	3	2017	3	2017
Interoperability Certification & Assessments: FY18 CVN 78 BL 10.10X Interoperability Assessment (18-1)	1	2018	1	2018
Interoperability Certification & Assessments: FY18 9C2 Certification Interoperability Assessment (18-3)	3	2018	3	2018
Interoperability Certification & Assessments: FY19 TBD Interoperability Assessment (19-4)	4	2019	4	2019
Interoperability Certification & Assessments: FY20 Event (20-2)	2	2020	4	2020
Interoperability Certification & Assessments: FY21 Event (21-2)	2	2021	3	2021
Warfare Systems Certification: FY15 Warfare Systems Cert (60 events + 3 WSCPs)	1	2015	4	2015
Warfare Systems Certification: FY16 Warfare Systems Cert (163 events + 49 WSCPs)	1	2016	4	2016
Warfare Systems Certification: FY17 Warfare Systems Cert (135 events + 32 WSCPs)	1	2017	4	2017
Warfare Systems Certification: FY18 Warfare Systems Cert (148 events + 32 WSCPs)	1	2018	4	2018
Warfare Systems Certification: FY19 Warfare Systems Cert (146 events + 0 WSCPs)	1	2019	4	2019
Warfare Systems Certification: FY20 Warfare Systems Cert (146 events + 0 WSCPs)	1	2020	4	2020
Warfare Systems Certification: FY21 Warfare Systems Cert (146 events + 0 WSCPs)	1	2021	4	2021
Warfare Systems Cybersecurity: Warfare Systems Cybersecurity	1	2016	4	2018
Warfare Systems Cybersecurity: Assessment development, codification, and refinement (metrics & methodology)	1	2016	4	2016
Warfare Systems Cybersecurity: Pilot with DIIAC & SFI Testing	3	2016	4	2016
Warfare Systems Cybersecurity: Follow-on Testing Event	4	2016	4	2016
Warfare Systems Cybersecurity: Assessment refinement and maintenance (metrics & methodology)	1	2017	4	2018
Warfare Systems Cybersecurity: FY17 Testing Events (3)	1	2017	4	2017
Warfare Systems Cybersecurity: FY18 Testing Events (3)	1	2018	4	2018

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603582N / *Combat System Integration*	Project (Number/Name) 3312 / *MTMD-Maritime Theater Missile Defense Forum*	

COST ($ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
3312: *MTMD-Maritime Theater Missile Defense Forum*	14.561	9.232	8.873	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	32.666
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This project funds participation in Maritime Integrated Air and Missile Defense projects with other nations. Included is participation in the Maritime Missile Defense Projects Framework Memorandum of Understanding of 2004 (as amended 2009). Known as the Maritime Theater Missile Defense (MTMD) forum, it promotes interoperability with the Navies of ten participating nations (Australia, Canada, France, Germany, Italy, Netherlands, Norway, Spain, United Kingdom and the United States). This project funds participation in several Project Arrangements and includes maritime contribution to the NATO Active Layered Theater Ballistic Missile Defense (ALTBMD) project, now known as NATO Ballistic Missile Defense (BMD). Engineering analysis and recommendations from MTMD activities are provided to European, Pacific and Central Combatant Commands to influence present day operations. Specifically, the MTMD Forum is addressing challenges with "Maritime Allied Air Defense in Support of Ballistic Missile Defense Operations" that face the Combatant Commanders during present day operations.

The MTMD forum provides protection against the proliferation of short, medium and long-range Ballistic Missile (BM) and Advanced Anti-Ship Cruise Missile (ASCM) threats through the creation of an interoperable sea-based Integrated Air and Missile Defense (IAMD) capability among coalition nations. This includes protection across the full spectrum of these threats through the enhanced utilization of existing sea-based systems to protect against current threats while progressively improving and developing systems and system-of- systems to effectively counter evolving threats.

This project supports USN participation in several Maritime IAMD related Project Arrangements and Working Groups including:

(1) Battle Management Command, Control, Communications, Computers, and Intelligence (BMC4I) to define and develop architectures as well as to perform engineering to address coalition capability gaps.
(2) Modeling & Simulation (M&S) to establish and maintain a maritime coalition M&S testbed and to perform legacy and future systems simulation testing.
(3) Coalition Distributed Engineering Plant (CDEP) to establish and maintain a maritime coalition Hardware-in-the-Loop Testbed and to conduct CDEP testing.
(4) Open Architecture (OA) to develop Interface Standards and Data Models.
(5) Test Planning and Execution (TPEX) to develop Test Plans, oversee exercise participation and conduct post event data analysis and reporting.
(6) Operational Requirements (OR) to develop a Coalition Maritime Missile Defense Operational Concept Document and to identify operational constraints and tactical constructs surrounding coalition maritime missile defense activities.
(7) Reciprocal Use of Test Facilities agreements with other nations to support Maritime IAMD and MTMD related demonstrations.

Starting in FY17 and through the out-years, the MTMD project moves to Program Element 0605853N under Project Unit 3312: MTMD-Maritime Theater Missile Defense Forum.

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603582N / *Combat System Integration*	**Project (Number/Name)** 3312 / *MTMD-Maritime Theater Missile Defense Forum*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Title: Maritime Theater Missile Defense Forum (MTMD)	9.232	8.873	0.000	0.000	0.000
Articles:	-	-	-	-	-

Description: This project funds participation in Maritime IAMD to promote interoperability with other nations. This project funds participation in Modeling and Simulation (M&S), Battle Management, Command, Control, Communications, Computers and Intelligence (BMC4I), Coalition Distributed Engineering Plant (CDEP), Test Planning and Execution (TPEX), Open Architecture (OA), and Operational Requirements (OR) activities.

FY 2015 Accomplishments:
(1) BMC4I continued engineering analysis and multi-national interoperability gap assessment from Target Architecture 1 Test results and developed Target Architecture input. BMC4I evaluated Recommended Point Solutions and provided final recommendations for the implementation in correcting coalition interoperability gaps. BMC4I finalized information exchange requirements in preparation for at-sea demonstrations.
(2) M&S completed analysis of Target Architecture tests and Test Architecture and provided assessments and recommendations to improve information exchange requirements identified by BMC4I.
(3) CDEP completed analysis of Target Architecture hardware-in-the-loop tests and provided assessments and recommendations to improve information exchanges required to conduct the at-sea demonstrations. CDEP provided the final architecture risk assessment and Capabilities & Limitations document to support the at-sea demonstrations.
(4) Open Architecture continued development of the Force Level Open Architecture Technical Standard. Inputs from
M&S and CDEP test results were used to improve the details of the standard.
(5) TPEX finalized preparations for MTMD participation as part of Joint Warrior 152 in September/October 2015. This 2015 At-Sea Demonstration will include live tracking events and a combination of live and simulated engagements. Integrated Air Defense and Ballistic Missile Defense test scenarios among the nations will be conducted. This is the first multi-national maritime test of its kind ever conducted. Planning for RIMPAC 2016 continued and included target configuration/procurement.
(6) Operational Requirements group continued to provide fleet inputs and operator oversight to test and evaluation events. The Operational Concept Document was updated as was final tactics, techniques and procedures in support of the at-sea demonstrations in 2015 and 2016.

FY 2016 Plans:
(1) BMC4I will continue engineering analysis and multi-national interoperability gap assessment from Target Architecture test results and complete development of Target Architectures based on requests for

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603582N / *Combat System Integration*	**Project (Number/Name)** 3312 / *MTMD-Maritime Theater Missile Defense Forum*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
information input from member nations. BMC4I will evaluate Recommended Point Solutions and provide final recommendations for the implementation in correcting coalition interoperability gaps. BMC4I will finalize information exchange requirements in preparation for at-sea demonstrations. BMC4I develop updates to MTMD Coalition Capabilities and Interoperability (CCI) and Systems Tactical Data Links Interoperability (STIR) Reports. (2) M&S will continue analysis of Target Architectures and conduct further assessments in support of providing recommendations to improve information exchange requirements identified by BMC4I. M&S will model and further Target Architectures and provide training in support of the 2016 at sea demonstration. (3) CDEP will conduct hardware-in-the-loop tests and provide assessments and recommendations to improve information exchanges required to conduct at-sea demonstrations. CDEP will evaluate At-Sea Demonstration architecture risk, and update the Capabilities & Limitations document to support the at-sea demonstrations. (4) Open Architecture will continue development of the Force Level Open Architecture Technical Standards. Inputs from M&S, CDEP and TPEX tests will be used to improve standards. (5) TPEX will finalize preparations for and conduct MTMD participation as part of at-sea test events. 2016 At-Sea Demonstrations will include live tracking events and a combination of live and simulated engagements. Integrated Air Defense and Ballistic Missile Defense test scenarios among the nations will be conducted. Planning for RIMPAC 2016 and follow-on at-sea testing in future years will continue and will include target configuration/ procurement. (6) Operational Requirements group will continue to provide fleet inputs and operator oversight to test and evaluation events. The Operational Concept Document will be updated as will final tactics, techniques and procedures in support of the at-sea demonstrations in 2016. ***FY 2017 Base Plans:*** Starting in FY17 and through the out-years, the MTMD project moves to Program Element 0605853N under Project Unit 3312: MTMD-Maritime Theater Missile Defense Forum. FY17 plans stated under the new Program Element. ***FY 2017 OCO Plans:*** N/A					
Accomplishments/Planned Programs Subtotals	9.232	8.873	0.000	0.000	0.000

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603582N / *Combat System Integration*	**Project (Number/Name)** 3312 / *MTMD-Maritime Theater Missile Defense Forum*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
• 0605853N: *PU 0149 INTERNATIONAL COOP MANAGEMENT, TECHNICAL AND INTL SUPT*	4.608	2.584	3.557	-	3.557	3.638	3.423	3.526	3.652	Continuing	Continuing

Remarks

D. Acquisition Strategy

N/A

E. Performance Metrics

Quarterly Program Reviews and Baseline Assessments

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603582N / *Combat System Integration*	Project (Number/Name) 3312 / *MTMD-Maritime Theater Missile Defense Forum*	

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
BCM4I Architectures Definition &	WR	NSWC/DD : DAHLGREN, VA	0.864	0.159	Nov 2014	0.154	Jan 2016	0.000		-		0.000	0.000	1.177	-
BMC4I Architectures Definition &	C/CPFF	NSWC/DD : DAHLGREN, VA	0.423	0.224	May 2015	0.239	Jan 2016	0.000		-		0.000	0.000	0.886	-
BMC41 Interoperability Program Design & Direction	C/CPFF	SPAWAR : SAN DIEGO, CA	0.850	0.320	Mar 2015	0.679	Jan 2016	0.000		-		0.000	0.000	1.849	Continuing
BMC4I Programmatic Support	C/CPFF	GRYPHON : WASHINGTON, DC	0.023	0.161	Dec 2014	0.140	Jan 2016	0.000		-		0.000	0.000	0.324	-
M&S Test Plan and Execution	WR	CDSA/DN : DAM NECK, VA	0.783	0.306	Oct 2014	0.244	Jan 2016	0.000		-		0.000	0.000	1.333	-
M&S Test Development & Engineering	C/CPFF	CDSA/DN : DAM NECK, VA	0.554	0.169	Jan 2015	0.244	Jan 2016	0.000		-		0.000	0.000	0.967	-
M&S Technical Support & Special Studies	C/CPFF	NAVSEA (JHU/ APL) : LAUREL, MD	0.764	0.336	Dec 2014	0.494	Jan 2016	0.000		-		0.000	0.000	1.594	-
CDEP Project Officer (PO)	WR	CDSA/DN : DAM NECK, VA	0.197	0.118	Oct 2014	0.364	Jan 2016	0.000		-		0.000	0.000	0.679	-
CDEP Interoperability Cert Assess	WR	NSWC/DD : DAHLGREN, VA	0.814	0.071	Nov 2014	0.212	Jan 2016	0.000		-		0.000	0.000	1.097	-
CDEP Test Event Plan & Coor for Data Mgt & Analysis	WR	NSWC/COR : RIVERSIDE, CA	0.509	0.145	Oct 2014	0.149	Jan 2016	0.000		-		0.000	0.000	0.803	-
CDEP Caps & Lims Development	WR	NSWC/PHD : VENTURA, CA	0.194	0.284	Oct 2014	0.292	Jan 2016	0.000		-		0.000	0.000	0.770	-
CDEP Cross Domain Network Engineering	WR	SSCPAC : SAN DIEGO, CA	0.472	0.103	Oct 2014	0.212	Jan 2016	0.000		-		0.000	0.000	0.787	-
CDEP Engineering & Operations	C/CPFF	SSCPAC (TEA) : SAN DIEGO, CA	0.210	0.179	Feb 2015	0.215	Jan 2016	0.000		-		0.000	0.000	0.604	-
CDEP Data Guard Engineering	C/CPFF	NSWC/DD (LM) : DAHLGREN, VA	0.512	0.109	Dec 2014	0.186	Jan 2016	0.000		-		0.000	0.000	0.807	-
CDEP Contract Engineering Support	C/CPFF	CDSA/DN (URS) : DAM NECK, VA	0.349	0.110	Nov 2014	0.148	Jan 2016	0.000		-		0.000	0.000	0.607	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603582N / *Combat System Integration*	**Project (Number/Name)** 3312 / *MTMD-Maritime Theater Missile Defense Forum*

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
OA Development of Interface Standards	WR	NSWC/DD : DAHLGREN, VA	0.000	0.413	Nov 2014	0.446	Jan 2016	0.000		-		0.000	0.000	0.859	-
TPEX Technical Support	WR	PEO IWS : WASHINGTON, DC	0.050	0.060	Nov 2014	0.051	Jan 2016	0.000		-		0.000	0.000	0.161	-
TPEX Link Management Support, BTS LAB	WR	SPAWAR : SAN DIEGO, CA	0.000	0.000		0.000		0.000		-		0.000	0.000	0.000	-
TPEX Data Analysis & Reporting, PA 1 PO	WR	NSWC/COR : RIVERSIDE, CA	0.275	1.296	Dec 2014	0.521	Jan 2016	0.000		-		0.000	0.000	2.092	-
TPEX Afloat Training & Readiness	WR	TTGLANT : NORFOLK, VA	0.000	0.000		0.000		0.000		-		0.000	0.000	0.000	-
TPEX Data Collection, Analysis & Reporting	WR	NSWC/DD : DAHLGREN, VA	0.100	0.413	Oct 2014	0.106	Jan 2016	0.000		-		0.000	0.000	0.619	-
TPEX Mini Groom Team, PO, PE, TDL	WR	NSWC/PHD : PORT HUENEME, CA	1.408	1.033	Nov 2014	0.318	Jan 2016	0.000		-		0.000	0.000	2.759	-
TPEX Test Plans, Trials Lead, Test Eng, Prog & Fin Management	C/CPFF	PEO IWS (TASC) : WASHINGTON, DC	0.811	1.322	Nov 2014	1.189	Jan 2016	0.000		-		0.000	0.000	3.322	-
TPEX Test Planning, Orbital Safety	C/CPFF	NAVSEA (JHU/ APL) : LAUREL, MD	0.050	0.970	Dec 2014	0.413	Jan 2016	0.000		-		0.000	0.000	1.433	-
TPEX Range Planning & execution, Safety Planning/Documentation, Clearances & Approval, Infrastructure Modifications	WR	UK MINISTRY OF DEFENSE : HEBRIDES, SCOTLAND	4.349	0.000		0.000		0.000		-		0.000	0.000	4.349	-
TPEX Targets & Weapons	WR	NSWC PHD/WSMR DET : CHINA LAKE, CA	0.000	0.258	Nov 2014	0.531	Dec 2015	0.000		-		0.000	0.000	0.789	-
TPEX Afloat Training & Readiness	WR	TTGPAC : SAN DIEGO, CA	0.000	0.000		0.053	Jan 2016	0.000		-		0.000	0.000	0.053	-
TPEX Air Target Support	WR	TTGPAC : NORFOLK, VA	0.000	0.000		0.000		0.000		-		0.000	0.000	0.000	-
TPEX Range Planning & execution, Safety	WR	PMRF : KAUAI, HI	0.000	0.052	Nov 2014	0.000		0.000		-		0.000	0.000	0.052	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603582N / *Combat System Integration*	**Project (Number/Name)** 3312 / *MTMD-Maritime Theater Missile Defense Forum*

Test and Evaluation ($ in Millions)

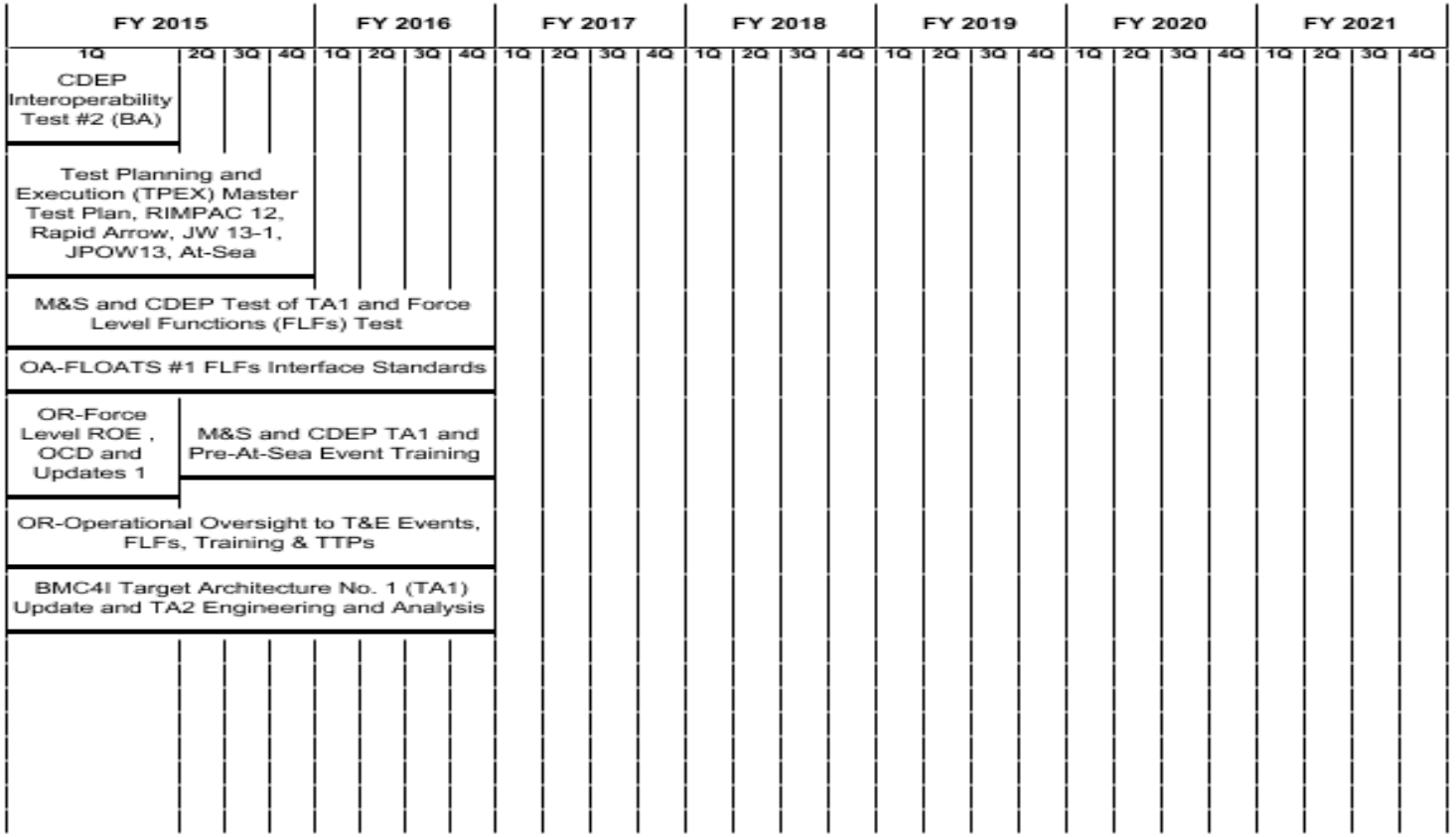
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Planning/Documentation, Clearances & Approvals															
TPEX SAAM Flight Travel	WR	NATIONAL GUARD BUREAU : ARLINGTON, VA	0.000	0.000		1.008	Jan 2016	0.000		-		0.000	0.000	1.008	-
TPEX Range & Target Support Services	WR	NAWC PM : POINT MUGU, CA	0.000	0.103	Nov 2014	0.265	Jan 2016	0.000		-		0.000	0.000	0.368	-
TPEX Technical Support	C/CPFF	MISSILE DEFENSE AGENCY : REDSTONE ARSENAL, AL	0.000	0.518	Apr 2015	0.000		0.000		-		0.000	0.000	0.518	-
		Subtotal	14.561	9.232		8.873		0.000		-		0.000	0.000	32.666	-

	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	14.561	9.232		8.873		0.000		-		0.000	0.000	32.666	-

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603582N / *Combat System Integration*	**Project (Number/Name)** 3312 / *MTMD-Maritime Theater Missile Defense Forum*

Proj: 3312 - MTMD - Maritime Theater Missile Defense Forum



2017PB - 0603582N - 3312

Exhibit R-4, RDT&E Schedule Profile: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603582N / *Combat System Integration*	**Project (Number/Name)** 3312 / *MTMD-Maritime Theater Missile Defense Forum*

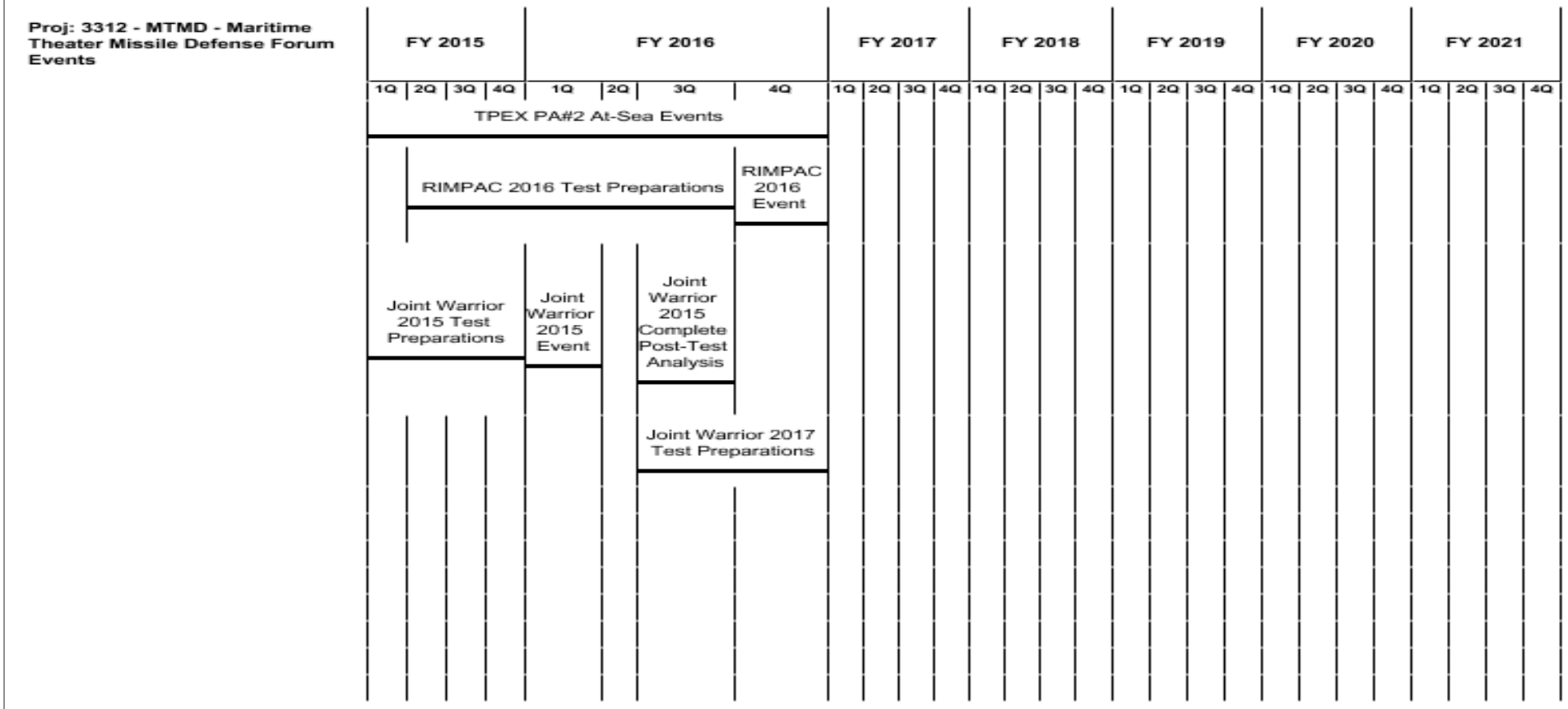


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Exhibit R-4A, RDT&E Schedule Details: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603582N / *Combat System Integration*	**Project (Number/Name)** 3312 / *MTMD-Maritime Theater Missile Defense Forum*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj: 3312 - MTMD - Maritime Theater Missile Defense Forum				
CDEP Interoperability Test #2 (BA)	1	2015	1	2015
Test Planning and Execution (TPEX) Master Test Plan, RIMPAC 12, Rapid Arrow, JW 13-1, JPOW13, At-Sea Event #1	1	2015	4	2015
M&S and CDEP Test of TA1 and Force Level Functions (FLFs) Test	1	2015	4	2016
OA-FLOATS #1 FLFs Interface Standards	1	2015	4	2016
OR-Force Level ROE , OCD and Updates 1	1	2015	1	2015
M&S and CDEP TA1 and Pre-At-Sea Event Training	2	2015	4	2016
OR-Operational Oversight to T&E Events, FLFs, Training & TTPs	1	2015	4	2016
BMC4I Target Architecture No. 1 (TA1) Update and TA2 Engineering and Analysis	1	2015	4	2016
Proj: 3312 - MTMD - Maritime Theater Missile Defense Forum Events				
TPEX PA#2 At-Sea Events	1	2015	4	2016
RIMPAC 2016 Test Preparations	2	2015	3	2016
RIMPAC 2016 Event	4	2016	4	2016
Joint Warrior 2015 Test Preparations	1	2015	4	2015
Joint Warrior 2015 Event	1	2016	1	2016
Joint Warrior 2015 Complete Post-Test Analysis	3	2016	3	2016
Joint Warrior 2017 Test Preparations	3	2016	4	2016

Exhibit R-2, RDT&E Budget Item Justification: PB 2017 Navy											Date: February 2016	
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 4: *Advanced Component Development & Prototypes (ACD&P)*					R-1 Program Element (Number/Name) PE 0603595N *I (U)Ohio Replacement*							
COST ($ in Millions)	**Prior Years**	**FY 2015**	**FY 2016**	**FY 2017 Base**	**FY 2017 OCO**	**FY 2017 Total**	**FY 2018**	**FY 2019**	**FY 2020**	**FY 2021**	**Cost To Complete**	**Total Cost**
Total Program Element	0.000	833.274	971.393	700.811	-	700.811	757.737	476.140	198.968	330.466	Continuing	Continuing
3220: *SBSD Advanced Submarine System Development*	0.000	796.804	971.393	700.811	-	700.811	757.737	476.140	198.968	330.466	Continuing	Continuing
3237: *Launch Test Facility*	0.000	36.470	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	36.470
Program MDAP/MAIS Code: P444												

A. Mission Description and Budget Item Justification

This program element supports innovative research and development in submarine Hull, Mechanical and Electrical (HM&E) 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), Independent Research and Development, and Small Business Innovation Research (SBIR) projects.

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.

Project Unit 3237:

The Launch Test Facility project constructs the Launch Test Facility at Naval Air Warfare Center, China Lake, CA to enable Full Scale Surface Launch Testing and evaluation / qualification of the TRIDENT II D5LE SWS missile launcher subsystem for the OHIO Replacement Submarine. The project construction will be authorized by 10 U.S.C. Section 2353, funded from Research, Development, Test, and Evaluation (RDT&E) appropriations, and will have no general utility and will be utilized solely to meet RDT&E contractual requirements.

Exhibit R-2, RDT&E Budget Item Justification: PB 2017 Navy					Date: February 2016
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 4: *Advanced Component Development & Prototypes (ACD&P)*		R-1 Program Element (Number/Name) PE 0603595N *I (U)Ohio Replacement*			
B. Program Change Summary ($ in Millions)	**FY 2015**	**FY 2016**	**FY 2017 Base**	**FY 2017 OCO**	**FY 2017 Total**
Previous President's Budget	853.277	971.393	712.354	-	712.354
Current President's Budget	833.274	971.393	700.811	-	700.811
Total Adjustments	-20.003	0.000	-11.543	-	-11.543
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-20.003	0.000			
• Rate/Misc Adjustments	0.000	0.000	-11.543	-	-11.543

Change Summary Explanation

Note: Beginning in 2015, there is an administrative change that shifts efforts funded from PE 0603561N (Advanced Submarine System Development) / Project 3220 to PE 0603595N (Ohio Replacement) / Project 3220. This shift is consistent with Congressional intent identified in the FY13 Appropriation Act.

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603595N / *(U)Ohio Replacement*	Project (Number/Name) 3220 / *SBSD Advanced Submarine System Development*	

COST ($ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
3220: *SBSD Advanced Submarine System Development*	0.000	796.804	971.393	700.811	-	700.811	757.737	476.140	198.968	330.466	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

Note

Note: Beginning in 2015, there is an administrative change that will shift efforts funded from PE 0603561N (Advanced Submarine System Development) / Project 3220 to PE 0603595N (OHIO Replacement) / Project 3220. This shift is consistent with Congressional intent identified in the FY13 Appropriation Act.

A. Mission Description and Budget Item Justification

The Sea Based Strategic Deterrent (SBSD) Advanced Submarine System Development project supports the OHIO Replacement (OR) program. The funding applies to the design, systems engineering, prototyping, and vendor qualification activities needed to execute the schedule for Common Missile Compartment (CMC) design, whole ship design, and component technologies development for the next generation U.S. ballistic missile submarine. This RDT&E program supports cooperation with the United Kingdom (UK) to maintain strategic deterrence, based on a single effort to develop a CMC as agreed by the UK Secretary of State for Defense and the U.S. Secretary of Defense in 2009.

The OHIO Replacement program strategy is to maximize the re-use of existing OHIO systems and new designs from the SEAWOLF and VIRGINIA Classes (as applicable), focus on Life Cycle Total Ownership Cost (TOC) affordability, and meet the military requirements established for this SSBN to achieve mission success in a challenging environment. The requested funding levels provide for the Technology Development, Design, and Engineering Integration efforts necessary to support the OHIO Replacement SSBN lead ship construction start in FY 2021.

The following key activities support a ship acquisition program to replace the OHIO Class SSBNs:

1. Design and development of a missile compartment, launch system, and strategic weapons support systems to meet U.S. strategic requirements while cooperating with the UK on modernizing its strategic deterrent in accordance with Presidential direction (December 2006).
2. Concept, System Definition, and Detailed Design for remaining portions of the ship will be accomplished through a Design/Build/Sustain approach modeled after the approach used by the VIRGINIA Class program.
3. Engineering and integration of existing technologies and development of new technologies required to provide the capabilities necessary to ensure platform operational effectiveness and minimize life cycle cost.

OR Concept and System Definition Prototyping, and Technology Development Efforts
The OR program supports design, systems engineering, prototyping and vendor qualification activities needed to develop CMC design, the OHIO Replacement whole ship design, and component development. The OR design timelines are based on the design approach proven on the VIRGINIA Class Program, adjusted for the additional complexity of a missile compartment and Strategic Weapons Systems (SWS). Planned technical studies and prototyping are necessary to reduce risks

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603595N / *(U)Ohio Replacement*	**Project (Number/Name)** 3220 / *SBSD Advanced Submarine System Development*

associated with updating SSBN system designs for current technical standards and demonstrating design feasibility of developmental technology to meet the ship design and construction schedule.

The Navy continues investing in program funded affordability initiatives similar to those employed successfully for VIRGINIA Class, but tailored to the unique SSBN mission and operational tempo of OHIO Replacement to drive down overall program costs. Efforts will focus on reducing ship construction costs through implementing more effective design features and production methods to produce a more affordable/producible submarine. As part of this effort, alternative contracting strategies are also being examined to include multi-class multiyear procurement (MYP) and economic order quantity (EOQ).

Activities for FY 2015 were executed to ensure the first article quad pack prototype of the CMC remains on schedule to support the UK SUCCESSOR Program. The CMC program will mature required technologies and re-host the TRIDENT II D5 SWS (Launcher, Fire Control and Navigation) while ensuring no degradation to D5 security, safety and performance. In addition, whole ship design efforts are focused on technologies requiring significant engineering, integration and development time as well as those technologies that are required to support ship design and construction schedules such as the propulsor and maneuvering/ship control. These technologies are critical for stealth capability for a ship class that will be in service until the 2080s. Ship detailed design efforts include important pre-construction activities such as finalizing ship requirements, risk characterization and mitigation, improvement and validation of performance prediction tools and improvement of design tools. Technology development will address engineering and integration of existing technologies as well as maturation of developmental technologies.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Title: Lead Design Yard (CMC / Ship Study and Design)	425.044	517.316	335.809	0.000	335.809
Articles:	-	-	-	-	-
FY 2015 Accomplishments: The combination of Common Missile Compartment (CMC) Design and Prototyping and Ship Study and Design represents the required Lead Design Yard (LDY) Shipbuilder effort for the OHIO Replacement (OR) Program. CMC: This funding applies to the design, systems engineering, prototyping, and vendor qualification activities needed to execute the schedule for Common Missile Compartment (CMC) design and component / technology development for the OHIO Replacement submarine. Included in this effort are prototyping of the Missile Tubes (MTs), Quad Packs (QPs) and ultimately the Missile Tube Module (MTM). Specific efforts in FY2015 included commencing efforts supporting prototyping of the Missile Tubes (MTs), Quad Packs (QPs) and ultimately the Missile Tube Module (MTM). First Article QP Arrangements Completed. Missile Tube Design Disclosures 97 percent Completed. CMC System Descriptions Completed. Commenced manufacture of first article QP missile tubes. Also included are continuing efforts for the design and development of the MTs, MTM and entire CMC to include: completion of approximately 79 percent of Diagrams, 6 percent of Design Disclosures (including 80 percent of First Article QP Design Disclosures), and 60 percent of CMC Arrangements (approximately 650 products). Completed all CMC Preliminary Hazard Analyses and Safety Requirements Hazard Analyses.					

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603595N / *(U)Ohio Replacement*	**Project (Number/Name)** 3220 / *SBSD Advanced Submarine System Development*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Additionally this effort continued validation of missile tube to missile tube quad pack production techniques development, testing, and integration of missile tube to keel robotic welding techniques that support process certification; generated digital manufacturing data for the prototype FAQP; began manufacturing of First Article MTs and placed contract actions for long lead material to support development of FAQP pressure hull. Ship Study and Design: This funding applies to the design, systems engineering, prototyping, and vendor qualification activities needed to execute the schedule for whole ship design, shipbuilder component / technology development for the OHIO Replacement submarine. Specific efforts in FY2015 included design of the forward and aft ends of OHIO Replacement including Rest of Ship (RoS) system integration including the neared completion of System Descriptions. Additionally this effort includes the completion of approximately 70 percent of engineered component procurement specifications, 90 percent of System Diagrams, 12 percent of Arrangements (approximately 200 products). This effort also commenced RoS Design Disclosures and completed approximately 70 percent of Preliminary Hazard Analyses. This funding also continues maintaining configuration control for all CMC interfaces with Rest of Ship, began ship integration of the Generation 1 Propulsor design and continued development of a Non-Shipboard Prototype to validate the next generation design tool at the shipbuilder.					
FY 2016 Plans: The combination of Common Missile Compartment (CMC) Design and Prototyping and Ship Study and Design represents the required Lead Design Yard (LDY) Shipbuilder effort for the OHIO Replacement (OR) Program. CMC: This funding applies to the design, systems engineering, prototyping, and vendor qualification activities needed to execute the schedule for Common Missile Compartment (CMC) design and component / technology development for the OHIO Replacement submarine. Included in this effort are continued prototyping of the Missile Tubes (MTs), Quad Packs (QPs) and ultimately the Missile Tube Module (MTM). Specific planned efforts in FY 2016 include continued fabrication of First Article prototype MTs, completion of First Article QP Design Disclosures, and Diagrams. Additionally, this effort includes the completion of approximately 20 percent of Design Disclosures (approximately 200 products) and 94 percent of CMC Arrangements (approximately 965 products). This effort also includes receiving approvals for CMC System Hazard Analyses (SHAs); performing assembly, installation and test of manufacturing fixtures required to prove Integrated Tube and Hull (ITH) manufacturing; commencing manufacturing of the FAQP pressure hull; support of development of Strategic Weapons Support Systems (SWSS) for the land based test facility; and placement of contract actions for material to support the Prototype MTM.					

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603595N / *(U)Ohio Replacement*	**Project (Number/Name)** 3220 / *SBSD Advanced Submarine System Development*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Ship Study and Design: Lead Design Yard (LDY) efforts increase by approximately 20 percent in FY 2016, driven by a 50 percent increase in labor hours and time related material associated with design disclosure and arrangement development as well as the accompanying engineering analysis. The increase in funding requirements from FY 2015 to FY 2016 supports the 83 percent design completion goal for an FY 2021 Lead Ship construction start and the aggressive 84 month build schedule necessary to support the first strategic deterrent patrol in FY 2031. This funding applies to the shipbuilder design, systems engineering, prototyping, and vendor qualification activities needed to execute the schedule for whole ship design, component / technology development for the OHIO Replacement submarine. Specific efforts in FY 2016 include the completion of approximately 93 percent of engineered component procurement specifications, RoS Systems Diagrams, 3 percent of Design Disclosures (approximately 75 products), 45 percent of Arrangements (approximately 800 products), and completion of Preliminary Hazard Analyses, and completed development of a Non-Shipboard Prototype to validate the next generation design tool at the shipbuilder. Efforts will also continue towards Safety Requirements Hazard Analyses and maintaining configuration control for all CMC interfaces with Rest of Ship and progressing ship integration of the Propulsor design.					
FY 2017 Base Plans: The combination of Common Missile Compartment (CMC) Design and Prototyping and Ship Study and Design represents the required Lead Design Yard (LDY) Shipbuilder effort for the OHIO Replacement (OR) Program. CMC: This funding applies to the design, systems engineering, prototyping, and vendor qualification activities needed to execute the schedule for Common Missile Compartment (CMC) design and component / technology development for the OHIO Replacement submarine. Included in this effort are continued prototyping of the Missile Tubes (MTs), Quad Packs (QPs) for quad packs and ultimately the Missile Tube Module (MTM). Specific planned efforts in FY 2017 include continued fabrication and outfitting of First Article QP prototype MTs; completion of approximately 30 percent of Design Disclosures (approximately 300 products), and 98 percent of CMC Arrangements (approximately 995 products) in support of the MTs, First Article QP (FAQP), and MTM build. This effort also includes completion of installation and test of manufacturing fixtures required to prove Integrated Tube and Hull (ITH) manufacturing, continued manufacture of the FAQP and continued support of development of Strategic Weapons Support Systems (SWSS) for the land based test facility. Ship Study and Design: This funding applies to the shipbuilder design, systems engineering, prototyping, and vendor qualification activities needed to execute the schedule for whole ship design, component / technology					

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603595N / *(U)Ohio Replacement*	**Project (Number/Name)** 3220 / *SBSD Advanced Submarine System Development*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
development for the OHIO Replacement submarine. Specific efforts in FY 2017 include the completion of engineered component procurement specifications, 6 percent of Design Disclosures (approximately 150 products), 79 percent of Arrangements (approximately 1,400 products), as well as completing CMC Subsystem, System Hazard Analyses, and Safety Requirements Hazard Analyses. Efforts will also continue towards maintaining configuration control for all CMC interfaces with Rest of Ship and progressing ship integration of the Propulsor design. ***FY 2017 OCO Plans:*** N/A					
Title: NAVSEA R&D and Prototyping	152.606	184.978	142.608	0.000	142.608
Articles:	-	-	-	-	-
FY 2015 Accomplishments: This funding applies to the Government combat systems, component and technology development for the OHIO Replacement (OR) submarine essential to achieving required signatures, maneuverability, combat and communications capabilities. Specific efforts in FY 2015 included hardware manufacturing of the Generation 1 Propulsor models for testing on the large scale vehicle, and commencement of the Generation 2 Propulsor design based on lessons learned from Generation 1 testing; Commenced manufacturing of the full scale prototype propulsor quick disconnect duct hardware; and established the full scale bearing test rig for future evaluations of candidate prototype OR propulsor bearing materials. Additional efforts included beginning Phase II of the Concept of Operations Exercise (COOPEX) to support Hovering and Missile Compensation Control System (HMCCS) and Ship Control System designs; conducting a full scale at-sea characterization test on a surrogate platform to inform stern design; transition of out-of-autoclave bow dome manufacturing process to the shipbuilder; continuing Government Furnished Equipment (GFE) development studies to enable delivery of preliminary Government Furnished Information (GFI) for Non-Propulsion Electronics Systems (NPES); continued OR specific systems engineering efforts and arrangements trade studies to support AN/BRR-6 reliability updates; and conducting water tunnel and model testing to support control surface design. This effort also continues Government support and oversight of development of approximately 50 engineered components. ***FY 2016 Plans:*** This funding applies to the Government combat systems, component and technology development for the OHIO Replacement (OR) submarine essential to achieving required signatures, maneuverability, combat and communications capabilities. Efforts in FY 2016 include Generation 1 Propulsor testing on the Large Scale Vehicle and continued Generation 2 Propulsor design (including small and intermediate scale testing).					

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603595N / *(U)Ohio Replacement*	**Project (Number/Name)** 3220 / *SBSD Advanced Submarine System Development*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Other efforts include machining and finishing of the quick disconnect duct prototype and preparations for the associated handling and assembly demonstrations for testing of candidate propulsor bearing materials at the full scale bearing test rig; and completing Concept of Operations Exercise (COOPEX) Phase II & III to support Hovering and Missile Compensation and Missile Compensation Control System (HMCCS) and Ship Control System designs. Specific efforts also include continued development, refinement, and delivery of GFI for NPES; continued assessment of AN/BRR-6 reliability based updates (including delivery of updated GFI); continued initial systems architecture assessment and development in conjunction with existing submarine classes to deliver increased GFI fidelity; and completion of testing and analysis to support the finalization of control surface design. This effort also continues Government support and oversight of development of approximately 50 engineered components. ***FY 2017 Base Plans:*** This funding applies to the Government combat systems, component and technology development for the OHIO Replacement (OR) submarine essential to achieving required signatures, maneuverability, combat and communications capabilities. Efforts in FY 2017 include Generation 2 propulsor design, intermediate scale testing, and hardware manufacturing for Large Scale Vehicle testing; begin installation of an array upgrade at the Acoustic Research Detachment (ARD) to support Generation 2 propulsor large scale vehicle testing; and completion of the quick disconnect duct demonstration. Other efforts include beginning testing of the OR prototype bearing at the full scale bearing test rig, start preliminary hydrodynamic characterization and submerged operating envelope development; development of drawings and procurement specifications for the OR bow dome. Specific efforts also include continued development, refinement, and delivery of GFI for NPES; continued assessment of AN/BRR-6 reliability based updates (including delivery of updated GFI); continued initial systems architecture assessment and development in conjunction with existing submarine classes to deliver increased GFI fidelity. This effort also continues Government support and oversight of development of approximately 50 engineered components. ***FY 2017 OCO Plans:*** N/A					
Title: Systems Engineering/Program Management	70.391	71.896	11.226	0.000	11.226
Articles:	-	-	-	-	-
FY 2015 Accomplishments: This funding applies to the Government technical and programmatic oversight including Program Office management and technical support from government laboratories for review, analysis and approval of lead					

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603595N / *(U)Ohio Replacement*	**Project (Number/Name)** 3220 / *SBSD Advanced Submarine System Development*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
design yard and various government performers' design deliverables. Specific efforts in FY 2015 include continued review and approval of Arrangements, System Descriptions/Diagrams, and Design Disclosures in accordance with the Integrated Master Schedule (IMS) via technical oversight, review and Government approval of all Lead Design Yard (LDY) developed design products. Continued maintenance planning and design for sustainment activities to ensure SBSD availability requirements can be met. In August 2015, the updated OHIO Replacement Capabilities Development Document (CDD) was submitted to the Joint Requirements Oversight Council (JROC) for validation. Final JROC validation received on 25 August 2015. Continued functional allocation of CDD requirements to platform design and system attributes and performance standards. Continued to identify and assess platform, shore facilities, and infrastructure characteristics to identify opportunities to positively impact program costs. Continued program affordability initiatives in order reduce overall out-year program costs. Specific initiatives include Integrated Product Development Environment (IPDE) process development and identification of candidates for material reuse. Continued program affordability efforts targeted to achieving potential savings associated with multi-year and/or Economic Order Quantity (EOQ) procurements across submarine classes, investigating the government vs. contractor furnished equipment mix for potential efficiencies, and potential savings associated with continuous missile tube and/or launch tube production runs. Continued efforts for Milestone B document preparation to fulfill OSD oversight requirements.					
FY 2016 Plans: This funding applies to the Government technical and programmatic oversight including Program Office management and technical support from government laboratories for review, analysis and approval of lead design yard and various government performers' design deliverables. Specific efforts in FY 2016 include continued review and approval of Arrangements, System Descriptions/Diagrams, and Design Disclosures in accordance with the Integrated Master Schedule (IMS) via technical oversight, review and Government approval of all Lead Design Yard (LDY) developed design products. Complete development and gain approval of TEMP and LFT&E Master Plan. Obtain waiver for Full-Up-System Level (FUSL) testing. Continue program affordability efforts targeted to quantifying potential savings associated with multi-year and/or Economic Order Quantity (EOQ) procurements across submarine classes, investigating the government vs. contractor furnished equipment mix for potential efficiencies, identifying and quantifying manufacturing/producibility improvements, and potential savings associated with continuous MT and/or launch tube production runs.					
FY 2017 Base Plans: This funding applies to the Government technical and programmatic oversight including Program Office management and technical support from government laboratories for review, analysis and approval of lead design yard and various government performers' design deliverables. Specific efforts in FY 2017 include higher					

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603595N / *(U)Ohio Replacement*	**Project (Number/Name)** 3220 / *SBSD Advanced Submarine System Development*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
fidelity functional mapping of JROC-validated CDD requirements to key subordinate design documents such as the NPES Functional Requirements Document (FRD) and Ship Building Specifications in support of the planned System Engineering Technical Review (SETR) events and in support of platform arrangements reviews and staffing of other design deliverables from the Lead Design Yard and PARMs. Requirements Development activities will migrate from the definition stage to the implementation and verification stage. ***FY 2017 OCO Plans:*** N/A					
Title: Strategic Weapons Systems Integration	148.763	197.203	211.168	0.000	211.168
Articles:	-	-	-	-	-
FY 2015 Accomplishments: Continued system engineering efforts required for the re-hosting and integration of the TRIDENT II (D5) SWS on the OHIO Replacement submarine including review and modification of SWS Coordination, Interface and Arrangement Drawings for SWS equipment within the CMC and Missile Control Center Module (MCCM), SWS system and subsystem detailed preliminary design, and Hardware and Software requirements development. Continued SWS Test Systems material procurement and builds, test berth /facility modifications and development of special test vehicles. Continued SWS Ashore test capability development. Continued SWS training capability/requirements development. Completed build and deliver Fire Control Engineering Test Systems. Continued design efforts for the development of a missile launch tube test capability and test stand including refurbishment of a test vehicle to support launch system prototype efforts and evaluation / qualification program. Continue design and development efforts for shipboard SWS Navigation. Continued systems engineering design efforts related to the OHIO Replacement guidance handling carts and procurement of a prototype guidance handling cart.					
FY 2016 Plans: Continue system engineering efforts required for the re-hosting and integration of the TRIDENT II (D5) SWS on the OHIO Replacement submarine including review and modification of SWS Coordination, Interface and Arrangement Drawings for SWS equipment within the CMC and Missile Control Center Module (MCCM) as the SWS system and its subsystems transition into detailed design. Continue SWS Test Systems material procurement and builds, test berth / facility modifications and development of special test vehicles. Continue SWS Ashore test capability development. Continue SWS training capability/requirements development. Complete final design efforts for the China Lake Launch Test Facility (LTF) . Conduct a launcher evaluation test readiness review. Conduct integration and test of multiple components at the LTF. Continue preliminary					

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603595N / *(U)Ohio Replacement*	**Project (Number/Name)** 3220 / *SBSD Advanced Submarine System Development*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Fire Control hardware and software subsystem integration testing. Continue design and development efforts for shipboard SWS Navigation. Complete build and test of phase 1 of the Inertial Navigation Simulator which involves the simulation of subsystem interfaces. Continue systems engineering design efforts related to the OHIO Replacement guidance handling carts. Conduct mechanical and electrical surface support equipment critical design reviews. Commence Reentry Body Simulator development. ***FY 2017 Base Plans:*** Continue system engineering efforts required for the re-hosting and integration of the TRIDENT II (D5) SWS on the OHIO Replacement submarine including review and modification of SWS Coordination, Interface and Arrangement Drawings for SWS equipment within the CMC and Missile Control Center Module (MCCM) and SWS system and subsystem detailed design. Complete land-based test berth / facility modifications. Continue SWS Test Systems material procurement and builds, and development of special test vehicles. Continue SWS Ashore test capability development. Continue SWS training capability/requirements development. Initiate the launcher evaluation testing at the China Lake Launch Test Facility (LTF). Conduct SWS Launcher and Fire Control subsystem Critical Design Reviews. Continue design and development efforts for shipboard SWS Navigation in preparation for the Critical Design Review. Continued systems engineering design efforts related to the OHIO Replacement guidance handling carts and procurement of a prototype guidance handling cart. Complete Reentry Body Simulator development. ***FY 2017 OCO Plans:*** N/A					
Accomplishments/Planned Programs Subtotals	796.804	971.393	700.811	0.000	700.811

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
• RDTEN/3219: *SBSD Nuclear Technology Development*	369.964	419.273	390.326	-	390.326	389.279	281.218	270.091	149.700	Continuing	Continuing
• RDTEN/3237: *ORP Launch Test Facility*	36.470	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	36.470
• MILCON/0805376N: *Ohio Replacement Power and Propulsion Facility*	23.985	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	23.985

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603595N / *(U)Ohio Replacement*	**Project (Number/Name)** 3220 / *SBSD Advanced Submarine System Development*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
• MILCON/0901211N: *MCON Design Funds*	0.364	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	0.364
• RDTEN/0951: *Joint Warhead Fuse Sustainment Program*	81.696	84.765	111.857	-	111.857	108.787	63.568	65.185	20.826	Continuing	Continuing
• OPN/5358: *SWS Modernization Fund*	209.583	240.694	215.138	-	215.138	245.396	238.665	254.815	243.736	Continuing	Continuing
• WPN/1250: *TRIDENT II Mods*	1,161.342	1,089.064	1,103.086	-	1,103.086	1,140.542	1,182.066	1,235.327	1,259.934	Continuing	Continuing
• OMN/1D2D: *Fleet Ballistic Missile*	994.191	1,034.668	1,030.267	-	1,030.267	1,046.348	1,066.921	1,127.576	1,151.370	Continuing	Continuing
• SCN/1045: *OHIO Replacement Submarine*	0.000	0.000	773.138	-	773.138	787.130	2,766.991	1,311.541	3,611.187	Continuing	Continuing

Remarks

D. Acquisition Strategy

The Common Missile Compartment (CMC)will be designed and developed to support the U.S. and UK in development of the OHIO Replacement and SUCCESSOR SSBN programs enabling a common U.S.-UK CMC and maximizing the benefit of the ongoing U.S.-UK partnership in strategic deterrence. The OHIO Replacement R&D efforts will incentivize cost reduction initiatives in the design, construction and operations & support portions of the program. R&D efforts will be performed by Navy laboratories, shipyards, private industry, and University Affiliated Research Centers.

E. Performance Metrics

Updated Integrated Master Schedule and CMC build strategy down-select. Development of signature management efforts to address knowledge gap, concepts for propulsor and shafting, and design guidance and interface control requirements.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603595N / *(U)Ohio Replacement*	**Project (Number/Name)** 3220 / *SBSD Advanced Submarine System Development*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Product Development	SS/CPFF	Ship Design Contractor-EB : Groton, CT	0.000	425.044	Oct 2014	517.316	Oct 2015	335.809	Oct 2016	-		335.809	Continuing	Continuing	Continuing
Product Development	WR	NSWC : Carderock, MD	0.000	145.437	Oct 2014	171.125	Oct 2015	121.628	Oct 2016	-		121.628	Continuing	Continuing	Continuing
Product Development	WR	NUWC : Newport, RI	0.000	14.808	Oct 2014	21.045	Oct 2015	10.045	Oct 2016	-		10.045	Continuing	Continuing	Continuing
Product Development	Various	NAVSEA : Various	0.000	23.921	Oct 2014	23.297	Oct 2015	10.935	Oct 2016	-		10.935	Continuing	Continuing	Continuing
Product Development	SS/CPFF	ARL Penn State University : State College, PA	0.000	0.492	Oct 2014	0.377	Oct 2015	0.377	Oct 2016	-		0.377	Continuing	Continuing	Continuing
Product Development	SS/CPFF	NGMS : Sunnyvale, CA	0.000	35.904	Oct 2014	51.886	Oct 2015	61.541	Oct 2016	-		61.541	Continuing	Continuing	Continuing
Product Development	SS/CPFF	JHU/APL : Laurel, MD	0.000	4.896	Oct 2014	7.317	Oct 2015	7.027	Oct 2016	-		7.027	Continuing	Continuing	Continuing
Product Development	WR	NUWC : Keyport, WA	0.000	0.000		0.000		0.332	Oct 2016	-		0.332	Continuing	Continuing	Continuing
Product Development	SS/CPFF	CSDL : Cambridge, MA	0.000	3.330	Oct 2014	3.393	Oct 2015	1.966	Oct 2016	-		1.966	Continuing	Continuing	Continuing
Product Development	WR	NSWC : Corona, CA	0.000	0.000		0.000		0.000		-		0.000	0.000	0.000	-
Product Development	SS/CPFF	LMFS : Mitchel Field, NY	0.000	7.935	Oct 2014	26.107	Oct 2015	20.209	Oct 2016	-		20.209	Continuing	Continuing	Continuing
Product Development	C/CPFF	EMCUBE : Alexandria, VA	0.000	0.951	Oct 2014	0.715	Oct 2015	0.649	Oct 2016	-		0.649	Continuing	Continuing	Continuing
Product Development	SS/CPFF	LMMSC : Sunnyvale, CA	0.000	26.472	Dec 2014	23.693	Dec 2015	18.313	Oct 2016	-		18.313	Continuing	Continuing	Continuing
Product Development	SS/CPFF	JRC : Washington, DC	0.000	0.867	Oct 2014	2.112	Dec 2015	1.863	Oct 2016	-		1.863	Continuing	Continuing	Continuing
Product Development	C/CPFF	GDAIS : Pittsfield, MA	0.000	25.291	Nov 2014	22.642	Nov 2015	41.039	Oct 2016	-		41.039	Continuing	Continuing	Continuing
Product Development	WR	CNSW : China Lake, CA	0.000	9.401	Nov 2014	13.175	Nov 2015	8.762	Oct 2016	-		8.762	Continuing	Continuing	Continuing
Product Development	SS/CPFF	IEC : Anaheim, CA	0.000	1.136	Oct 2014	1.023	Oct 2015	0.660	Oct 2016	-		0.660	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603595N / *(U)Ohio Replacement*	Project (Number/Name) 3220 / *SBSD Advanced Submarine System Development*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Product Development	WR	NSWC : Dahlgren, VA	0.000	3.432	Oct 2014	3.732	Oct 2015	6.032	Oct 2016	-		6.032	Continuing	Continuing	Continuing
Product Development	SS/CPFF	BAE : Rockville, MD	0.000	7.624	Oct 2014	8.106	Oct 2015	7.484	Oct 2016	-		7.484	Continuing	Continuing	Continuing
Product Development	SS/CPFF	BNA : Huntington Beach, CA	0.000	0.894	Dec 2014	1.213	Dec 2015	1.081	Oct 2016	-		1.081	Continuing	Continuing	Continuing
Product Development	WR	NSWC Crane : Crane, IN	0.000	12.205	Nov 2014	19.786	Nov 2015	23.027	Oct 2016	-		23.027	Continuing	Continuing	Continuing
Product Development	SS/CPFF	SPA : Alexandria, VA	0.000	2.711	Oct 2014	2.950	Oct 2015	2.705	Oct 2016	-		2.705	Continuing	Continuing	Continuing
Product Development	Various	SSP : Various	0.000	5.222	Oct 2014	8.976	Oct 2015	8.101	Oct 2016	-		8.101	Continuing	Continuing	Continuing
		Subtotal	0.000	757.973		929.986		689.585		-		689.585	-	-	-

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Contractor Management Support	C/CPFF	Various : Multiple Awards	0.000	19.938	Jan 2015	21.925	Oct 2015	0.000	Oct 2016	-		0.000	Continuing	Continuing	Continuing
Government Management Support	WR	Various: NSWC : Carderock, MD	0.000	18.477	Oct 2014	19.032	Oct 2015	10.786	Oct 2016	-		10.786	Continuing	Continuing	Continuing
Travel	WR	NAVSEA HQ : Washington, D.C.	0.000	0.416	Oct 2014	0.450	Oct 2015	0.440	Oct 2016	-		0.440	Continuing	Continuing	Continuing
		Subtotal	0.000	38.831		41.407		11.226		-		11.226	-	-	-

	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	796.804		971.393		700.811		-		700.811	-	-	-

Remarks

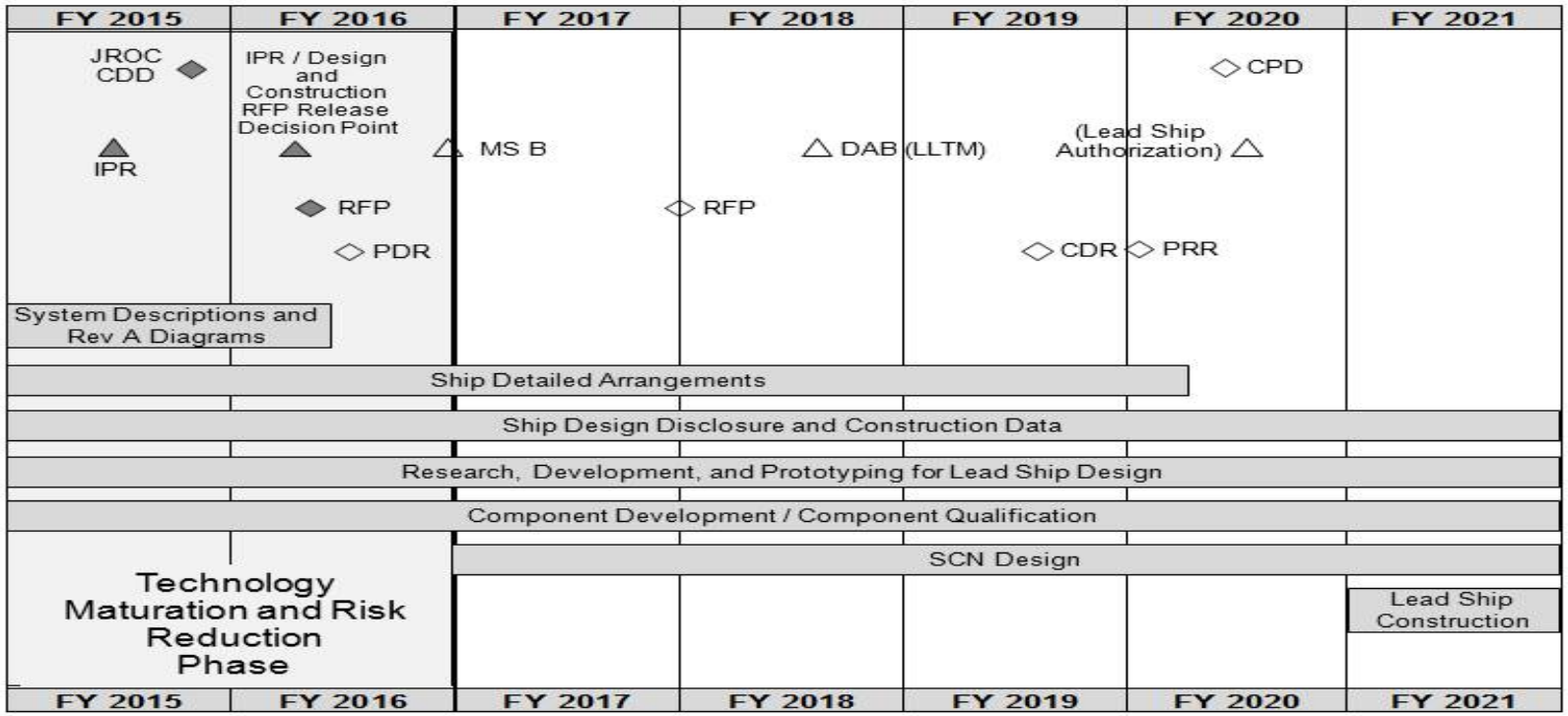
The listed Award Dates represent the date on which initial obligations occur for the effort.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603595N / *(U)Ohio Replacement*	Project (Number/Name) 3220 / *SBSD Advanced Submarine System Development*	

	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	Cost To Complete	Total Cost	Target Value of Contract

Note: Beginning in 2015, there is an administrative change that shifts efforts funded from PE 0603561N (Advanced Submarine System Development) / Project 3220 to PE 0603595N (Ohio Replacement) / Project 3220. This shift is consistent with Congressional intent identified in the FY13 Appropriation Act.

Exhibit R-4, RDT&E Schedule Profile: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603595N / *(U)Ohio Replacement*	**Project (Number/Name)** 3220 / *SBSD Advanced Submarine System Development*



CDD - Capabilities Development Document
CDR - Critical Design Review
CPD - Capability Production Document
DAB - Defense Acquisition Board
IPR - In Progress Review
JROC - Joint Requirements Oversight Council
LLTM - Long Lead Time Material
MS - Milestone
PDR - Preliminary Design Review
PRR – Production Readiness Review
RDT&E - Research, Development, Test, & Evaluation
RFP - Request for Proposal
SCN - Shipbuilding and Conversion, Navy
SRR - System Requirements Review

Exhibit R-4A, RDT&E Schedule Details: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603595N / *(U)Ohio Replacement*	**Project (Number/Name)** 3220 / *SBSD Advanced Submarine System Development*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Notes: * Effort began prior to 1st Quarter FY 2015. ** Effort continues past 4th Quarter FY 2021				
System Descriptions and Rev A Diagrams*	1	2015	2	2016
Ship Detailed Arrangements*	1	2015	1	2020
Ship Design Disclosure and Construction Data*, **	1	2015	4	2021
Research, Development, and Prototyping for Lead Ship*, **	1	2015	4	2021
Component Development/Component Qualification* , **	1	2015	4	2021
SCN Design**	1	2017	4	2021
Lead Ship Construction**	1	2021	4	2021

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603595N / *(U)Ohio Replacement*	Project (Number/Name) 3237 / *Launch Test Facility*	

COST ($ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
3237: *Launch Test Facility*	0.000	36.470	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	36.470
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Project Unit 3237: Project constructs a new Launch Test Facility to support surface launch testing and evaluation of full-scale launch technologies. The project construction is authorized by 10 U.S.C. Section 2353, funded from Research, Development, Test, and Evaluation (RDT&E) appropriations, and will have no general utility and utilized solely to meet RDT&E contractual requirements. This project enables full-scale testing of a Trident II D5LE SWS missile launcher subsystem to collect launch event information for verification and validation of modeling and simulation software, to evaluate and demonstrate launcher subsystem performance, and to qualify the launcher subsystem hardware. This project provides a test facility to conduct qualification testing of full-scale launcher hardware. The project will provide performance and safety data to mitigate the risk of a tactical failure in the fleet.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Title: OR Launch Test Facility	36.470	0.000	0.000	0.000	0.000
Articles:	-	-	-	-	-
FY 2015 Accomplishments: Construct the Launch Test Facility at Naval Air Warfare Center, China Lake, CA to enable Full Scale Launch Testing and evaluation / qualification of the TRIDENT II D5LE missile launcher subsystem for the OHIO Replacement Submarine. Additional details are contained in the form DD1391 provided as a supplement to the budget materials.					
FY 2016 Plans: N/A					
FY 2017 Base Plans: N/A					
FY 2017 OCO Plans: N/A					
Accomplishments/Planned Programs Subtotals	36.470	0.000	0.000	0.000	0.000

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603595N / *(U)Ohio Replacement*	**Project (Number/Name)** 3237 / *Launch Test Facility*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
• RDTEN/3219: *SBSD Nuclear Technology Development*	369.964	419.273	408.116	-	408.116	398.693	289.034	276.625	155.700	Continuing	Continuing

Remarks

D. Acquisition Strategy

FFP Contract executed through NAVFAC Multiple Award Construction Contract.

NAVFAC has the contractual warrant to buy design services. NAVFAC/Southwest executes the technical administration, planning, and scheduling for the overall design of the Launch Test Facility (LTF) based on the Facility Design Criteria executed by NAVFAC/SW. NAVFAC/SW Construction effort is led by NAVFAC/SW and executed by NAVFAC/SW Facilities Engineering and Acquisition Division (FEAD) for construction, certification and validation of the facility.

The facility will provide the necessary foundations, buildings, cranes, infrastructure, ordnance storage, test vehicle arrestment and other services & amenities needed to conduct full-scale surface launch test, integration testing, arrestment, and recovery/reuse of D5LE SWS test vehicles. Operation of the LTF requires interactions with NAWS & NAWCWD at China Lake, CA and its existing infrastructure, the environment, and operators & maintenance personnel. The facility is being developed to support the Surface Launch Test system capabilities which will provide a full scale, reusable launch test capability to support Launcher Subsystem development, evaluation and qualification, and Trident II D5LE SWS Missile Subsystem risk reduction.

E. Performance Metrics

Authority to Construct (ATC)
Authority to Operate (ATO)

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603595N / *(U)Ohio Replacement*	Project (Number/Name) 3237 / *Launch Test Facility*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Product Development	WR	NAWC CL : China Lake, CA	0.000	36.470	Oct 2014	0.000		0.000		-		0.000	0.000	36.470	-
		Subtotal	0.000	36.470		0.000		0.000		-		0.000	0.000	36.470	-

	Prior Years	FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	36.470		0.000		0.000		-		0.000	0.000	36.470	-

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603595N / *(U)Ohio Replacement*	**Project (Number/Name)** 3237 / *Launch Test Facility*

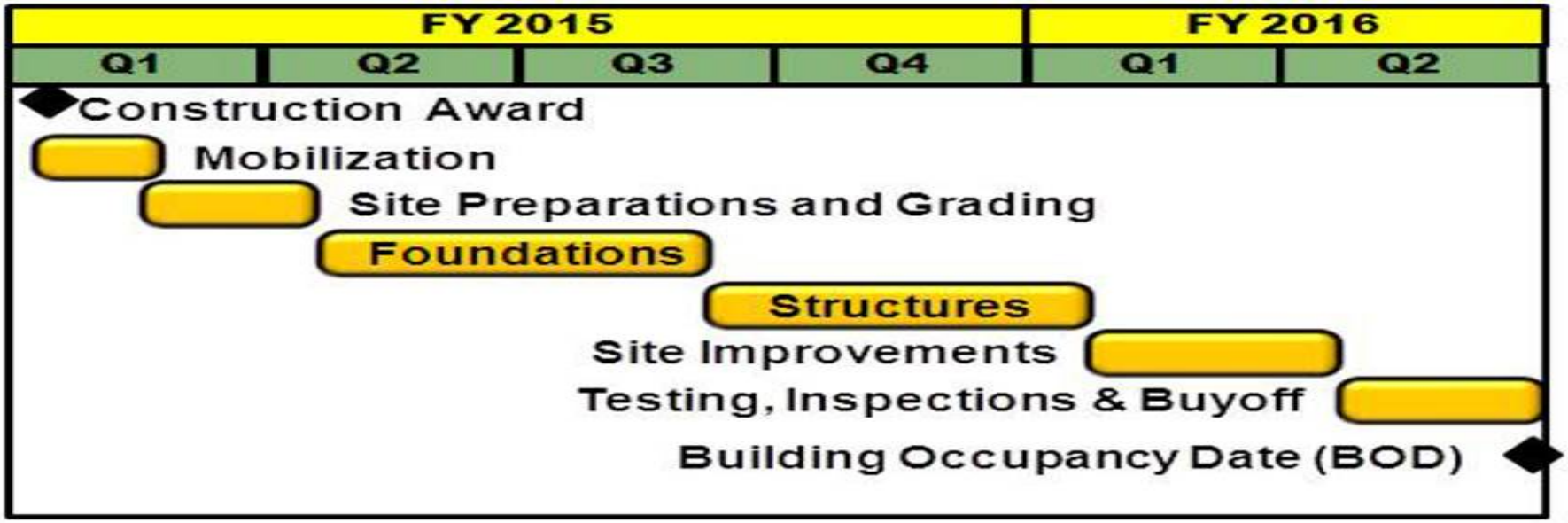


Exhibit R-4A, RDT&E Schedule Details: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603595N / *(U)Ohio Replacement*	**Project (Number/Name)** 3237 / *Launch Test Facility*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 3237				
Construction Contract Request for Proposal Issued (Estimated)	1	2015	1	2015
Construction Contract Awarded	1	2015	1	2015
Launch Test Facility Construction	1	2015	2	2016
Mobilization	1	2015	1	2015
Site Preparations and Grading	1	2015	2	2015
Foundations	2	2015	3	2015
Structures	3	2015	1	2016
Site Improvements	1	2016	2	2016
Testings, Inspections and Buyoff	2	2016	2	2016
Beneficial Occupancy Date (estimated 18 months after contract award)	2	2016	2	2016

Exhibit R-2, RDT&E Budget Item Justification: PB 2017 Navy	Date: February 2016
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 0603596N *I (U)LCS Mission Modules*

COST ($ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
Total Program Element	105.682	172.602	203.143	160.058	-	160.058	72.820	54.940	43.170	30.956	Continuing	Continuing
3129: *LCS Mission Package Development*	105.682	172.602	203.143	160.058	-	160.058	72.820	54.940	43.170	30.956	Continuing	Continuing

A. Mission Description and Budget Item Justification

This Program Element (PE) provides funds for detailed design, development, issue resolution, certification, integration, and testing of the Littoral Combat Ship (LCS) Mission Modules (MM). LCS is a fast, agile, and networked surface combatant with capabilities optimized to defeat asymmetric threats, and ensure naval and joint force access into contested littoral regions. It uses open-systems architecture design, modular weapons, sensor systems, and a variety of manned and unmanned vehicles to expand the battle space and project offensive power into the littoral.

The LCS MMs provide tailored warfighting capability for one at a time of the three focused mission areas:

MCM - provides capability to conduct minehunting (detection, localization, classification, identification, and neutralization) and mine sweeping operations for mine threats.
SUW - provides capability to conduct enhanced-range coordinated detection, tracking, classification, identification, and neutralization of groups of attacking, multiple, small boat threats, and to conduct maritime security missions.
ASW - provides capability to detect, classify, localize, and prosecute enemy submarines; counter diesel submarine threats in the littoral shallow waters and their associated deep water approaches; and to provide an escort capability for forces transiting through submarine threat areas.

B. Program Change Summary ($ in Millions)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Previous President's Budget	176.948	206.149	125.761	-	125.761
Current President's Budget	172.602	203.143	160.058	-	160.058
Total Adjustments	-4.346	-3.006	34.297	-	34.297
• Congressional General Reductions	-	-0.036			
• Congressional Directed Reductions	-	-12.970			
• Congressional Rescissions	-	-			
• Congressional Adds	-	10.000			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-4.346	0.000			
• Program Adjustments	0.000	0.000	34.805	-	34.805
• Rate/Misc Adjustments	0.000	0.000	-0.508	-	-0.508

Exhibit R-2, RDT&E Budget Item Justification: PB 2017 Navy	Date: February 2016
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 0603596N *I (U)LCS Mission Modules*

Change Summary Explanation

FY16:
$10M increase is a result of a Congressional add for Small Business Tech Insertion.

$12.970M decrease is a result of a Congressional reduction to remove ASW operational assessment of non-requirements compliant development asset.

FY17:
Decrease in LCS Mission Modules RDTEN by $6.695M was required for the Department of the Navy to comply with the Bipartisan Budget Act of 2015.

FY17 increase of $18.0M is a result of a realignment from OPN to RDT&E,N to support the rephasing of SUW and ASW test events.

FY17 increase of $8.3M supports the continued development of the Unmanned Influence Sweep System (UISS) as part of the MCM MP Increment III.

FY17 increase of $7.4M supports the train to qualify / train to certify (T2Q/T2C) requirements for the LCS Mission Modules.

FY17 increase of $7.8M was realigned from RMS OPN to accelerate unmanned system integration efforts in alignment with the Independent Review Team (IRT) recommendations.

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603596N / *(U)LCS Mission Modules*	Project (Number/Name) 3129 / *LCS Mission Package Development*	

COST ($ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
3129: *LCS Mission Package Development*	105.682	172.602	203.143	160.058	-	160.058	72.820	54.940	43.170	30.956	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Program provides focused war fighting capabilities in littoral mine countermeasures, countering small boat threats, and littoral anti-submarine warfare to provide ensured access to enable the US Joint Force operations in the littorals. A mission package is a combination of warfare mission modules with specialized crew, support equipment, and vehicles including manned helicopters and unmanned maritime systems. They are packaged in a modular fashion so that they can be quickly swapped out pier side. Mission module development includes architectures, interfaces, and integration of mission systems. Mission systems integration also includes the procurement of the first mission packages to be used on the Flight 0 Littoral Combat Ships (LCS). Although the total quantity is under review due to LCS ship and Frigate quantity adjustments, the numerical distribution of mission packages across the LCS/Frigate fleet is not expected to change the Program of Record within the FYDP. The Navy will determine the numerical distribution of MCM, SUW, and ASW mission packages across the LCS/FF Fleet. The systems to be fielded as part of the mission packages and the required RDT&E efforts will not be affected by the LCS and FF quantity adjustments. The LCS will be focused-mission ships that have the ability to embark the SUW, MCM, or ASW mission packages. The Frigates will be multi-mission ships, with certain SUW and ASW war-fighting capabilities installed.

An incremental development approach to delivering capability allows the continued insertion of mature capabilities throughout the life of the program without the need for modifications to the sea frames. Future mission package increments will be considered when joint warfighting objectives or changing threats create new operational capability requirements that cannot be met by current mission package designs, or when new technological opportunities allow significant progress toward delivering cost effective, enhanced capabilities. Future mission module increments can be tested, constructed, and incorporated into existing mission packages, one of the most important benefits of LCS modular design.

The LCS Mine Countermeasures (MCM) mission package will counter deep, shallow, and tethered mines in the littoral without putting Sailors in the minefield. When the MCM mission package is embarked, LCS is capable of conducting detect-to-engage operations (hunting, sweeping, and neutralization) against very shallow and deep-water sea mine threats. The MCM mission package provides these capabilities through the use of sensors and weapons deployed from an MH-60S multi-mission helicopter and unmanned off-board vehicles. The MCM package consists of the following systems: Coastal Battlefield Reconnaissance & Analysis (COBRA), Airborne Laser Mine Detection System (ALMDS), Remote Multi-Mission Vehicle (RMMV) (as modified based on Independent Review Team (IRT) recommendations), AQS-20A Mine hunting Sonar, Airborne Mine Neutralization System (AMNS), Unmanned Influence Sweep System (UISS) (which is comprised of the Unmanned Surface Vehicle (USV) and the Unmanned Surface Sweep System (US3)), Surface Mine Countermeasures (SMCM), Unmanned Undersea Vehicle (UUV) with Low Frequency Broad Band (LFBB), support equipment, and support containers. The individual systems are combined into five modules: Organic Airborne Mine Countermeasures (OAMCM) Module, Remote Mine Hunting Module, Unmanned Influence Sweep Module, Coastal Mine Reconnaissance Module and the Buried Mine Module. The Organic Airborne Mine Countermeasures Module provides rapid mine hunting and clearing using the embarked MH-60 helicopter and Mine Countermeasure systems. The Remote Mine Hunting Module uses a Remote Multi-Mission Vehicle (RMMV) and AQS-20A to provide sustained mine hunting and clearing from the surface. The Influence Sweep Module provides endurance bottom sweep capability, the Coastal Mine Reconnaissance Module (CMRM) will allow detection of minefield patterns and obstacles from

an embarked Fire Scout VTUAV, and the Buried Mine Module will allow detection of buried mines. When complete, the MCM mission package will provide full capability against floating, tethered, bottom, and buried mines.

The ASW mission package enables LCS to conduct detect-to-engage operations against modern submarines that pose a threat. Specific ASW capabilities include protecting forces in transit, protecting joint operating areas, and establishing ASW barriers.

ASW modules developed to provide the warfighter capabilities that can be employed for ASW area search as well as high value unit escort missions. Module components include a torpedo countermeasures system, a Variable Depth Sonar, and a Multi-Function Towed Array. The Aviation Module offers airborne threat localization and engagement capability through a Fire Scout VTUAV and an MH-60R with MK54 torpedoes. The individual systems are combined into three modules: Torpedo Defense Countermeasure; ASW Escort/Large area Clearance; and Aviation Module.

The SUW mission package increases firepower and offensive/defensive capabilities against large numbers of highly maneuverable, fast, small craft threats, giving LCS the ability to protect the sea lanes and move a force quickly through a choke point or other strategic waterway. With the SUW mission package embarked, LCS has enhanced detection and engagement capability against enemy small craft and similar littoral surface threats.

The SUW mission package is comprised of several modules including the Gun Mission Module (GMM). The GMM is comprised of two high velocity 30mm cannons and is augmented with the ship's 57mm gun to counter close in to mid-range threats. The Aviation Module uses the embarked MH-60R helicopter with Hellfire missile and the MQ-8B Fire Scout Vertical Take-off and Landing Tactical Unmanned Aerial Vehicle (VTUAV) for the detection, identification, and classification of surface contacts and to engage long range threats. The Maritime Security Module supports the embarkation of a Visit, Board, Search, and Seizure (VBSS) team. The Surface to Surface Missile Module (SSMM) will provide missile coverage for mid-range threats and small boats.

The LCS Mission Modules Common Equipment consists of enabling products required by all mission packages to provide common hardware interfaces, computer operating environment, communications systems, aviation interface systems, and portable development & integration test-sets. Common hardware interfaces include definition, installation, and control of mechanical, electrical, and cooling requirements common to all mission packages. The Mission Package Computing Environment (MPCE) provides common services and Operating Environment to support all Mission Package Application Software and Open Architecture Products. The Multi-Vehicle Communications System (MVCS) enables the control and data exchange of simultaneous unmanned mission vehicles and the Seaframes. Aviation interface systems include integration and management of data communications, data processing, and physical hardware interfaces such as common equipment and containers used by all mission packages. Development and integration test-sets provide a mobile operating environment installed in the Mission Package Portable Control Stations (MP-PCS) to serve as a surrogate Seaframe during mission package development and integration test events at test ranges.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Title: System Engineering	17.018	9.633	11.830	0.000	11.830
Articles:	-	-	-	-	-
FY 2015 Accomplishments:					

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603596N / *(U)LCS Mission Modules*	**Project (Number/Name)** 3129 / *LCS Mission Package Development*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Conducted three (3) System Engineering Technical Reviews (SETR) as follows: Surface-to-Surface Missile Module (SSMM) CDR, and Antisubmarine Warfare (ASW) Mission Package CDR to ensure that each system under review could proceed into development, module integration, and test. Assessed each Configuration Item within each system under review to ensure each product had been captured in the appropriate detailed design documents. Established the initial Production Baseline for each system/module under review. Developed and/or updated SE documentation in support of Milestone C: Systems Engineering Plan; Information Assurance Strategy; Program Protection Plan; Programmatic Environmental, Safety, and Health Evaluation (PESHE); Clinger Cohen Act. Continued to align LCS MM requirements and development plans toward the Incremental KPP approach and in support of Net-Centric operations: Supported CPD Development for the MPs; MP Department of Defense Architecture Framework (DoDAF) Architectures. Continued the implementation of LCS MM M&S strategic plan to support performance prediction; validation of T&E plans; and/or training and stim/sim efforts. Continued Safety/ESOH risk/hazard analysis and mitigation tracking: Aligned hazards and MARs to product baseline; ESOH risk/hazard analysis and mitigation; Implemented DoD/DoN ESOH related directives and initiatives affecting the program to SE Team. Continued to provide HSI subject matter expertise into development and implementation of MP common systems (i.e. CSA, MPCC, feedback process); assessed and addressed HSI issues associated with Mission Packages; evaluated manpower and workload policies affected by new technology implementation; aligned MP HSI tasks and activities to MP SETR events; tracked and mitigated MP HSI risks and issues; updated and implemented the PMS 420 HSIP. Continued Implementation of the Corrosion Prevention and Control Plan (CPCP). Continued to provide Configuration Management for the PMS 420 LCS MM Program: identified and controlled Mission Package configurations via the PMS420 CCB; managed Test Observation Report (TOR); captured and tracked problems found during integration testing, Navy Core Testing (NCT), and ship visits.					

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603596N / *(U)LCS Mission Modules*	**Project (Number/Name)** 3129 / *LCS Mission Package Development*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Continued to update the MP Reliability, Availability, Maintainability-Cost (RAM-C) Report (which comprises the RAM-C Analysis Report and the RAM-C Rationale Report) to assess LCS MP RAM metrics, influenced design of MP hardware and support-system design, and helped determine the optimal mix of hardware design, support-system design, and lifecycle cost. Coordinated with and assisted the PMS 420 APMs and LSEs with the scheduling, planning, and execution of SETRs. Verified that the LCS MPCE, the MMs, and MVCS were compliant with DoD and DON IA policies, and that such compliance is stated in their respective program Information Assurance Strategies, PRA artifacts, and other program documentation. Conducted analysis to determine the methodology and engineering design efforts required to create a federated architecture of Mission Package Application Software (MPAS) with the focus on integration into future LCS seaframes.					
FY 2016 Plans: Develop and/or update SE documentation in support of Milestone C: Systems Engineering Plan; Information Assurance Strategy; Program Protection Plan; PESHE; Clinger Cohen Act, Life Cycle Mission Data Plan Continue to align LCS MM requirements and development plans toward the Incremental KPP approach and in support of Net-Centric operations: Support CPD Development for the MPs; MP DODAF Architectures. Continue the implementation a LCS MM M&S strategic plan to support performance prediction; validation of T&E plans; and/or training and stim/sim efforts. Continue Safety/ESOH risk/hazard analysis and mitigation tracking: Align hazards and MARs to product baseline; ESOH risk/hazard analysis and mitigation; Implement DoD/DoN ESOH related directives and initiatives affecting the program to SE Team. Continue to provide HSI subject matter expert into development and implementation of MP common systems, i.e. CSA, MPCC, feedback process; assess and address HSI issues associated with Mission Packages; evaluate					

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B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
manpower and workload policies affected by new technology implementation; align MP HSI tasks and activities to MP SETR events; track and mitigate MP HSI risks and issues; update and implement the PMS 420HSIP. Continue Implementation of the Corrosion Prevention and Control Plan (CPCP). Continue to provide Configuration Management for the PMS 420 LCS MM Program: identify and control Mission Package configurations via the PMS420 CCB; manage Test Observation Report (TOR); capture and track problems found during integration testing, Navy Core Testing (NCT), and ship visits. Continue to update the MP Reliability, Availability, Maintainability-Cost (RAM-C) Report (which comprises the RAM-C Analysis Report and the RAM-C Rationale Report) to assess LCS MP RAM metrics, influence design of MP hardware and support-system design, and help determine the optimal mix of hardware design, support-system design, and lifecycle cost. Coordinate with and assist the PMS 420 APMs and LSEs with the scheduling, planning, and execution of SETRs. Verify that the LCS MPCE, the MMs, and MVCS are compliant with DoD and DON IA policies, and that such compliance is stated in their respective program Information Assurance Strategies, PRA artifacts, and other program documentation. ***FY 2017 Base Plans:*** Conduct the following System Engineering Technical Reviews (SETR): MPCE 2.0 CDR MPCE 2.0 TRR MCM Increment III PDR MCM Increment III CDR MCM Increment IV CDR MCM Increment IV SRR Continue the overarching system engineering efforts as follows; Continue to develop and implement process to track lead/lag SE Metrics to include requirements, RTVM, and SRLs Continue to implement a Technical Performance Measure (TPM) Plan					

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B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Continue to support the Corrosion Prevention and Control Plan (CPCP) Continue to implement MBSE strategy on critical MP interfaces identified during the ASW SFR and SSMM assessment Continue to assist in TOR adjudication and prioritization Continue to standardize and improve Reliability, Availability and Maintainability (RAM) data collection Continue to Implement a LCS MMs M&S strategic plan to support performance prediction, validation of T&E plans, and/or training and stim/sim efforts Continue to support training in the development of the requirements set for the CMPT and associated stim/sim systems Continue to implement the Configuration Management Plan (CMP) to differentiate between developmental and product baselines and look to streamline CCB processes Continue to align hazards and Mishap Assessment Reports (MARs) to product baseline Conduct Safety Risk Assessment of new development technologies such as Common Software Architecture (CSA) Continue ESOH risk/hazard analysis and mitigation tracking Continue to implement the Hazardous Materials Management Plan (HMMP) ***FY 2017 OCO Plans:*** N/A					
Title: Program Management	4.533	4.252	4.300	0.000	4.300
Articles:	-	-	-	-	-
FY 2015 Accomplishments: Continued PM efforts: business and administrative planning, organizing, directing, coordinating, controlling, and approval actions designated to accomplish overall program objectives that are not associated with specific hardware elements or included in systems engineering. ***FY 2016 Plans:*** Continue PM efforts: business and administrative planning, organizing, directing, coordinating, controlling, and approval actions designated to accomplish overall program objectives that are not associated with specific hardware elements or included in systems engineering. ***FY 2017 Base Plans:***					

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B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Continue PM efforts: business and administrative planning, organizing, directing, coordinating, controlling, and approval actions designated to accomplish overall program objectives that are not associated with specific hardware elements or included in systems engineering. ***FY 2017 OCO Plans:*** N/A					
Title: System Test and Evaluation	33.305	17.901	29.130	0.000	29.130
Articles:	-	-	-	-	-
FY 2015 Accomplishments: MCM MP: Completed MCM MP Increment I developmental testing. Completed test planning and the Test Readiness Review (TRR) for MCM MP Increment I TECHEVAL. Executed MCM MP Increment I TECHEVAL and began analysis/report development. SUW MP: Conducted SUW MP Increment I & II IOT&E aboard LCS 2 variant. Began planning for integration testing of VTUAV with the SUW MP. Continued test planning for SUW MP Increment III (Surface-to-Surface Missile Module (SSMM)) test events planned for FY16 and FY17. Initiated SSMM live fire program with the Longbow Hellfire Missile. Executed the first Guided Test Vehicle (GTV) event, to include data analysis and reporting. ASW MP: Continued test planning for developmental testing of the ASW MP on the LCS platform in FY16. Conducted National Environmental Policy Act (NEPA) and environmental planning and coordination to support DT/ TECHEVAL/OT/FOTE. Conducted and supported Certification, Test, and Evaluation to include software certification/ assessment testing, reporting, and events such as MPRAs, MRAs, Test Readiness Reviews, WSESRB, etc in order to support fleet deployment upon completion of the IOT&E and FOTE events. ***FY 2016 Plans:*** MCM MP: Conduct MCM MP Increment II developmental testing of VTUAV/COBRA from Independence variant. SUW MP: Continue planning and executing SSMM live fire test program. Will execute a second GTV event with the Longbow Hellfire missile - includes planning, testing, data analysis, and reporting.					

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B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Conduct and Support Certification Test and Evaluation to include software certification/assessment testing, reporting, and events such as MPRAs, MRAs, MRRs, Test Readiness Reviews, WSESRB, etc in order to support test events and Fleet deployment upon completion of the IOT&E. ***FY 2017 Base Plans:*** Increase in Test and Evaluation from FY16 to FY17 is detailed in the efforts below and includes additional ASW MP testing. MCM MP: Plan and conduct MCM Increment II operational testing. Plan and conduct initial DT (LH&R) for MCM MP Increment II on both LCS variants. SUW MP: Finalize planning and execute DT, TECHEVAL and IOT&E for SSMM on LCS 1 variant. Plan and execute developmental testing for SSMM on LCS 2 variant. Plan for TECHEVAL and IOT&E of SSMM on LCS 2 variant in FY18. ASW MP: Plan and execute ASW DT and TECHEVAL on LCS 1 variant. Plan for IOT&E on Freedom variant in FY18. Plan for ASW DT and conduct ship checks for Independence variant. ***FY 2017 OCO Plans:*** N/A					
Title: Integration, Assemble, Test and Checkout	14.278	8.375	9.400	0.000	9.400
Articles:	-	-	-	-	-
FY 2015 Accomplishments: Performed Mission Package - Seaframe Integration and Aviation Integration. Seaframe Integration provided services that supported the successful integration of the MCM, SUW, and ASW Mission Packages into both variants of LCS seaframes. Mission Package (MP) - Integration assessment reports to support MCM MP TECHEVAL on LCS 2. Integration assessment reports to support deployment of LCS 3 with SUW MP. Engineering studies and seaframe modifications to support SUW MP TECHEVAL and IOT&E on LCS 4. Engineering studies and seaframe modifications to support ASW MP TECHEVAL and IOT&E on LCS 5 and 6. Aviation Integration provided services that supported the successful integration of aviation assets of the MCM, SUW, and ASW Mission Packages into both variants of LCS seaframes. Hardware engineering for Aviation Support Containers, including roll-on/roll-off (RO/RO) Cabinets and Mezzanine. Hardware Engineering for VTUAV Global Command and Control System (GCCS) back-fits. Improve communications for TCDL within					

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B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Combat to the Mission Packages. Software Engineering for the continued development of the Helo Support Function (HSF) and Mission Package Application Software (MPAS) with Aviation assets. Support and integration of VTUAV modifications including Advanced Precision Kill Weapon System and Radar RDC. Continued program level Integration, Assembly, Test & Checkout efforts of ECPs required to correct findings from Developmental and Operational test events. ***FY 2016 Plans:*** Perform Mission Package - Seaframe Integration and Aviation Integration. Seaframe Integration provides services that support the successful integration of the MCM, SUW, and ASW Mission Packages into both variants of LCS seaframes. Aviation Integration provides services that support the successful integration of aviation assets of the MCM, SUW, and ASW Mission Packages into both variants of LCS seaframes. FY16 will include the following efforts: - Continue Seaframe Change Management and Execution using Alteration Integration Team (AIT); - Continue ICD 2.0 and IDS 2.0 configuration management; - Continue integrating SUW Increment III (Surface-to-Surface Missile Module) onto both of the variants; - Conduct wakefield characterization testing from Freedom variant to support L&R integration of the USV, Knifefish, and any potential future organic offboard vehicles; - Conduct integration testing of MCM MP Increment II (VTUAV/COBRA) for Independence variant, including integration of COBRA Post Mission Analysis hardware into the mission package. This will also involve testing MCM MPAS software at the DIF. - Continue the integration of MCM MP Increment III (Unmanned Influence Sweep System (UISS)) into laydown plan and weight/stability analysis; - Begin integrating MCM MP Increment IV (Knifefish) into laydown plan and weight/stability analysis; begin ASW MP integration on Freedom variant and INDY variant; and continue to expand role of MSSIT for FIT checks and IV&V checks. ***FY 2017 Base Plans:*** Perform Mission Package - Seaframe Integration and Aviation Integration. Seaframe Integration provides services that support the successful integration of the MCM, SUW, and ASW Mission Packages into both variants of LCS seaframes. Aviation Integration provides services that support the successful integration of aviation assets of the MCM, SUW, and ASW Mission Packages into both variants of LCS seaframes.					

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B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
FY17 will include the following efforts: - Continue Seaframe Change Management and Execution using AIT for MPC GUID Mods, MPCE v1.9 Tech Refreshes for LCS 4, and MVCS v1.1.0 Baseline Upgrades; - Integrating SUW MP Increment III on Freedom variant to support DT event; - Integrating MCM MP Increment II on Freedom variant for Phase I and Phase 2 DT events; - Integrating MCM MP Increment III on INDY variant in support of DT event; - Integrating ASW MP on Freedom variant to support DT event; - MPAS-CMS Integration Testing at DIF & MSIC; - Conduct seaframe feasibility studies with both shipbuilders for ASW, MCM and SUW MP Integration; - MSSIT Test Kit Development for Aviation and Mission Package Interfaces; - Common Software Architecture Integration; - MPCE v1.9 INCOs on new ships; - Maintain ICD 2.0 and IDS Configuration Management. ***FY 2017 OCO Plans:*** N/A					
Title: Training Systems Development	16.425	15.915	12.750	0.000	12.750
Articles:	-	-	-	-	-
FY 2015 Accomplishments: Continued development of training and training systems for MCM, SUW and ASW Mission Module Detachments in accordance with NTSPs. Performed vendor and interim training for formal MCM, SUW, and ASW test events. Funded training related detachment and replacement Sailor travel for vendor and interim formal training in accordance with CSPPs. Transitioned MCM and SUW tactical team training to NETC facilities and achieved initial capability at LCS Training facility for MCM and SUW tactical team training. Updated formal curriculum to incorporate findings from program test events, operations and classroom experience. Updated formal curriculum to incorporate findings from program test events, operations and classroom experience. Continued analysis of MCM and SUW training to validate effective training delivery and identify changes necessary to deliver training that will achieve Train to Certify KPP. Completed analysis to determine initial ASW training and trainer requirements and began development of ASW Training and trainers. Continued initial LCS ASW training using SQQ-89 courses. Developed curriculum and system changes to support incremental capability fielding plan. Commenced update of Common Mission Package Trainer (CMPT) for ASW and development of LCS ASW MM Fundamentals and CAPSTONE courses with a plan to achieve RFT in FY16. Train to Certify (T2C) capability					

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B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
will be achieved in FY19 after all systems have been delivered, trainers in place and formal training has been developed and accepted. ***FY 2016 Plans:*** Continue development of training and training systems for MCM, SUW and ASW Mission Module Detachments in accordance with NTSPs. Perform vendor and interim training for formal MCM, SUW, and ASW test events. Fund training related detachment and replacement Sailor travel for vendor and interim formal training in accordance with CSPPs. Achieve initial capability at LCS Training facility for MCM and SUW mission bay training. Update formal curriculum to incorporate findings from program test events, operations and classroom experience. Update formal curriculum to incorporate findings from program test events, operations and classroom experience. Continue analysis of MCM and SUW training to validate effective training delivery and identify changes necessary to deliver training that will achieve Train to Certify KPP. Complete analysis to determine initial ASW training and trainer requirements and begin development of ASW Training and trainers. Continue initial LCS ASW training using SQQ-89 courses. Achieve RFT of LCS SUW MM Fundamentals and CAPSTONE courses at LTF. Commence training sailors at LTF Mission Bay Trainer which is expected to RFT late FY15. Achieve RFT of MK-50 GMM differences course at Dam Neck. Develop curriculum and system changes to support incremental capability fielding plan. Complete development of Common Mission Package Trainer (CMPT) for ASW software and Achieve RFT for LCS ASW MM Fundamentals and CAPSTONE courses. Train to Certify (T2C) capability will be achieved in FY19 after all systems have been delivered, trainers in place and formal training has been developed and accepted. ***FY 2017 Base Plans:*** Continue development of training and training systems for MCM, SUW and ASW Mission Module Detachments in accordance with NTSPs. Perform vendor and interim training for formal MCM, SUW, and ASW test events. Fund training related detachment and replacement Sailor travel for vendor and interim formal training in accordance with CSPPs. Achieve initial capability at LCS Training facility for MCM and SUW mission bay training. Update formal curriculum to incorporate findings from program test events, operations and classroom experience. Update formal curriculum to incorporate findings from program test events, operations and classroom experience. Continue analysis of MCM and SUW training to validate effective training delivery and identify changes necessary to deliver training that will achieve Train to Certify KPP. Continue development of ASW Training and trainers. Continue initial LCS ASW training using SQQ-89 courses.					

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B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Achieve RFT of LCS MCM Fundamentals and LCS SUW MM Fundamentals courses at LTF. Develop curriculum and system changes to support incremental capability fielding plan. Complete development of Common Mission Package Trainer (CMPT) for ASW software and Achieve RFT for LCS ASW MM Fundamentals, Planning and CAPSTONE courses. Train to Certify (T2C) capability will be achieved in FY19 after all systems have been delivered, trainers in place and formal training has been developed and accepted. ***FY 2017 OCO Plans:*** N/A					
Title: Program Technical Data	1.829	2.071	1.940	0.000	1.940
Articles:	-	-	-	-	-
FY 2015 Accomplishments: Updated Program Technical Data packages to incorporate findings from SUW TECHEVAL and IOT&E test events. Finalized initial Integrated Logistics Support products in support of MCM MP TECHEVAL and IOT&E. Continued Technical Manual Management Activity to review, produce, and distribute technical documentation for the program. Completed development and began implementation of MPSF automated inventory management system (IMS) based on RFID solution. Prepared for inclusion of ASW into IMS. Began integrated logistics overarching support for the follow-on mission package increments. Provided overarching provisioning for Program. Developed the ASW MP and Surface-to-Surface Missile Module (SSMM) provisioning documentation to include: Allowance Parts Lists (APL) maintenance and development of Preliminary Allowance List (PALs) or Allowance Equipage Lists (AELs) as required for the ASW and SUW MPs. Updated existing provisioning packages as a result of Engineering Change Proposals (ECP) assessment or approvals. ***FY 2016 Plans:*** Finalize the technical data packages for the ASW MP. Coordinate and manage Acquisition Logistics engineering tasks. Update the reliability models including reliability growth, update the performance Based Logistics (PBL) strategy to reflect development and initial implementation of the ASW MP, Surface-to-Surface Missle Module (SSMM) and follow on MCM mission modules. Update program technical data packages to incorporate findings frrom MCM TECHEVAL event conducted in FY15. ***FY 2017 Base Plans:*** Update Program Technical Data Package (TDP) to incorporate findings from the MCM TECHEVAL. Update TDP for ASW MP modifications to support installation on the Independence variant. Finalize the TDP for MCM					

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Increment III and IV. Incorporate developmental test finds into the SSMM TDP. Finalize the initial Integrated Logistics Support products in support of SUW Increment III (SSMM) TECHEVAL and IOT&E. ***FY 2017 OCO Plans:*** N/A					
Title: Common Equipment	7.864	22.330	8.650	0.000	8.650
Articles:	-	-	-	-	-
FY 2015 Accomplishments: Conducted technology insertion for MPCE on LCS 1-4, Common Mission Package Trainer (CMPT) and Mission Package Portable Control Station (MPPCS). Continued development activities to evolve MPCE software architecture to a Service Oriented Architecture (SOA), MPCE v2.0, in support of the Common Software Architecture (CSA) Baseline. Updated MUS Design Documentation to align with MPCE 2.0 System Subsystem Specification (SSS). Mission Package Communications: Performed post-RTT modifications to HFGW hardware and software. Developed required logistics documentation for the HFGW radio. Completed MVCS v2.0.0. Integrated MVCS into MPCE, and support CSA requirements. Supported MVCS installation on UISS. Conducted and supported testing of MVCS on Knifefish. Implemented anti-jamming Requirements for MVCS.					
FY 2016 Plans: MPCE v1.9 - Continue hardware tech refresh activities at MP development sites and ship set deliveries for ships in accordance with Ship Project Directives (SPDs); - MPS/MPOE, Develop new software release of MPS/MPOE for MPAS integration on as required basis. Continue integration of Common Software Architecture (CSA) into the ASW MP. Continue evolving the MPCE software architecture to a Service Oriented Architecture (SOA), MPCE 2.0. Complete MPCE 2.0 System Subsystem Spec (SSS) documenting the merge of CSA SSS requirements with the MPCE SSS. Conduct tech refresh/insertion studies needed to sustain incremental MPCE capability upgrades. Identify technology refresh cycles and the hardware required to meet current requirements while addressing obsolescence and future MPCE SSS requirements. MVCS v1.2.0, develop software changes to support UISS and SMCM UUV integration and complete definition of requirements to integrate High Frequency Ground Wave (HFGW) radio. Small Business Technology Insertion (SBIR): Anti-Jam capability, magic filter technology transition into RT-1944 radio.					

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Technology trasition of next generation RT1944A/U LOS radio, seminal transition event (STE) to demonstrate increased bandwidth and communication relay capabilities. Continue implementation of Automated Test and Retest (ATRT) Development of Unmanned System Common Control (USCC) capabilities. Improvements for SIPRNET cross-platform communication and other cyber-security. ***FY 2017 Base Plans:*** Mission Package Computing Environment Conduct tech refresh of MPCE 1.9 hardware. Conduct MPCE activities required to support ASW MP certification. Conduct MPCE groom and TOR remediation activities to support ASW MP IOT&E and MCM MP Increment I (Freedom Variant) integration and test. Incorporate CR fixes into CSA Build 4 and initiate CSA Build 5. Multi Vehicle Communications Systems: MVCS 2.0, HW Conduct tech refresh/insertion studies needed to sustain incremental MVCS capability upgrades. Identify technology refresh cycles and the hardware required to meet current requirements while addressing obsolescence and future MVCS SSS requirements. MVCS Software v3.0 In support in MCM MP Increment III and IV, deliver updates for UISS and Knifefish integration. Commence monitoring by MPCE Utility Services (MUS), define initial AJ software capabilities and integrate CSA updated Resolve radio obsolesce issues associated with the PRC-117. Conduct transition studies for the High Frequency Ground Wave (HFGW) radio. ***FY 2017 OCO Plans:*** N/A					
Title: Mine Countermeasures (MCM) Mission Package	18.965	18.211	24.308	0.000	24.308
Articles:	-	-	-	-	-
FY 2015 Accomplishments: MCM MP Increment I (ALMDS, AMNS, RMMV, AN/AQS-20): Conducted grooming, prepared and executed TECHEVAL. Initiated integration and engineering for MCM MP capabilities on Freedom variant. MCM MP Increment II (VTUV/COBRA): Initiated integration on the Independence variant.					

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MCM MP Increment III (UISS): Initiated the UISS EDM contract. Initiated integration of UISS into the MCM MP. Conducted the UISS Systems Requirements Review (SRR). Resolved hardware PTRs identified during testing through development of ACSNs. In support of MCM mission package, incorporated the following items into MPAS: Corrected software PTRs identified during MCM MP testing, and initiated UISS software integration. Performed systems engineering (risk management, information assurance, human systems integration, safety), configuration management, and Integrated Logistics Support in support. ***FY 2016 Plans:*** MCM MP Increment I (ALMDS, AMNS, RMMV, AN/AQS-20): Start the implementation of Independent Review Team (IRT) recommendations, which is examining using alternative mission systems to meet the MCM minehunting requirements. Continue to conduct integration, engineering, and test planning for MCM capabilities on the Freedom variant. MCM MP Increment II (VTUAV/COBRA): Continue the integration/developmental testing of VTUAV/COBRA on the Independence variant to support an FY17 operational test. MCM MP Increment III (UISS): Complete the design and development of UISS EDMs. Conduct contractor testing of the Unmanned Surface Vehicle (USV) and Unmanned Surface Sweep System (USSS) EDMs. Develop UISS mission module specifications and conduct Systems Engineering Technical Reviews (SETRs). Initiate UISS integration into the MCM MP. MCM MP Increment IV (Knifefish): Complete the design and development of Knifefish EDMs and Knifefish support containers. Conduct contractor testing of the Knifefish EDMs. Develop mission module specifications and conduct Systems Engineering Technical Reviews (SETRs) as planned. In support of MCM mission package, incorporate the following items into MCM MPAS: Correction of software PTRs identified during testing, integration of MEDAL EA, and upgrade MPAS Operating Systems to maintain IA compliance. Perform systems engineering (risk management, information assurance, human systems integration, safety), configuration management, and Integrated Logistics Support. ***FY 2017 Base Plans:***					

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MCM MP increases from FY16 to FY17 to account for increased efforts as a result of the Independent Review Team (IRT) to identify alternate vehicles for the MCM MP. MCM MP Increment I (ALMDS, AMNS, RMMV, AN/AQS-20): Continue the implementation of Independent Review Team recommendations. MCM MP Increment II (VTUAV/COBRA): Conduct operational testing of VTUAV/COBRA. MCM MP Increment III (UISS): Complete integration of UISS into MCM MP and prepare for developmental testing on an LCS platform. For MCM MP Increment IV (Knifefish): Initiate integration of Knifefhish into MCM MP to include launch and recovery testing from an LCS platform. In support of MCM mission package, incorporate the following items into MCM MPAS: Correction of software PTRs identified during MCM MP testing, integration of NSAM and UISS software and upgrade MPAS Operating Systems to maintain IA compliance. Perform systems engineering (risk management, information assurance, human systems integration, safety), configuration management and Integrated Logistics Support. Test Net-Centric Sensor Analysis for MIW (NSAM) software to verify integration of AQS-20 P3I into MCM MP. ***FY 2017 OCO Plans:*** N/A					
Title: Anti-Submarine Warfare (ASW) Mission Package	20.523	50.357	21.140	0.000	21.140
Articles:	-	-	-	-	-
FY 2015 Accomplishments: Prepared detailed Technical Data Package (TDPs) for Mission Module Engineering Development Model (EDM) weight reduction Preliminary Design Reviews (PDR) Q3 FY15 and executed the Mission Package PDR event in Q4FY15. Initiated the development of the Escort Mission Module (EMM) ASW Mission Package (MP) Mission Modules (MM) in accordance with approved Preliminary Design. Initiated the development of a draft ASW Mission Package Capabilities Production Document (CPD) and provided engineering, modeling and analysis support to refine/clarify Capabilities Development Document (CDD) Key Performance Parameters (KPPs) and Additional Attributes (AAs).					

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B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Initiated the PEO LCS Rapid Technology Insertion (RTI) ASW Mission Package Weight Reduction Initiative (RFP # N66604-14-R-1120) proposal evaluation and made Phase I Base Contract awards. Executed Base Contract Transition Study and exercised and prepared for Option I ward in Q1FY16. Option I procures the test asset articles and addresses the ship integration issues to support ASW Mission Package embarkation. Continued Light Weight Tow (LWT) torpedo countermeasure mission module wet end and system control software development. Started procurement of LWT EDM components. Supported development of LWT over boarding and retrieval system. Initiated the Technical Data Package development in support of LWT installation onboard LCS. Continued Escort Mission Module acoustic processing, aviation integration support software, and Mission Package Application Software (MPAS) development to support testing and software certification and follow on Advance Development Model shipboard risk mitigation testing. Initiated the ASW MP end-to-end (E2E) integration test events at Land Based Integration Test (LBIT) and PAX River SAIL for Aviation integration, LM and GD CMS integration, and performance validation testing. Executed ASW MP Detachment training. Planned, prepared and performed Safety and Hazard analysis, Environmental Analysis, HSI Evaluations, and Reliability Assessment. Updated current LCS 1 Temporary Alteration/Non-Permanent Change (TEMPALT/NPC) to support ASW Mission Package embarkation on LCS-1 in FY16. Oversaw and supported execution of shipboard industrial work in accordance with ASW MP TEMPALT/NPC Completed the engineering and design development for FREEDOM variant SHIPALT/PC TDP to enable embarkation of the ASW MP. ***FY 2016 Plans:*** Develop testing objectives, conduct performance prediction modeling and prepare test plans to support the start execution of an ASW Mission Package TECHEVAL in FY17. Oversee and support execution of shipboard industrial work in accordance with ASW Mission Package Ship Alteration Permanent Change (SHIPALT/PC) Technical Data Package (TDP) and any additional Mission Module installation ECPs.					

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B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Closeout ASW Mission Package Engineering Development Model (EDM)/weight reduction PDR by completing engineering efforts to resolve or adjudicate PDR Request for Action (RFA). Prepare detailed Technical Data Package (TDP) for Mission Package Critical Design Review (CDR) and execute the CDR event. Complete development of a draft ASW Mission Package Capabilities Production Document (CPD) and provide engineering, modeling, and analysis support to OPNAV as CPD is staffed though JROC review and approval process. Continue management of PEO LCS Rapid Technology Insertion (RTI) initiative Phase II (EDM Assessment) and complete procurement of test asset fabrication and integration to support continuation of Phase II component and system level validation testing and ASW Mission Package / Ship integration. Continue to develop final ship integration approaches to support LCS Ship Alteration Permanent Change (SHIPALT/PC) Technical Data Package (TDP) development. Complete Light Weight Tow (LWT) torpedo countermeasure mission module wet end and system control software development. Complete procurement of test assets and acquire necessary test spares to support ship integration. Continue development of initial ASW Mission Package system operator training materials and course curriculum to support Train to Qualify and Train to Certify requirements. Support development and exploitation of component and system level modeling and simulation capabilities to enable high fidelity virtual reality training. Continue Escort Mission Module acoustic processing, aviation integration support software, and Mission Package Application Software (MPAS) development and maturation to support IOT&E software certification and follow on shipboard testing FY18. ***FY 2017 Base Plans:*** Complete RTI Phase II which includes pre production test article through contractor level testing. Participate in RTI phase II design reviews and feasibility testing to verify performance. Upon completion of RTI Phase II, exercise RTI Phase III in support of ship or Mission Module integration, testing, Validation and Verification (V&V), certification and delivery. Conduct mission module and mission package level Land Based Integration Test (LBIT) end-to-end (E2E) integration testing, including events at PAX River SAIL for Aviation integration, Combat Management System					

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B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
(CMS) integration and performance validation testing in support of ASW MP TECHEVAL and begin planning for ASW MP IOT&E. Perform Find, Fix, and Repair (FFR) of identified hardware and software issues prior to the IOT&E software certification in Q3 FY17 and Developmental Testing/Operational Testing on INDEPENDENCE variant platforms. Develop FY18 testing objectives, conduct performance prediction modeling and prepare test plans to support the execution of an ASW Mission Package operational testing of the ASW MP. Support EDM Lightweight Tow/LCS integration. Prepare Modular Testing Vehicle (MTV) torpedoes to support in-water testing of integrated Support Lightweight Tow DT/OT at Canadian Fleet Maritime Experimental Testing Range (CFMETR). Award AN/SLQ-61 LRIP/PRA contract, production system development. Continue development of ASW Mission Package system operator training materials and course curriculum to support Train to Qualify and Train to Certify requirements. Continue development of component and system level modeling and simulation capabilities to enable high fidelity virtual reality training. Deliver Operations and Maintenance and Fundamentals courseware to LCS Training Facility. Conduct Factory training events in support of formal courseware development. Deliver Interactive Electronic Technical Manual (IETM) to support EMM normal and casualty modes, system Employment. Deliver Preventive and Corrective Maintenance to include Maintenance Requirement Cards (MRC). Conduct ILS certification. Deliver Allowance equipage Lists (AEL) and Allowance Parts Lists (APL). Establish repair capability. Complete Supportability Analysis Tasks and Maintenance Planning. Continue Escort Mission Module acoustic processing, Aviation integration support software and Command and Control software development to support IOT&E software certification in Q3 FY17 and follow on shipboard testing. Initiate safety analysis of the ASW EDM systems developed under the RTI initiative and conduct integration safety analyses on the Independence variant. ***FY 2017 OCO Plans:***					

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B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
N/A					
Title: Surface Warfare (SUW) Mission Package	34.869	51.269	34.690	0.000	34.690
Articles:	-	-	-	-	-

FY 2015 Accomplishments:
Conducted SSMM Critical Design Review (CDR). Continued developmental testing to categorize modifications to the current MPAS baseline. Continued modifications to MPAS to support continued SSMM development. Continued planning the SSMM environmental confidence level testing. Continued development of the detailed launcher design that supports the SSMM Increment II concept.

Find/Fix/Repair technical issues associated with GMM and MPAS identified during TECHEVAL and IOT&E test events onboard LCS 3 in FY14. Conducted TECHEVAL and IOT&E in Q4FY15 on LCS 4.

Maintained configuration control of SUW MP data, hardware, and software. Collected data and performed analysis associated with the SUW MP Reliability, Maintainability, and Availability (RMA) program. Conducted combat system certification, MP certification, obtained WSESRB/SSSTRP approval, IA approvals, and conducted shipboard test events with each seaframe manufacturer. Supported DT from LCS 2 variant, and OT from LCS 2 variant.

FY 2016 Plans:
Continue developmental testing to categorize modifications to the current MPAS baseline. Continue modifications to MPAS to support continued SSMM development. Complete planning and execute the SSMM environmental confidence level testing. Execute engineering and developmental testing of SSMM. Continue development of the detailed launcher design that supports the SSMM concept. Find/Fix/Repair technical issues associated with SSMM and MPAS identified during STF and DT events.

FY 2017 Base Plans:
Conduct combat system certification, MP certification, obtain WSESRB/SSSTRP approval, IA approvals, and conduct shipboard test events with each seaframe manufacturer. Conduct SUW Increment III TECHEVAL and IOT&E on the Freedom variant FY17 and prepare for TECHEVAL and IOT&E on Independence variant FY18. Prepare for deployment of the SUW Increment III (SSMM EDM-2).

Complete all Integrated Logistics Support (ILS) products in support SUW Increment III IOC. Deliver all Interactive Electronic Technical Manuals (IETM) to support SSMM normal and casualty modes, and SSMM installation and employment. Complete and deliver all Maintenance Requirements Cards (MCR). Conduct ILS certification.

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B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Deliver all Provisioning Documentation to include Allowance equipage Lists (AEL) and Allowance Parts Lists (APLs). Procure all testing spares required to support SUW Increment III TECHEVAL and IOT&E. Begin integration of VTUAV into SUW MP MPAS. ***FY 2017 OCO Plans:*** N/A					
Title: Reliability, Availability and Maintainability	2.993	2.829	1.920	0.000	1.920
Articles:	-	-	-	-	-
FY 2015 Accomplishments: Continued to monitor Reliability Growth and updated plans as necessary. Continued to refine RAM model assumptions based on actual data and conducted multiple sensitivity analysis to quantify the effect of alternate sparing philosophies (i.e., more onboard spares, complete spare system, etc.) based on mission module availability. Refined modeling of MCM, SUW, and ASW MPs. Continued utilizing FRACAS to feed back product and process improvements to the Systems Engineering and ILS organizations. Drafted RAM-C Analysis Report as necessary. Updated RAM-C Rationale Report as necessary.					
FY 2016 Plans: Continue the systematically management and elimination of failures and failure modes through identification, classification, analysis and removal or mitigation. Continue the refinement of the MCM, SUW, and ASW RAM models by integration actual data collected during mission package TECHEVAL and Initial Operational Test and Evaluation (IOT&E) and conduct multiple sensitivity analysis to quantify the effect of alternate sparing philosophies (i.e., more onboard spares, complete spare system, etc.) based on mission module availability. Conduct reliability testing of the ASW MP and Surface-to-Surface Missile Module (SSMM). Conduct root cause analysis and recommend corrective action on all discovered failure modes. Continue utilizing FRACAS to feedback MCM, SUW and MCM product and process improvements to the Systems Engineering and ILS organizations. Update RAM-C Rationale Report as necessary.					
FY 2017 Base Plans: Continue to compile system and package level Reliability and Maintenance (RAM-C) data to support reliability engineering and a prioritized initial spares list. Continue the systematically management and elimination of failures and failure modes through identification, classification, analysis and removal or mitigation. Continue the refinement of the MCM, SUW, and ASW RAM					

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B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
models by integration actual data collected during mission package TECHEVAL and Initial Operational Test and Evaluation (IOT&E) and conduct multiple sensitivity analysis to quantify the effect of alternate sparing philosophies (i.e., more onboard spares, complete spare system, etc.) based on mission module availability. Conduct reliability testing of the ASW MP and Surface-to-Surface Missile Module (SSMM). Conduct root cause analysis and recommend corrective action on all discovered failure modes. Continue utilizing FRACAS to feedback MCM, SUW and MCM product and process improvements to the Systems Engineering and ILS organizations. Update RAM-C Rationale Report as necessary. Continue to implement the Failure Reporting, Analysis, and Corrective Action System (FRACAS) and Failure Review Boards (FRBs) ***FY 2017 OCO Plans:*** N/A					
Accomplishments/Planned Programs Subtotals	172.602	203.143	160.058	0.000	160.058

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
• 1600: *LCS Common Mission Modules Equipment*	30.938	23.061	27.840	-	27.840	39.682	23.387	16.504	22.384	Continuing	Continuing
• 1601: *LCS MCM Mission Modules*	15.270	67.451	57.146	-	57.146	161.605	197.738	103.456	203.284	Continuing	Continuing
• 1602: *LCS ASW Mission Modules.*	0.000	0.000	31.952	-	31.952	53.465	53.722	54.717	55.812	Continuing	Continuing
• 1603: *LCS SUW Mission Modules*	14.750	35.228	22.466	-	22.466	43.885	40.384	41.306	42.130	Continuing	Continuing
• 1605: *Remote Minehunting System (RMS)*	0.000	53.077	0.000	-	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing

Remarks

D. Acquisition Strategy

The LCS Mission Module Acquisition Strategy is employing an incremental procurement approach to allow for the rapid introduction of additional capabilities as system technology matures. This phased plan provides incremental fielding of capability through the introduction of mature programs of record into the respective Mission Packages until the full baseline capability defined in the Capability Development Document (CDD) is reached.

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E. Performance Metrics

Program Completed Milestone B January 2014
Conducted the SUW MP TECHEVAL/IOT&E aboard LCS 1 variant.
Conducted SUW MP DT, TECHEVAL and IOT&E on LCS 2 variant
Conducted MCM Increment I TECHEVAL on LCS 2 variant

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Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
1.1 System Engineering	WR	NSWC PC : Panama City, FL	1.081	3.088	Oct 2014	2.000	Oct 2015	3.327	Nov 2016	-		3.327	Continuing	Continuing	Continuing
1.1 System Engineering	WR	NSWC DD : Dahlgren, VA	0.405	2.574	Oct 2014	1.000	Oct 2015	2.000	Nov 2016	-		2.000	Continuing	Continuing	Continuing
1.1 System Engineering	C/CPFF	Northrop Grumman : Bethpage, NY	2.097	4.461	Dec 2014	2.500	Dec 2015	4.000	Dec 2016	-		4.000	Continuing	Continuing	Continuing
1.1 System Engineering	WR	SPAWAR PAC : San Diego, CA	0.850	3.581	Oct 2014	1.500	Jan 2016	1.500	Dec 2016	-		1.500	Continuing	Continuing	Continuing
1.1 System Engineering	WR	NUWC NPT : Newport, RI	0.000	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
1.1 System Engineering	C/CPFF	CACI : Fairfax, VA	0.319	0.828	Dec 2014	1.000	Jan 2016	0.000		-		0.000	Continuing	Continuing	Continuing
1.1 System Engineering	C/CPFF	AAC : Uniontown, PA	0.000	0.637	Dec 2014	0.000		0.000		-		0.000	0.000	0.637	-
1.1 System Engineering	WR	NSWC PHD : Port Hueneme, CA	0.000	0.765	Nov 2014	0.000		0.000		-		0.000	0.000	0.765	-
1.1 System Engineering	WR	NSWC Carderock : Bethesda, MD	0.174	0.956	Oct 2014	0.400	Nov 2015	1.000	Nov 2016	-		1.000	0.000	2.530	-
1.1 System Engineering	C/CPFF	JHU/APL : Laurel, MD	0.287	0.127	Dec 2014	0.000		0.000		-		0.000	0.000	0.414	-
1.4 Integration, Assembly, Test and Check	WR	NAWC AD : Patuxent River, MD	0.108	1.175	Oct 2014	0.300	Oct 2015	0.950	Mar 2017	-		0.950	Continuing	Continuing	Continuing
1.1 System Engineering	C/CPFF	Lockheed Martin : Riviera Beach, FL	0.000	0.000		1.233	Dec 2015	0.000		-		0.000	0.000	1.233	-
1.4 Integration, Assembly, Test and Checkout	C/CPFF	Northrop Grumman : Bethpage, NY	0.086	0.587	Dec 2014	0.575	Dec 2015	0.250	Jan 2017	-		0.250	0.000	1.498	-
1.4 Integration, Assembly, Test and Check	WR	SPAWAR PAC : San Diego, CA	0.000	0.000		0.580	Dec 2015	0.750	Jan 2017	-		0.750	Continuing	Continuing	Continuing
1.4 Integration, Assembly, Test and Check	WR	NUWC NPT : Newport, RI	0.000	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
1.4 Integration, Assembly, Test and Check	WR	NSWC PC : Panama City, FL	0.106	0.294	Oct 2014	0.300	Oct 2015	0.750	Jan 2017	-		0.750	Continuing	Continuing	Continuing
1.4 Integration, Assembly, Test and Check	WR	SUPSHIP Gulfcoast : Pascagoula, MS	0.000	0.000		2.500	Jan 2016	0.000		-		0.000	Continuing	Continuing	Continuing

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Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
1.4 Integration, Assembly, Test and Check	WR	SUPSHIP Bath : Bath, ME	0.000	0.000		1.495	Mar 2016	0.000		-		0.000	Continuing	Continuing	Continuing
1.4 Integration, Assembly, Test and Check	WR	NSWC DD : Dahlgren, VA	0.112	2.577	Oct 2014	0.300	Oct 2015	1.200	Mar 2017	-		1.200	Continuing	Continuing	Continuing
1.4 Integration, Assembly, Test and Checkout	WR	NSWC PHD : Port Hueneme, CA	0.000	0.658	Oct 2014	0.320	Dec 2015	0.225	Jan 2017	-		0.225	0.000	1.203	-
1.4 Integration, Assembly, Test and Checkout	WR	NSWC Crane : Crane, Indiana	0.144	1.469	Oct 2014	0.280	Nov 2015	0.000		-		0.000	0.000	1.893	-
1.4 Integration, Assembly, Test and Checkout	WR	NSWC Carderock : Bethesda, MD	0.285	6.392	Oct 2014	0.300	Nov 2015	1.000	Dec 2016	-		1.000	0.000	7.977	-
1.4 Integration, Assembly, Test and Checkout	C/CPFF	CACI : Fairfax, VA	0.118	0.832	Dec 2014	0.950	Jan 2016	0.525	Jan 2017	-		0.525	0.000	2.425	-
1.4 Integration, Assembly, Test and Checkout	Sub Allot	CECOM Bldg 1207 : Various	0.073	0.294	Oct 2014	0.475	Jan 2016	0.250	Feb 2017	-		0.250	0.000	1.092	-
1.4 Integration, Assembly, Test and Check	C/CPFF	Lockheed Martin : Various	0.000	0.000		0.000		3.307	Feb 2017	-		3.307	0.000	3.307	-
1.4 Integration, Assembly, Test and Checkout	WR	NAVAIR : Lakehurst	0.000	0.000		0.000		0.200	Mar 2017	-		0.200	0.000	0.200	-
1.12 Common Equipment Development	C/CPFF	Northrop Grumman : Bethpage, NY	0.736	0.392	Dec 2014	0.745	Jan 2016	0.544	Dec 2016	-		0.544	Continuing	Continuing	Continuing
1.12 Common Equipment Development	WR	NSWC PC : Panama City, FL	2.217	2.105	Oct 2014	6.582	Oct 2015	4.425	Nov 2016	-		4.425	Continuing	Continuing	Continuing
1.12 Common Equipment Development	WR	NUWC NPT : Newport, RI	0.279	0.343	Oct 2014	0.550	Oct 2015	0.402	Dec 2016	-		0.402	Continuing	Continuing	Continuing
1.12 Common Equipment Development	WR	NSWC DD : Dahlgren, VA	0.561	0.343	Oct 2014	0.600	Oct 2015	0.438	Nov 2016	-		0.438	Continuing	Continuing	Continuing
1.12 Common Equipment Development	WR	NAVAIR PMA266 : Patuxent River, MD	0.000	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
1.12 Common Equipment Development	C/CPFF	AAC : Uniontown, PA	0.306	2.747	Dec 2014	1.701	Jan 2016	1.242	Feb 2017	-		1.242	0.000	5.996	-
1.12 Common Equipment Development	WR	PMW 760 : Various	0.233	0.245	Nov 2014	0.000		0.173	Jan 2017	-		0.173	0.000	0.651	-

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Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
1.12 Common Equipment Development	WR	SPAWAR PACIFIC : San Diego, CA	0.372	0.783	Nov 2014	0.950	Dec 2015	0.694	Dec 2016	-		0.694	0.000	2.799	-
1.12 Common Equipment Development	Sub Allot	PMW 760 : San Diego, CA	0.000	0.000		0.238	Nov 2015	0.000		-		0.000	0.000	0.238	-
1.12 Common Equipment Development	TBD	SBIR : Various	0.000	0.000		10.154	Mar 2016	0.000		-		0.000	0.000	10.154	-
1.12 Common Equipment Development	C/CPFF	ARL/UT : Austin, TX	0.171	0.490	Dec 2014	0.000		0.000		-		0.000	0.000	0.661	-
1.12 Common Equipment Development	C/CPFF	Progeny : Manassas, VA	0.000	0.000		1.000	Jan 2016	0.730	Mar 2017	-		0.730	0.000	1.730	-
1.13 MCM MP	WR	NSWC PC : Panama City, FL	8.358	11.346	Oct 2014	2.211	Oct 2015	13.119	Nov 2016	-		13.119	Continuing	Continuing	Continuing
1.13 MCM MP	WR	NSWC CD : Little Creek, VA	0.000	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
1.13 MCM MP	Sub Allot	PMS 406 : Various	3.629	8.232	Dec 2014	16.000	Jan 2016	11.000	Mar 2017	-		11.000	0.000	38.861	-
1.13 MCM MP	Sub Allot	PMS 495 : Various	0.000	0.000		0.000		0.000		-		0.000	0.000	0.000	-
1.13 MCM MP	C/CPFF	Lockheed Martin : Riviera Beach, FL	4.782	0.000		0.000		0.000		-		0.000	0.000	4.782	-
1.14 ASW MP	Sub Allot	PEO IWS5 : Various	17.402	7.918	Oct 2014	8.300	Jan 2016	4.870	Mar 2017	-		4.870	0.000	38.490	-
1.14 ASW MP	WR	NUWC NPT : Newport, RI	5.407	3.360	Oct 2014	6.588	Oct 2015	5.600	Dec 2016	-		5.600	0.000	20.955	-
1.14 ASW MP	TBD	Various : Various	0.000	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
1.14 ASW MP	WR	CDSA Dam Neck : Virginia Beach, VA	0.802	0.587	Oct 2014	0.807	Oct 2015	3.500	Dec 2016	-		3.500	0.000	5.696	-
1.14 ASW MP	C/CPFF	Northrop Grumman : Bethpage, NY	0.374	1.273	Dec 2014	3.500	Jan 2016	3.417	Feb 2017	-		3.417	0.000	8.564	-
1.14 ASW MP	C/CPFF	SPA : Washington, DC	0.000	0.587	Jun 2015	0.600	Dec 2015	0.250	Jan 2017	-		0.250	0.000	1.437	-
1.14 ASW MP	Sub Allot	EDM Contractor : Various	0.000	2.568	Oct 2014	28.800	Jan 2016	2.500	Mar 2017	-		2.500	0.000	33.868	-
1.14 ASW MP	WR	NSWC PCD : Panama City, FL	0.000	0.117	Oct 2014	0.000		0.000		-		0.000	0.000	0.117	-

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Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
1.14 ASW MP	WR	NSWC DD : Dahlgren, VA	0.000	0.196	Oct 2014	0.250	Nov 2015	0.000		-		0.000	0.000	0.446	-
1.14 ASW MP	C/CPFF	CACI : Arlingrton, VA	0.000	0.343	Dec 2014	0.258	Jan 2016	0.000		-		0.000	0.000	0.601	-
1.14 ASW MP	WR	NUWC KPT : Keyport, WA	0.000	0.441	Oct 2014	0.154	Nov 2015	0.000		-		0.000	0.000	0.595	-
1.14 ASW MP	WR	SSC PAC : San Diego, CA	0.000	3.133	Oct 2014	1.100	Dec 2015	0.000		-		0.000	0.000	4.233	-
1.15 SUW MP	WR	NSWC DD : Dahlgren, VA	11.350	9.361	Oct 2014	9.500	Oct 2015	7.500	Nov 2016	-		7.500	Continuing	Continuing	Continuing
1.15 SUW MP	WR	NSWC PHD : Port Hueneme, CA	4.009	5.128	Oct 2014	12.000	Dec 2015	2.000	Nov 2016	-		2.000	Continuing	Continuing	Continuing
1.15 SUW MP	WR	SPAWAR PACIFIC : San Diego, CA	0.000	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
1.15 SUW MP	C/CPFF	JAMS PO : Various	0.000	0.000		0.000		6.480	Feb 2017	-		6.480	0.000	6.480	-
1.15 SUW MP	C/CPFF	Northrop Grumman : Bethpage, NY	8.700	17.981	Dec 2014	20.000	Dec 2015	15.960	Jan 2017	-		15.960	0.000	62.641	-
1.15 SUW MP	Sub Allot	PEO IWS 3 : Various	0.000	0.000		7.319	Dec 2015	2.500	Feb 2017	-		2.500	0.000	9.819	-
1.15 SUW MP	WR	NAWC WD : Ridgecrest, CA	3.868	1.958	Oct 2014	2.000	Jan 2016	0.000		-		0.000	0.000	7.826	-
1.15 SUW MP	WR	NSWC CD : Crane, IN	0.000	0.196	Oct 2014	0.200	Dec 2015	0.000		-		0.000	0.000	0.396	-
1.15 SUW MP	WR	NSWC Corona : Corona, CA	0.000	0.245	Oct 2014	0.250	Nov 2015	0.250	Jan 2017	-		0.250	0.000	0.745	-
1.16 MP-PCS Equipment	WR	Various : Various	0.000	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
1.19 Pre-Production Engineering	WR	Various : Various	0.000	0.000		0.000		0.000		-		0.000	0.000	0.000	-
1.20 Irregular Warfare Module	C/CPFF	Northrop Grumman : Bethpage, NY	0.000	0.000		0.000		0.000		-		0.000	0.000	0.000	-
1.20 Irregular Warfare Module	WR	SPARWAR PAC : San Diego, CA	0.000	0.000		0.000		0.000		-		0.000	0.000	0.000	-
1.1.7 System Engineering RAM-C Project	WR	Various : Various	0.000	0.000		0.000		0.000		-		0.000	0.000	0.000	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603596N / *(U)LCS Mission Modules*	Project (Number/Name) 3129 / *LCS Mission Package Development*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
		Subtotal	79.801	113.713		160.365		108.828		-		108.828	-	-	-

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
1.5 Training Systems Development	WR	NAWC TSD : Orlando, FL	0.803	2.007	Oct 2014	0.750	Jan 2016	1.042	Mar 2017	-		1.042	Continuing	Continuing	Continuing
1.5 Training Systems Development	WR	NSWC PC : Panama City, FL	0.486	1.615	Oct 2014	2.500	Nov 2015	2.385	Nov 2016	-		2.385	Continuing	Continuing	Continuing
1.5 Training Systems Development	WR	NSWC PHD : Port Hueneme, CA	0.728	1.266	Oct 2014	1.500	Nov 2015	0.462	Dec 2016	-		0.462	Continuing	Continuing	Continuing
1.5 Training Systems Development	C/CPFF	AAC : Uniontown, PA	0.738	2.890	Dec 2014	3.500	Jan 2016	3.465	Feb 2017	-		3.465	Continuing	Continuing	Continuing
1.5 Training Systems Development	C/CPFF	CACI : Fairfax, VA	0.370	0.734	Dec 2014	1.250	Jan 2016	0.000		-		0.000	0.000	2.354	-
1.5 Training Systems Development	C/CPIF	TBD-PSS : Washington, DC	0.000	0.000		0.000		1.121	Nov 2016	-		1.121	0.000	1.121	-
1.5 Training Systems Development	WR	CSCS : Dahlgren, VA	0.853	1.713	Oct 2014	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
1.5 Training Systems Development	C/CPFF	Northrop Grumman : Bethpage, NY	0.204	1.084	Dec 2014	0.350	Jan 2016	0.541	Jan 2017	-		0.541	0.000	2.179	-
1.5 Training Systems Development	WR	CNSF : San Diego, CA	0.370	0.734	Oct 2014	0.900	Dec 2015	0.555	Jan 2017	-		0.555	Continuing	Continuing	Continuing
1.5 Training Systems Development	WR	NSWC, Dahlgren : Dahlgren, VA	0.000	0.269	Oct 2014	0.275	Oct 2015	0.000	Nov 2016	-		0.000	0.000	0.544	-
1.5 Training Systems Development	WR	NUWC, Newport : Newport, RI	0.000	1.224	Oct 2014	0.070	Oct 2015	0.072	Feb 2017	-		0.072	0.000	1.366	-
1.5 Training Systems Development	WR	JHU/APL : Laurel, MD	0.000	0.979	Nov 2014	0.500	Feb 2016	0.000	Feb 2017	-		0.000	0.000	1.479	-
1.5 Training Systems Development	Sub Allot	Various : Various	0.000	0.000		1.520	Oct 2015	1.957	Mar 2017	-		1.957	0.000	3.477	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603596N / *(U)LCS Mission Modules*	Project (Number/Name) 3129 / *LCS Mission Package Development*	

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
1.5 Training Systems Development	C/BA	CDSA, Dam Neck : Dam Neck, VA	0.000	1.713	Oct 2014	2.800	Oct 2015	1.150	Jan 2017	-		1.150	0.000	5.663	-
1.6 Program Technical Data	WR	NSWC PC : Panama City, FL	0.000	0.613	Oct 2014	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
1.6 Program Technical Data	C/CPFF	Northrop Grumman : Bethpage, NY	0.133	0.942	Dec 2014	2.071	Jan 2016	1.440	Jan 2017	-		1.440	0.000	4.586	-
1.6 Program Technical Data	C/CPIF	TBD-PSS : Washington, DC	0.000	0.000		0.000		0.500	Dec 2016	-		0.500	0.000	0.500	-
1.6 Program Technical Data	WR	CACI : Fairfax, VA	0.110	0.274	Dec 2014	0.000		0.000		-		0.000	0.000	0.384	-
1.1.10 Reliability, Maintainability, and Availability	C/CPFF	CACI : Fairfax, VA	0.178	0.734	Dec 2014	0.921	Jan 2016	0.000		-		0.000	Continuing	Continuing	Continuing
1.1.10 Reliability, Maintainability, and Availability	WR	NSWC PC : Panama City, FL	0.708	0.881	Oct 2014	0.217	Nov 2015	0.225	Nov 2016	-		0.225	Continuing	Continuing	Continuing
1.1.10 Reliability, Maintainability, and Availability	WR	NUWC, NPT : Newport, RI	0.074	1.129	Oct 2014	0.116	Oct 2015	0.150	Dec 2016	-		0.150	Continuing	Continuing	Continuing
1.1.10 Reliability, Maintainability, and Availability	C/BA	NSWC, Dahlgren : Dahlgren, VA	0.890	0.250	Oct 2014	0.233	Nov 2015	0.200	Nov 2016	-		0.200	0.000	1.573	-
1.1.10 Reliability, Maintainability, and Availability	WR	NAVSEALOGCEN : Norfolk, VA	0.000	0.000		0.731	Oct 2015	0.620	Dec 2016	-		0.620	0.000	1.351	-
1.1.10 Reliability, Maintainability, and Availability	C/CPFF	Northrop Grumman : Bethpage, NY	0.000	0.000		0.152	Dec 2015	0.225	Jan 2017	-		0.225	0.000	0.377	-
1.1.10 Reliability, Maintainability, and Availability	WR	CDSA Dam Neck : Virginia Beach, VA	0.000	0.000		0.116	Oct 2015	0.125	Dec 2016	-		0.125	0.000	0.241	-
1.1.10 Reliability, Maintainability, and Availability	WR	NSWC PHD : Port Hueneme, CA	0.000	0.000		0.343	Nov 2015	0.350	Dec 2016	-		0.350	0.000	0.693	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603596N / *(U)LCS Mission Modules*	Project (Number/Name) 3129 / *LCS Mission Package Development*	

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
1.1.10 Reliability Maintainance	C/CPIF	ESS-TBD : Washington DC	0.000	0.000		0.000		1.031	Dec 2016	-		1.031	0.000	1.031	-
		Subtotal	6.645	21.051		20.815		17.616		-		17.616	-	-	-

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
1.3 System Test and Evaluation	WR	NSWC PCD : Panama City, FL	6.146	11.469	Oct 2014	0.000		8.000	Nov 2016	-		8.000	0.000	25.615	-
1.3 System Test and Evaluation	WR	NSWC DD : Dahlgren, VA	3.250	7.348	Oct 2014	6.000	Oct 2015	4.000	Nov 2016	-		4.000	0.000	20.598	-
1.3 System Test and Evaluation	WR	NUWC NPT : Newport, RI	0.485	0.743	Oct 2014	0.800	Oct 2015	1.600	Nov 2016	-		1.600	0.000	3.628	-
1.3 System Test and Evaluation	WR	NSWC PHD : Port Hueneme, CA	5.160	7.768	Oct 2014	5.500	Dec 2015	7.820	Jan 2017	-		7.820	0.000	26.248	-
1.3 System Test and Evaluation	WR	SPAWAR PAC : San Diego, CA	0.808	1.150	Nov 2014	1.300	Jan 2016	2.000	Dec 2016	-		2.000	0.000	5.258	-
1.3 System Test and Evaluation	WR	COMOPTEVFOR : Norfolk, VA	0.546	1.148	Nov 2014	1.300	Jan 2016	1.300	Mar 2017	-		1.300	0.000	4.294	-
1.3 System Test and Evaluation	WR	PMA 266 : Patuzent River, MD	0.226	0.352	Dec 2014	0.400	Dec 2015	0.407	Mar 2017	-		0.407	0.000	1.385	-
1.3 System Test and Evaluation	C/BA	Silver Ships : Theodore, AL	0.355	0.548	Dec 2014	0.000		0.000		-		0.000	0.000	0.903	-
1.3 System Test and Evaluation	C/BA	CNSF : Norfolk, VA	0.161	0.250	Nov 2014	0.000		0.000		-		0.000	0.000	0.411	-
1.3 System Test and Evaluation	C/BA	NAWC WD : Point Mugu, CA	1.617	2.333	Nov 2014	2.030	Jan 2016	3.000	Feb 2017	-		3.000	0.000	8.980	-
1.3 System Test and Evaluation	C/BA	NSWC Corona : Corona, CA	0.000	0.196	Nov 2014	0.571	Dec 2015	1.000	Jan 2017	-		1.000	0.000	1.767	-
		Subtotal	18.754	33.305		17.901		29.127		-		29.127	0.000	99.087	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603596N / *(U)LCS Mission Modules*	Project (Number/Name) 3129 / *LCS Mission Package Development*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Acquisition Workforce	Various	Various : Various	0.000	0.000		0.000		0.000		-		0.000	0.000	0.000	-
1.2 Program Management	C/CPFF	CACI : Fairfax, VA	0.482	4.533	Dec 2014	2.683	Jan 2016	0.000		-		0.000	0.000	7.698	-
1.2 Program Management	WR	NSWC PCD : Panama City, FL	0.000	0.000		0.000		0.000		-		0.000	0.000	0.000	-
1.2 Program Management	WR	NSWC DD : Dahlgren, VA	0.000	0.000		0.000		0.000		-		0.000	0.000	0.000	-
1.2 Program Management	FFRDC	Mitre : McLean, VA	0.000	0.000		1.379	Nov 2015	1.300	Jan 2017	-		1.300	0.000	2.679	-
1.2 Program Management	C/CPIF	TBD - PSS : Washington DC	0.000	0.000		0.000		1.937	Nov 2016	-		1.937	0.000	1.937	-
1.2 Program Management	C/CPFF	NSWC Crane : Various	0.000	0.000		0.000		1.250	Dec 2016	-		1.250	0.000	1.250	-
		Subtotal	0.482	4.533		4.062		4.487		-		4.487	0.000	13.564	-

	Prior Years	FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	105.682	172.602		203.143		160.058		-		160.058	-	-	-

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603596N / *(U)LCS Mission Modules*	**Project (Number/Name)** 3129 / *LCS Mission Package Development*

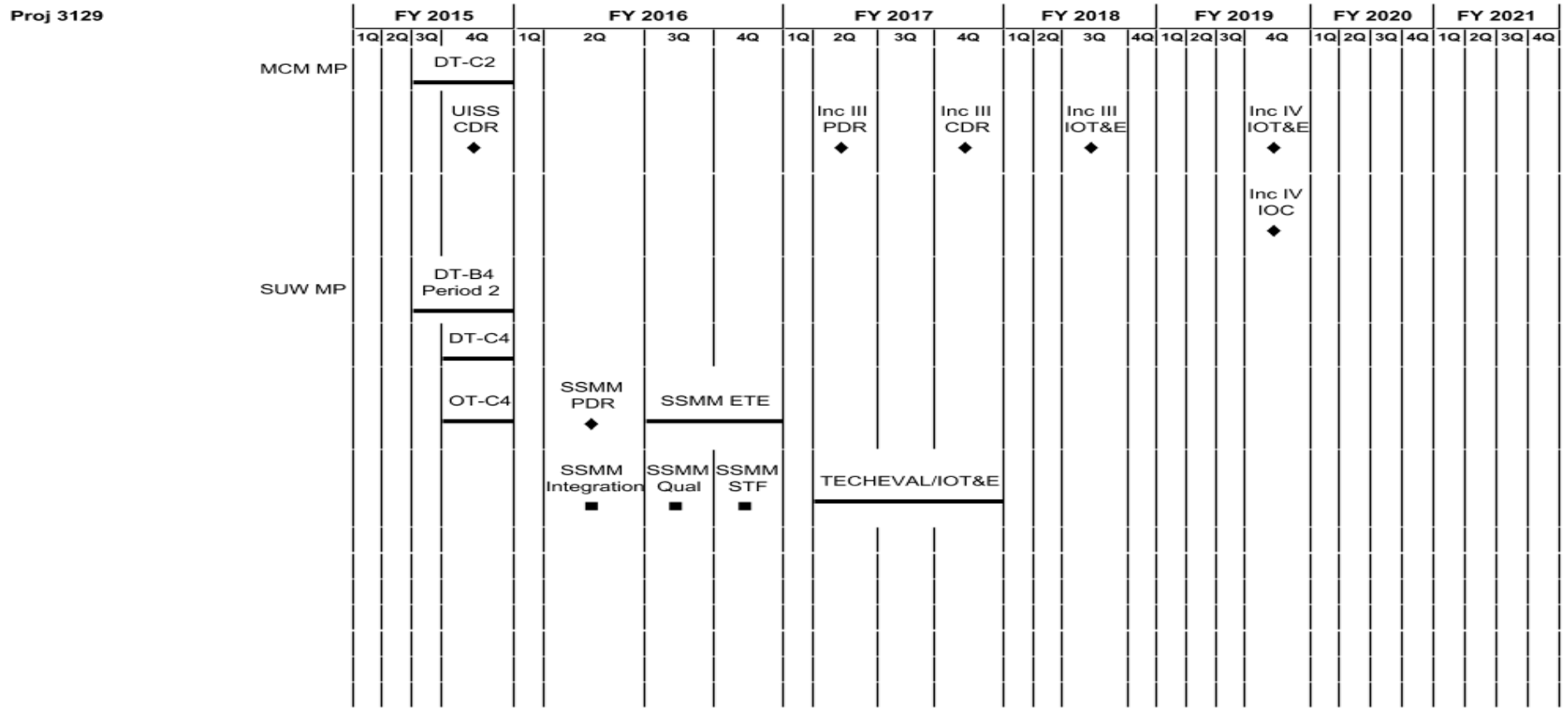

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Exhibit R-4, RDT&E Schedule Profile: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603596N / *(U)LCS Mission Modules*	**Project (Number/Name)** 3129 / *LCS Mission Package Development*

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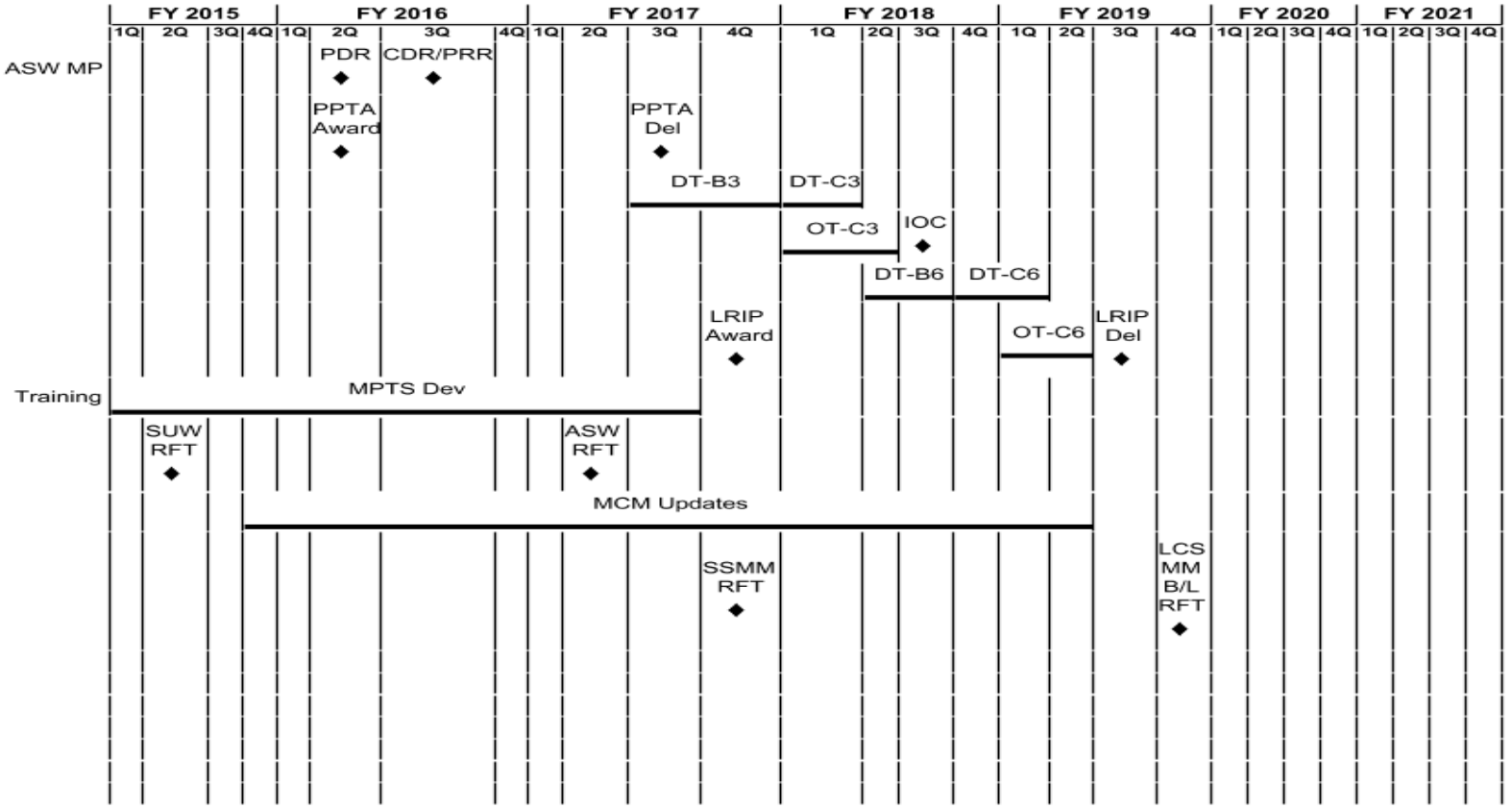

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Exhibit R-4A, RDT&E Schedule Details: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603596N / *(U)LCS Mission Modules*	**Project (Number/Name)** 3129 / *LCS Mission Package Development*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 3129				
MCM MP: MCM MP Increment I TECHEVAL DT-C2 (Independence Variant)	3	2015	4	2015
MCM MP: UISS Program of Record: CDR	4	2015	4	2015
MCM MP: MCM MP Increment III Delta PDR	2	2017	2	2017
MCM MP: MCM MP Increment III Delta CDR	4	2017	4	2017
MCM MP: MCM Increment III IOT&E	3	2018	3	2018
MCM MP: MCM Increment IV IOT&E	4	2019	4	2019
MCM MP: MCM MP Increment IV IOC	4	2019	4	2019
SUW MP: SUW Increment I & II Developmental Testing DT - B4 Pr. 2 (Independence Variant)	3	2015	4	2015
SUW MP: SUW Increment I & II TECHEVAL DT-C4 (Independence Variant)	4	2015	4	2015
SUW MP: SUW MP Increment I & II IOT&E OT-C4 (Independence Variant)	4	2015	4	2015
SUW MP: SUW MM SSMM PDR	2	2016	2	2016
SUW MP: SUW MM (SSMM End-to-End Testing)	3	2016	4	2016
SUW MP: Surface-to-Surface Missle Module Functional Integration Test (FIT) on LCS	2	2016	2	2016
SUW MP: SSMM Qualification Testing Complete	3	2016	3	2016
SUW MP: SSMM Structural Test Fire	4	2016	4	2016
SUW MP: SSMM TECHEVAL/IOT&E	2	2017	4	2017
Page 2				
ASW MP: ASW MP PDR	2	2016	2	2016
ASW MP: ASW MP CDR/PRR	3	2016	3	2016
ASW MP: ASW MP Pre-Production Test Article (PPTA) Award	2	2016	2	2016
ASW MP: ASW MP PPTA 1 Delivery	3	2017	3	2017

Exhibit R-4A, RDT&E Schedule Details: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603596N / *(U)LCS Mission Modules*	**Project (Number/Name)** 3129 / *LCS Mission Package Development*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
ASW MP: ASW MP DT-B3 (Freedom Variant)	3	2017	4	2017
ASW MP: ASW MP TECHEVAL DT-C3 (Freedom Variant)	1	2018	1	2018
ASW MP: ASW MP IOT&E OT-C3 (Freedom Variant)	1	2018	2	2018
ASW MP: ASW MP IOC	3	2018	3	2018
ASW MP: ASW MP DT-B6 (Independence Variant)	2	2018	3	2018
ASW MP: ASW MP TECHEVAL DT-C6 (Independence Variant)	4	2018	1	2019
ASW MP: ASW MP IOT&E OT-C6 (Independence Variant)	1	2019	2	2019
ASW MP: ASW MP LRIP 1 Award	4	2017	4	2017
ASW MP: ASW MP LRIP 1 Delivery	3	2019	3	2019
Training: Mission Package Training System (MPTS) HW/SW Development	1	2015	3	2017
Training: SUW LTF Initial Ready For Training	2	2015	2	2015
Training: ASW LTF Initial Ready For Training	2	2017	2	2017
Training: MCM Courseware Update (RMMV, UISS, Knifefish)	4	2015	2	2019
Training: SUW Courseware Update (SSMM) RFT	4	2017	4	2017
Training: Initial LCS MM Baseline Final Ready for Training RFT	4	2019	4	2019

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Exhibit R-2, RDT&E Budget Item Justification: PB 2017 Navy	Date: February 2016
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 0603597N *I (U)Automated Test and Analysis*

COST ($ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
Total Program Element	9.639	7.816	23.000	0.000	-	0.000	8.000	8.000	8.000	8.160	Continuing	Continuing
9B88: *Automated Test and Analysis*	9.639	7.816	23.000	0.000	-	0.000	8.000	8.000	8.000	8.160	Continuing	Continuing

A. Mission Description and Budget Item Justification

Prior to FY2016, the Navy developed a capability called Automated Test and Retest (ATRT). ATRT supported reproducible and quantitative testing and analysis of Naval Ship Combat Systems Integration, AEGIS Combat System Advanced Capability Build (ACB) 12, Antisubmarine Warfare Integrated Common Processor/Acoustic Rapid Commercial Off The Shelf Insertion (ARCI), and Littoral Combat Ship (LCS) Mission Module development. Funding also supported expansion of ATRT to other NAVSEA-affiliated programs. The success of ATRT in reducing the time to complete critical testing, improve and speed test analysis, find and correct critical design flaws has led to an expansion of the capability to a Naval enterprise wide effort, not just a Navy Ship effort.

In FY2016, ATRT was expanded to include the entire Naval enterprise and renamed Automated Test and Analysis (ATA). ATA expands the automated test methods currently in use such as Automated Test and Re-Test, adds new methods of testing and use of automated test technologies, and standardizes automated test practices, methods and tools. In addition,
funding supports the development of enterprise level strategies to apply ATA technology to the software-intensive acquisition programs.

The FY2015 ATRT project was funded on Program Element 0603597N under Project Unit 9B88: "Automated Test and Re-Test".
Starting in FY16 and through the out-years, the project is renamed "Automated Test and Analysis" on Program Element 0603597N under Project Unit 9B88.

B. Program Change Summary ($ in Millions)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Previous President's Budget	8.115	8.000	8.000	-	8.000
Current President's Budget	7.816	23.000	0.000	-	0.000
Total Adjustments	-0.299	15.000	-8.000	-	-8.000
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	15.000			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.299	0.000			
• Program Adjustments	0.000	0.000	-8.000	-	-8.000
• Rate/Misc Adjustments	0.000	0.000	0.000	-	0.000

Exhibit R-2, RDT&E Budget Item Justification: PB 2017 Navy	Date: February 2016
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 0603597N *I (U)Automated Test and Analysis*

Change Summary Explanation

FY16: Per Congressional decision, an additional $15M is added to FY16's budget for ATA to expand its use to as many programs as possible in order to maximize the return on investment.

FY17: As a result of the FY16 Congressional action, FY17's budget is reduced to account for carryover.

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603597N / *(U)Automated Test and Analysis*	Project (Number/Name) 9B88 / *Automated Test and Analysis*	

COST ($ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
9B88: *Automated Test and Analysis*	9.639	7.816	23.000	0.000	-	0.000	8.000	8.000	8.000	8.160	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Prior to FY2016, the Navy developed a capability called Automated Test and Retest (ATRT). ATRT supported reproducible and quantitative testing and analysis of Naval Ship Combat Systems Integration, AEGIS Combat System Advanced Capability Build (ACB) 12, Antisubmarine Warfare Integrated Common Processor/Acoustic Rapid Commercial Off The Shelf Insertion (ARCI), and Littoral Combat Ship (LCS) Mission Module development. Funding also supported expansion of ATRT to other NAVSEA-affiliated programs. The success of ATRT in reducing the time to complete critical testing, improve and speed test analysis, find and correct critical design flaws has led to an expansion of the capability to a Naval enterprise wide effort, not just a Navy Ship effort.

In FY2016, ATRT was expanded to include the entire Naval enterprise and renamed Automated Test and Analysis (ATA). ATA expands the automated test methods currently in use such as Automated Test and Re-Test, adds new methods of testing and use of automated test technologies, and standardizes automated test practices, methods and tools. In addition, funding supports the development of enterprise level strategies to apply ATA technology to the software-intensive acquisition programs.

The FY2015 ATRT project was funded on Program Element 0603597N under Project Unit 9B88: "Automated Test and Re-Test". Starting in FY16 and through the out-years, the project is renamed "Automated Test and Analysis" on Program Element 0603597N under Project Unit 9B88.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Title: Automated Test and Re-Test	7.816	0.000	0.000	0.000	0.000
Articles:	-	-	-	-	-
FY 2015 Accomplishments: The Automated Test and Retest (ATRT) program has continued with nine ATRT efforts increasing the use of automated testing in software intensive program execution. The NAVSEA FY15 investments in automated testing supported the analysis of 7 developmental tests/operational tests or Combat System Ships Qualification Trials (CSSQT) At-Sea-Tests, 3 installation tests, and 11 development, integration or certification test events. The ATRT program continues to advocate the maturation/ development of standards, specifications, and contract language that would improve test tool commonality and reuse across the Navy testing domains. NAVSEA is investigating the applicability of ATRT to Warfare System Certification Testing.					

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603597N / *(U)Automated Test and Analysis*	**Project (Number/Name)** 9B88 / *Automated Test and Analysis*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Conducted a Naval enterprise-wide data call soliciting automated test tool proposals that can significantly reduce the time to complete critical testing, improve and speed test analysis, and identify and correct critical design flaws in Navy acquisition programs. Ten proposals were selected to research improvements in automated testing and analysis in FY16 for Link-16 user testing and analysis, Undersea Tracking Ranges real-time testing synchronization and reporting, enhance Strike Force Interoperability mission requirements for automated combat system testing, address Joint Mission Planning System (JMPS) for the Joint Strike Fighter testing, Unmanned Aircraft Common Control System (CCS) subsystem integration testing, the Digital Battlespace Environment Simulator (DBES), the Marine Corps Global Combat Support System (GCSS-MC), and the Electronic Chart Display and Information System-Navy (ECDIS-N). ***FY 2016 Plans:*** N/A ***FY 2017 Base Plans:*** N/A ***FY 2017 OCO Plans:*** N/A					
Title: Automated Test and Analysis	0.000	23.000	0.000	0.000	0.000
Articles:	-	-	-	-	-
FY 2015 Accomplishments: N/A ***FY 2016 Plans:*** Ten proposals were selected based on their ability to best describe technical merit for ten criteria to include extensibility, enhanced coverage, improved fidelity and reduction in Total Ownership Cost by the Executive Steering Group, which includes Senior Executive level representatives from Naval Sea, Naval Air, Space and Naval Warfare, and US Marine Corps Systems Commands. Those projects have initiated automated testing and analysis to support and develop Link-16 user testing and analysis, Undersea Tracking Ranges real-time testing synchronization and reporting, enhance Strike Force Interoperability mission requirements for automated combat system testing, address JMPS for the Joint Strike Fighter testing, Unmanned Aircraft CCS subsystem integration testing, the DBES, the GCSS-MC, and the ECDIS-N. There are sixteen (16) additional previously evaluated projects identified as potentially impactful to the Navy Enterprise ATA initiative. With the additional					

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603597N / *(U)Automated Test and Analysis*	**Project (Number/Name)** 9B88 / *Automated Test and Analysis*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Congressional plus up, this program is poised to improve Interoperability, SSBN Modernization, Carrier and LCS testing advances, Integration, system validation and tech refresh capabilities. ATA will continue with another Naval enterprise-wide data call soliciting automated test tool proposals that will spring-board from these efforts and can significantly reduce the time to complete critical testing, improve and speed test analysis, and identify and correct critical design flaws in Navy acquisition programs for further study in FY 2017. These automated testing projects will reduce errors, increase capabilities and enhance reporting timelines for critical Navy program initiatives. ***FY 2017 Base Plans:*** N/A ***FY 2017 OCO Plans:*** N/A					
Accomplishments/Planned Programs Subtotals	7.816	23.000	0.000	0.000	0.000

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

The ATA program will solicit automated test tool proposals from all qualified sources that show the potential to significantly reduce the time to complete critical testing, improve and speed test analysis, and find and correct critical design flaws in Naval acquisition programs. All valid submitted proposals will be evaluated by an Executive Steering Group (ESG) composed of Senior Executive level representatives from NAVSEA, NAVAIR, SPAWAR and US Marine Corps Systems Commands. Proposals selected by the ESG will be funded for one year, in which time they must demonstrate their ability to significantly reduce the time to complete critical testing, improve and speed test analysis, or find and correct critical design flaws in Navy acquisition programs. Successful funded proposals will be advertised and made available across the Naval enterprise for acquisition program consideration, funding, and use.

E. Performance Metrics

Progress towards meeting the objectives of the ATA efforts will be monitored via the following:
- Quarterly ATA Executive Steering Group Meetings
- Quarterly Program Reviews

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603597N / *(U)Automated Test and Analysis*	**Project (Number/Name)** 9B88 / *Automated Test and Analysis*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Automated Test & Retest	C/CPFF	Innovative Defense Technologies (IDT) : Ballston, VA	8.576	7.263	Jan 2015	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Automated Test & Retest	WR	Various NSWCs : Not Specified	0.613	0.352	Dec 2014	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Automated Test & Analysis	C/CPFF	Innovative Defense Technologies (IDT) : Ballston, VA	0.000	0.000		18.765	Dec 2015	0.000		-		0.000	0.000	18.765	-
Automated Test & Analysis	WR	SPAWAR Pacific : San Diego, CA	0.000	0.000		2.214	Dec 2015	0.000		-		0.000	0.000	2.214	-
Automated Test & Analysis	C/CPFF	Marine Corp : Not Specified	0.000	0.000		0.913	Dec 2015	0.000		-		0.000	0.000	0.913	-
Automated Test & Analysis	C/CPFF	Various Contractors : Not Specified	0.000	0.000		0.542	Mar 2016	0.000		-		0.000	0.000	0.542	-
Automated Test & Analysis	WR	Various NSWCs : Not Specified	0.000	0.000		0.000		0.000		-		0.000	0.000	0.000	-
		Subtotal	9.189	7.615		22.434		0.000		-		0.000	-	-	-

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Automated Test & Analysis	C/CPFF	Gryphon Technologies : Washington, DC	0.263	0.174	May 2015	0.566	Dec 2015	0.000		-		0.000	Continuing	Continuing	Continuing
Automated Test & Analysis	C/CPFF	Alion Sciences : McLean, VA	0.187	0.027	Apr 2015	0.000		0.000		-		0.000	0.000	0.214	-
		Subtotal	0.450	0.201		0.566		0.000		-		0.000	-	-	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603597N / *(U)Automated Test and Analysis*	Project (Number/Name) 9B88 / *Automated Test and Analysis*	

	Prior Years	FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	9.639	7.816		23.000		0.000		-		0.000	-	-	-

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603597N / *(U)Automated Test and Analysis*	**Project (Number/Name)** 9B88 / *Automated Test and Analysis*

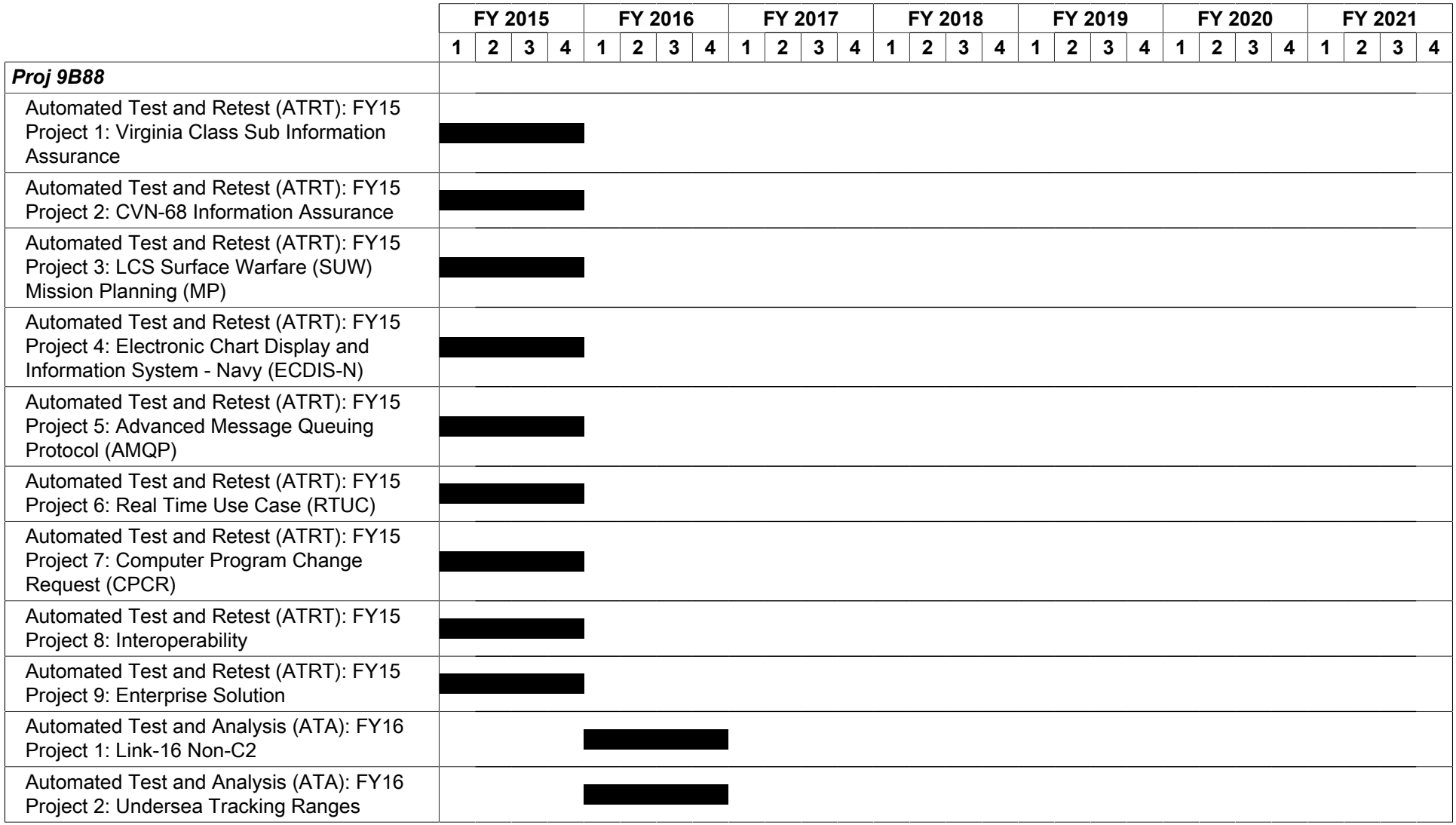

Exhibit R-4, RDT&E Schedule Profile: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603597N / *(U)Automated Test and Analysis*	**Project (Number/Name)** 9B88 / *Automated Test and Analysis*

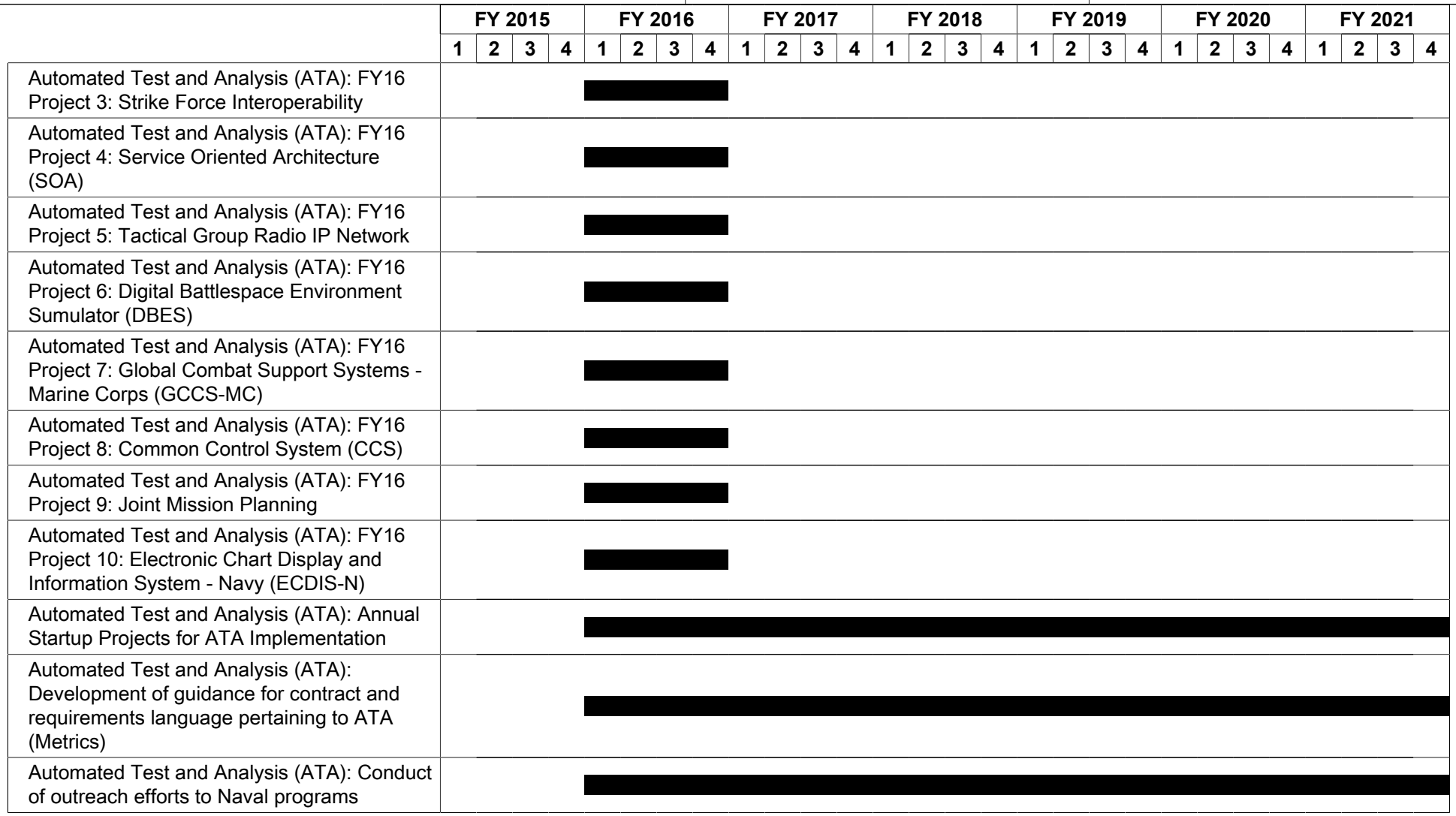

Exhibit R-4, RDT&E Schedule Profile: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603597N / *(U)Automated Test and Analysis*	**Project (Number/Name)** 9B88 / *Automated Test and Analysis*

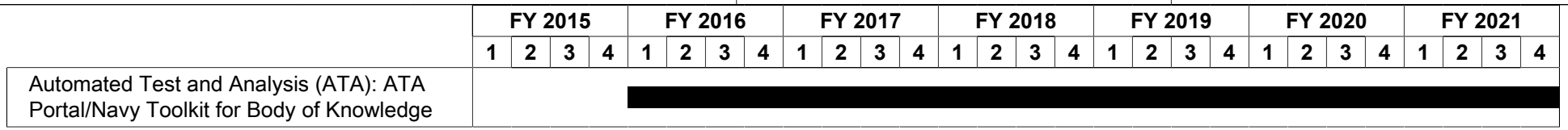

Exhibit R-4A, RDT&E Schedule Details: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603597N / *(U)Automated Test and Analysis*	**Project (Number/Name)** 9B88 / *Automated Test and Analysis*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 9B88				
Automated Test and Retest (ATRT): FY15 Project 1: Virginia Class Sub Information Assurance	1	2015	4	2015
Automated Test and Retest (ATRT): FY15 Project 2: CVN-68 Information Assurance	1	2015	4	2015
Automated Test and Retest (ATRT): FY15 Project 3: LCS Surface Warfare (SUW) Mission Planning (MP)	1	2015	4	2015
Automated Test and Retest (ATRT): FY15 Project 4: Electronic Chart Display and Information System - Navy (ECDIS-N)	1	2015	4	2015
Automated Test and Retest (ATRT): FY15 Project 5: Advanced Message Queuing Protocol (AMQP)	1	2015	4	2015
Automated Test and Retest (ATRT): FY15 Project 6: Real Time Use Case (RTUC)	1	2015	4	2015
Automated Test and Retest (ATRT): FY15 Project 7: Computer Program Change Request (CPCR)	1	2015	4	2015
Automated Test and Retest (ATRT): FY15 Project 8: Interoperability	1	2015	4	2015
Automated Test and Retest (ATRT): FY15 Project 9: Enterprise Solution	1	2015	4	2015
Automated Test and Analysis (ATA): FY16 Project 1: Link-16 Non-C2	1	2016	4	2016
Automated Test and Analysis (ATA): FY16 Project 2: Undersea Tracking Ranges	1	2016	4	2016
Automated Test and Analysis (ATA): FY16 Project 3: Strike Force Interoperability	1	2016	4	2016
Automated Test and Analysis (ATA): FY16 Project 4: Service Oriented Architecture (SOA)	1	2016	4	2016
Automated Test and Analysis (ATA): FY16 Project 5: Tactical Group Radio IP Network	1	2016	4	2016
Automated Test and Analysis (ATA): FY16 Project 6: Digital Battlespace Environment Sumulator (DBES)	1	2016	4	2016

Exhibit R-4A, RDT&E Schedule Details: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603597N / *(U)Automated Test and Analysis*	**Project (Number/Name)** 9B88 / *Automated Test and Analysis*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Automated Test and Analysis (ATA): FY16 Project 7: Global Combat Support Systems - Marine Corps (GCCS-MC)	1	2016	4	2016
Automated Test and Analysis (ATA): FY16 Project 8: Common Control System (CCS)	1	2016	4	2016
Automated Test and Analysis (ATA): FY16 Project 9: Joint Mission Planning	1	2016	4	2016
Automated Test and Analysis (ATA): FY16 Project 10: Electronic Chart Display and Information System - Navy (ECDIS-N)	1	2016	4	2016
Automated Test and Analysis (ATA): Annual Startup Projects for ATA Implementation	1	2016	4	2021
Automated Test and Analysis (ATA): Development of guidance for contract and requirements language pertaining to ATA (Metrics)	1	2016	4	2021
Automated Test and Analysis (ATA): Conduct of outreach efforts to Naval programs	1	2016	4	2021
Automated Test and Analysis (ATA): ATA Portal/Navy Toolkit for Body of Knowledge	1	2016	4	2021

Exhibit R-2, RDT&E Budget Item Justification: PB 2017 Navy											Date: February 2016	
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 4: *Advanced Component Development & Prototypes (ACD&P)*					R-1 Program Element (Number/Name) PE 0603599N *I Frigate Development*							
COST ($ in Millions)	**Prior Years**	**FY 2015**	**FY 2016**	**FY 2017 Base**	**FY 2017 OCO**	**FY 2017 Total**	**FY 2018**	**FY 2019**	**FY 2020**	**FY 2021**	**Cost To Complete**	**Total Cost**
Total Program Element	0.000	0.000	30.000	84.900	-	84.900	62.800	71.400	33.500	37.700	Continuing	Continuing
3086: *Frigate*	0.000	0.000	30.000	84.900	-	84.900	62.800	71.400	33.500	37.700	Continuing	Continuing

Note

PE 0603599N was created per Congressional direction to establish a new budget line item.

A. Mission Description and Budget Item Justification

This Program Element (PE) provides funds for the design, development, issue resolution, certification, and testing of the Frigate (FF). The Frigate will be a multi-mission ship that will leverage the existing Littoral Combat Ship (LCS) designs, focusing on anti-surface warfare and anti-submarine warfare capabilities (SUW/ASW).

B. Program Change Summary ($ in Millions)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Previous President's Budget	0.000	0.000	0.000	-	0.000
Current President's Budget	0.000	30.000	84.900	-	84.900
Total Adjustments	0.000	30.000	84.900	-	84.900
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	30.000			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Program Adjustments	0.000	0.000	84.900	-	84.900

Change Summary Explanation

PE 0603599N was created in FY16 to establish the Frigate PE. $84.9M was transferred from PE 0603581N LCS PE to this PE.

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603599N / *Frigate Development*	Project (Number/Name) 3086 / *Frigate*	

COST ($ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
3086: *Frigate*	0.000	0.000	30.000	84.900	-	84.900	62.800	71.400	33.500	37.700	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

As directed by the Secretary of Defense (SECDEF), the Navy via the Small Surface Combatant Task Force (SSCTF) reviewed the capabilities of Littoral Combat Ship (LCS) and explored alternatives to provide a more lethal and survivable ship to meet future missions. The SSCTF recommendations served as the foundation for the revised requirements for the modified LCS (designated as the Frigate (FF)).

The RDT&E for the Frigate Program will leverage existing LCS processes and infrastructure to ensure the success of the Frigate and commonality with LCS. Frigate efforts comprise design and development efforts for a more lethal and survivable multi-mission warship focusing on both anti-surface warfare and anti-submarine warfare capabilities (SUW/ASW). Additionally, it includes design, development, issue resolution, certification and testing efforts required to support the design baseline for 11 Frigates (FY19-25).

The Frigate design and development phases include platform design and development, experimentation, combat system element integration, development of Technical Data Packages(TDPs), total ship system engineering and integration, combat systems and warfare systems certification, and planning and conduct of system testing. These efforts include procurement of combat and warfare system elements and/or simulators to support production representative testing in support of design, development, and certification efforts and ordnance in support of testing. Primary design modifications will include an over-the-horizon surface-to-surface missile system, upgraded air defense weapons and sensors, advanced electronic warfare system and improved decoys, and the ability to employ all elements of the SUW and ASW mission packages (horizon surface-to-surface missile system, 30mm guns, variable depth sonar, towed array and torpedo defense).

The RDT&E portion of Frigate funding is also composed of formal Developmental and Operational Assessment testing of the Frigates. Test and Evaluation (T&E) will concentrate on verifying integration and interoperability of employed technologies and systems in the Frigate designs to achieve the mission capabilities and performance requirements as defined in the Frigate program's baseline Capabilities Development Documents (CDD) (currently in the Navy approval phase). 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).

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Title: Test & Evaluation	0.000	0.200	4.000	0.000	4.000
Articles:	-	-	-	-	-
Description: Execute formal Frigate test planning in support of Developmental Testing and Operational Testing (DT/OT), including Live Fire Test and Evaluation (LFT&E), and procurement of T&E Ordnance. Plan for and execute DT and C4I integration, and test; aviation (manned and unmanned) integration.					

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603599N / *Frigate Development*	**Project (Number/Name)** 3086 / *Frigate*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
FY 2015 Accomplishments: N/A ***FY 2016 Plans:*** Conduct development Frigate program Test and Evaluation Master Plan (TEMP) updates from existing LCS TEMP. Conduct analysis of future Frigate testing approaches throughout the development cycle. ***FY 2017 Base Plans:*** Conduct development Frigate program Test and Evaluation Master Plan (TEMP) updates from existing LCS TEMP. Develop plan to support future updates required to support land-based SIM/STIM, modeling and test requirements for the Frigate platform. Continue analysis of future Frigate testing approaches throughout the development cycle. ***FY 2017 OCO Plans:*** N/A					
Title: Ship Systems / C4I / Warfare Systems Engineering	0.000	29.800	80.900	0.000	80.900
Articles:	-	-	-	-	-
Description: The Frigate will be a multi-mission ship that will leverage the existing Littoral Combat Ship (LCS) designs,and focusing on anti-surface warfare and anti-submarine warfare capabilities (SUW/ASW). The Frigate adds capability while maximizing the LCS investments made to date in the small surface combatant force. Modifications will include over-the-horizon surface-to-surface missile system, upgraded Air Defense weapons and sensors, advanced electronic warfare system and improved decoys, and all elements of the SUW and ASW mission packages (horizon surface-to-surface missile system, 30mm guns, variable depth sonar, towed array and torpedo defense). ***FY 2015 Accomplishments:*** N/A ***FY 2016 Plans:*** Conduct system engineering efforts to execute system requirements review (SRR) and prepare for future preliminary design review (PDR), including decomposing CDD requirements into system and warfare system element specifications, defining logical and physical interfaces, finalizing warfare system element selections, and conducting analyses to refine acquisition and contracting approaches for the FF systems. This includes analysis, engineering					

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603599N / *Frigate Development*	**Project (Number/Name)** 3086 / *Frigate*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
design work and testing for OTH missile system selection. Conduct ship preliminary design, naval architecture, machinery engineering, trade-off studies, and topside design analysis for both LCS ship variants to integrate warfare system, vulnerability, and recoverability improvements. Fund LCS shipbuilders and prime integrators to assess weight reduction initiatives and design feasibility of improved systems on LCS Class ships no later than FY19. ***FY 2017 Base Plans:*** Increase from FY16 to FY17 is to support development efforts detailed below to support procurement of the FF starting in FY19. Ship Systems Engineering Continue system engineering efforts related to naval architecture, machinery engineering and topside design analysis. Effort will be focused on enhancing data developed during the Preliminary Design (PD) period within the structures, mass properties, stability, materials, hydrodynamics and arrangements/habitability disciplines to develop a biddable Technical Data Package (TDP) in support of the FY17 Request for Proposal (RFP). Emphasis will be placed on the structural and stability disciplines, consisting of modeling, and incorporation of lethality and survivability enhancements to the LCS Flight 0+ design, to include the flow-down impacts to the supporting machinery and electrical systems. C4I / Warfare Systems Engineering Continue system engineering efforts related to C4I and warfare systems specifications. Transition preliminary design efforts to a biddable Technical Data Package (TDP) to inform planned FY2017 shipbuilding contract Request for Proposals (RFP). Continue OTH systems engineering and testing efforts for integration of OTH missile. Continue CMS development efforts to ensure full ship integration aligns with total ship design efforts. Finalize all SWaP data for C4I suites. Develop a test, integration and certification capability. Integrate other CS elements into total ship design. Implement additional cyber security/ information assurance (IA) measures on the warfare system and C4I suite to pace the current threat. ***FY 2017 OCO Plans:*** N/A					
Accomplishments/Planned Programs Subtotals	0.000	30.000	84.900	0.000	84.900

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603599N / *Frigate Development*	**Project (Number/Name)** 3086 / *Frigate*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
• SCN/2127: *Littoral Combat Ship*	1,584.094	1,414.265	1,211.625	-	1,211.625	669.275	906.182	773.697	1,416.067	0.000	16,768.719

Remarks

D. Acquisition Strategy

The current Acquisition Strategy for Frigate is to down select to one variant in FY19. The draft Acquisition Strategy document will be completed in FY16 to allow for a Request for Proposal (RFP) to be released late in FY17 to support Frigate procurement in FY19.

E. Performance Metrics

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). The LCS program conducts annual Defense Acquisition Board In-Process Reviews (DAB IPRs). The first Seaframe and Mission Module integrated program DAB IPR was conducted in January 2013 and is held in September thereafter.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603599N / *Frigate Development*	Project (Number/Name) 3086 / *Frigate*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Ship Design Modifications	C/CPAF	Lockheed Martin : Various	0.000	0.000		5.555	Nov 2015	16.777	Nov 2016	-		16.777	Continuing	Continuing	Continuing
Ship Design Modifications	C/CPAF	Austal : Mobile, AL	0.000	0.000		5.277	Nov 2015	12.835	Nov 2016	-		12.835	Continuing	Continuing	Continuing
Warfare Systems Development	WR	NSWC, DD : Dahlgren, VA	0.000	0.000		3.339	Nov 2015	11.729	Nov 2016	-		11.729	Continuing	Continuing	Continuing
C4I Development	WR	PEO C4I : San Diego, CA	0.000	0.000		0.850	Nov 2015	1.059	Nov 2016	-		1.059	Continuing	Continuing	Continuing
Aviation Integration Development	WR	NAWC, AD : Patuxent River, MD	0.000	0.000		0.350	Nov 2015	0.707	Nov 2016	-		0.707	Continuing	Continuing	Continuing
Warfare Systems Development	WR	NUWC, Newport : Newport, RI	0.000	0.000		0.062	Nov 2015	0.126	Nov 2016	-		0.126	Continuing	Continuing	Continuing
C4I Development	WR	SPAWAR : Charleston, SC	0.000	0.000		1.106	Nov 2015	1.589	Nov 2016	-		1.589	Continuing	Continuing	Continuing
C4I Development	WR	SPAWAR : San Diego, CA	0.000	0.000		0.390	Nov 2015	1.485	Nov 2016	-		1.485	Continuing	Continuing	Continuing
Common Combat Management System Development (CMS)	C/BA	Lockheed Martin : Various	0.000	0.000		2.360	Dec 2015	15.468	Dec 2016	-		15.468	Continuing	Continuing	Continuing
Radar Development	WR	NSWC, Crane : Crane, Indiana	0.000	0.000		0.000	Nov 2015	0.301	Nov 2016	-		0.301	Continuing	Continuing	Continuing
Over the Horizon (OTH) Missile Development	WR	NAWC, China Lake : China Lake, CA	0.000	0.000		0.450	Nov 2015	0.909	Nov 2016	-		0.909	Continuing	Continuing	Continuing
		Subtotal	0.000	0.000		19.739		62.985		-		62.985	-	-	-

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Government Engineering Support	WR	NSWC, CD : Carderock, MD	0.000	0.000		1.952	Nov 2015	5.423	Nov 2016	-		5.423	Continuing	Continuing	Continuing
Government Engineering Support	WR	NSWC, SSES : Philadelphia, PA	0.000	0.000		0.992	Nov 2015	2.964	Nov 2016	-		2.964	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603599N / *Frigate Development*	Project (Number/Name) 3086 / *Frigate*	

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Government Engineering Support	WR	NSWC, DD : Dahlgren, VA	0.000	0.000		0.040	Nov 2015	0.080	Nov 2016	-		0.080	Continuing	Continuing	Continuing
Government Engineering Support	WR	NSWC, Indian Head : Indian Head, MD	0.000	0.000		0.085	Nov 2015	0.171	Nov 2016	-		0.171	Continuing	Continuing	Continuing
Contractor Engineering Support	C/CPAF	Alion : Arlington, VA	0.000	0.000		1.771	Dec 2015	2.907	Dec 2016	-		2.907	Continuing	Continuing	Continuing
Contractor Engineering Support	C/CPAF	Booz Allen Hamilton : McLean, VA	0.000	0.000		0.727	Dec 2015	0.778	Dec 2016	-		0.778	0.000	1.505	-
		Subtotal	0.000	0.000		5.567		12.323		-		12.323	-	-	-

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Test & Evaluation	WR	NSWC, DD : Dahlgren, VA	0.000	0.000		0.200	Mar 2016	4.000	Nov 2016	-		4.000	Continuing	Continuing	Continuing
		Subtotal	0.000	0.000		0.200		4.000		-		4.000	-	-	-

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Support	C/CPAF	Alion : Arlington, VA	0.000	0.000		4.494	Dec 2015	5.592	Dec 2016	-		5.592	Continuing	Continuing	Continuing
		Subtotal	0.000	0.000		4.494		5.592		-		5.592	-	-	-

	Prior Years	FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	0.000		30.000		84.900		-		84.900	-	-	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603599N / *Frigate Development*	Project (Number/Name) 3086 / *Frigate*	

	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	Cost To Complete	Total Cost	Target Value of Contract

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603599N / *Frigate Development*	**Project (Number/Name)** 3086 / *Frigate*

Notional Frigate Program Schedule

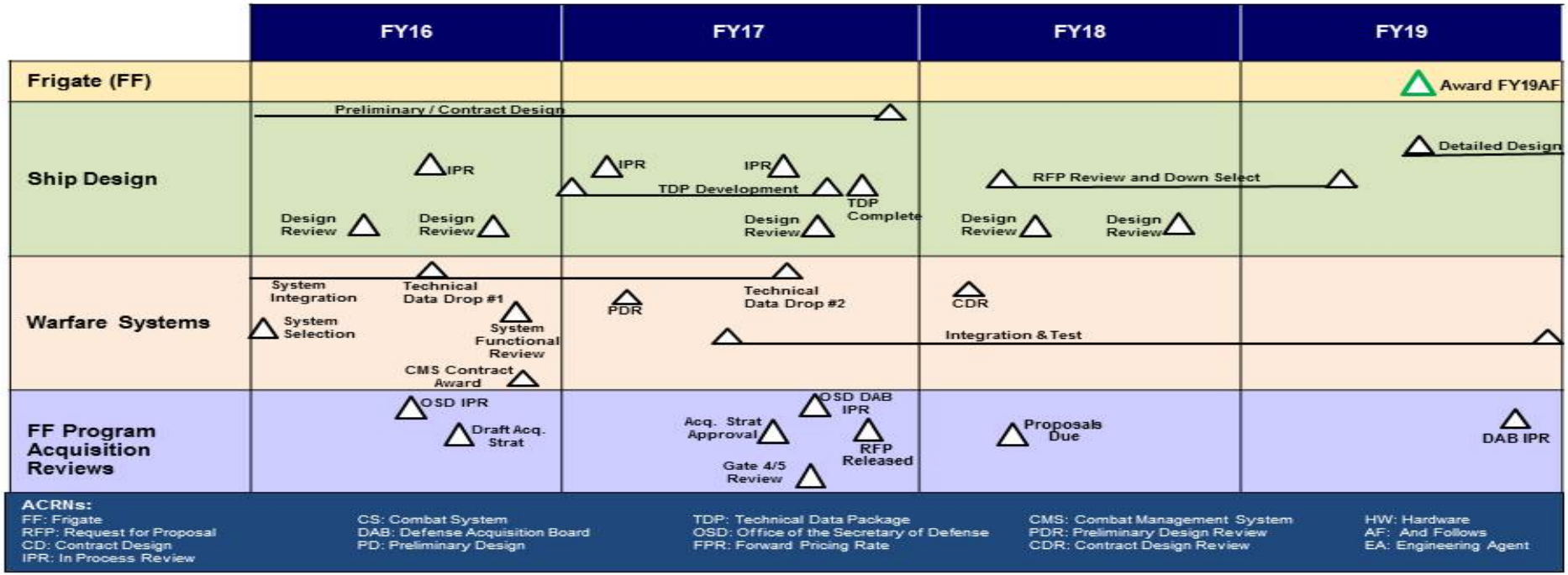

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Exhibit R-4A, RDT&E Schedule Details: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603599N / *Frigate Development*	**Project (Number/Name)** 3086 / *Frigate*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 3086				
Preliminary/ Contract Design	4	2015	4	2017
Warfare System Selection	1	2016	1	2016
Warfare Systems Integration	1	2016	3	2017
Technical Data Package Data Drop #1	3	2016	3	2016
Design Review #1	2	2016	2	2016
In Process Review #1	3	2016	3	2016
Draft Acquisition Strategy	3	2016	3	2016
Acquisition Strategy Approval	3	2017	3	2017
Design Review #2	4	2016	4	2016
In Process Review #2	1	2017	1	2017
Integration and Test	3	2017	4	2019
In Process Review #3	3	2017	3	2017
Design Review #3	3	2017	3	2017
Production RFP Released	4	2017	4	2017
Technical Data Package Data Drop #2	3	2017	3	2017
Design Review #4	2	2018	2	2018
Design Review #5	4	2018	4	2018
RFP Proposals Due	2	2018	2	2018
Detailed Design	3	2019	2	2021
RFP Review and Downselect	2	2018	2	2019

Exhibit R-2, RDT&E Budget Item Justification: PB 2017 Navy											Date: February 2016	
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 4: *Advanced Component Development & Prototypes (ACD&P)*					R-1 Program Element (Number/Name) PE 0603609N *I Conventional Munitions*							
COST ($ in Millions)	**Prior Years**	**FY 2015**	**FY 2016**	**FY 2017 Base**	**FY 2017 OCO**	**FY 2017 Total**	**FY 2018**	**FY 2019**	**FY 2020**	**FY 2021**	**Cost To Complete**	**Total Cost**
Total Program Element	215.134	7.603	7.678	8.342	-	8.342	8.938	8.550	8.742	8.930	Continuing	Continuing
0363: *Insensitive Munitions Adv. Development*	215.134	7.603	7.678	8.342	-	8.342	8.938	8.550	8.742	8.930	Continuing	Continuing

A. Mission Description and Budget Item Justification

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. The Insensitive Munitions Advanced Development (IMAD) 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. Insensitive Munitions (IM) 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.

B. Program Change Summary ($ in Millions)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Previous President's Budget	7.603	7.678	9.208	-	9.208
Current President's Budget	7.603	7.678	8.342	-	8.342
Total Adjustments	0.000	0.000	-0.866	-	-0.866
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Program Adjustments	0.000	0.000	-0.561	-	-0.561
• Rate/Misc Adjustments	0.000	0.000	-0.305	-	-0.305

Change Summary Explanation

Decrease in Conventional Munitions by $0.345M as required for the Department of the Navy to comply with the Bipartisan Budget Act of 2015.

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603609N / *Conventional Munitions*	Project (Number/Name) 0363 / *Insensitive Munitions Adv. Development*	

COST ($ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
0363: *Insensitive Munitions Adv. Development*	215.134	7.603	7.678	8.342	-	8.342	8.938	8.550	8.742	8.930	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

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 Program Executive Offices (PEO) are implementing IM in their priority munitions. IM are identified as a Department of Defense (DoD) critical technology requirement and considered as part of a weapon design. The 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 program managers (PM) 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 Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Title: Insensitive Munitions Adv. Development	7.603	7.678	8.342	0.000	8.342
Articles:	-	-	-	-	-
Description: Validate and assess weapon systems plan of action and milestones for IM compliance. Review Insensitive Munitions Strategic Plan (IMSP) for Navy compile and analyze weapon system, energetic 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 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 2015 Accomplishments: 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					

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603609N / *Conventional Munitions*	**Project (Number/Name)** 0363 / *Insensitive Munitions Adv. Development*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
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. Evaluate and demonstrate IM boost propellant formulation for future Tomahawk systems providing improved and comparable performance to in-service systems and better IM characteristics. Assess 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 cook-off and impact scenarios. Look at new ways to develop rocket propellant formulations that meet performance requirements and solve IM deficiencies. Resolve IM problems using top down approach. Evaluate ordnance and container concepts. 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. Review modeling to solve impact and cook-off with AUR pallet in support of a cooperative effort with AGS LRLAP. The technical focus is on new weapons and PIP. Evaluate and demonstrate MK54 ASROC VLA solid propellant rocket IM capabilities that meet performance. Demonstrate and qualify improved booster explosives and insensitive metalized propellants that are IM compliant for Tomahawk weapon systems. Evaluation of all issues and concerns related to heated RDX discoloration. Perform demonstration and qualification testing of AMRAAM and Sidewinder for joint insensitive munitions to improve response to combat and hazards. Evaluate and provide a modular ballistic shield for protection of Navy munitions. Assess characterization of MEMS in support of IM Navy qualifications. Demonstrate and qualify Insensitive Primer for large caliber gun propellant charges. IMAD works collaboratively with the JIMTP to transition JIMTP's S&T products to address PEO IM requirements. The PEOs IMSPs provide a comprehensive IM technology requirements list that helps to focus IM technology thrusts throughout DoD. FY 2015 supported additional efforts such as: the demonstration and qualification of IM improved booster explosive for GP Bombs; the demonstration and qualification of insensitive metalized propellants in IM compliant rocket motors for high performance systems such as Standard Missile and Tomahawk; and to perform process development of cook-off resistant TPE a potential replacement for all explosives. ***FY 2016 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. Evaluate and demonstrate IM boost propellant formulation for future Tomahawk systems					

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603609N / *Conventional Munitions*	**Project (Number/Name)** 0363 / *Insensitive Munitions Adv. Development*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
providing improved and comparable performance to in-service systems and better IM characteristics. Assess 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 cook-off and impact scenarios. Look at new ways to develop rocket propellant formulations that meet performance requirements and solve IM deficiencies. Resolve IM problems using top down approach. Evaluate ordnance and container concepts. 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. Review modeling to solve impact and cook-off with AUR pallet in support of a cooperative effort with AGS LRLAP. The technical focus is on new weapons and PIP. Evaluate and demonstrate MK54 ASROC VLA solid propellant rocket IM capabilities that meet performance. Demonstrate and qualify improved booster explosives and insensitive metalized propellants that are IM compliant for Tomahawk weapon systems. Evaluation of all issues and concerns related to heated RDX discoloration. Perform demonstration and qualification testing of AMRAAM and Sidewinder for joint insensitive munitions to improve response to combat and hazards. Evaluate and provide a modular ballistic shield for protection of Navy munitions. Assess characterization of MEMS in support of IM Navy qualifications. Demonstrate and qualify Insensitive Primer for large caliber gun propellant charges. IMAD works collaboratively with the JIMTP to transition JIMTP's S&T products to address PEO IM requirements. The PEOs IMSPs provide a comprehensive IM technology requirements list that helps to focus IM technology thrusts throughout DoD. In FY16 program will continue to support the demonstration and qualification of IM improved booster explosive for GP Bombs; the demonstration and qualification of insensitive metalized propellants in IM compliant rocket motors for high performance systems such as Standard Missile and Tomahawk; and to perform process development of cook-off resistant TPE a potential replacement for all explosives. And were feasible start Evaluation and demonstration of an improved Solid propellant for IM compliant Mk-135 rocket motor, Container secondary cook-off mitigation evaluation, Evaluation and demonstration of a Reduced scale fragment impact test for gun propellants, Evaluation and demonstration of Improvement of Sympathetic Reaction Modeling for the MK 54 Lightweight torpedo, Enhanced blast explosive qualification, Next generation Area attack weapon fragment impact evaluation, and demonstration of primer technologies for Navy gun propulsion systems. ***FY 2017 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					

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603609N / *Conventional Munitions*	**Project (Number/Name)** 0363 / *Insensitive Munitions Adv. Development*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
multi-mission, high performance rocket motor. Evaluate options for minimum smoke propellants for shoulder launched applications. Evaluate and demonstrate IM boost propellant formulation for future Tomahawk systems providing improved and comparable performance to in-service systems and better IM characteristics. Assess 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 cook-off and impact scenarios. Look at new ways to develop rocket propellant formulations that meet performance requirements and solve IM deficiencies. Resolve IM problems using top down approach. Evaluate ordnance and container concepts. 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. Review modeling to solve impact and cook-off with AUR pallet in support of a cooperative effort with AGS LRLAP. The technical focus is on new weapons and PIP. Evaluate and demonstrate MK54 ASROC VLA solid propellant rocket IM capabilities that meet performance. Demonstrate and qualify improved booster explosives and insensitive metalized propellants that are IM compliant for Tomahawk weapon systems. Evaluation of all issues and concerns related to heated RDX discoloration. Perform demonstration and qualification testing of AMRAAM and Sidewinder for joint insensitive munitions to improve response to combat and hazards. Evaluate and provide a modular ballistic shield for protection of Navy munitions. Assess characterization of MEMS in support of IM Navy qualifications. Demonstrate and qualify Insensitive Primer for large caliber gun propellant charges. IMAD works collaboratively with the JIMTP to transition JIMTP's S&T products to address PEO IM requirements. The PEOs IMSPs provide a comprehensive IM technology requirements list that helps to focus IM technology thrusts throughout DoD. FY 2017 will continue to support additional efforts such as Evaluation and demonstration of an improved Solid propellant for IM compliant Mk-135 rocket motor, Container secondary cook-off mitigation evaluation, Evaluation and demonstration of a Reduced scale fragment impact test for gun propellants, Evaluation and demonstration of Improvement of Sympathetic Reaction Modeling for the MK 54 Lightweight torpedo, Enhanced blast explosive qualification, Next generation Area attack weapon fragment impact evaluation, and demonstration of primer technologies for Navy gun propulsion systems. ***FY 2017 OCO Plans:*** N/A					
Accomplishments/Planned Programs Subtotals	7.603	7.678	8.342	0.000	8.342

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603609N / *Conventional Munitions*	**Project (Number/Name)** 0363 / *Insensitive Munitions Adv. Development*

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

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 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603609N / *Conventional Munitions*	**Project (Number/Name)** 0363 / *Insensitive Munitions Adv. Development*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
PROPULSION DEV. AND EVAL.	WR	NAWC DIV/CHINA LAKE : WX	94.855	2.350	Nov 2014	2.447	Nov 2015	3.100	Nov 2016	-		3.100	Continuing	Continuing	Continuing
EXPLOSIVES DEV. AND EVAL.	WR	NSWC/INDIAN HEAD DIV. : WX	80.639	1.884	Nov 2014	1.843	Nov 2015	2.016	Nov 2016	-		2.016	Continuing	Continuing	Continuing
ORDNANCE DEV. AND EVAL.	WR	NSWC/DAHLGREN : WX	24.147	1.213	Nov 2014	0.992	Nov 2015	1.097	Nov 2016	-		1.097	Continuing	Continuing	Continuing
GUN PROPULSION AND EVAL.	WR	NSWC/INDIAN HEAD DIV. : WX	6.780	1.309	Nov 2014	1.442	Nov 2015	1.176	Nov 2016	-		1.176	Continuing	Continuing	Continuing
		Subtotal	206.421	6.756		6.724		7.389		-		7.389	-	-	-

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
PROGRAM MANAGEMENT SUPT	WR	NOSSA : IN HEAD MD	5.809	0.157	Nov 2014	0.159	Nov 2015	0.175	Nov 2016	-		0.175	Continuing	Continuing	Continuing
PROGRAM MANAGEMENT SUPPORT	MIPR	DTIC : FT BELVOIR VA	2.904	0.690	Nov 2014	0.795	Nov 2015	0.778	Nov 2016	-		0.778	Continuing	Continuing	Continuing
		Subtotal	8.713	0.847		0.954		0.953		-		0.953	-	-	-

	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	215.134	7.603		7.678		8.342		-		8.342	-	-	-

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603609N / *Conventional Munitions*	**Project (Number/Name)** 0363 / *Insensitive Munitions Adv. Development*

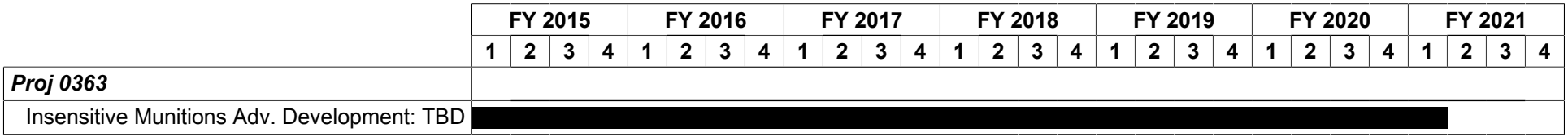

Exhibit R-4A, RDT&E Schedule Details: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603609N / *Conventional Munitions*	**Project (Number/Name)** 0363 / *Insensitive Munitions Adv. Development*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 0363				
Insensitive Munitions Adv. Development: TBD	1	2015	1	2021

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Exhibit R-2, RDT&E Budget Item Justification: PB 2017 Navy											Date: February 2016	
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 4: *Advanced Component Development & Prototypes (ACD&P)*					R-1 Program Element (Number/Name) PE 0603611M *I Marine Corps Assault Vehicles*							
COST ($ in Millions)	**Prior Years**	**FY 2015**	**FY 2016**	**FY 2017 Base**	**FY 2017 OCO**	**FY 2017 Total**	**FY 2018**	**FY 2019**	**FY 2020**	**FY 2021**	**Cost To Complete**	**Total Cost**
Total Program Element	130.138	101.175	212.173	158.682	-	158.682	177.520	78.166	32.216	59.509	Continuing	Continuing
0025: *New Amphibious Vehicle*	130.138	101.175	212.173	158.682	-	158.682	177.520	78.166	32.216	59.509	Continuing	Continuing

Program MDAP/MAIS Code:
Project MDAP/MAIS Code(s): 472

Note

ACV Increment 1.1 leverages and continues the work that was previously accomplished under the Marine Personnel Carrier (MPC) program, funded in PE 0206623M; Project 9C85.

A. Mission Description and Budget Item Justification

The New Amphibious Vehicle is an armored personnel carrier, balanced in performance, protection, and payload for employment within the Ground Combat Element (GCE) and throughout the range of military operations, to include a swim capability.

B. Program Change Summary ($ in Millions)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Previous President's Budget	105.749	219.082	160.691	-	160.691
Current President's Budget	101.175	212.173	158.682	-	158.682
Total Adjustments	-4.574	-6.909	-2.009	-	-2.009
• Congressional General Reductions	-	-0.009			
• Congressional Directed Reductions	-	-6.900			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-1.020	0.000			
• SBIR/STTR Transfer	-3.555	0.000			
• Rate/Misc Adjustments	0.001	0.000	-2.009	-	-2.009

Change Summary Explanation

The decrease in funding from FY16 to FY17 ($53.491M) is attributed to the shift from design, EMD vehicle build, and test planning activities to test and evaluation activities.

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603611M / *Marine Corps Assault Vehicles*	Project (Number/Name) 0025 / *New Amphibious Vehicle*	

COST ($ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
0025: *New Amphibious Vehicle*	130.138	101.175	212.173	158.682	-	158.682	177.520	78.166	32.216	59.509	Continuing	Continuing
Quantity of RDT&E Articles		-	32	-	-	-	4	-	-	-		

Project MDAP/MAIS Code: 472

A. Mission Description and Budget Item Justification

The New Amphibious Vehicle is an armored personnel carrier, balanced in performance, protection, and payload for employment within the Ground Combat Element (GCE) and throughout the range of military operations, to include a swim capability. FY16 and FY17 funds will support Amphibious Combat Vehicle (ACV) Increment 1.1 Engineering, Manufacturing and Development (EMD) contracts, Test & Evaluation (T&E) activities and associated program support.

The decrease in funding from FY16 to FY17 ($53.491M) is attributed to the shift from design, EMD vehicle build, and test planning activities to test and evaluation activities.

Note: ACV Increment 1.1 leverages and continues the work previously accomplished under the Marine Personnel Carrier (MPC) program, funded in PE 0206623M; Project 9C85.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Title: Product Development	93.986	184.039	109.536	0.000	109.536
Articles:	-	32	-	-	-
Description: System design and development; EMD test vehicle tooling and manufacturing; prime contractor Developmental and Operational test, and Logistics Management Information (LMI) data development.					
FY 2015 Accomplishments: - Continued plans, in accordance with approved Acquisition Strategy, to competitively award two EMD contracts, combined with FY16 funds, in 1Q FY16 for the manufacturing of 16 EMD test vehicles each (32 total). - Completed acquisition of Remote Weapon Stations (RWS) and Communication Suites as Government Furnished Property (GFP) for integration into the EMD test vehicles.					
FY 2016 Plans: - Complete award of EMD contracts to two vendors to build 16 test vehicles each (32 total).					
FY 2017 Base Plans: - Complete EMD manufacturing and receive 32 test vehicle deliveries.					

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603611M / *Marine Corps Assault Vehicles*	**Project (Number/Name)** 0025 / *New Amphibious Vehicle*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
- Initiate contractor developmental test (DT) activities. - Initiate corrective action modifications that result from Reliability Growth Testing. ***FY 2017 OCO Plans:*** N/A					
Title: Management Services	2.513	10.251	7.033	0.000	7.033
Articles:	-	-	-	-	-
Description: Contract Advisory and Assistance Services (Engineering and Technical Support, Management Support Services, and Studies and Analyses). ***FY 2015 Accomplishments:*** - Completed engineering, technical, and management services supporting ACV Request for Proposal (RFP) development and release. - Completed evaluation of technology development efforts and other studies to advance high water speed capability. - Initiated analyses to validate ship to shore connector requirement for the Amphibious Combat Vehicle. ***FY 2016 Plans:*** - Continue business, acquisition, logistics, and engineering related activities for ACV 1.1 document development, program analysis, acquisition logistics management, and financial management support. - Initiate engineering and technical services in support of RWS marinization, logistical, maintenance support, and integration. - Initiate Depot Source of Repair (DSOR) Analyses on secondary repairable items. - Initiate product support Business Case Analysis (PS BCA) on concepts for the ACV 1.1. Conduct facilities impact assessment at ACV 1.1 fielding locations. - Initiate analyses of product support elements to support Maintenance Plan development, Support and Test Equipment, Calibration, and other logistics elements. ***FY 2017 Base Plans:*** - Continue business, acquisition, logistics, and engineering related activities for ACV 1.1 document development, program analysis, acquisition logistics management, and financial management support. - Continue engineering and technical services in support of RWS marinization, logistical, maintenance support, and integration. - Continue force protection modeling and simulation activities.					

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603611M / *Marine Corps Assault Vehicles*	**Project (Number/Name)** 0025 / *New Amphibious Vehicle*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
- Continue Depot Source of Repair (DSOR) Analyses on secondary repairable items, and product support Business Case Analysis on concepts for the ACV 1.1. - Continue facilities impact assessment at ACV 1.1 fielding locations, and continue analyses of product support elements to support Maintenance Plan development, Support and Test Equipment, Calibration, and other logistics elements. - Conduct Manufacturing Readiness Assessment. ***FY 2017 OCO Plans:*** N/A					
Title: Test & Evaluation ***Articles:*** ***Description:*** Government developmental, operational, and live fire test and evaluation activities. ***FY 2015 Accomplishments:*** N/A ***FY 2016 Plans:*** - Initiate Developmental, Operational, and Live Fire Test and Evaluation (LFT&E) planning events to support development of detailed test strategies. ***FY 2017 Base Plans:*** - Initiate formation of the Operational Test (OT) team and begin initial development of the OT detailed test plan. - Initiate training for personnel to support execution of DT, OT, and LFT&E events. - Conduct development test for two vendors on 32 EMD vehicles and begin Operational Assessment (OA). - Conduct DT activities such as: Land Mobility, Safety/Human Factors, Lethality, Water Mobility, Communication, and Survivability ***FY 2017 OCO Plans:*** N/A	0.000 -	2.923 -	32.170 -	0.000 -	32.170 -
Title: Program Support ***Articles:*** ***Description:*** Government labor, material, and travel for integrated logistics support, technical publications, support equipment development, in-house technical support, and program management support.	4.676 -	14.960 -	9.943 -	0.000 -	9.943 -

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603611M / *Marine Corps Assault Vehicles*	**Project (Number/Name)** 0025 / *New Amphibious Vehicle*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
FY 2015 Accomplishments: - Continued Digital Integration Facility (DIF) Architecture support - Completed evaluation and testing of Aft Lifting Body concept and high water speed technology development. - Initiated procurement of ACV 1.1 Government Furnished Property (GFP) for EMD vehicles. ***FY 2016 Plans:*** - Continue DIF Architecture support - Initiate engineering support for GFP issues documented during technical information and review meetings; generate products, acquire equipment and software to implement Vehicle Integration for C4ISR/EW Interoperability (VICTORY) initiative compliance process for ACV 1.1. - Initiate hydrodynamic model testing; Reliability, Availability, and Maintainability (RAM-D), and human systems integration activities for ACV 1.1. - Initiate inventory, checkout, kitting, shipment, and trouble shooting ACV 1.1 GFP. ***FY 2017 Base Plans:*** - Continue engineering support for communication suite issues documented during technical information and review meetings. - Continue hydrodynamic model testing; Reliability, Availability, and Maintainability (RAM-D), and human systems integration activities for ACV 1.1. - Continue technical support for training packages for ACV 1.1 - Continue procurement, inventory, checkout, kitting, shipment, and troubleshooting of ACV 1.1 communications suite GFP for Low Rate Initial Production (LRIP) test vehicles. - Continue DIF Architecture support ***FY 2017 OCO Plans:*** N/A					
Accomplishments/Planned Programs Subtotals	101.175	212.173	158.682	0.000	158.682

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
• 2025: *Amphibious Combat Vehicle*	0.000	0.000	0.000	-	0.000	166.652	183.136	193.053	630.483	0.000	1,173.324

Remarks

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603611M / *Marine Corps Assault Vehicles*	**Project (Number/Name)** 0025 / *New Amphibious Vehicle*

D. Acquisition Strategy

The Acquisition Strategy awards two competitive Engineering, Manufacturing and Development (EMD) contracts to two vendors to build 16 test vehicles each (32 total). The ACV Increment 1.1 enters the acquisition cycle at Milestone B in FY16 which leads to a down select to one vendor. In FY18 the program will enter into Low Rate Initial Production (LRIP).

E. Performance Metrics

Milestone Reviews
Milestone B: 1QFY16

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603611M / *Marine Corps Assault Vehicles*	Project (Number/Name) 0025 / *New Amphibious Vehicle*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
System Design & Development	C/FPIF	Various : Various	71.446	80.869	Nov 2015	183.311	Nov 2015	106.799	Jan 2017	-		106.799	Continuing	Continuing	Continuing
Other Product Development	C/FFP	SPAWAR/ NEW JERSEY : Charleston/Picatinny	0.000	13.117	Jul 2015	0.728	Jul 2016	2.737	Jan 2017	-		2.737	Continuing	Continuing	Continuing
Prior Years Cumulative Funding	Various	Various : Various	18.506	0.000		0.000		0.000		-		0.000	0.000	18.506	-
		Subtotal	89.952	93.986		184.039		109.536		-		109.536	-	-	-

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Test and Evaluation - EMD Detailed Planning	WR	AVTB : Camp Pendleton, CA	1.069	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Propulsion System Demonstrator	WR	NSWC Carderock - SSES Philly : Philadelphia, PA	1.193	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Integrated Logistics Support	WR	NSWC - Dahlgren : Dahlgren, VA	0.279	0.119	Apr 2015	0.350	Apr 2016	0.425	Apr 2017	-		0.425	Continuing	Continuing	Continuing
Technical Data & Pubs Development	WR	NSWC Carderock : Philadelphia, PA	0.000	0.000		0.100	Sep 2016	0.100	Sep 2017	-		0.100	Continuing	Continuing	Continuing
In-House Technical Support	WR	SPAWAR Charleston : SPAWAR Charleston	6.685	4.446	Apr 2015	14.410	Apr 2016	9.308	Apr 2017	-		9.308	Continuing	Continuing	Continuing
Program Management Support	WR	Various : Various	0.004	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Travel	Various	Various : Various	0.515	0.111	Jan 2015	0.100	Sep 2016	0.110	Sep 2017	-		0.110	Continuing	Continuing	Continuing
		Subtotal	9.745	4.676		14.960		9.943		-		9.943	-	-	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603611M / *Marine Corps Assault Vehicles*	Project (Number/Name) 0025 / *New Amphibious Vehicle*	

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation	WR	Various : Various	2.071	0.000		0.647	Jan 2016	18.074	Jan 2017	-		18.074	Continuing	Continuing	Continuing
Operational Test Evaluation (OT&E)	WR	MCOTEA : Quantico, Va	0.000	0.000		2.193	Jan 2016	7.510	Jan 2017	-		7.510	Continuing	Continuing	Continuing
Live Fire Test & Evaluation (LFT&E)	WR	Various : Various	0.000	0.000		0.083	Jan 2016	6.586	Jan 2017	-		6.586	Continuing	Continuing	Continuing
		Subtotal	2.071	0.000		2.923		32.170		-		32.170	-	-	-

Remarks

* The FY 2017 award date for cost categories with various activities is the actual obligation date for the last award in the category.

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Engineering and Technical Services	C/FFP	Various : Various	12.156	2.380	Jan 2015	1.600	Jul 2016	1.945	Jul 2017	-		1.945	Continuing	Continuing	Continuing
Management Support Services	C/FFP	DDG : Stafford VA	9.899	0.133	Jan 2015	8.501	Apr 2016	4.788	Jul 2017	-		4.788	Continuing	Continuing	Continuing
Studies and Analyses	C/FFP	Various : Various	6.315	0.000		0.150	Apr 2016	0.300	Jul 2017	-		0.300	Continuing	Continuing	Continuing
		Subtotal	28.370	2.513		10.251		7.033		-		7.033	-	-	-

	Prior Years	FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	130.138	101.175		212.173		158.682		-		158.682	-	-	-

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603611M / *Marine Corps Assault Vehicles*	**Project (Number/Name)** 0025 / *New Amphibious Vehicle*

ACV 1.1 Schedule

As of 6 July 15

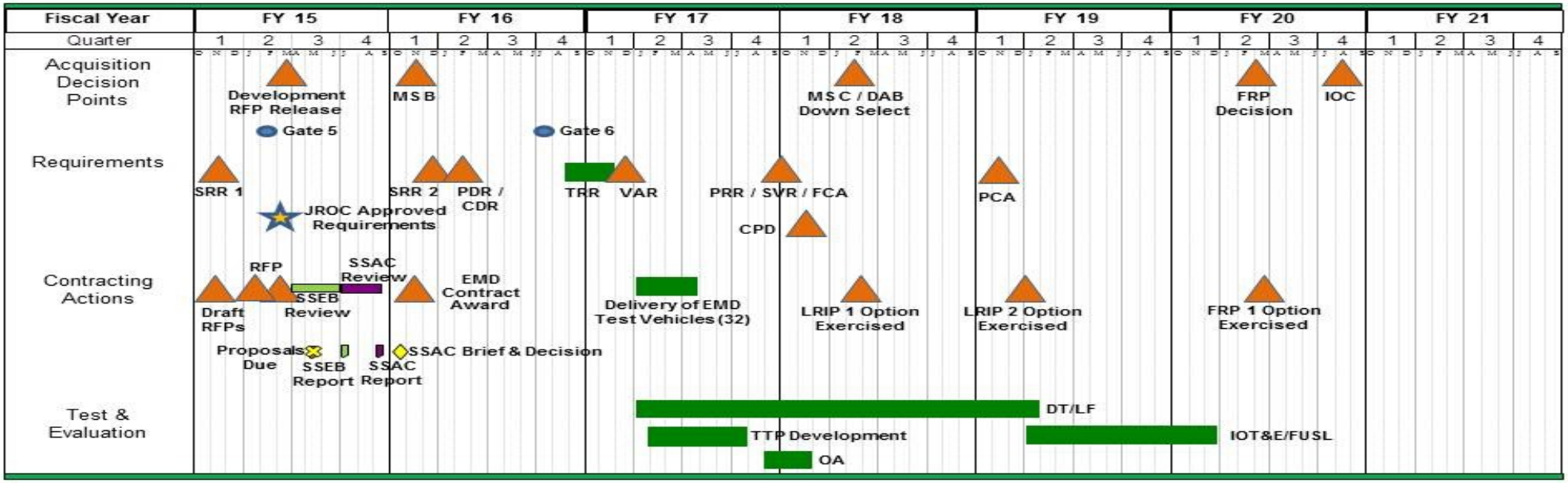

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Exhibit R-4A, RDT&E Schedule Details: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603611M / *Marine Corps Assault Vehicles*	**Project (Number/Name)** 0025 / *New Amphibious Vehicle*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 0025				
Draft Request for Proposal (RFP) 1	1	2015	1	2015
Draft Request for Proposal (RFP) 2	1	2015	1	2015
System Readiness Review 1	1	2015	1	2015
Draft Request for Proposal (RFP) 3	2	2015	2	2015
JROC Approved Requirements	2	2015	2	2015
Development RFP Release	2	2015	2	2015
MS B	1	2016	1	2016
EMD Contract Award	1	2016	1	2016
System Readiness Review 2	1	2016	1	2016
Preliminary Design Review/Critical Design Review	2	2016	2	2016
EMD Vehicle Delivery (32 Vehicles)	2	2017	3	2017
Vehicle Acceptance Review	1	2017	1	2017
Development Test/Live Fire Test	2	2017	2	2019
TTP Development	2	2017	4	2017
Operational Assessment (OA)	4	2017	1	2018
PRR/System Verification Review (SVR)	1	2018	1	2018
Capabilities Production Document (CPD)	1	2018	1	2018
MS C/DAB Down Select	2	2018	2	2018
LRIP Option 1 Exercised	2	2018	2	2018
PCA	1	2019	1	2019
Initial Operational Test & Evaluation (IOT&E)/Full Up System Level (FUSL)	2	2019	1	2020

Exhibit R-4A, RDT&E Schedule Details: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603611M / *Marine Corps Assault Vehicles*	**Project (Number/Name)** 0025 / *New Amphibious Vehicle*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
LRIP Option 2 Exercised	2	2019	2	2019
FRP Decision	2	2020	2	2020
FRP Option Exercised	2	2020	2	2020
IOC	4	2020	4	2020

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Exhibit R-2, RDT&E Budget Item Justification: PB 2017 Navy											Date: February 2016	
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 4: *Advanced Component Development & Prototypes (ACD&P)*					R-1 Program Element (Number/Name) PE 0603635M *I Marine Corps Grnd Cmbt/Supt Sys*							
COST ($ in Millions)	**Prior Years**	**FY 2015**	**FY 2016**	**FY 2017 Base**	**FY 2017 OCO**	**FY 2017 Total**	**FY 2018**	**FY 2019**	**FY 2020**	**FY 2021**	**Cost To Complete**	**Total Cost**
Total Program Element	32.464	1.242	0.378	1.303	-	1.303	1.422	1.341	1.365	1.395	Continuing	Continuing
1964: *Anti-Armor Weapon System*	2.982	0.930	0.378	0.886	-	0.886	1.022	0.974	0.991	1.014	Continuing	Continuing
2614: *SMAW Follow-On*	29.482	0.312	0.000	0.417	-	0.417	0.400	0.367	0.374	0.381	Continuing	Continuing

Note

The Joint Light Tactical Vehicle (JLTV) program, Project number 3209 transitioned to BA 04 PE 0605812M beginning in FY 2013.

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 tests related to specific ground weapon systems.

B. Program Change Summary ($ in Millions)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Previous President's Budget	1.342	0.623	1.444	-	1.444
Current President's Budget	1.242	0.378	1.303	-	1.303
Total Adjustments	-0.100	-0.245	-0.141	-	-0.141
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-0.245			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-0.100	0.000			
• SBIR/STTR Transfer	-0.001	0.000			
• Rate/Misc Adjustments	0.001	0.000	-0.141	-	-0.141

Change Summary Explanation

The increase in funding for Anti-Armor Weapon System (Project 1964) from FY16 to FY17 ($508K) is due to efforts to improve the Saber power system and the Global Positioning System (GPS).

The increase in funding for SMAW Follow-On (Project 2614) from FY16 to FY17 ($417K) is in support of qualification and testing of the densified propellant.

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603635M / *Marine Corps Grnd Cmbt/ Supt Sys*	Project (Number/Name) 1964 / *Anti-Armor Weapon System*	

COST ($ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
1964: *Anti-Armor Weapon System*	2.982	0.930	0.378	0.886	-	0.886	1.022	0.974	0.991	1.014	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The M41A4 Saber system is the primary heavy, anti-armor launch system for the TOW Missile within the Ground Combat Element of the Marine Corps. The Anti-Armor Weapons System-Heavy (AAWS-H) program, working in concert with the U.S. Army, will develop and integrate technology improvements into the Improved Target Acquisition System (ITAS) to meet Increment II system requirements as jointly agreed. Improvements centered on integration of sight image enhancements were concluded in FY13. Other efforts have focused on providing engineering and technical support such as the study of densified propellant and battery replacement for the Saber system (far-target location accuracy improvements). Laser designation capability has been postponed due to prioritization.

The increase in funding from FY16 to FY17 ($0.508M) is due to efforts to improve the Saber power system and the Global Positioning System (GPS) of the Saber system.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Title: Densified Propellant	0.199	0.000	0.000	0.000	0.000
Articles:	-	-	-	-	-
FY 2015 Accomplishments: -Completed the qualification of densified propellant.					
FY 2016 Plans: N/A					
FY 2017 Base Plans: N/A					
FY 2017 OCO Plans: N/A					
Title: Saber Battery Replacement	0.731	0.378	0.636	0.000	0.636
Articles:	-	-	-	-	-
FY 2015 Accomplishments:					

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603635M / *Marine Corps Grnd Cmbt/ Supt Sys*	**Project (Number/Name)** 1964 / *Anti-Armor Weapon System*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
-Continued research of a replacement battery for Saber to address safety concerns, while maintaining the same or increased capabilities for power and longevity. Previous research resulted in a technical data package. -Initiated testing of replacement battery. ***FY 2016 Plans:*** -Continue research of a replacement battery for Saber to address safety concerns, while maintaining the same or increased capabilities for power and longevity. -Continue testing of replacement battery. ***FY 2017 Base Plans:*** -Complete research of a replacement battery for Saber to address safety concerns, while maintaining the same or increased capabilities for power and longevity. -Complete testing of replacement battery. ***FY 2017 OCO Plans:*** N/A					
Title: Global Positioning System (GPS) Improvement ***Articles:***	0.000 -	0.000 -	0.250 -	0.000 -	0.250 -
FY 2015 Accomplishments: N/A ***FY 2016 Plans:*** N/A ***FY 2017 Base Plans:*** -Initiate research for improvements to future GPS for the Saber system. ***FY 2017 OCO Plans:*** N/A					
Accomplishments/Planned Programs Subtotals	0.930	0.378	0.886	0.000	0.886

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603635M / *Marine Corps Grnd Cmbt/ Supt Sys*	**Project (Number/Name)** 1964 / *Anti-Armor Weapon System*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
• PMC/3017: *Anti-Armor Weapon Systems-Heavy*	1.506	0.668	17.080	-	17.080	21.483	21.957	5.926	6.049	Continuing	Continuing

Remarks

D. Acquisition Strategy

The Saber system is a joint program with the U.S. Army. FY15-FY17 funding supports the development, integration, and qualification of incremental improvements to meet objective requirements and assesses emergent technologies.

E. Performance Metrics

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603635M / *Marine Corps Grnd Cmbt/ Supt Sys*	Project (Number/Name) 1964 / *Anti-Armor Weapon System*	

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Anti Armor	WR	NSWC Indian Head : Indian Head, MD	2.423	0.199	Oct 2014	0.000		0.000		-		0.000	0.000	2.622	-
Anti Armor	WR	NSWC Crane : Crane, IN	0.385	0.731	Oct 2014	0.196	Jan 2016	0.636	Oct 2016	-		0.636	0.000	1.948	-
Anti Armor	WR	NSWC Carderock : Bethesda, MD	0.000	0.000		0.182	Feb 2016	0.000		-		0.000	0.000	0.182	-
Anti Armor	WR	Yuma Test Ground : Yuma, AZ	0.174	0.000		0.000		0.000		-		0.000	0.000	0.174	-
Anti Armor	TBD	CCWS Redstone Arsenal : Huntsville, AL	0.000	0.000		0.000		0.250	Apr 2017	-		0.250	Continuing	Continuing	Continuing
		Subtotal	2.982	0.930		0.378		0.886		-		0.886	-	-	-

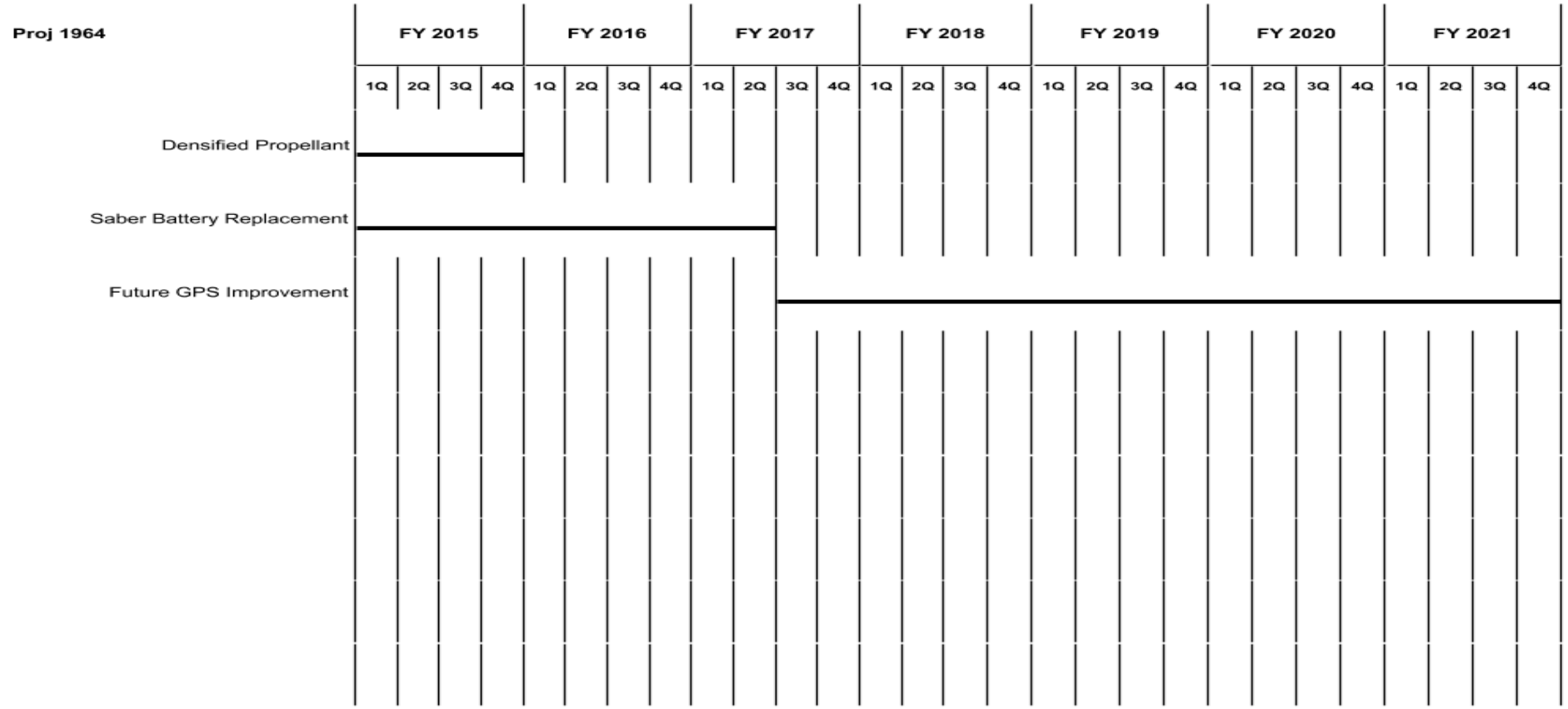
Remarks

The increase in funding from FY16 to FY17 supports testing of the replacement battery.

	Prior Years	FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	2.982	0.930		0.378		0.886		-		0.886	-	-	-

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603635M / *Marine Corps Grnd Cmbt/ Supt Sys*	**Project (Number/Name)** 1964 / *Anti-Armor Weapon System*



2017PB - 0603635M - 1964

Exhibit R-4A, RDT&E Schedule Details: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603635M / *Marine Corps Grnd Cmbt/ Supt Sys*	**Project (Number/Name)** 1964 / *Anti-Armor Weapon System*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 1964				
Densified Propellant: Densified Propellant	1	2015	4	2015
Saber Battery Replacement: Saber Battery Replacement	1	2015	2	2017
GPS Improvement: Future GPS Improvement	3	2017	4	2021

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603635M / *Marine Corps Grnd Cmbt/ Supt Sys*	Project (Number/Name) 2614 / *SMAW Follow-On*	

COST ($ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
2614: *SMAW Follow-On*	29.482	0.312	0.000	0.417	-	0.417	0.400	0.367	0.374	0.381	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The solution to the Follow on to SMAW (FOTS) capability requirement has been defined as the SMAW MOD 2 system. It is a lightweight, short range, fire-and-forget assault weapon comprised of a launcher and integral sighting system that enables a Marine to neutralize a variety of ground targets. Marine Expeditionary Forces will employ the SMAW MOD 2 across the spectrum of conflict, under all environmental conditions, to destroy a variety of ground targets. As defined in the FOTS Capability Production Document (CPD), the program consists of requirements for a new Launcher and integrated laser range finder and thermal sight. The Launcher will be physically and functionally compatible with existing inventory of SMAW rocket variants [High Explosive Dual Purpose, Anti-Armor, Novel Explosive and Common Practice (CP)] and will replace the existing Mark 153 Mod 0 SMAW launcher. R&D supports the work being performed to develop new propellant technologies for an enhanced rocket motor as well as development of the SMAW Mod 2 replacement millijoule meter and next generation firing mechanism.

Due to change in acquisition strategy, full rate production of SMAW Mod 2 is now scheduled to begin in FY17.

The increase in funding for SMAW Follow-On (Project 2614) from FY16 to FY17 ($417K) is in support of qualification and testing of the densified propellant.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Title: Engineer and technical support.	0.312	0.000	0.417	0.000	0.417
Articles:	-	-	-	-	-
FY 2015 Accomplishments: -Continued engineering support for the development and testing of the Densified Propellant.					
FY 2016 Plans: N/A					
FY 2017 Base Plans: -Continue engineering support for the development and testing of the Densified Propellant. -Initiate qualification of Densified Propellant in accordance with Technology Transition Agreement (TTA) . -Initiate and complete qualification of current millijoule meter. -Initiate development of replacement millijoule meter. -Initiate development of next generation firing mechanism.					
FY 2017 OCO Plans:					

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603635M / *Marine Corps Grnd Cmbt/ Supt Sys*	**Project (Number/Name)** 2614 / *SMAW Follow-On*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
N/A					
Accomplishments/Planned Programs Subtotals	0.312	0.000	0.417	0.000	0.417

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
• PMC/3016: *Follow on to SMAW*	4.818	0.000	24.666	-	24.666	25.058	0.000	0.000	0.000	Continuing	Continuing

Remarks

D. Acquisition Strategy

FY15-FY17 strategy is to complete development and qualification of upgraded components to the SMAW MOD 2 system.

The Office of Naval Research is funding densified propellant under a Technology Transition Agreement (TTA) through FY18. The PMO will begin programmatic documentation and planning to support transition for final design and qualification of densified propellant in FY17 if TTA technology readiness level 7 is achieved per Memorandum of Agreement (MOA).

E. Performance Metrics

Milestone reviews and technical reviews.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603635M / *Marine Corps Grnd Cmbt/ Supt Sys*	Project (Number/Name) 2614 / *SMAW Follow-On*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Prior Year Cumulative Funding	Various	Various : Various	1.748	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
		Subtotal	1.748	0.000		0.000		0.000		-		0.000	-	-	-

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Prior Year Cumulative Funding	Various	Various : Various	16.300	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Engineering & Technical Support	WR	NSWC Indian Head : Indian Head, VA	0.529	0.312	Dec 2014	0.000		0.217	Dec 2016	-		0.217	Continuing	Continuing	Continuing
Engineering & Technical Support	TBD	MCSC Contracts : Quantico, VA	0.000	0.000		0.000		0.100	Feb 2017	-		0.100	Continuing	Continuing	Continuing
Engineering & Technical Support	WR	NSWC Dahlgren : Dahlgren, VA	0.000	0.000		0.000		0.100	Dec 2016	-		0.100	0.000	0.100	-
		Subtotal	16.829	0.312		0.000		0.417		-		0.417	-	-	-

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Operational Testing & Support	WR	Marine Corps Operational Test & Eval Activity : Quantico, VA	5.164	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Prior year cumulative funding	Various	Various : Various	0.326	0.000		0.000		0.000		-		0.000	0.000	0.326	-
		Subtotal	5.490	0.000		0.000		0.000		-		0.000	-	-	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603635M / *Marine Corps Grnd Cmbt/ Supt Sys*	Project (Number/Name) 2614 / *SMAW Follow-On*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Prior year cumulative funding	Various	Various : Various	5.415	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
		Subtotal	5.415	0.000		0.000		0.000		-		0.000	-	-	-

	Prior Years	FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	29.482	0.312		0.000		0.417		-		0.417	-	-	-

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603635M / *Marine Corps Grnd Cmbt/ Supt Sys*	**Project (Number/Name)** 2614 / *SMAW Follow-On*

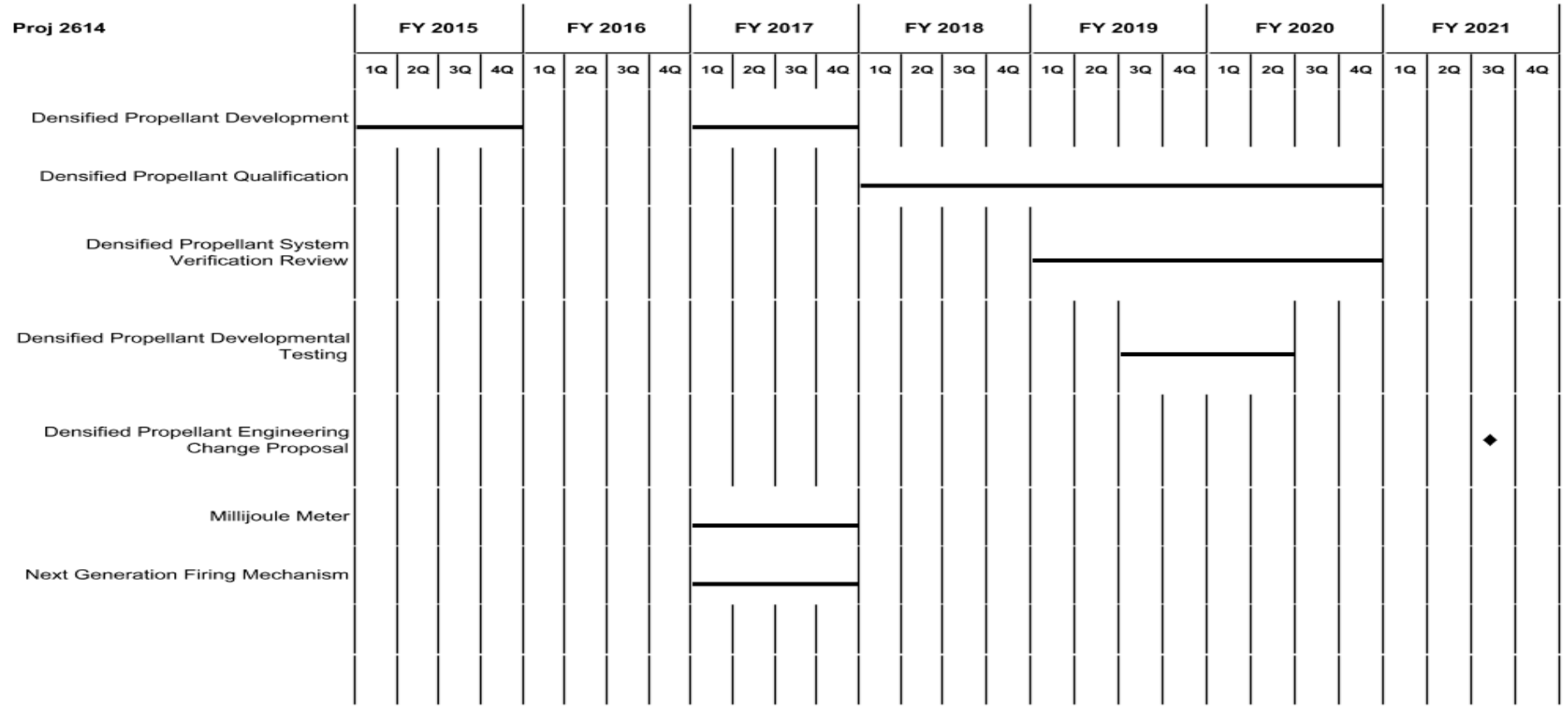


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Exhibit R-4A, RDT&E Schedule Details: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603635M / *Marine Corps Grnd Cmbt/ Supt Sys*	**Project (Number/Name)** 2614 / *SMAW Follow-On*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 2614				
Densified Propellant Development: Densified Propellant Development	1	2015	4	2015
Densified Propellant Development: Densified Propellant Development - Continued	1	2017	4	2017
Densified Propellant Qualification: Densified Propellant Qualification	1	2018	4	2020
Densified Propellant System Verification Review: Densified Propellant System Verification Review	1	2019	4	2020
Densified Propellant Developmental Testing: Densified Propellant Developmental Testing	3	2019	2	2020
Densified Propellant Engineering Change Proposal: Densified Propellant Engineering Change Proposal	3	2021	3	2021
Millijoule Meter: Millijoule Meter	1	2017	4	2017
Next Generation Firing Mechanism: Next Generation Firing Mechanism	1	2017	4	2017

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Exhibit R-2, RDT&E Budget Item Justification: PB 2017 Navy											Date: February 2016	
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 4: *Advanced Component Development & Prototypes (ACD&P)*					R-1 Program Element (Number/Name) PE 0603654N *I JT Service Explosive Ordn Dev*							
COST ($ in Millions)	**Prior Years**	**FY 2015**	**FY 2016**	**FY 2017 Base**	**FY 2017 OCO**	**FY 2017 Total**	**FY 2018**	**FY 2019**	**FY 2020**	**FY 2021**	**Cost To Complete**	**Total Cost**
Total Program Element	542.034	22.273	15.330	46.911	-	46.911	49.624	45.284	44.977	46.025	Continuing	Continuing
0377: *JT Service Expl Ord Disp System*	345.921	10.112	5.108	14.039	-	14.039	13.566	11.574	11.837	12.091	Continuing	Continuing
1317: *EOD Diving System*	103.452	2.049	2.200	5.467	-	5.467	5.102	4.486	4.584	4.683	Continuing	Continuing
3177: *Joint Counter Radio-Controlled IED Elec Warfare*	0.000	0.000	0.000	9.845	-	9.845	11.886	11.796	10.708	11.017	Continuing	Continuing
4023: *VSW MCM/Force Protection UUV*	92.661	10.112	8.022	17.560	-	17.560	19.070	17.428	17.848	18.234	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 for the research and development of Electronic Warfare (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. Utilize Joint requirements to provide a system of systems approach for a suite of equipment for mounted, dismounted, and fixed site operations; provide a Joint Counter RCIED EW (CREW) development of equipment, procedures, and tactical aids to make rapid improvements to performance, supportability and affordability, while maintaining pace with evolving global threat.

Exhibit R-2, RDT&E Budget Item Justification: PB 2017 Navy					Date: February 2016
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 4: *Advanced Component Development & Prototypes (ACD&P)*			R-1 Program Element (Number/Name) PE 0603654N *I JT Service Explosive Ordn Dev*		
B. Program Change Summary ($ in Millions)	**FY 2015**	**FY 2016**	**FY 2017 Base**	**FY 2017 OCO**	**FY 2017 Total**
Previous President's Budget	21.384	18.260	41.524	-	41.524
Current President's Budget	22.273	15.330	46.911	-	46.911
Total Adjustments	0.889	-2.930	5.387	-	5.387
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-2.931			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	0.990	0.000			
• SBIR/STTR Transfer	-0.101	0.000			
• Program Adjustments	0.000	0.000	10.044	-	10.044
• Rate/Misc Adjustments	0.000	0.001	-4.657	-	-4.657

Change Summary Explanation

Decrease in JT Service Explosive Ordnance Development by $1.4 million as required for the Department of the Navy to comply with the Bipartisan Budget Act of 2015.

FY 2017 funding request includes $10M for Joint Counter Radio-Controlled IED Electronic Warfare (CREW) due to PE 0604653N consolidation into PE 0603654N beginning in FY 2017. Other Rate/Misc Adjustments (MISC) ($4.657K).

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603654N / *JT Service Explosive Ordn Dev*	Project (Number/Name) 0377 / *JT Service Expl Ord Disp System*	

COST ($ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
0377: *JT Service Expl Ord Disp System*	345.921	10.112	5.108	14.039	-	14.039	13.566	11.574	11.837	12.091	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

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). High Fidelity Weapons Mass Destruction performs detection and identification of hazardous material contained in devices using radiological and biological means. Advanced EOD Robot System (AEODRS) 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.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Title: EOD DECISION SUPPORT SYSTEMS (DSS)	1.677	0.874	2.238	0.000	2.238
Articles:	-	-	-	-	-
FY 2015 Accomplishments: Continued improvements to the JEOD Decision Support System (DSS) based on prioritized user input, and provide Analysis of Alternatives for warfighter initiated improvements.					
FY 2016 Plans: Continue limited improvements to JEOD Decision Support System (DSS) based on user input, provide Analysis of Alternatives for warfighter initiated improvements and conduct procurement, testing and evaluation of potential commercial non-development items (CNDI) meeting EOD warfighter needs.					
FY 2017 Base Plans: Continue improvements to the JEOD Portal, Mobile Field Kit (MFK), and Common Control platform based on user input/prioritization, provide Analysis of Alternatives for warfighter initiated improvements and conduct procurements, testing and evaluation of potential commercial non-development items (CNDI) meeting EOD warfighters needs.					
FY 2017 OCO Plans: N/A					
Title: EOD ROBOTICS	7.435	4.234	10.437	0.000	10.437

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603654N / *JT Service Explosive Ordn Dev*	**Project (Number/Name)** 0377 / *JT Service Expl Ord Disp System*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Articles:	-	-	-	-	-
FY 2015 Accomplishments: Expanded Advanced EOD Robotics Increment 1 architecture for use in Increments 2 & 3 resulting in prototype development and testing. ***FY 2016 Plans:*** Conduct development and test of Advanced EOD Robotics System Increments prototypes. Continue development of Advanced EOD Robotics System Increments 1 and 2. ***FY 2017 Base Plans:*** Conduct testing on Advanced EOD Robotics System (AEODRS) Increment One - dismounted operations, provided by Prime Systems Integrator (PSI) development contractor. Begin development of AEODRS Increment Two - tactical operations, with PSI development contractor." ***FY 2017 OCO Plans:*** N/A					
Title: TCM AN/PLT-XXX SYSTEMS	1.000	0.000	1.364	0.000	1.364
Articles:	-	-	-	-	-
FY 2015 Accomplishments: Developed loadsets beyond current threater. Upgrade current theater loadsets to remain current with continually changing threats. ***FY 2016 Plans:*** N/A ***FY 2017 Base Plans:*** Development loadset upgrades for fielded EOD TCM systems to remain current with continually changing threats and develop loadsets beyond current theater, both CONUS/OCONUS to remain current with continual changing threats. ***FY 2017 OCO Plans:*** N/A					
Accomplishments/Planned Programs Subtotals	10.112	5.108	14.039	0.000	14.039

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603654N / *JT Service Explosive Ordn Dev*	**Project (Number/Name)** 0377 / *JT Service Expl Ord Disp System*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
• OPN/5509: *EOD Equipment (VN075)*	0.000	10.905	5.955	-	5.955	0.000	9.050	9.360	5.669	0.000	58.822

Remarks

FY17 Procurement reductions per POM17.

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

Processed 43 Joint Service EOD Decision Support System (DSS) change requests resulting in the release of 1,290 Mobile Field Kit and Publication Suite Software copies per quarter to the Joint Services including USN. Completed TCM, AN/PLT-5 loadset upgrade for EOD use in-theater based upon new IED/UXO threats seen during operations. Awarded and kicked off development efforts for the Advanced EOD Robotics System, Increment one, prime system integrator.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603654N / *JT Service Explosive Ordn Dev*	**Project (Number/Name)** 0377 / *JT Service Expl Ord Disp System*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Primary Hardware Development	WR	EODTD : Indian Head, MD	149.897	5.684	Oct 2014	2.977	Nov 2015	9.746	Oct 2016	-		9.746	Continuing	Continuing	Continuing
Software Development	WR	EODTD : Indian Head, MD	27.934	1.528	Oct 2014	1.000	Oct 2015	2.000	Oct 2016	-		2.000	Continuing	Continuing	Continuing
ILS	WR	EODTD : Indiah Head, MD	48.090	0.500	Oct 2014	0.450	Oct 2015	0.600	Oct 2016	-		0.600	Continuing	Continuing	Continuing
		Subtotal	225.921	7.712		4.427		12.346		-		12.346	-	-	-

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Support	C/CPFF	HARRIS : Herndon, VA	7.433	0.500	Oct 2014	0.081	Oct 2015	0.350	Nov 2016	-		0.350	Continuing	Continuing	Continuing
		Subtotal	7.433	0.500		0.081		0.350		-		0.350	-	-	-

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation	WR	EODTD : Indian Head, MD	75.479	0.915	Oct 2014	0.450	Oct 2015	0.858	Nov 2016	-		0.858	Continuing	Continuing	Continuing
Operation Test & Evaluation	WR	EODTD : Indian Head, MD	10.983	0.500	Oct 2014	0.000	Oct 2015	0.085	Nov 2016	-		0.085	Continuing	Continuing	Continuing
		Subtotal	86.462	1.415		0.450		0.943		-		0.943	-	-	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603654N / *JT Service Explosive Ordn Dev*	**Project (Number/Name)** 0377 / *JT Service Expl Ord Disp System*

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Manangement Support	WR	EODTD : Indian Head, MD	9.653	0.485	Oct 2014	0.150	Oct 2015	0.400	Oct 2016	-		0.400	Continuing	Continuing	Continuing
Miscellaneous	WR	EODTD : Indian Head, MD	16.452	0.000	Oct 2014	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
		Subtotal	26.105	0.485		0.150		0.400		-		0.400	-	-	-

	Prior Years	FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	345.921	10.112		5.108		14.039		-		14.039	-	-	-

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603654N / *JT Service Explosive Ordn Dev*	**Project (Number/Name)** 0377 / *JT Service Expl Ord Disp System*

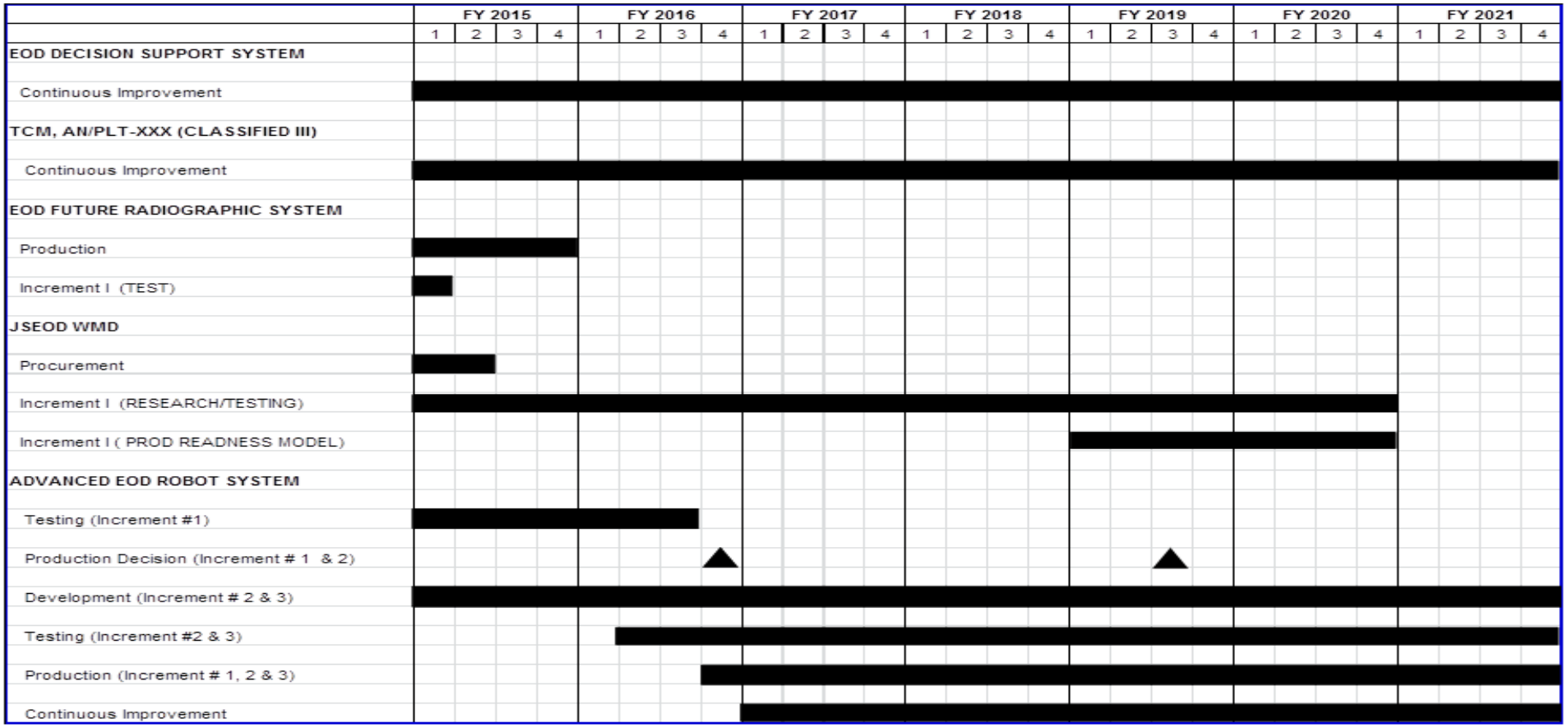

Exhibit R-4A, RDT&E Schedule Details: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603654N / *JT Service Explosive Ordn Dev*	**Project (Number/Name)** 0377 / *JT Service Expl Ord Disp System*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 0377				
Title: EOD DECISION SUPPORT SYSTEM	1	2015	4	2021
DSS Continous Improvement	1	2015	4	2021
Title: TCM, AN/PLT-XXX (CLASSIFIED III)	1	2015	4	2021
AN/PLT-XXX Continous Improvement	1	2015	4	2021
Title: EOD FUTURE RADIOGRAPHIC SYSTEM	1	2015	4	2015
Production	1	2015	4	2015
Increment I (TEST)	1	2015	1	2015
Title: JS EOD WMD	1	2015	4	2020
Procurement	1	2015	2	2015
Increment I (RESEARCH/TESTING)	1	2015	4	2020
Increment I (PROD READNESS MODEL)	1	2019	4	2020
Title: ADVANCED EOD ROBOT SYSTEM	1	2015	4	2020
Testing (#1)	1	2015	3	2016
Production Decision (INCREMENT #1)	4	2016	4	2016
Development (INCREMENT # 2 & 3)	1	2015	4	2021
Testing (INCREMENT # 2 & 3)	2	2016	3	2021
Production (INCREMENT 1, 2 & 3)	4	2016	4	2021
Continous Improvement (1,2,3)	1	2017	4	2021

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603654N / *JT Service Explosive Ordn Dev*	Project (Number/Name) 1317 / *EOD Diving System*	

COST ($ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
1317: *EOD Diving System*	103.452	2.049	2.200	5.467	-	5.467	5.102	4.486	4.584	4.683	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

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 and Expeditionary MCM Company establishment by US Fleet Forces Command. 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, underwater improvised explosive devices, and unexploded ordnance.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Title: DIVER SAFETY & LIFE SUPPORT SYSTEMS	1.600	1.950	3.328	0.000	3.328
Articles:	-	-	-	-	-

Description: 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, emergency life support systems and the ability to train divers and to evaluate Mine Countermeasures (MCM)/Explosive Ordnance Disposal (EOD) tools, tactics and procedures with regard to influence cleanliness against sea mines both at home and in controlled threat areas prior to commencing EOD operations.

FY 2015 Accomplishments:
Continued EOD UBA acquisition initiative and develop improvements to Mine Warfare EOD Training and Readiness Evaluation Systems (METRES) tool set.

FY 2016 Plans:
Enter engineering and manufacturing development phase in progressing towards a production decision. Continue development, testing and evaluation of METRES product improvements.

FY 2017 Base Plans:
Continue engineering and manufacturing development phase in progressing towards a production decision. Continue development, testing and evaluation of METRES product improvements. Increased ACAT efforts for

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603654N / *JT Service Explosive Ordn Dev*	**Project (Number/Name)** 1317 / *EOD Diving System*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
the next generation Underwater Breathing Apparatus with significant testing including production of the EDM rigs. ***FY 2017 OCO Plans:*** N/A					
Title: ADVANCED DIVER INTEGRATED SENSORS ***Articles:*** ***Description:*** Develop Advanced Diver Integrated Sensors equipment to enhance EOD and MDSU ability to detect, access, 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 2015 Accomplishments:*** Entered into risk reduction phase for the development of the next generation Advanced Integrated Sensor System for EOD divers as a replacement of the UIS. Continued CIP integration with DHINS. ***FY 2016 Plans:*** Initiate acquisition program for the next generation Advanced Integrated Sensor System for Expeditionary MCM forces. ***FY 2017 Base Plans:*** Continue acquisition program for the next generation Advanced Integrated Sensor System for Expeditionary MCM forces. STRIDENT effort significantly increased with acquisition of an Advanced Development Model and conducting initial testing. ***FY 2017 OCO Plans:*** N/A	0.399 -	0.200 -	1.949 -	0.000 -	1.949 -
Title: ADVANCED FIRING SYSTEM ***Articles:*** ***Description:*** Develops product improvements to existing systems for below and above water neutralization of underwater threats to support EOD and MDSU operations. ***FY 2015 Accomplishments:***	0.050 -	0.050 -	0.190 -	0.000 -	0.190 -

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603654N / *JT Service Explosive Ordn Dev*	**Project (Number/Name)** 1317 / *EOD Diving System*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Began fielding miniaturized AFCT to meet approved inventory objectives. Analyzed and developed alternatives for improvement to acoustic firing device (AFD) receivers. ***FY 2016 Plans:*** Complete testing, evaluation and fielding of AFCTs, and begin development and testing of product improvement to AFD receiver subsystems. ***FY 2017 Base Plans:*** Continue development and testing of product improvements to AFD receiver subsystems. ***FY 2017 OCO Plans:*** N/A					
Accomplishments/Planned Programs Subtotals	2.049	2.200	5.467	0.000	5.467

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
• OPN/0977a: *Underwater EOD Program (Cost Code UQ034)*	1.000	1.000	1.730	-	1.730	3.960	4.050	11.500	5.520	0.000	53.505
• OPN/0977b: *UW EOD (UQ036)*	0.000	0.338	0.411	-	0.411	1.233	0.440	6.600	6.600	0.000	18.822

Remarks

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 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

Research and Develop technologies for the design of Diver Safety Systems, Advanced Diver Integrated Sensors 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 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603654N / *JT Service Explosive Ordn Dev*	**Project (Number/Name)** 1317 / *EOD Diving System*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Primary Hardware Development	WR	EODTECHDIV : IH, MD	41.266	0.470	Oct 2014	0.367	Oct 2015	0.995	Oct 2016	-		0.995	Continuing	Continuing	Continuing
Software Development	WR	EODTECHDIV : IH MD	4.517	0.250	Oct 2014	0.389	Oct 2015	1.439	Oct 2016	-		1.439	Continuing	Continuing	Continuing
Systems Engineering	WR	EODTECHDIV : IH MD	8.228	0.000		0.000		0.000		-		0.000	0.000	8.228	-
ILS	WR	EODTECHDIV : IH MD	11.916	0.000		0.000		0.000		-		0.000	0.000	11.916	-
Systems Engineering	WR	NSWC : Panama City	1.728	0.200	Oct 2014	0.300	Oct 2015	0.617	Oct 2016	-		0.617	Continuing	Continuing	Continuing
Systems Engineering	WR	SPAWAR : San Diego	3.262	0.192	Oct 2014	0.180	Oct 2015	0.376	Oct 2016	-		0.376	Continuing	Continuing	Continuing
		Subtotal	70.917	1.112		1.236		3.427		-		3.427	-	-	-

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Support1	C/CPFF	HARRIS : Herndon VA	3.537	0.000		0.000		0.000		-		0.000	0.000	3.537	-
Program Management Support2	C/CPFF	HARRIS : Herndon VA	3.371	0.250	Oct 2014	0.250	Nov 2015	0.530	Oct 2016	-		0.530	Continuing	Continuing	Continuing
Integrated Logistics Support	WR	Not Specified : Not Specified	0.000	0.000		0.000		0.000		-		0.000	0.000	0.000	-
Configuration Management	WR	Not Specified : Not Specified	0.000	0.000		0.000		0.000		-		0.000	0.000	0.000	-
Technical Data	WR	Not Specified : Not Specified	0.000	0.000		0.000		0.000		-		0.000	0.000	0.000	-
GFE	WR	Not Specified : Not Specified	0.000	0.000		0.000		0.000		-		0.000	0.000	0.000	-
Award Fees	WR	Not Specified : Not Specified	0.000	0.000		0.000		0.000		-		0.000	0.000	0.000	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603654N / *JT Service Explosive Ordn Dev*	Project (Number/Name) 1317 / *EOD Diving System*	

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
		Subtotal	6.908	0.250		0.250		0.530		-		0.530	-	-	-

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Development Test & Evaluation	WR	EODTECHDIV : IH MD	7.486	0.356	Oct 2014	0.338	Oct 2015	0.719	Oct 2016	-		0.719	Continuing	Continuing	Continuing
Operational Test & Evaluation	WR	EODTECHDIV : IH MD	1.560	0.000		0.000		0.000		-		0.000	0.000	1.560	-
		Subtotal	9.046	0.356		0.338		0.719		-		0.719	-	-	-

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Support	WR	EODTECHDIV : IH MD	9.625	0.331	Oct 2014	0.328	Nov 2015	0.769	Oct 2016	-		0.769	0.000	11.053	-
Miscellaneous	WR	NSWC, Activities : Not Specified	6.943	0.000	Oct 2014	0.048	Nov 2015	0.022	Oct 2016	-		0.022	0.000	7.013	-
Acquisition Workforce Fund	Various	Various : Various	0.013	0.000		0.000		0.000		-		0.000	0.000	0.013	-
		Subtotal	16.581	0.331		0.376		0.791		-		0.791	0.000	18.079	-

	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	103.452	2.049		2.200		5.467		-		5.467	-	-	-

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603654N / *JT Service Explosive Ordn Dev*	**Project (Number/Name)** 1317 / *EOD Diving System*

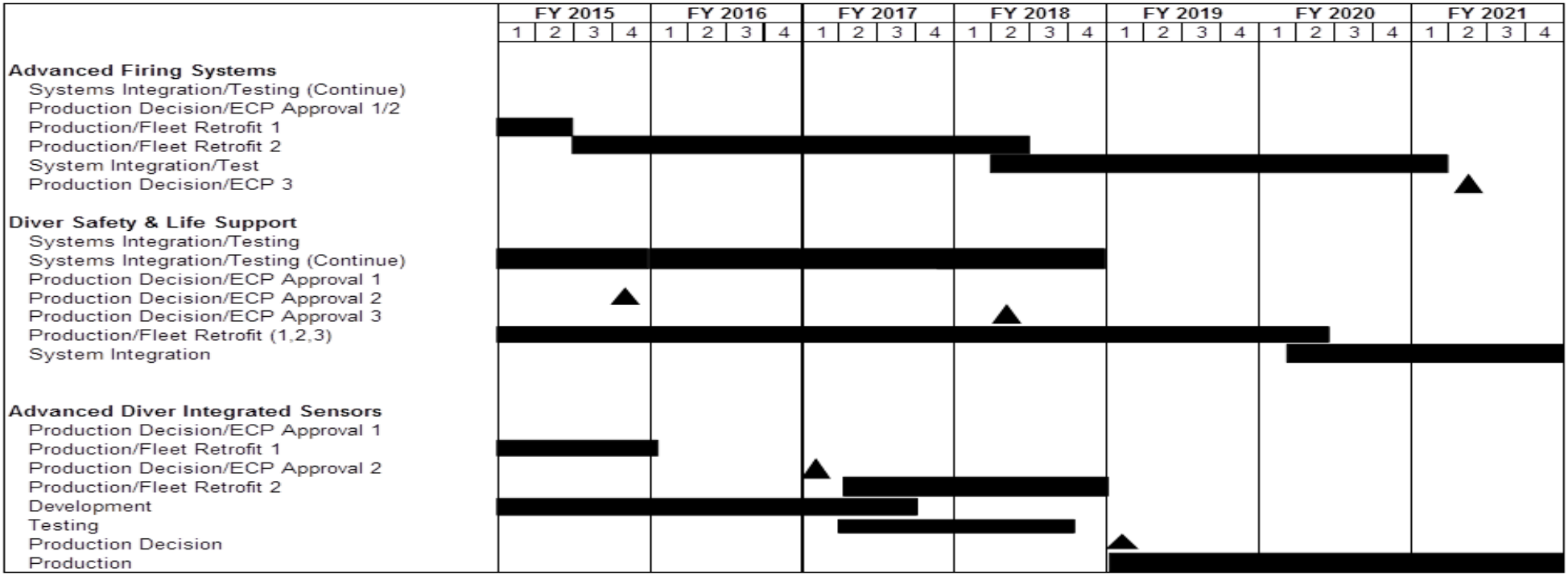

Exhibit R-4A, RDT&E Schedule Details: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603654N / *JT Service Explosive Ordn Dev*	**Project (Number/Name)** 1317 / *EOD Diving System*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 1317				
Title: ADVANCED FIRING SYSTEMS	1	2015	4	2021
Production/Fleet Retrofit 1	1	2015	2	2015
Production/Fleet Retrofit 2	3	2015	2	2018
System Integration/Testing	2	2018	1	2021
Production Decision/ECP 3	2	2021	2	2021
Title: DIVER SAFETY & LIFE SUPPORT	1	2015	4	2021
System Integration/Testing (Continue)	1	2015	4	2018
"Production Decision/ECP Approval 2"	4	2015	4	2015
Production Decision/ECP Approval 3	2	2018	2	2018
Production/Fleet Retrofit (2,3)	1	2015	2	2021
System Integration	2	2020	4	2021
Title: ADVANCED DIVER INTEGRATED SENSORS	1	2015	4	2021
Production/Fleet Retrofit 1	1	2015	4	2015
Production Decision/ECP Approval 2	3	2017	3	2017
Production/Fleet Retrofit 2	3	2017	4	2018
Development	1	2015	3	2017
Testing	2	2017	3	2018
Production Decision- 3	3	2018	3	2018
Production - 3	4	2018	4	2021

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603654N / *JT Service Explosive Ordn Dev*	Project (Number/Name) 3177 / *Joint Counter Radio-Controlled IED Elec Warfare*	

COST ($ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
3177: *Joint Counter Radio-Controlled IED Elec Warfare*	0.000	0.000	0.000	9.845	-	9.845	11.886	11.796	10.708	11.017	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Provides for the research and development of Electronic Warfare (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. Utilize Joint requirements to provide a system of systems approach for a suite of equipment for mounted, dismounted, and fixed site operations; provide a Joint Counter RCIED EW (CREW) development of equipment, procedures, and tactical aids to make rapid improvements to performance, supportability and affordability, while maintaining pace with evolving global threat.

The JCREW system, Increment 1 Block 1 (I1B1) is the next generation of counter RCIED systems. This family of systems includes fixed site, mounted and dismounted units, which provide countermeasures against the global RCIED threat. Key system design features include significant performance increases over current legacy systems, a modular open architecture system to address current and future advanced threats, robust information assurance and security, and is net-capable for improved Communications and Control (C2). JCREW I1B1 supports global deployment and sustainment for all combatant commands providing increased protection to Warfighter against the evolving worldwide RCIED threats.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Title: Joint Counter Radio-Controlled IED Elec Warfare	0.000	0.000	9.845	0.000	9.845
Articles:	-	-	-	-	-
Description: Supports the design, integration and test of Tech Insertion hardware, software, and advanced techniques into JCREW systems. Tech Insertion candidates include ONR sponsored technologies ready for transition to JCREW, and techniques, hardware and software performance improvements developed by Navy laboratories, FFRDs, UARCs, and the JCREW Prime contractor. Analysis of Alternatives will be conducted to evaluate and select Tech Insertion candidates based on technical maturity, cost, and performance. Hardware and software updates will be designed, tested, and implemented into JCREW through Engineering Change Proposals.					
FY 2015 Accomplishments: N/A					
FY 2016 Plans:					

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603654N / *JT Service Explosive Ordn Dev*	**Project (Number/Name)** 3177 / *Joint Counter Radio-Controlled IED Elec Warfare*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
N/A ***FY 2017 Base Plans:*** Develop and test advanced techniques to maintain JCREW performance against evolving global RCIEDs. Execute Engineering Change Proposal to design, and fabricate hardware and software changes for Tech Insertion I. ***FY 2017 OCO Plans:*** N/A					
Accomplishments/Planned Programs Subtotals	0.000	0.000	9.845	0.000	9.845

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
• OPN/5509: *Explosive Ordnance Disposal Equip*	0.000	0.000	0.774	99.329	100.103	0.806	0.925	0.928	0.941	0.000	103.703

Remarks

PE 0604653N/JT Cntr Radio Controlled IED Elec War (JCREW) consolidated into PE 0603654N/JT Service Explosive Ordn Dev FY17 and out.

D. Acquisition Strategy

FRP Production Line Start Up and Ramp Up and FRP Organic Depot Line Startup and Ramp Up in FY 2017. Spares support and OEM Depot will be utilized during LRIP phase. Establishment of Organic Depot capability during LRIP phase in support of FRP Decision Review with Weapons System Support Center Mechanicsburg as Primary Inventory Control Activity (PICA). Full Rate Production contract will be full and open competition using LRIP final Tech Data Package (TDP) with unlimited data rights. Tech Insertion will help to maintain JCREW performance against evolving global RCIED threats.

E. Performance Metrics

LRIP contract awarded September 2015. Deliveries will support IOC. Analysis of Alternatives for Tech Insertion 1 in September 2015. Request for Proposal (RFP) for Full Rate Production will release the 1st quarter of FY17.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603654N / *JT Service Explosive Ordn Dev*	Project (Number/Name) 3177 / *Joint Counter Radio-Controlled IED Elec Warfare*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Primary Hardware Development	Various	TBD : TBD	0.000	0.000		0.000		1.929	Nov 2016	-		1.929	Continuing	Continuing	Continuing
Systems Engineering	Various	TBD : TBD	0.000	0.000		0.000		0.964	Nov 2016	-		0.964	Continuing	Continuing	Continuing
Software Development	Various	TBD : TBD	0.000	0.000		0.000		0.964	Nov 2016	-		0.964	Continuing	Continuing	Continuing
System Integration	Various	TBD : TBD	0.000	0.000		0.000		0.964	Nov 2016	-		0.964	Continuing	Continuing	Continuing
		Subtotal	0.000	0.000		0.000		4.821		-		4.821	-	-	-

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Loadset Development	FFRDC	JHU/APL, MITRE: : Laurel, MD	0.000	0.000		0.000		0.442	Nov 2016	-		0.442	Continuing	Continuing	Continuing
Systems Engineering	WR	NSWC: : Various	0.000	0.000		0.000		1.436	Nov 2016	-		1.436	Continuing	Continuing	Continuing
Program Management Support	WR	IHEODTD: : Indian Head, MD	0.000	0.000		0.000		0.331	Nov 2016	-		0.331	Continuing	Continuing	Continuing
		Subtotal	0.000	0.000		0.000		2.209		-		2.209	-	-	-

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Test & Evaluation	WR	NSWC : Various	0.000	0.000		0.000		1.208	Nov 2016	-		1.208	Continuing	Continuing	Continuing
Test & Evaluation	MIPR	YPG : Yuma, Arizona	0.000	0.000		0.000		0.600	Nov 2016	-		0.600	Continuing	Continuing	Continuing
		Subtotal	0.000	0.000		0.000		1.808		-		1.808	-	-	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603654N / *JT Service Explosive Ordn Dev*	**Project (Number/Name)** 3177 / *Joint Counter Radio-Controlled IED Elec Warfare*

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Support	C/CPFF	Cydecor : Various	0.000	0.000		0.000		0.575	Dec 2016	-		0.575	Continuing	Continuing	Continuing
Miscellaneous	WR	NSWC : Various	0.000	0.000		0.000		0.432	Dec 2016	-		0.432	Continuing	Continuing	Continuing
		Subtotal	0.000	0.000		0.000		1.007		-		1.007	-	-	-

	Prior Years	FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	0.000		0.000		9.845		-		9.845	-	-	-

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603654N / *JT Service Explosive Ordn Dev*	**Project (Number/Name)** 3177 / *Joint Counter Radio-Controlled IED Elec Warfare*

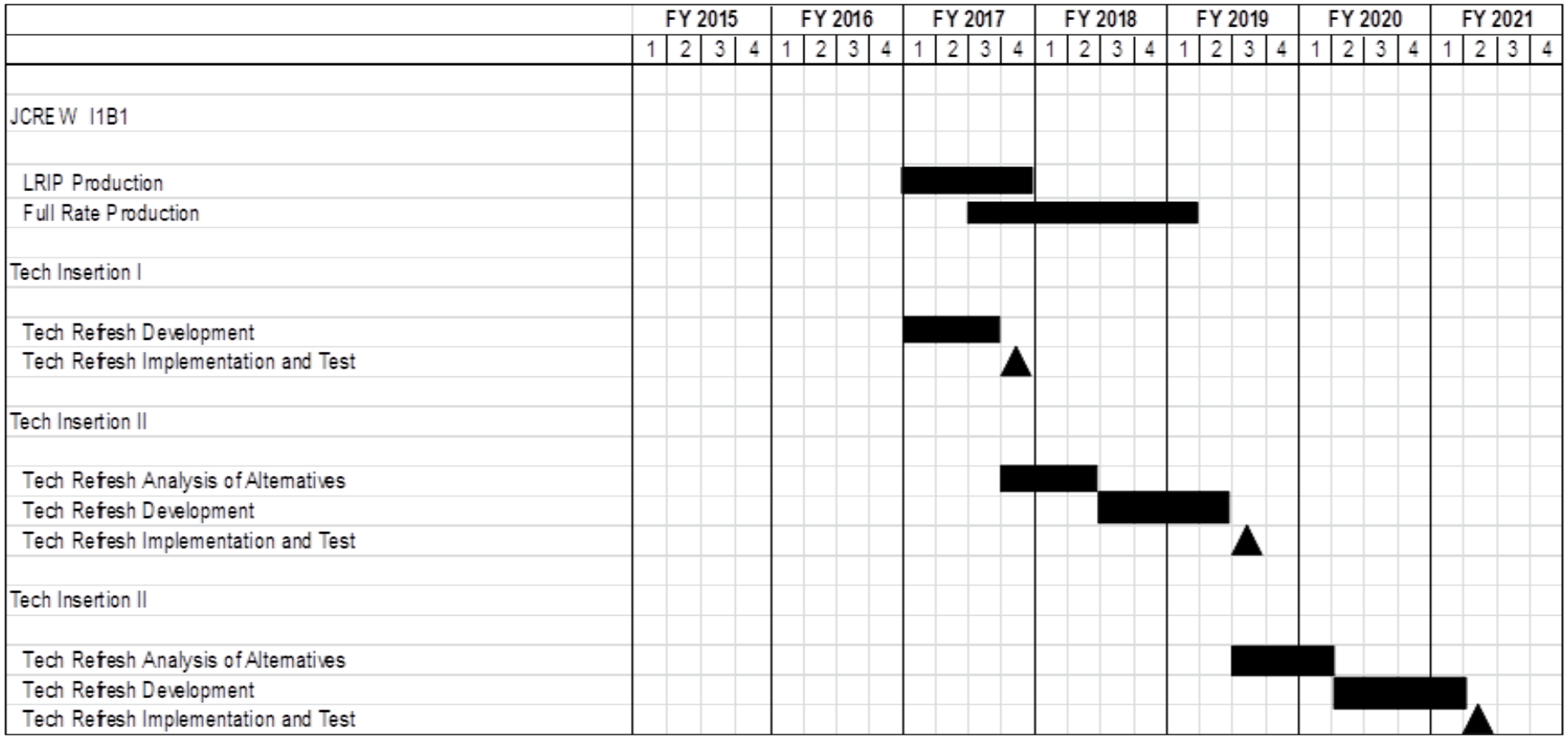

Exhibit R-4A, RDT&E Schedule Details: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603654N / *JT Service Explosive Ordn Dev*	**Project (Number/Name)** 3177 / *Joint Counter Radio-Controlled IED Elec Warfare*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 3177				
LRIP Production	1	2017	4	2017
Full Rate Production	3	2017	1	2019
TECH INSERTION 1	1	2017	4	2017
Tech Refresh Development (1)	1	2017	3	2017
Tech Refresh Implementation and Test (1)	4	2017	4	2017
TECH INSERTION 2	4	2017	3	2019
Tech Refresh Analysis of Alternatives (2)	4	2017	2	2018
Tech Refresh Development (2)	3	2018	2	2019
Tech Refresh Implementation and Test (2)	3	2019	3	2019
TECH INSERTION 3	3	2019	2	2021
Tech Refresh Analysis of Alternatives (3)	3	2019	1	2020
Tech Refresh Development (3)	2	2020	1	2021
Tech Refresh Implementation and Test (3)	2	2021	2	2021

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603654N / *JT Service Explosive Ordn Dev*	Project (Number/Name) 4023 / *VSW MCM/Force Protection UUV*	

COST ($ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
4023: *VSW MCM/Force Protection UUV*	92.661	10.112	8.022	17.560	-	17.560	19.070	17.428	17.848	18.234	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Provides for development of affordable expeditionary, unmanned underwater systems to support Navy Expeditionary forces including Explosive Ordnance (EOD). Mobile Diving and Salvage Units, and Shallow Water (SW), Very Shallow Water (VSW) and Underwater Mine Countermeasures (UMCM) mission operations. The equipment must be highly portable in order to support the Navy 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 Expeditionary UUV systems to support localization render-safe and detailed intelligence gathering of UXO including Underwater Improvised Explosive Devices. This project supports CNO N957 MCM UUV Roadmap.

FY 2017 will focus on developing, testing and ultimately fielding advanced sensors that will allow warfighters to detect, classify and localize high priority threats in meeting mine warfare missions. Also, resources will be used to expand deployability of the MK 18 Family of Systems abroad a higher number of shipboard platforms and also to deploy the family of systems from additional small boats other than the 11m RHIB. The Increment 1 MK 18 Mod 2 upgrade will allow implementation of Automated Target Recognition (ATR), advanced autonomy architecture and enhanced eletro-optic sensor performance

FY 2017 will also support the initiation of the next increment of the MK 18 Mod 2 which will enable mine identification and marking, this enhancement will reduce the MCM tactical timeline. Also, the MK 18 Mod 1 systems will be re-configured with ATR and advanced autonomy architecture to reduce the MCM tactical timeline. These efforts will improve the projected inventory of 36 MK 18 Mod 2 vehicles and 63 MK 18 Mod 1 vehicles for fleet expeditionary forces. Currently, the MK 18 Family of Systems are being employed in multiple theater of operations and for CONUS based missions as well.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Title: VSW MCM/Force Protection UUV	10.112	8.022	17.560	0.000	17.560
Articles:	-	-	-	-	-
Description: This program supports development, testing and Fleet approval for evolving generations of affordable, expeditionary Unmanned Underwater Vehicles (UUV), support equipment, and Common Operator Interface Navy (COIN) systems to address validated requirements in support of Expeditionary SW and VSW UMCM 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 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603654N / *JT Service Explosive Ordn Dev*	**Project (Number/Name)** 4023 / *VSW MCM/Force Protection UUV*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
FY 2015 Accomplishments: Continued to develop, test and evaluate mature technology solutions to support integration into block upgrades via ECP retrofits to fielded MK 18 MOD 1 UUV and HULS, Developed and executed MK 18 MOD 2 UUV systems capability increments, and Neutralization systems. Planned and executed structured UOES and requirements compliance testing and evaluation associated with program execution (RCT&E) to evaluate effectiveness, supportability and suitability of prototype block upgrade retrofit kits. ***FY 2016 Plans:*** Continue testing evaluation, fielding and installation of MK 18 MOD 1 and MOD 2 UUV Systems to meet US Fleet Forces Command inventory objectives in support of the Expeditionary MCM Company capability establishment. Continue testing and evaluation of MK 18 UUV family of systems (FoS) capability increments and HULS ECP product improvements. Initiate acquisition of Expeditionary UUV Neutralization System (EUNS) program to develop standoff explosives threat object investigation, assessment, neutralization and battle damage assessment capabilities. ***FY 2017 Base Plans:*** Continue testing evaluation, fielding and installation of MK 18 MOD 1 and MOD 2 UUV Systems to meet US Fleet Forces Command inventory objectives in support of the Expeditionary MCM Company capability establishment. Continue testing and evaluation of MK 18 UUV family of systems (FoS) capability increments and HULS ECP product improvements. Continue acquisition of Expeditionary UUV Neutralization System (EUNS) program to develop standoff explosives threat object investigation, assessment, neutralization and battle damage assessment capabilities. Initiation of next generation Expeditionary UUV assessment for MCM with advanced sensor products for operations in complex undersea environments. ***FY 2017 OCO Plans:*** N/A					
Accomplishments/Planned Programs Subtotals	10.112	8.022	17.560	0.000	17.560

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603654N / *JT Service Explosive Ordn Dev*	**Project (Number/Name)** 4023 / *VSW MCM/Force Protection UUV*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
• OPN/0977: *Underwater EOD Program (Cost Code UQ034)*	41.362	33.706	11.810	-	11.810	37.867	27.818	13.782	21.355	0.000	232.320

Remarks

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 prior to fielding baseline systems and capability improvement package increments. These UUV operators also participate in detailed requirements analyses and definition. Operational capabilities with UUV have been realized at designated operational 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

Research and Develop technologies for the design of Unmanned Underwater Systems to provide enhanced fleet capabilities to locate, classify, identify, assess, neutralize and conduct post-neutralization battle damage assessment/verification of mines and unexploded ordnance.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603654N / *JT Service Explosive Ordn Dev*	Project (Number/Name) 4023 / *VSW MCM/Force Protection UUV*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Primary Hardware Development	WR	Multiple Activites : Not Specified	15.986	2.196	Oct 2014	1.692	Oct 2015	3.382	Oct 2016	-		3.382	0.000	23.256	-
Systems Engineering	WR	NSWC, Activities : Not Specified	10.097	1.915	Oct 2014	1.602	Oct 2015	3.159	Oct 2016	-		3.159	0.000	16.773	-
Primary Hardware Development	WR	EODTECHDIV : IH, MD	16.238	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Systems Engineering	WR	EODTECHDIV : IH, MD	18.037	2.139	Oct 2014	1.715	Oct 2015	3.458	Oct 2016	-		3.458	Continuing	Continuing	Continuing
		Subtotal	60.358	6.250		5.009		9.999		-		9.999	-	-	-

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Technical Support	C/CPFF	HARRIS : Herndon, VA	5.028	0.355	Oct 2014	0.315	Oct 2015	0.586	Oct 2016	-		0.586	Continuing	Continuing	Continuing
		Subtotal	5.028	0.355		0.315		0.586		-		0.586	-	-	-

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation	WR	Multiple Activities : Not Specified	10.143	1.900	Oct 2014	1.409	Oct 2015	3.519	Oct 2016	-		3.519	0.000	16.971	-
Operational Test & Evaluation	WR	NSWC, Activities : Not Specified	1.848	0.644	Oct 2014	0.639	Oct 2015	1.642	Oct 2016	-		1.642	0.000	4.773	-
Developmental Test & Evaluation	WR	EODTECHDIV : IH, MD	8.063	0.556	Oct 2014	0.436	Oct 2015	1.151	Oct 2016	-		1.151	Continuing	Continuing	Continuing
Operational Test & Evaluation	WR	EODTECHDIV : IH, MD	1.424	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
		Subtotal	21.478	3.100		2.484		6.312		-		6.312	-	-	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603654N / *JT Service Explosive Ordn Dev*	**Project (Number/Name)** 4023 / *VSW MCM/Force Protection UUV*

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Support	WR	EODTECHDIV : IH, MD	3.476	0.407	Oct 2014	0.169	Nov 2015	0.443	Oct 2016	-		0.443	Continuing	Continuing	Continuing
Miscellaneous	WR	NSWC, Activities : Not Specified	2.303	0.000	Oct 2014	0.045	Nov 2015	0.220	Oct 2016	-		0.220	Continuing	Continuing	Continuing
DAWDF	Various	Not Specified : Not Specified	0.018	0.000		0.000		0.000		-		0.000	0.000	0.018	-
		Subtotal	5.797	0.407		0.214		0.663		-		0.663	-	-	-

	Prior Years	FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	92.661	10.112		8.022		17.560		-		17.560	-	-	-

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603654N / *JT Service Explosive Ordn Dev*	**Project (Number/Name)** 4023 / *VSW MCM/Force Protection UUV*

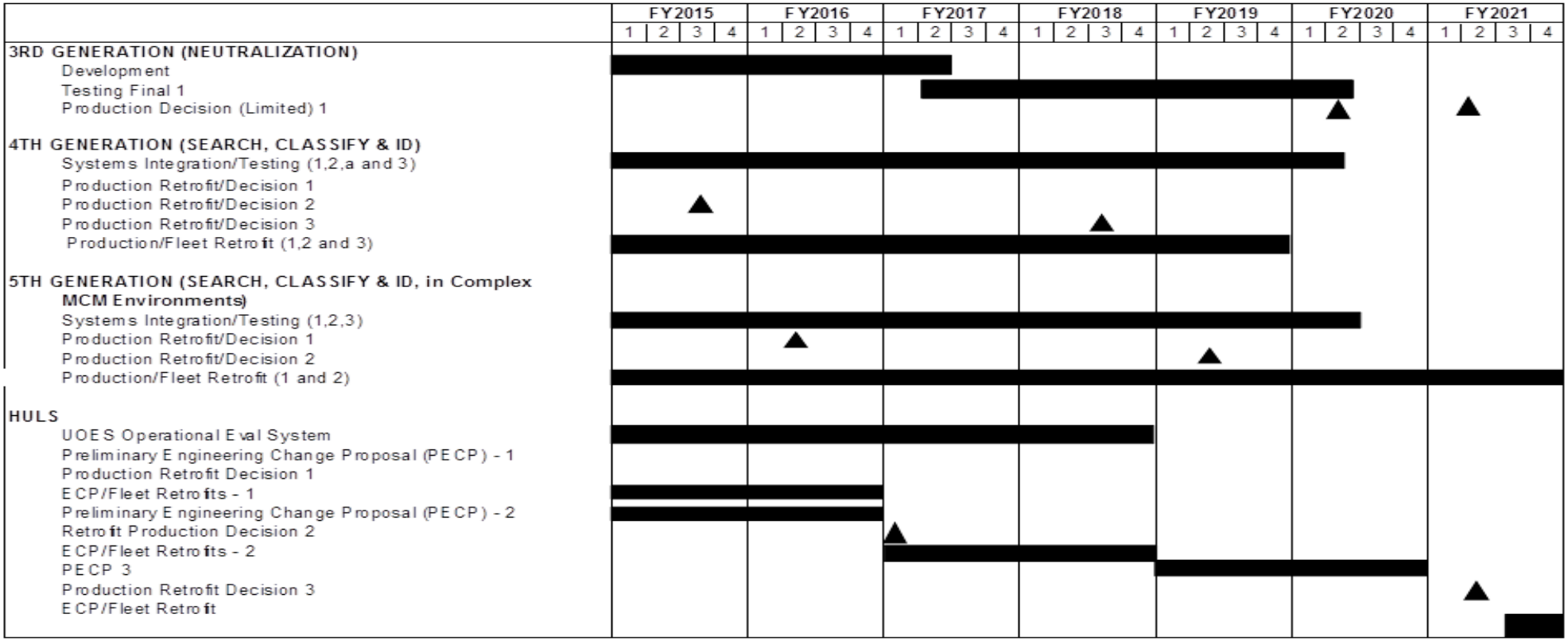

Exhibit R-4A, RDT&E Schedule Details: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603654N / *JT Service Explosive Ordn Dev*	**Project (Number/Name)** 4023 / *VSW MCM/Force Protection UUV*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 4023				
3RD GENERATION (NEUTRALIZATION)	1	2015	4	2021
Development	1	2015	2	2019
Testing Final 1	3	2017	2	2020
Production Decision (Limited) 1	2	2020	2	2020
Title: 4th GENERATION (SEARCH-CLASSIFY & ID)	1	2015	4	2021
Systems Integration/Testing (1,2,and 3)	1	2015	4	2020
Production/Retrofit Decision 2	3	2015	3	2015
Production/Retrofit Decision 3	3	2017	3	2017
Production Retrofit Decision 4	2	2018	2	2018
Production/Fleet Retrofit (1,2,and 3)	1	2015	1	2021
5th GENERATION (SEARCH, CLASSIFY & ID, IN COMPLEX MCM ENVIRONMENTS	1	2015	4	2021
Systems Integration/Testing (1,2,3)	1	2015	4	2021
Production Retrofit/Decision 1	2	2016	2	2016
Production Retrofit/Decision 2	2	2019	2	2019
Production Retrofit/Decision 3	3	2020	3	2020
Production/Fleet Retrofit (1 and 2)	1	2015	4	2021
Title: HULS	1	2015	4	2020
User Operational Eval System (UOES)	1	2015	4	2018
ECP/Fleet Retrofits - 1	1	2015	4	2016
Preliminary Engineering Change Proposal (PECP) - 2	1	2015	4	2016
Retrofit Production Decision 2	1	2017	1	2017

Exhibit R-4A, RDT&E Schedule Details: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603654N / *JT Service Explosive Ordn Dev*	**Project (Number/Name)** 4023 / *VSW MCM/Force Protection UUV*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
ECP/Fleet Retrofits - 2	1	2017	4	2018
PECP - 3	1	2019	4	2020
Production Retrofit Decision 3	2	2021	2	2021
ECP/Fleet Retrofit 3	3	2021	4	2021

Exhibit R-2, RDT&E Budget Item Justification: PB 2017 Navy												Date: February 2016
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 4: *Advanced Component Development & Prototypes (ACD&P)*					R-1 Program Element (Number/Name) PE 0603658N *I Cooperative Engagement*							
COST ($ in Millions)	**Prior Years**	**FY 2015**	**FY 2016**	**FY 2017 Base**	**FY 2017 OCO**	**FY 2017 Total**	**FY 2018**	**FY 2019**	**FY 2020**	**FY 2021**	**Cost To Complete**	**Total Cost**
Total Program Element	486.306	41.158	73.786	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	601.250
2039: *COOP Engagement*	486.306	41.158	73.786	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	601.250
Program MDAP/MAIS Code: 582												

A. Mission Description and Budget Item Justification

Cooperative Engagement Capability (CEC) significantly improves Battle Force Anti-Air Warfare (AAW) capability by coordinating all Battle Force AAW sensors into a single, real-time, composite track picture to support integrated fire control. CEC distributes sensor data from each USMC Command Control Unit, USA Aerostat, US Navy Ship, and US Navy Aircraft, or cooperating unit (CU), to all other CUs in the battle force through a real-time, line of sight, high data rate sensor and engagement data distribution network. CEC is highly resistant to jamming and provides accurate gridlocking between CUs. Each CU independently employs high capacity, parallel processing and advanced algorithms to combine all distributed sensor data into a fire control quality track picture which is the same for all CUs. CEC data is presented as a superset of the best AAW sensor capabilities from each CU, all of which are integrated into a single input to each CU's combat weapons system. CEC significantly improves our Battle Force defense in depth, including both local area and ship defense capabilities against current and future AAW threats. Moreover, CEC provides critical connectivity and integration of over-land air defense systems capable of countering emerging air threats, including land attack cruise missiles, in a complex littoral environment.

Each military Service funds CEC development for their combat systems. The CEC Program Office oversees CEC development for all services.

CEC consists of the Data Distribution System (DDS), the Cooperative Engagement Processor (CEP), and interface with Combat Systems and sensors. The DDS encodes and distributes own-ship sensor and engagement data and is a high capacity, jam resistant, directive system providing a precision gridlocking and high throughput of data. The CEP is a high capacity distributed processor that processes force levels of data in near real-time. The 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.

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

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

Exhibit R-2, RDT&E Budget Item Justification: PB 2017 Navy	Date: February 2016
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 0603658N *I Cooperative Engagement*

In support of Interoperability, CEC will continue to work collaboratively with other Combat Systems programs (AWS, E-2C, E-2D, SSDS, CDLMS, C2P, and SGS/AC) to develop the software and implement design corrections and system changes. CEC will analyze the interactions of interoperability issues and impacts and provide collaboration for development of CEC and other system changes, develop the long term solutions, including the engineering process to validate small parts of developmental software ideas, and utilize M&S to validate design approaches in the systems engineering realm.

B. Program Change Summary ($ in Millions)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Previous President's Budget	37.310	76.247	81.475	-	81.475
Current President's Budget	41.158	73.786	0.000	-	0.000
Total Adjustments	3.848	-2.461	-81.475	-	-81.475
• Congressional General Reductions	-	-0.007			
• Congressional Directed Reductions	-	-2.454			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	4.500	0.000			
• SBIR/STTR Transfer	-0.652	0.000			
• Program Adjustments	0.000	0.000	-81.475	-	-81.475

Change Summary Explanation

FY 2015 funding is increased by $4.5M for OMNIBUS.
FY 2016 funding is reduced by $2.461M for Program Execution.
FY 2017 funding is increased by $5.9M for CEC Fire Control Loop Improvement Project and by $1.9M for CEC Increment 2.
FY 2017 funding is reduced by $89.275M due to the realignment from Program Element 0603658N to Program Element 0607658N.

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603658N / *Cooperative Engagement*	Project (Number/Name) 2039 / *COOP Engagement*	

COST ($ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
2039: *COOP Engagement*	486.306	41.158	73.786	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	601.250
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

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In support of Interoperability, CEC will continue to work collaboratively with other Combat Systems programs (AWS, E-2C, E-2D, SSDS, CDLMS, C2P, and SGS/AC) to develop the software and implement design corrections and system changes. CEC will analyze the interactions of interoperability issues and impacts and provide collaboration for development of CEC and other system changes. Develop the long term solutions, including the engineering process to validate small parts of developmental software ideas, and utilize M&S to validate design approaches in the systems engineering realm.

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603658N / *Cooperative Engagement*	**Project (Number/Name)** 2039 / *COOP Engagement*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Title: E-2D	0.000	3.500	0.000	0.000	0.000
Articles:	-	-	-	-	-
FY 2015 Accomplishments: N/A					
FY 2016 Plans: Support DSSC 2 CEC flight test and IV&V, and develop and incorporate corrective actions as required to support E-2D CEC DSSC 2 software Product Certification Panel. Support E-2D CEC AMIIP and NIFC-CA Enhancements requirements development, systems engineering, and software development efforts in conjunction with E-2D DSSC 3 software development. Assess impacts of SDP-S -005 development and fielding on E-2D, and conduct related systems engineering.					
FY 2017 Base Plans: N/A					
FY 2017 OCO Plans: N/A					
Title: B/L 2.1 INTEGRATION AND FOT&E TESTING	7.300	8.400	0.000	0.000	0.000
Articles:	-	-	-	-	-
FY 2015 Accomplishments: Completed NIFC-CA Live Fire Test #3 at White Sands Missile Range. Conducted Phase 1 of CEC Operational Test (OT-D1A) of AN/USG-2B with Aegis Baseline 9A on USS CHANCELLORSVILLE (CG 62). Completed Developmental Testing (DT-D1C) of AN/USG-2B with Aegis Baseline 9C on USS JOHN PAUL JONES (DDG 53). Commenced Developmental Test (DT-D2) of AN/USG-2B with CVN 78.					
FY 2016 Plans: Continue support of NIFC-CA testing. Complete CEC Operational Test (OT-D1A) of AN/USG-2B with Aegis Baseline 9A on USS PRINCETON (CG 59). Complete Operational Test (OT-D1C) of AN/USG-2B with Aegis Baseline 9C on USS JOHN PAUL JONES (DDG 53) and USS ARLEIGH BURKE (DDG 51). Continue Developmental Test (DT-D2) of AN/USG-2B with CVN 78. Commence Developmental Test (DT-D3) of AN/USG-2B with DDG 1000.					
FY 2017 Base Plans: N/A					
FY 2017 OCO Plans:					

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603658N / *Cooperative Engagement*	**Project (Number/Name)** 2039 / *COOP Engagement*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
N/A					
Title: SYSTEM IMPROVEMENTS	13.128	8.547	0.000	0.000	0.000
Articles:	-	-	-	-	-
FY 2015 Accomplishments: Continued system improvements at Land Based Test Sites (LBTS) to accurately reflect CEC equipment in the fleet. Continued development of a CEC Adaptive Layer for Advanced Combat Baseline 16 (ACB-16) to include supporting Technical Interchange Meetings (TIM), Modeling and Simulation updates, and initial Wrap Around Simulation Program(WASP) development. Conducted CEC ACB 16 System Functional Review (SFR) and System Requirement Review (SRR). Continued to monitor Cyber/Information Assurance (IA) posture and program protection and began development of IA specific ECP's. Began Common Array Block (CAB) antenna integration efforts. Commenced CVN-78 integration efforts to include land based testing.					
FY 2016 Plans: Significantly ramp up efforts to meet the rigor of the ACB-16 Preliminary Design Review (PDR); deliver CEC to CSEDS with a CEC system supporting the ACB-16 combat system prototype. Coincident with that, integrate with ACB-16's updated sensors, find and resolve trouble reports and conduct associated analysis. Continue integration efforts for CEC with the CVN 78 combat system, including SSDS and the DBR. Continue to support on-ship CEC development and integration efforts with the DDG 1000 TSCE and MFR system. Complete IA focused ECPs and begin fielding across all platforms. Ramp up CAB antenna integration efforts to support Engineering Development Model (EDM) testing.					
FY 2017 Base Plans: N/A					
FY 2017 OCO Plans: N/A					
Title: NETWORK ENABLED ELECTRONIC DEFENSE SYSTEM (NEEDS)	7.331	7.302	0.000	0.000	0.000
Articles:	-	-	-	-	-
FY 2015 Accomplishments: Continued analysis, definition and development of NEEDS capability, system architecture and design, external interface requirements, development of prototype implementation, evaluation of real time processing load, development of WASP capabilities, development of recorded data playback capability, support for TIMs, Interface Control Working Groups (ICWG), and In-Process Reviews (IPR). Conducted Preliminary Design Review (PDR). Refined NEEDS algorithms, and Modeling and Simulation (M&S) capabilities. Developed					

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603658N / *Cooperative Engagement*	**Project (Number/Name)** 2039 / *COOP Engagement*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Technical Performance Measures (TPM) and updated the CEC Critical Test Integration (CTI) notebook. Conducted robust data collect and continued analysis, definition and development of NEEDS capability, system architecture and design, and evaluation of prototype implementation and real-time processing load in Software Integration Laboratory (SIL) environments using recorded real world system data. ***FY 2016 Plans:*** Continue analysis, definition and development of NEEDS capability, system architecture and design, external interface requirements, development of prototype implementation, evaluation of real-time processing load, development of WASP capabilities, and development of recorded data playback capability, and support for TIMs, Interface Control Working Groups (ICWG) and In-Process Reviews (IPR). Conduct Critical Design Review (CDR). Begin iterative Code Unit and Test (CUT) software development process. Continue to collect real-world data in Software Integration Laboratory (SIL) to refine initial NEEDS Software Module and update M&S capabilities. Continue to refine Technical Performance Measures (TPM) and CEC Critical Test Integration (CTI) Notebook. ***FY 2017 Base Plans:*** N/A ***FY 2017 OCO Plans:*** N/A					
Title: FIELD ACTIVITIES	6.324	7.409	0.000	0.000	0.000
Articles:	-	-	-	-	-
FY 2015 Accomplishments: Continued Field activity support of CEC development and fielding efforts, (including SE/IA, Technical Direction Agent, In-Service Engineering, Integrated Logistics Support planning) and program management support. ***FY 2016 Plans:*** Continue field activity support of CEC development and fielding efforts (including SE/IA, Technical Direction Agent, In-Service Engineering, Integrated Logistics Support planning) and program management support. Support ongoing Common Array Block (CAB) Antenna development effort by providing close coordination with shipyards to refine the CAB Antenna fielding plan for both forward-fit and backfit platforms. Participate in discussions to identify and resolve CEC training systems limitations for pier-side Fleet Synthetic Training (FST) events and ensure appropriate CEC configuration after each event. ***FY 2017 Base Plans:***					

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603658N / *Cooperative Engagement*	**Project (Number/Name)** 2039 / *COOP Engagement*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
N/A ***FY 2017 OCO Plans:*** N/A					
Title: LINK 16/INTEROPERABILITY ***Articles:*** ***FY 2015 Accomplishments:*** Continued development of Far Term Interoperability Improvement Project (FTIIP) approach. ***FY 2016 Plans:*** Commence development of Far Term Interoperability Improvement Project (FTIIP) software. Coordinate Development and Integration requirements across all FTIIP programs. Commence integration of FTIIP software. ***FY 2017 Base Plans:*** N/A ***FY 2017 OCO Plans:*** N/A	0.800 -	5.200 -	0.000 -	0.000 -	0.000 -
Title: COMMON ARRAY BLOCK (CAB) ANTENNA ***Articles:*** ***FY 2015 Accomplishments:*** Conducted Preliminary Design Review (PDR) and began development and testing of Engineering Design Model (EDM) CAB-Ship and CAB-Expeditionary antenna systems to inform system trades, refine system models, optimize thermal capacities, and refined path for final design. ***FY 2016 Plans:*** Conduct Critical Design Review (CDR) and commence build and test of EDMs of the CAB-Ship antenna. ***FY 2017 Base Plans:*** N/A ***FY 2017 OCO Plans:*** N/A	6.275 -	15.109 -	0.000 -	0.000 -	0.000 -
Title: NAVAL INTEGRATED FIRE CONTROL-COUNTER AIR (NIFC-CA) ***Articles:*** ***FY 2015 Accomplishments:***	0.000 -	2.457 -	0.000 -	0.000 -	0.000 -

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603658N / *Cooperative Engagement*	**Project (Number/Name)** 2039 / *COOP Engagement*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
N/A ***FY 2016 Plans:*** Support NIFC CA Increment 1 refinement against increasingly challenging test cases at White Sands Missile Range (WSMR) and At-Sea with test support, model updates, post-analysis, and software updates. Also begin development of NIFC CA Increment 2 capability with Interface Design Description (IDD) refinement, model updates and development of initial software loads for test at WSMR. Conduct System Functional Review (SFR) and System Requirement Review (SRR). ***FY 2017 Base Plans:*** N/A ***FY 2017 OCO Plans:*** N/A					
Title: AIR AND MISSILE DEFENSE RADAR (AMDR) ***Articles:*** ***FY 2015 Accomplishments:*** N/A ***FY 2016 Plans:*** Begin robust AMDR Adaptive Layer development, Wrap Around Simulation Program (WASP) development and WASP certification process. Develop CEC AMDR Interface Design Description (IDD). Develop Cooperative Engagement Processor (CEP) Kernel changes and software updates. Assist in development of DT & OT plans. Provide Information Assurance assessment of new CEP interfaces. Support AMDR Joint Test Review (JTR). Develop and deliver initial CEC Sensor Adaptive Layers for all AMDR functions (Surface, Air, etc.). Conduct Trade Studies to determine the DDG-51 Flt III destroyer effort in support of AMDR integration. Install and Check Out AMDR Adaptive Layer Stand Alone CEP (SACEP), remote SACEP, and WASP at the Naval Systems Computing Center (NSCC) in Moorestown, NJ in support of Aegis Combat System Interface Support Equipment (CS ISE) development. ***FY 2017 Base Plans:*** N/A ***FY 2017 OCO Plans:*** N/A	0.000 -	8.762 -	0.000 -	0.000 -	0.000 -
Title: FIRE CONTROL LOOP IMPROVEMENT INITIATIVE (FCLIP) PHASE 2	0.000	7.100	0.000	0.000	0.000

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603658N / *Cooperative Engagement*	**Project (Number/Name)** 2039 / *COOP Engagement*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Articles:	-	-	-	-	-
FY 2015 Accomplishments: N/A					
FY 2016 Plans: Commence development efforts for Fire Control Loop Improvement Project (FCLIP) phase 2. Coordinate FCLIP improvements with host combat system and other combat system elements. Integrate the updated FCLIP software to accomplish improved air object tracking, to include new interface to Close In Weapon System (CIWS) Sensor and updated interface to the SPQ-9B radar system.					
FY 2017 Base Plans: N/A					
FY 2017 OCO Plans: N/A					
Accomplishments/Planned Programs Subtotals	41.158	73.786	0.000	0.000	0.000

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
• SCN: *Navy, SCN*	11.200	34.100	17.700	-	17.700	31.300	18.100	12.500	12.700	64.000	504.431
• APN/0204152N: *Navy, APN*	15.986	16.280	19.914	-	19.914	16.925	10.358	10.565	10.776	57.200	375.987
• OPN/2606: *CEC*	33.939	25.695	22.034	-	22.034	34.401	32.066	32.047	31.863	66.525	1,035.295
• RDT&E/0206313M: *USMC*	0.752	0.762	3.487	-	3.487	2.092	1.255	0.752	0.730	0.000	31.700
• RDT&E/0206335M: *USMC*	0.603	0.315	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	2.352
• O&M,N/0206626M: *USMC*	3.508	1.396	3.254	-	3.254	3.157	3.062	2.970	2.881	0.000	25.775
• PMC/0206313M: *USMC*	1.924	6.266	6.480	-	6.480	8.070	3.500	3.550	0.000	0.000	30.570
• OPN/0960: *CG/MOD*	21.900	0.000	0.000	-	0.000	0.000	0.000	0.000	6.200	0.000	59.737
• OPN/0900: *DDG/MOD*	5.000	2.400	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	63.911

Remarks

D. Acquisition Strategy

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

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603658N / *Cooperative Engagement*	**Project (Number/Name)** 2039 / *COOP Engagement*

Contracts:
Common Array Block (CAB) antenna - contract competitively awarded 4Qtr FY2013.
CEC Design Agent/Engineering Services (DA/ES) follow-on sole source contract awarded 4Qtr FY2013.
CEC Production - New contract competitively awarded in 2Qtr FY2015.
CEC DA/ES contract will be competitively awarded 1Qtr FY2019.

E. Performance Metrics

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

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603658N / *Cooperative Engagement*	Project (Number/Name) 2039 / *COOP Engagement*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
AN/USG-2/3 Design Agent/Engineering Services	C/CPFF	Raytheon : St. Petersburg, FL	110.049	10.863	Feb 2015	6.483	Feb 2016	0.000		-		0.000	0.000	127.395	-
TDA	C/CPFF	JHU/APL : Laurel, MD	64.877	6.522	Feb 2015	6.751	Feb 2016	0.000		-		0.000	0.000	78.150	-
SI/DA	C/CPAF	General Dynamics : Fairfax, VA	23.979	0.000		0.000		0.000		-		0.000	0.000	23.979	-
SI/DA	C/CPAF	Award Fees : Not Specified	2.903	0.000		0.000		0.000		-		0.000	0.000	2.903	-
DDG 1000	C/CPAF	Raytheon : Massachusetts	10.983	0.000		0.000		0.000		-		0.000	0.000	10.983	-
DDG 1000	C/CPAF	Award Fees : Not Specified	0.447	0.000		0.000		0.000		-		0.000	0.000	0.447	-
NIFC-CA Integration	TBD	Various : Not Specified	39.342	0.000		2.457	Jan 2016	0.000		-		0.000	0.000	41.799	-
In-Service Engineering Activity	WR	NSWC : Port Hueneme, CA	3.790	0.848	Nov 2014	1.825	Dec 2015	0.000		-		0.000	0.000	6.463	-
Software Support Activity/ SEIA	WR	NSWC : Dahlgren, VA	16.542	1.019	Nov 2014	2.157	Dec 2015	0.000		-		0.000	0.000	19.718	-
Production Engineering Activity	WR	NSWC : Crane, IN	5.694	0.000		0.000		0.000		-		0.000	0.000	5.694	-
JTRS	TBD	Various : Not Specified	8.500	0.000		0.000		0.000		-		0.000	0.000	8.500	-
Various	TBD	Miscellaneous : Not Specified	29.133	0.000		2.740	Dec 2015	0.000		-		0.000	0.000	31.873	-
NAVSSI	WR	SPAWAR : San Diego, CA	0.368	0.000		0.000		0.000		-		0.000	0.000	0.368	-
Certification	MIPR	NSA : Fort Meade, MD	1.200	0.000		0.000		0.000		-		0.000	0.000	1.200	-
Certification	WR	SPAWAR : Charleston, SC	0.930	0.000		0.000		0.000		-		0.000	0.000	0.930	-
Joint Exercises	WR	Various : Not Specified	3.744	0.000		0.000		0.000		-		0.000	0.000	3.744	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603658N / *Cooperative Engagement*	Project (Number/Name) 2039 / *COOP Engagement*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
LBTS Testing	WR	CDSA Damneck : Virginia Beach, VA	6.495	0.500	Nov 2014	0.500	Dec 2015	0.000		-		0.000	0.000	7.495	-
LBTS Testing	WR	SCSC : Wallops Island, VA	5.883	0.500	Jan 2015	0.700	Jan 2016	0.000		-		0.000	0.000	7.083	-
E-2D Integration	TBD	Various : Not Specified	44.258	0.000		3.500	Dec 2015	0.000		-		0.000	0.000	47.758	-
MSI/NCCT	MIPR	Wright Patterson AFB : Dayton, OH	1.228	0.000		0.000		0.000		-		0.000	0.000	1.228	-
Common Array Block Development	C/CPFF	Various : Not Specified	19.177	6.275	Jan 2015	15.109	Jan 2016	0.000		-		0.000	0.000	40.561	-
NEEDS	C/CPFF	Various : Not Specified	17.297	7.331	Feb 2015	7.302	Feb 2016	0.000		-		0.000	0.000	31.930	-
AMDR	C/CPFF	Various : Not Specified	3.250	0.000		8.762	Feb 2016	0.000		-		0.000	0.000	12.012	-
JTMC	C/CPFF	Raytheon : St. Petersburg, FL	1.000	0.000		0.000		0.000		-		0.000	0.000	1.000	-
FCLIP	C/CPFF	Various : Not Specified	0.000	0.000		7.100	Feb 2016	0.000		-		0.000	0.000	7.100	-
		Subtotal	421.069	33.858		65.386		0.000		-		0.000	0.000	520.313	-

Remarks

Explanations for the use of "WR and Reqn" 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.
- E-2D Integration/NIFC-CA "Various/TBDs" are for classified programs and several document types.

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Test/ACB Support	C/CPFF	Raytheon : St. Petersburg, FL	3.468	0.630	Feb 2015	1.016	Feb 2016	0.000		-		0.000	0.000	5.114	-
Test/ACB Support	C/CPFF	JHU/APL : Laurel, MD	1.030	0.630	Feb 2015	1.016	Feb 2016	0.000		-		0.000	0.000	2.676	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603658N / *Cooperative Engagement*	Project (Number/Name) 2039 / *COOP Engagement*	

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Test Support	WR	NRL : Washington, DC	0.313	0.000		0.000		0.000		-		0.000	0.000	0.313	-
Test/ACB Support	WR	NSWC : Port Hueneme, CA	20.541	2.050	Feb 2015	1.795	Feb 2016	0.000		-		0.000	0.000	24.386	-
Air Operations Test Support	WR	NAVAIR (PMA207) : Patuxent River, MD	8.637	0.525	Feb 2015	1.025	Feb 2016	0.000		-		0.000	0.000	10.187	-
Test Data Reduction Analysis	WR	NWAS : Corona, CA	14.329	1.732	Feb 2015	1.873	Feb 2016	0.000		-		0.000	0.000	17.934	-
Test Support	WR	COMOPTEVFOR : Norfolk, VA	10.051	1.405	Feb 2015	1.151	Feb 2016	0.000		-		0.000	0.000	12.607	-
Test/ACB Support	WR	NSWC : Dahlgren, VA	1.438	0.328	Feb 2015	0.524	Feb 2016	0.000		-		0.000	0.000	2.290	-
		Subtotal	59.807	7.300		8.400		0.000		-		0.000	0.000	75.507	-

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.

Test support also includes the following funding for ACB integration support:
FY14 - $3.0M

Management Services ($ in Millions)

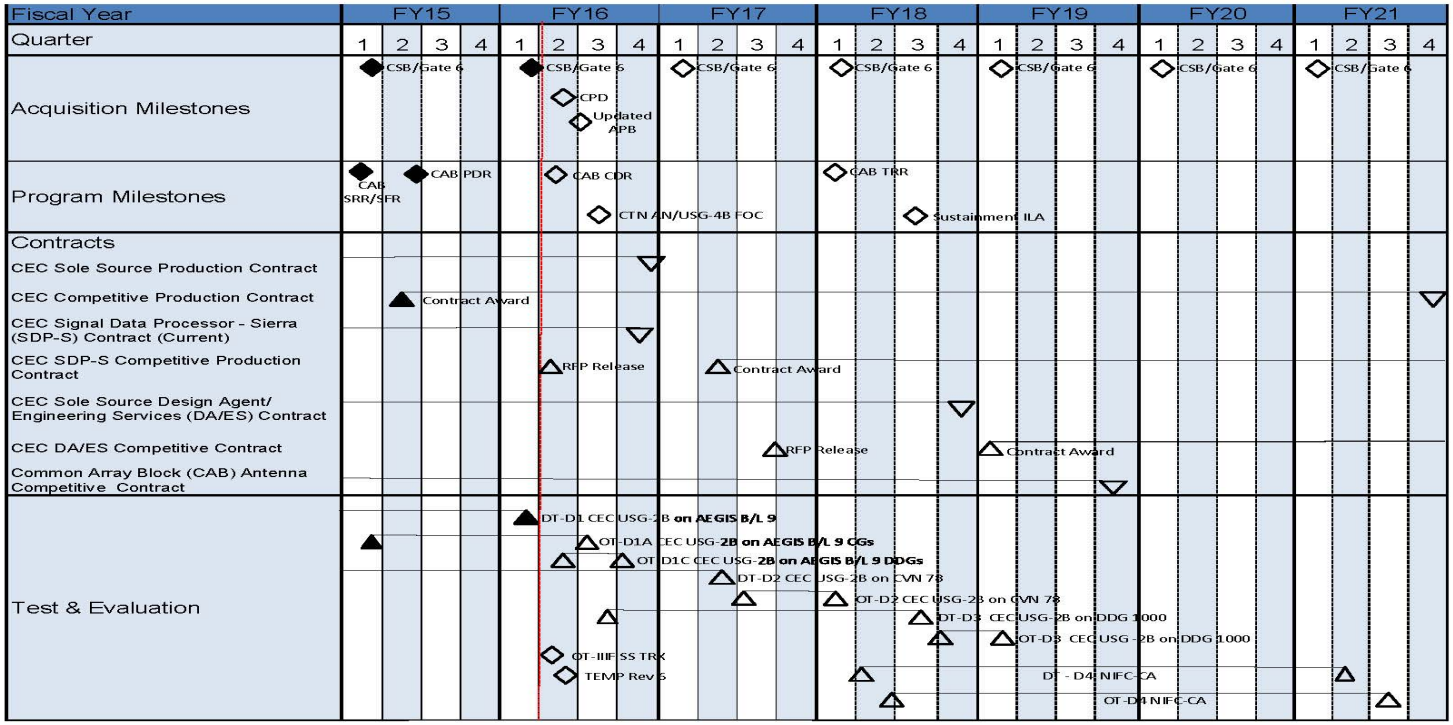
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Support	C/FFP	Booz Allen & Hamilton : Washington, DC	5.070	0.000		0.000		0.000		-		0.000	0.000	5.070	-
Program Management Support	C/FFP	Tech Marine Business : Washington, DC	0.360	0.000		0.000		0.000		-		0.000	0.000	0.360	-
		Subtotal	5.430	0.000		0.000		0.000		-		0.000	0.000	5.430	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603658N / *Cooperative Engagement*	Project (Number/Name) 2039 / *COOP Engagement*	

	Prior Years	FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	486.306	41.158		73.786		0.000		-		0.000	0.000	601.250	-

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603658N / *Cooperative Engagement*	**Project (Number/Name)** 2039 / *COOP Engagement*



Copy of CEC Program Congressional Schedule_05 January 2016

Exhibit R-4A, RDT&E Schedule Details: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603658N / *Cooperative Engagement*	**Project (Number/Name)** 2039 / *COOP Engagement*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 2039				
FY15 CSB/Gate 6	1	2015	1	2015
FY16 CSB/Gate 6	1	2016	1	2016
FY17 CSB/Gate 6	1	2017	1	2017
FY18 CSB/Gate 6	1	2018	1	2018
FY19 CSB/Gate 6	1	2019	1	2019
FY20 CSB/Gate 6	1	2020	1	2020
FY21 CSB/Gate 6	1	2021	1	2021
CPD	2	2016	2	2016
Updated APB	3	2016	3	2016
CAB SRR/SFR	1	2015	1	2015
CAB PDR	2	2015	2	2015
CAB CDR	2	2016	2	2016
CAB TRR	1	2018	1	2018
Sustainment ILA	3	2018	3	2018
CTN AN/USG-4B FOC	3	2016	3	2016
CEC Sole Source Production Contract	1	2015	4	2016
CEC Competitive Production Contract	2	2015	4	2021
CEC SDP-S Competitive Production Contract	2	2017	4	2021
CEC Design Agent/Engineering Services (DA/ES) Contract	1	2015	4	2018
CEC DA/ES Competitive Contract	1	2019	4	2021
DT-D1 CEC USG-2B on AEGIS B/L 9	1	2015	1	2016
OT-D1A CEC USG-2B on AEGIS B/L 9 CGs	1	2015	3	2016

Exhibit R-4A, RDT&E Schedule Details: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603658N / *Cooperative Engagement*	**Project (Number/Name)** 2039 / *COOP Engagement*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
OT-D1C CEC USG-2B on AEGIS B/L 9 DDGs	2	2016	4	2016
DT-D2 CEC USG-2B on CVN 78	1	2015	2	2017
OT-D2 CEC USG-2B on CVN 78	3	2017	1	2018
DT-D3 CEC USG-2B on DDG 1000	3	2016	3	2018
OT-D3 CEC USG-2B on DDG 1000	4	2018	1	2019
OT-IIIF SS TRX	2	2016	2	2016
TEMP Rev 6	2	2016	2	2016
DT-D4 NIFC-CA	2	2018	2	2021
OT-D4 NIFC-CA	2	2018	3	2021
CEC SDP-S Contract	1	2015	4	2016
Common Array Block (CAB) Contract	1	2015	4	2019
SDP-S RFP Release	2	2016	2	2016
DA/ES RFP Release	4	2017	4	2017

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Exhibit R-2, RDT&E Budget Item Justification: PB 2017 Navy	Date: February 2016
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 0603713N *I Ocean Engineering Tech Dev*

COST ($ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
Total Program Element	115.542	6.126	4.520	4.556	-	4.556	6.455	6.061	5.769	5.890	Continuing	Continuing
0099: *Deep Submergence Bio Med Dev*	28.649	2.157	4.000	3.603	-	3.603	4.697	4.630	4.507	4.601	Continuing	Continuing
0394: *Shallow Depth Diving EQ*	86.893	3.969	0.520	0.953	-	0.953	1.758	1.431	1.262	1.289	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, underwater ship husbandry, 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 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Previous President's Budget	6.264	4.520	5.946	-	5.946
Current President's Budget	6.126	4.520	4.556	-	4.556
Total Adjustments	-0.138	0.000	-1.390	-	-1.390
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.137	0.000			
• Program Adjustments	0.000	0.000	-1.265	-	-1.265
• Rate/Misc Adjustments	-0.001	0.000	-0.125	-	-0.125

Change Summary Explanation

Decrease in Ocean Engineering Tech Dev RDTE,N by $209K as required for the Department of the Navy to comply with the Bipartisan Budget Act of 2015.

The FY 2017 funding request was reduced by $1.056 million to account for the availability of prior years execution balance.

FY 2015 was reduced due to Submarine Rescue System program delay.

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603713N / *Ocean Engineering Tech Dev*	Project (Number/Name) 0099 / *Deep Submergence Bio Med Dev*	

COST ($ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
0099: *Deep Submergence Bio Med Dev*	28.649	2.157	4.000	3.603	-	3.603	4.697	4.630	4.507	4.601	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

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, enhanced underwater swimming efficiency, enhanced diver thermal protection, and real-time decompression guidance.
Requirements: NAPDD #587-873, Deep Submergence Biomedical Development, 23 November 1999.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Title: Deep Submergence Bio Med Dev - Diver Health and Safety	1.079	2.000	1.802	0.000	1.802
Articles:	-	-	-	-	-
Description: 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. Investigation of diver in-water maladies, develop/improve real-time decompression guidance and dive planning.					

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603713N / *Ocean Engineering Tech Dev*	**Project (Number/Name)** 0099 / *Deep Submergence Bio Med Dev*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
FY 2015 Accomplishments: Breathing cheaper nitrox (oxygen/nitrogen) breathing mixtures was found to be as good as or better than expensive trimix (oxygen/helium/nitrogen) in preventing decompression sickness in diver bounce for dives tested. Developed probabilistic decompression algorithm models and decompression tables, pulmonary oxygen toxicity model recovery model, Preliminary physiological collected and information provided for divers performing multiple long-duration dives, and on the effects of breathing resistance (due to diving apparatus) and carbon dioxide with underwater exercise. Tools developed for measuring heat loss through different parts of body in divers in cold water. Multi-year projects are ongoing. ***FY 2016 Plans:*** Complete above projects. Initiate scientific and operational studies of enhanced diver communications and hearing protection, cognitive and performance effects of diver CO2 levels, direct contribution of oxygen to decompression stress, identification of decompression sickness biomarkers, development of optimal heat distribution for cold water diving, mitigation of performance decrements from long oxygen diving. ***FY 2017 Base Plans:*** Continue multi-year projects and investigations into decompression modeling/guidance/tables; reducing risks of Central Nervous System (CNS) and pulmonary oxygen toxicity; developing strategies for enhancing diver performance and reducing injury risks under varying conditions of carbon dioxide, oxygen, temperature, breathing resistance, hydration, and workload; and investigate new modalities in the diagnosis and treatment of decompression sickness and arterial gas embolism. Investigate medical aspects of diving at altitude. ***FY 2017 OCO Plans:*** N/A					
Title: Deep Submergence Bio Med Dev - Submarine Rescue	1.078	2.000	1.801	0.000	1.801
Articles:	-	-	-	-	-
Description: 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					

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603713N / *Ocean Engineering Tech Dev*	**Project (Number/Name)** 0099 / *Deep Submergence Bio Med Dev*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
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. ***FY 2015 Accomplishments:*** Certain drugs appear potentially useful for decreasing the Central Nervous System (CNS) oxygen toxicity and pulmonary oxygen toxicity in animals for certain dives. Magnitude of effect in people is unknown, so there's no magic pill available at this time. Multiyear studies are ongoing. ***FY 2016 Plans:*** Complete Saturation drop out predictions for decompression sickness (DCS). Initiate scientific studies of Titotropium inhaler use to reduce pulmonary oxygen toxicity in DISSUB survivors, and executive decision performance decrements in chronic and acute exposures of submariners to very mild elevations of CO2. ***FY 2017 Base Plans:*** Continue multi-year projects and investigations into optimizing the prevention of decompression sickness, oxygen toxicity, and other medical problems in rescues and rescuers (tenders/attendants) during pressurized submarine rescue operations and training. Investigate biomedical modalities to reduce DCS, Arterial Gas Embolism (AGE) and other injury for escape/rescue from a pressurized disabled submarine at depths too shallow for safe mating with the SRDRS rescue vehicle. ***FY 2017 OCO Plans:*** N/A					
Accomplishments/Planned Programs Subtotals	2.157	4.000	3.603	0.000	3.603

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

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 Undersea Medical Officer. Contracting by competitive process using BAA and leveraging ONR capabilities.

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603713N / *Ocean Engineering Tech Dev*	**Project (Number/Name)** 0099 / *Deep Submergence Bio Med Dev*

E. Performance Metrics

Quarterly Program Reviews

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603713N / *Ocean Engineering Tech Dev*	Project (Number/Name) 0099 / *Deep Submergence Bio Med Dev*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Diving Equipment Product Development	C/CPAF	Phoenix International : Largo, MD	0.738	0.000		0.000		0.000		-		0.000	0.000	0.738	-
Diving Equipment Product Development	WR	Various : Various	0.600	0.000		0.000		0.000		-		0.000	0.000	0.600	-
		Subtotal	1.338	0.000		0.000		0.000		-		0.000	0.000	1.338	-

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Development Test & Evaluation	WR	NEDU : Panama City, FL	18.691	1.069	Jun 2015	1.117	Nov 2015	1.132	Nov 2016	-		1.132	Continuing	Continuing	Continuing
Development Test & Evaluation	WR	NMRC : Silver Spring, MD	7.004	0.415	Mar 2015	0.296	Nov 2015	0.100	Nov 2016	-		0.100	Continuing	Continuing	Continuing
Development Test & Evaluation	Various	DUKE UNIV : Durham, NC	0.538	0.174	Nov 2014	1.070	Jul 2016	1.045	Jul 2017	-		1.045	0.000	2.827	-
Development Test & Evaluation	WR	NIST : Gaithersburg, MD	0.040	0.000		0.000		0.000		-		0.000	0.000	0.040	-
Development Test & Evaluation	C/CPAF	GPC : Irvine, CA	0.200	0.000		0.000		0.000		-		0.000	0.000	0.200	-
Development Test & Evaluation	C/CPFF	ROH : Arlington, VA	0.030	0.022	Jun 2015	0.000		0.000		-		0.000	0.000	0.052	-
Development Test & Evaluation	TBD	TBD : Not Specified	0.000	0.000		1.123	Mar 2016	0.914	Mar 2017	-		0.914	0.000	2.037	-
Development Test & Evaluation	C/CPFF	Unknown : Not Specified	0.000	0.000		0.022	Mar 2016	0.022	Nov 2016	-		0.022	0.000	0.044	-
Development Test & Evaluation	C/FFP	WISCONSIN : Madison, WI	0.000	0.200	Oct 2015	0.000		0.000		-		0.000	0.000	0.200	-
Development Test & Evaluation	C/FFP	SUNY : Buffalo, NY	0.000	0.134	Apr 2015	0.312	Apr 2016	0.290	Apr 2017	-		0.290	0.000	0.736	-
		Subtotal	26.503	2.014		3.940		3.503		-		3.503	-	-	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603713N / *Ocean Engineering Tech Dev*	Project (Number/Name) 0099 / *Deep Submergence Bio Med Dev*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Support	Various	NEDU : Panama City	0.229	0.000		0.000		0.000		-		0.000	0.000	0.229	-
Travel	Various	Various : Various	0.381	0.070	Oct 2014	0.010	Oct 2015	0.050	Oct 2016	-		0.050	Continuing	Continuing	Continuing
*SBIR Assessment	Various	Various : Various	0.182	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Acquisition Workforce	Various	Various : Various	0.016	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Program Management Support	WR	NSWC : Carderock, MD	0.000	0.063	Apr 2015	0.000		0.000		-		0.000	0.000	0.063	-
Program Management Support	WR	FISC : Yorktown, VA	0.000	0.010	Oct 2015	0.000		0.000		-		0.000	0.000	0.010	-
Program Management Support	C/CPFF	Unknown: Not Specified : Not Specified	0.000	0.000		0.050	Jun 2016	0.050	Nov 2016	-		0.050	0.000	0.100	-
		Subtotal	0.808	0.143		0.060		0.100		-		0.100	-	-	-

	Prior Years	FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	28.649	2.157		4.000		3.603		-		3.603	-	-	-

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603713N / *Ocean Engineering Tech Dev*	**Project (Number/Name)** 0099 / *Deep Submergence Bio Med Dev*

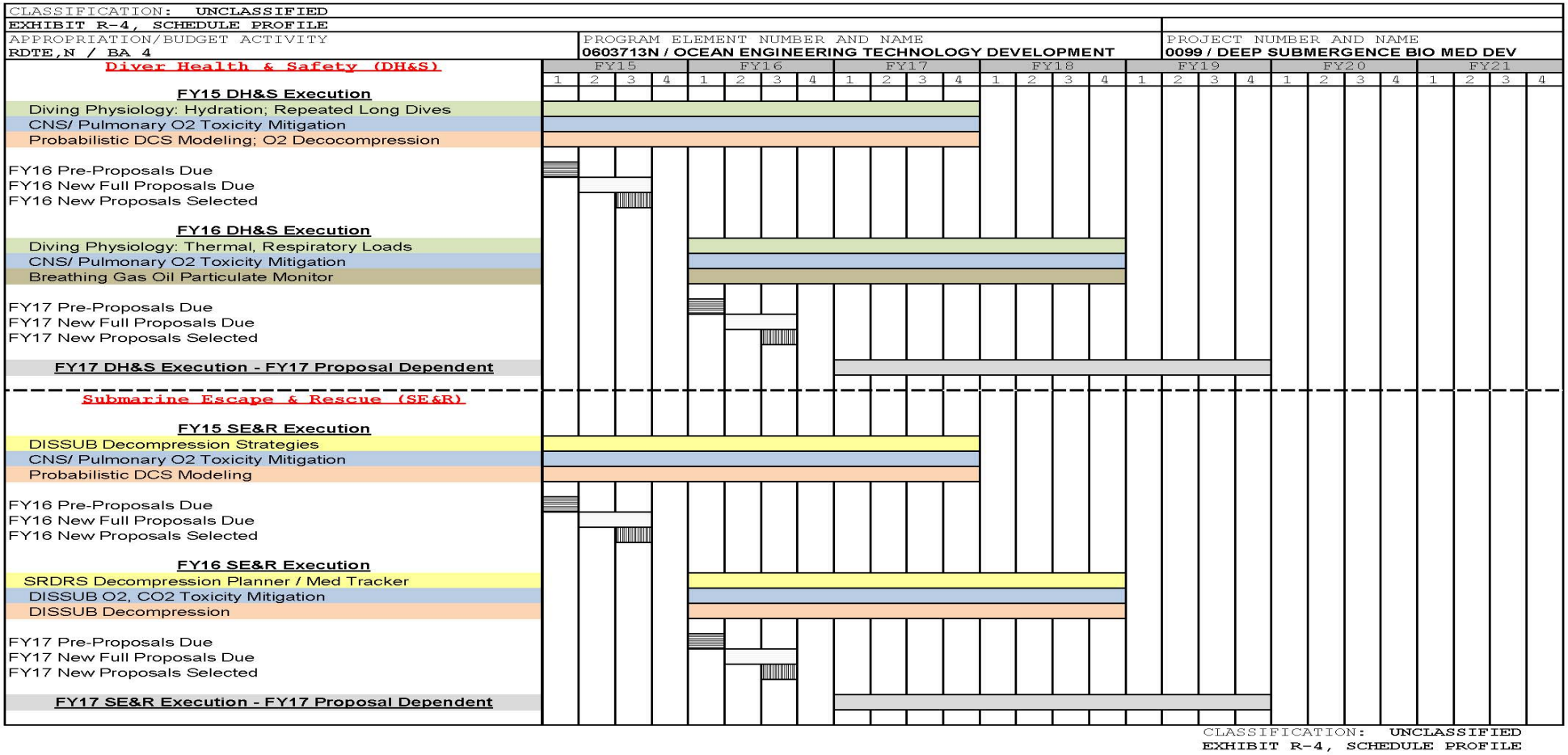

Exhibit R-4A, RDT&E Schedule Details: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603713N / *Ocean Engineering Tech Dev*	**Project (Number/Name)** 0099 / *Deep Submergence Bio Med Dev*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 0099				
Diver Health & Safety (DH&S): FY15 DH&S Execution: Diving Physiology: Hydration; Repeated Long Dives	1	2015	4	2017
Diver Health & Safety (DH&S): FY15 DH&S Execution: CNS/ Pulmonary O2 Toxicity Mitigation	1	2015	4	2017
Diver Health & Safety (DH&S): FY15 DH&S Execution: Probabilistic DCS Modeling; O2 Decocompression	1	2015	4	2017
Diver Health & Safety (DH&S): FY16 Pre-Proposals Due	1	2015	1	2015
Diver Health & Safety (DH&S): FY16 New Full Proposals Due	2	2015	3	2015
Diver Health & Safety (DH&S): FY16 New Proposals Selected	3	2015	3	2015
Diver Health & Safety (DH&S): 'FY16 DH&S Execution: Diving Physiology: Thermal, Respiratory Loads	1	2016	4	2018
Diver Health & Safety (DH&S): 'FY16 DH&S Execution: CNS/ Pulmonary O2 Toxicity Mitigation	1	2016	4	2018
Diver Health & Safety (DH&S): 'FY16 DH&S Execution: Breathing Gas Oil Particulate Monitor	1	2016	4	2018
Diver Health & Safety (DH&S): FY17 Pre-Proposals Due	1	2016	1	2016
Diver Health & Safety (DH&S): FY17 New Full Proposals Due	2	2016	3	2016
Diver Health & Safety (DH&S): FY17 New Proposals Selected	3	2016	3	2016
Diver Health & Safety (DH&S): FY17 DH&S Execution: FY17 Proposal Dependent	1	2017	4	2019
Submarine Escape & Rescue (SE&R): FY15 SE&R Execution: DISSUB Decompression Strategies	1	2015	4	2017
Submarine Escape & Rescue (SE&R): FY15 SE&R Execution: CNS/ Pulmonary O2 Toxicity Mitigation	1	2015	4	2017

Exhibit R-4A, RDT&E Schedule Details: PB 2017 Navy		Date: February 2016
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	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Submarine Escape & Rescue (SE&R): FY15 SE&R Execution: Probabilistic DCS Modeling	1	2015	4	2017
Submarine Escape & Rescue (SE&R): FY16 Pre-Proposals Due	1	2015	1	2015
Submarine Escape & Rescue (SE&R): FY16 New Full Proposals Due	2	2015	3	2015
Submarine Escape & Rescue (SE&R): FY16 New Proposals Selected	3	2015	3	2015
Submarine Escape & Rescue (SE&R): FY16 SE&R Execution: SRDRS Decompression Planner / Med Tracker	1	2016	4	2018
Submarine Escape & Rescue (SE&R): FY16 SE&R Execution: DISSUB O2, CO2 Toxicity Mitigation	1	2016	4	2018
Submarine Escape & Rescue (SE&R): FY16 SE&R Execution: DISSUB Decompression	1	2016	4	2018
Submarine Escape & Rescue (SE&R): FY17 Pre-Proposals Due	1	2016	1	2016
Submarine Escape & Rescue (SE&R): FY17 New Full Proposals Due	2	2016	3	2016
Submarine Escape & Rescue (SE&R): FY17 New Proposals Selected	3	2016	3	2016
Submarine Escape & Rescue (SE&R): FY17 SE&R Execution: FY17 Proposal Dependent	1	2017	4	2019

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603713N / *Ocean Engineering Tech Dev*	Project (Number/Name) 0394 / *Shallow Depth Diving EQ*	

COST ($ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
0394: *Shallow Depth Diving EQ*	86.893	3.969	0.520	0.953	-	0.953	1.758	1.431	1.262	1.289	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Submarine Rescue managed under PMS 391. Efforts through FY15 focus 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 a manned system that provides intervention system capability. To reduce operational risk, an initiative is in process to transition from AUWS to an unmanned Remote Operated Vehicle (ROV). Intervention assets support 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. The Submarine Rescue System-Submarine Decompression System (SRS-SDS) Initial Operational Capability (IOC) and SRDRS Full Operational Capability (FOC) have been delayed due to efforts associated with Pressurized Rescue Module (PRM) restoration to service. The SRDRS will provide a global rapid response capability to support submarine rescue missions with an increase in capability.

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. R&D will be performed in the areas of contaminated water diving, diver thermal protection, and diver sound protection.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Title: Shallow Depth Diving EQ - SRDRS	2.651	0.000	0.000	0.000	0.000
Articles:	-	-	-	-	-
Description: Continue acceptance testing of the prototype Submarine Decompression System and support equipment. Continue integration and testing of all SRDRS components.					
FY 2015 Accomplishments: Plan to continue design/development/fabrication of Pressurized Rescue Module System 6 atmospheres absolute (ata) efforts.					

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603713N / *Ocean Engineering Tech Dev*	**Project (Number/Name)** 0394 / *Shallow Depth Diving EQ*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Plan to continue developmental testing and development of Operating Procedures, Emergency Procedures, and Test Procedures in support of future evolutions including Unmanned Testing, Manned Testing and Sea Trials. Continue Post Delivery Element Shakedown efforts. ***FY 2016 Plans:*** N/A ***FY 2017 Base Plans:*** N/A ***FY 2017 OCO Plans:*** N/A					
Title: Shallow Depth Diving EQ - Diving ***Articles:*** ***Description:*** Continued research on contaminated water diving and research on diver thermal protection, CO2 monitors, and diver sound protection. ***FY 2015 Accomplishments:*** Start development of a double-lock flexible recompression chamber. Complete testing of production models of the free diver heating system (FDHS). Conduct testing of portable air monitor devices. ***FY 2016 Plans:*** Continue development work on a double lock flexible recompression chamber. ***FY 2017 Base Plans:*** Continue development of a double lock flexible recompression chamber. ***FY 2017 OCO Plans:*** N/A	1.318 -	0.520 -	0.953 -	0.000 -	0.953 -
Accomplishments/Planned Programs Subtotals	3.969	0.520	0.953	0.000	0.953

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603713N / *Ocean Engineering Tech Dev*	**Project (Number/Name)** 0394 / *Shallow Depth Diving EQ*

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 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603713N / *Ocean Engineering Tech Dev*	Project (Number/Name) 0394 / *Shallow Depth Diving EQ*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total 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	-
PRMS	C/FFP	Oceanworks : Ontario, Canada	4.150	0.000		0.000		0.000		-		0.000	0.000	4.150	-
Systems Engineering - Design, Integration	C/CPAF	Oceaneering : Hanover, MD	22.301	1.257	Oct 2014	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Systems Engineering - Technical	Various	Various : Various	0.537	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Systems Engineering - Design, Integration	C/CPAF	Oceaneering : Hanover, MD	6.391	0.356	Mar 2015	0.000		0.000		-		0.000	0.000	6.747	-
Systems Engineering - Design, Integration	C/CPAF	Oceaneering : Hanover, MD	2.873	0.307	Aug 2015	0.000		0.000		-		0.000	0.000	3.180	-
Systems Engineering - Design & Integration	C/CPAF	Oceaneering : Hanover, MD	1.897	0.000		0.000		0.000		-		0.000	0.000	1.897	-
Diving Equipment Product Development (00C)	Various	Various : Various	2.053	0.569	Jun 2015	0.000		0.553	Jan 2017	-		0.553	0.000	3.175	-
Diving Equipment Product Development (00C)	C/CPFF	GPC : Irvine, CA	1.002	0.363	Aug 2015	0.000		0.000		-		0.000	0.000	1.365	-
Diving Equipment Product Development (00C)	C/CPFF	PCCI : Alexandria, VA	0.000	0.329	Dec 2014	0.452	May 2016	0.300	Jan 2017	-		0.300	0.000	1.081	-
Diving Equipment Product Development (00C)	C/CPFF	RINI TECHOLOGIES : Oviedo, FL	0.000	0.000		0.000		0.000		-		0.000	0.000	0.000	-
		Subtotal	65.028	3.181		0.452		0.853		-		0.853	-	-	-

Remarks

1. Oceaneering is the prime for SRDRS Transfer Under Pressure (TUP) capability. SRDRS Full Operational Capability (FOC) has been delayed due to efforts associated with Pressurized Rescue Module (PRM) restoration to service; FY15 funding decrease is due to program delays.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603713N / *Ocean Engineering Tech Dev*	Project (Number/Name) 0394 / *Shallow Depth Diving EQ*	

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Development Support (00C)	Various	Various : Various	4.806	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Integrated Logistics Support	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
		Subtotal	6.136	0.000		0.000		0.000		-		0.000	-	-	-

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation	Various	Various : Various	3.187	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Operational Test & Evaluation	WR	COMOPTEVFOR : Norfolk, VA	0.899	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Test Baseline Documentation	WR	NUWC Keyport : Keyport, WA	0.032	0.000		0.000		0.000		-		0.000	0.000	0.032	-
		Subtotal	4.118	0.000		0.000		0.000		-		0.000	-	-	-

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Contractor Engineering Support	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	2.197	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603713N / *Ocean Engineering Tech Dev*	Project (Number/Name) 0394 / *Shallow Depth Diving EQ*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Government Engineering Support	Various	Various : Various	1.859	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Program Management Support	Various	Perot : Washington, DC	2.110	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Travel (Submarine Rescue)	Various	NAVSEA : Washington, DC	0.784	0.036	Oct 2014	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Travel (00C)	Various	NAVSEA : Washington, DC	0.100	0.040	Oct 2014	0.018	Oct 2015	0.050	Oct 2016	-		0.050	0.000	0.208	-
SBIR Assessment	Various	Various : Various	0.443	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Acquisition Workforce	Various	Various : Various	0.021	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Program Management Support	C/CPIF	Dell Federal : Washington, DC	0.674	0.000		0.000		0.000		-		0.000	0.000	0.674	-
Program Management Support	C/CPIF	Dell Federal : Washington, DC	0.993	0.000		0.000		0.000		-		0.000	0.000	0.993	-
Program Management Support	C/CPIF	Dell Federal : Washington, DC	1.672	0.695	Jun 2015	0.000		0.000		-		0.000	0.000	2.367	-
Government Engineering Support	WR	PNSY : Portsmouth, NH	0.427	0.000		0.000		0.000		-		0.000	0.000	0.427	-
Program Management Support (00C)	WR	NEDU : Panama City, FL	0.060	0.000		0.000		0.000		-		0.000	0.000	0.060	-
Program Management Support (00C)	C/CPFF	Unknown : Not Specified	0.000	0.017	Mar 2015	0.050	Jun 2016	0.050	Nov 2016	-		0.050	0.000	0.117	-
		Subtotal	11.611	0.788		0.068		0.100		-		0.100	-	-	-

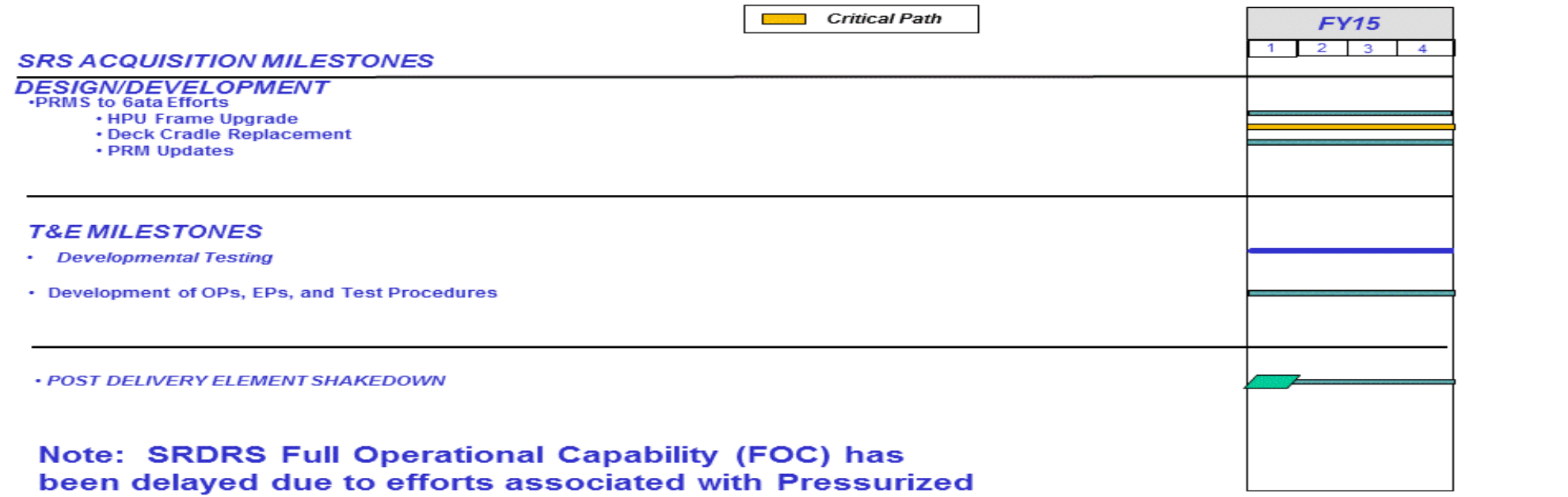
	Prior Years	FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	86.893	3.969		0.520		0.953		-		0.953	-	-	-

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603713N / *Ocean Engineering Tech Dev*	**Project (Number/Name)** 0394 / *Shallow Depth Diving EQ*

SRDRS Acquisition
Transfer Under Pressure

Update 6 Jul 2015



Note: SRDRS Full Operational Capability (FOC) has been delayed due to efforts associated with Pressurized Rescue Module (PRM) restoration to service; FY15 funding decrease is due to program delays.

Exhibit R-4A, RDT&E Schedule Details: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603713N / *Ocean Engineering Tech Dev*	**Project (Number/Name)** 0394 / *Shallow Depth Diving EQ*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 0394				
Design and Development	1	2015	4	2015
HPU Frame Upgrade	1	2015	4	2015
Deck Cradle Replacement	1	2015	4	2015
PRM Updates	1	2015	4	2015
T&E Milestones	1	2015	4	2015
Developmental Testing	1	2015	4	2015
Development of OPs, EPS, and Test Procedures	1	2015	4	2015
Post Delivery Element Shakedown	1	2015	4	2015

Exhibit R-2, RDT&E Budget Item Justification: PB 2017 Navy											Date: February 2016	
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 4: *Advanced Component Development & Prototypes (ACD&P)*					R-1 Program Element (Number/Name) PE 0603721N *I Environmental Protection*							
COST ($ in Millions)	**Prior Years**	**FY 2015**	**FY 2016**	**FY 2017 Base**	**FY 2017 OCO**	**FY 2017 Total**	**FY 2018**	**FY 2019**	**FY 2020**	**FY 2021**	**Cost To Complete**	**Total Cost**
Total Program Element	409.800	13.200	19.289	20.343	-	20.343	20.951	20.974	21.131	21.561	Continuing	Continuing
0401: *Shipboard Waste Mgmt*	337.163	5.612	8.393	8.195	-	8.195	8.807	8.864	8.894	9.083	Continuing	Continuing
0817: *Environmental Sustainability Development (NESDI)*	35.036	3.712	5.604	6.822	-	6.822	6.554	6.648	6.887	7.023	Continuing	Continuing
9204: *Marine Mammal Research*	37.601	3.876	5.292	5.326	-	5.326	5.590	5.462	5.350	5.455	Continuing	Continuing

A. Mission Description and Budget Item Justification

This program develops and evaluates processes, hardware, systems, operational procedures, scientific methods, and environmental studies 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.

Many environmental laws, regulations, and policies impose restrictions on Navy training and testing, 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. 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) OPNAV M-5090.1, Environmental and Natural Resources Program Manual,(f) 40 CFR Part 9 and Chapter VII (Uniform National Discharge Standards [UNDS] Phase I Standard), (EO) 13148, Greening the Government Through Leadership in Environmental Management, (g) Nonindigenous Aquatic Nuisance Prevention and Control Act of 1990, (h) National Invasive Species Act of 1996, (i) 33 CFR 151 Subpart D-Ballast Water Management for Control of Nonindigenous Species in Waters of the United States, (j) Clean Air Act, (k) Federal Insecticide, Fungicide, and Rodenticide Act, (l) Marine Mammal Protection Act, and (m) Endangered Species Act. References (a) through (m) establish Level I environmental protection requirements. 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. 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.

The MMR program is responsible for applied research and works to address the Navy's key research needs and transition the results and technologies for use within the Navy's at-sea environmental compliance and permitting processes in compliance with the Marine Mammal Protection Act and the Endangered Species Act, with the goals of improving marine species impact analysis (including marine mammal take estimates), mitigation measures and monitoring capabilities. Key points of the MMR mission are: (1) Improve the best available science regarding the potential impacts to marine species from Navy activities, (2) Expand the technology and methods available to the U.S. Navy marine species monitoring program (3) Preserve core Navy readiness capabilities. The RDT&E efforts funded under the MMR program allow the Navy to avoid or reduce the chances of costly litigation for non-compliance.

Exhibit R-2, RDT&E Budget Item Justification: PB 2017 Navy	Date: February 2016
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 0603721N *I Environmental Protection*

B. Program Change Summary ($ in Millions)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Previous President's Budget	13.200	20.711	20.541	-	20.541
Current President's Budget	13.200	19.289	20.343	-	20.343
Total Adjustments	0.000	-1.422	-0.198	-	-0.198
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-1.422			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	0.000	0.000			
• Rate/Misc Adjustments	0.000	0.000	-0.198	-	-0.198

Change Summary Explanation

FY 2017 decrease in Environmental Protection RDTEN by $0.842M as required for the Department of the Navy to comply with the Bipartisan Budget Act of 2015.

The FY 2017 funding request was also reduced by $0.466 million to account for the availability of prior year execution balances.

Technical: Not applicable.
Schedule: Not applicable.

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy										Date: February 2016		
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0603721N / *Environmental Protection*				Project (Number/Name) 0401 / *Shipboard Waste Mgmt*			
COST ($ in Millions)	**Prior Years**	**FY 2015**	**FY 2016**	**FY 2017 Base**	**FY 2017 OCO**	**FY 2017 Total**	**FY 2018**	**FY 2019**	**FY 2020**	**FY 2021**	**Cost To Complete**	**Total Cost**
0401: *Shipboard Waste Mgmt*	337.163	5.612	8.393	8.195	-	8.195	8.807	8.864	8.894	9.083	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

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 and 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., access to environmental data for planning Fleet operations and exercises.

The Afloat Environmental Quality Program supports the designated Technical Warrant Holder for Environmental Systems & Materials Engineering, with responsibility 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 Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Title: Technical Authority	1.200	3.087	2.587	0.000	2.587
Articles:	-	-	-	-	-
FY 2015 Accomplishments:					

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603721N / *Environmental Protection*	**Project (Number/Name)** 0401 / *Shipboard Waste Mgmt*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
- In FY15 and prior, Non-Copper Antifouling and Solid Waste are addressed under the Technical Authority Program. Beginning in FY16, the Shipboard Waste Management Program Objective Memorandum separates Non-Copper Antifouling and Solid Waste from the Technical Authority Program. - Identified, acquired, and evaluated various commercial off-the-shelf compacting equipment to understand the effectiveness of reducing waste volume for storage at sea to comply with the Act to Prevent Pollution from Ships (APPS) - Developed test plan for logging system to assess the effectiveness of recording exchanges - Performed technology assessment of treatment systems for Navy shipboard application - Met with the North Atlantic Treaty Organization (NATO) and foreign Navy data exchange partners to leverage lessons learned on afloat environmental compliance - Performed ship design studies on the impact of the integration of engine emission treatment systems on future ship design - Worked with Fleet, acquisition programs, and technical authorities to review and provide comments on issues, risks and opportunities so as minimize the cost and risk to the Navy Non-Copper Antifouling: - Executed panel test of an antifouling coating of high interest to SEA05P2 - Integrated effort into on-going Office of Naval Research (ONR) Inter-site Calibration Study - Prepared, exposed, and inspected panels quarterly Solid Waste: - Performed extensive, full scale, long-term endurance laboratory testing of shipboard solid waste management equipment for compactor, baler, and densifier, evaluating effectiveness and reliability of equipment to facilitate execution of technical authority for ship and submarine environmental capabilities. - Developed waste stream management plans for tested equipment in support of the Act to Prevent Pollution from Ships, which invokes the requirements of MARPOL, Annex V - Completed metal Alternative Trash Compactor Unit can testing and update design based on fleet input - Continued development of environmental equipment/system requirements documentation, design criteria/ guidance, specification standards, and certification protocols ***FY 2016 Plans:*** - Perform assessments of emergent commercial off the shelf oil spill and air emission processes and technologies to enable effective compliance at minimal life cycle cost and risk to operations					

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603721N / *Environmental Protection*	**Project (Number/Name)** 0401 / *Shipboard Waste Mgmt*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
- Identify systems that are worthy of detailed acquisition and evaluation - Perform design studies of rapid ballast water tank treatment technologies - Prepare Design Practice Criteria manuals for both APPS compliant solid waste management systems as well as ballast water treatment system - Review emergent ship spills and other discharge violations - Identify opportunities to reduce the risk of future violations - Meet with NATO and foreign Navy data exchange partners to leverage lessons learned on afloat environmental compliance - Work with Fleet, acquisition programs, and technical authorities to review and provide comments on issues, risks, and opportunities so as minimize the cost and risk to the Navy - Continue development of environmental equipment/system requirements documentation, design criteria/ guidance, specification standards, and certification protocols					
FY 2017 Base Plans: - Perform assessments of emergent commercial off the shelf oil spill and air emission processes and technologies to enable effective compliance at minimal life cycle cost and risk to operations - Identify systems that are worthy of detailed acquisition and evaluation - Perform design studies of rapid ballast water tank treatment technologies - Prepare Design Practice Criteria manuals for both APPS compliant solid waste management systems as well as ballast water treatment system - Review emergent ship spills and other discharge violations - Identify opportunities to reduce the risk of future violations - Meet with NATO and foreign Navy data exchange partners to leverage lessons learned on afloat environmental compliance - Work with Fleet, acquisition programs, and technical authorities to review and provide comments on issues, risks, and opportunities so as minimize the cost and risk to the Navy - Continue development of environmental equipment/system requirements documentation, design criteria/ guidance, specification standards, and certification protocols					
FY 2017 OCO Plans: N/A					
Title: Liquid Wastes	2.000	2.122	2.050	0.000	2.050
Articles:	-	-	-	-	-
FY 2015 Accomplishments:					

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603721N / *Environmental Protection*	**Project (Number/Name)** 0401 / *Shipboard Waste Mgmt*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Oil Pollution Abatement: - Investigated commercial Marine Pollution Control Devices (MPCD) for affordability initiatives supporting LHA-8 - Initiated shipboard evaluation of LCS oil water separator Non-Oily Waste: - Conducted a market survey of commercial marine sanitation devices and peripheral support equipment - Installed commercial biological marine sanitation device for laboratory evaluation and conducted pre-test - Leveraged Army land-based testing to evaluate two sewage treatment technologies for marine application Uniformed National Discharge Standards (UNDS): - Supported Endangered Species Act Consultation for UNDS Batch One, Phase II - Prepared Navy UNDS Implementation Plan for 11 UNDS Batch One, Phase II discharge - Drafted MPCD performance standards for 14 UNDS Batch Two, Phase II Discharges - Beginning in FY16, UNDS efforts are funded by O&MN					
FY 2016 Plans: Oil Pollution Abatement: - Purchase and evaluate commercial MPCDs for affordability initiatives supporting LHA-8 - Finalize shipboard evaluation of LCS oil water separator - Initiate testing of automated oil water separator for LSD life extension Non-Oily Waste: - Develop procurement specification for marine sanitation devices - Complete laboratory testing of commercial biological marine sanitation device - Test grease pretreatment components to support procurement specification development					
FY 2017 Base Plans: Oil Pollution Abatement: - Complete testing of MPCDs for affordability initiatives supporting LHA-8 - Complete testing of automated oil water separator for LSD life extension - Investigate commercial oil content monitors for potential new discharge standard Non-Oily Waste: - Publish procurement specification for marine sanitation devices					

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603721N / *Environmental Protection*	**Project (Number/Name)** 0401 / *Shipboard Waste Mgmt*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
- Acquire marine sanitation device materials to validate marine sanitation device procurement specification ***FY 2017 OCO Plans:*** N/A					
Title: Hazardous Material Control and Management	1.200	1.061	1.016	0.000	1.016
Articles:	-	-	-	-	-
FY 2015 Accomplishments: - Researched, tested and evaluated less hazardous or non-hazardous substitutes for high-risk hazardous materials - Tested newly developed paint mixer in shipboard setting - Investigated common cleaner dispenser(s) - Completed placard template for deep sinks where emulsions could occur and link to appropriate documentation - Published hazardous material Engineering Technical Authority Procedure (ETAP) ***FY 2016 Plans:*** - Expand ETAP to include link to health hazard assessments - Research, test, and evaluate less hazardous or non-hazardous substitutes for high-risk hazardous materials - Continue shipboard evaluation of new paint mixer - Down select and test cleaner dispenser(s) shipboard ***FY 2017 Base Plans:*** - Research, test, and evaluate less hazardous or non-hazardous substitutes for high-risk hazardous materials - Continue test and evaluation of pollution-prevention equipment aboard surface ships and submarines ***FY 2017 OCO Plans:*** N/A					
Title: Ballast Water Management	1.212	0.965	1.368	0.000	1.368
Articles:	-	-	-	-	-
FY 2015 Accomplishments: - Installed a ballast water exchange logging system on a test platform to assist the ships with ballast water exchange procedures and recordkeeping to comply with OPNAV M-5090.1 Environmental Readiness Program. - Conducted studies on design options to integrate a treatment system on future ship designs					

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603721N / *Environmental Protection*	**Project (Number/Name)** 0401 / *Shipboard Waste Mgmt*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
- Investigated commercially approved ballast water treatment systems and other design options to allow for treatment to meet future ballast water discharge requirements, and testing facility protocols to develop recommendations for NAVSEA system approval requirements ***FY 2016 Plans:*** - Initiate new efforts to conduct research evaluating ballast water treatment hardware/systems in preparation for anticipated ballast water standards in joint EPA/DoD negotiated Uniform National Discharge Standards (UNDS) Batch 2 - Evaluate the procurement of a ballast water treatment system to determine suitability for shipboard use. - Continue development of NAVSEA requirements for ship integration and begin efforts to procure treatment systems to test suitability and operability for ship integration ***FY 2017 Base Plans:*** - Perform full scale evaluation of a commercial ballast water treatment system for verification of suitability as a shipboard system - Continue to develop shipboard procedural documents and design guidance for meeting ballast water discharge standards requirements and continue to investigate commercial and design options to comply with discharge standards requirements ***FY 2017 OCO Plans:*** N/A					
Title: Solid Waste Management	0.000	0.965	0.978	0.000	0.978
Articles:	-	-	-	-	-
FY 2015 Accomplishments: - In FY15 and prior, Solid Waste is addressed under the Technical Authority Program ***FY 2016 Plans:*** - Beginning in FY16, the Shipboard Waste Management Program Objective Memorandum segregates Solid Waste from the Technical Authority Program - Perform extensive full scale laboratory long term endurance testing of shipboard solid waste management equipment for waste converter evaluating effectiveness and reliability of equipment to facilitate execution of technical authority for ship and submarine environmental capabilities					

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603721N / *Environmental Protection*	**Project (Number/Name)** 0401 / *Shipboard Waste Mgmt*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
- Initiate extensive full scale laboratory long term endurance testing of shipboard solid waste incinerator, evaluating effectiveness and reliability of equipment to facilitate execution of technical authority for ship environmental capabilities ***FY 2017 Base Plans:*** - Complete extensive full scale laboratory long term endurance testing of shipboard solid waste management equipment for incinerator evaluating effectiveness and reliability of equipment to facilitate execution of technical authority for ship environmental capabilities ***FY 2017 OCO Plans:*** N/A					
Title: Non-Copper Antifouling	0.000	0.193	0.196	0.000	0.196
Articles:	-	-	-	-	-
FY 2015 Accomplishments: - In FY15 and prior, Non-Copper Antifouling is addressed under the Technical Authority Program ***FY 2016 Plans:*** - Beginning in FY16, the Shipboard Waste Management Program Objective Memorandum segregates Non-Copper Antifouling from the Technical Authority Program - Identify advanced antifouling coating systems - Prepare samples and execute release rate testing under contract and in accordance with standard/ASTM test methods - Compare results to release rates associated with legacy, qualified coating systems (copper ablative coatings) - Identify coatings with copper release rates equal to or lower than legacy systems - Prepare final report with recommendations for follow-on testing ***FY 2017 Base Plans:*** - Evaluate NAVSEA screening and qualification test requirements for fouling release (with and without biocides) and antifouling coatings - Identify gaps; develop and execute testing to fill gaps - Compare results from historical qualification tests with full scale data plus Office of Naval Research (ONR) Intersite Calibration Study and Fouling Release Coating Study data - Prepare final report with recommendations					

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603721N / *Environmental Protection*	**Project (Number/Name)** 0401 / *Shipboard Waste Mgmt*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
- Draft qualification procedure modifications as needed ***FY 2017 OCO Plans:*** N/A					
Accomplishments/Planned Programs Subtotals	5.612	8.393	8.195	0.000	8.195

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

RDT&E Contracts are Competitive Procurements.

E. Performance Metrics

Quarterly Program Reviews

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603721N / *Environmental Protection*	Project (Number/Name) 0401 / *Shipboard Waste Mgmt*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Ancillary Hardware Development	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	-

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total 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	-

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation	MIPR	US Army Corps of Engineers : Norfolk, VA	0.687	0.000		0.000		0.000		-		0.000	0.000	0.687	-
Developmental Test & Evaluation	C/CPFF	NSWCCD, Bethesda, MD : Bethesda, MD	194.895	5.392	Nov 2014	8.145	Nov 2015	7.940	Nov 2016	-		7.940	Continuing	Continuing	Continuing
Developmental Test & Evaluation	WR	NSWCIHD : Indian Head, MD	1.086	0.000		0.000		0.000		-		0.000	0.000	1.086	-
Developmental Test & Evaluation	WR	NRL,Wash,DC : Wash,DC	30.876	0.220	Nov 2014	0.248	Nov 2015	0.255	Nov 2016	-		0.255	Continuing	Continuing	Continuing
Developmental Test & Evaluation	WR	SPAWARSYSCEN : SD,CA	12.308	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603721N / *Environmental Protection*	Project (Number/Name) 0401 / *Shipboard Waste Mgmt*	

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation	WR	Misc. Govt Labs : TBD	22.975	0.000		0.000		0.000		-		0.000	0.000	22.975	-
Developmental Test & Evaluation	C/CPFF	SAIC : San Diego, CA	15.570	0.000		0.000		0.000		-		0.000	0.000	15.570	-
Developmental Test & Evaluation	C/CPFF	Misc. Contracts : TBD	13.103	0.000		0.000		0.000		-		0.000	0.000	13.103	-
Process Control Engineering	C/CPFF	M. Rosenblatt & Sons : Arlington, VA	6.547	0.000		0.000		0.000		-		0.000	0.000	6.547	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	301.087	5.612		8.393		8.195		-		8.195	-	-	-

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Travel	Allot	NAVSEA HQ : Washington, DC	0.375	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
SBIR Assessment	TBD	Not Specified : Not Specified	0.227	0.000		0.000		0.000		-		0.000	0.000	0.227	Continuing
		Subtotal	0.602	0.000		0.000		0.000		-		0.000	-	-	-

	Prior Years	FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	337.163	5.612		8.393		8.195		-		8.195	-	-	-

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603721N / *Environmental Protection*	**Project (Number/Name)** 0401 / *Shipboard Waste Mgmt*

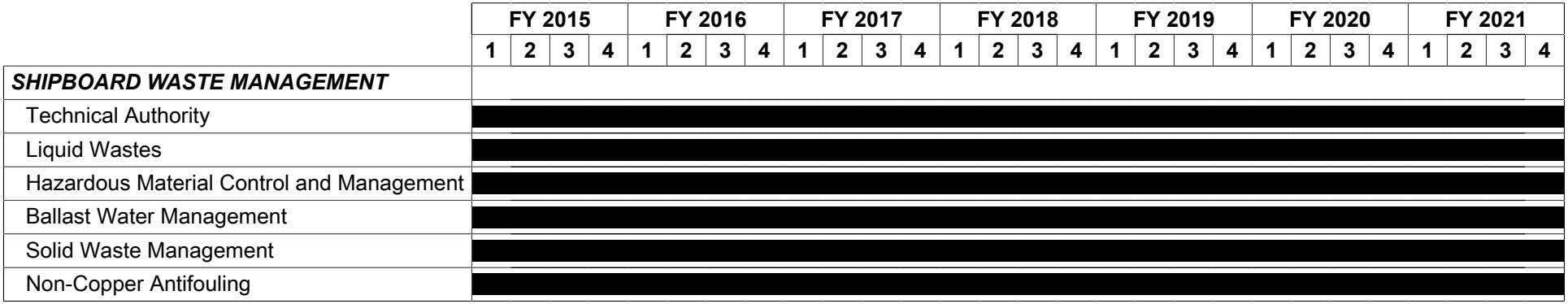


Exhibit R-4A, RDT&E Schedule Details: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603721N / *Environmental Protection*	**Project (Number/Name)** 0401 / *Shipboard Waste Mgmt*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
SHIPBOARD WASTE MANAGEMENT				
Technical Authority	1	2015	4	2021
Liquid Wastes	1	2015	4	2021
Hazardous Material Control and Management	1	2015	4	2021
Ballast Water Management	1	2015	4	2021
Solid Waste Management	1	2015	4	2021
Non-Copper Antifouling	1	2015	4	2021

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603721N / *Environmental Protection*	Project (Number/Name) 0817 / *Environmental Sustainability Development (NESDI)*	

COST ($ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
0817: *Environmental Sustainability Development (NESDI)*	35.036	3.712	5.604	6.822	-	6.822	6.554	6.648	6.887	7.023	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

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, be an 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 protect and sustain our forces at home and abroad.

This program identifies pervasive Navy shore side 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.

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 underwater UXO, the evaluation and prioritization of 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, processes, 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, 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, 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), 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.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Title: Maximize Training & Testing Requirements Within Environmental Constraints	0.590	0.719	1.334	0.000	1.334
Articles:	-	-	-	-	-
FY 2015 Accomplishments: Provided and validated knowledge, models, and processes to mitigate environmental impacts restrictions' and costs of Navy training test ranges to maximize the availability and utilization of the ranges. Started multi-spectral weapon impact detection system and underwater low environmental impact munitions breaching technology to better characterize environmental impacts of munitions on training ranges and munitions response sites.					
FY 2016 Plans: FY16 funding will be applied to: - Provide funding for the validated knowledge, models, and processes to mitigate environmental impacts, restrictions, and costs of Navy training and test ranges to maximize the availability and utilization of the ranges.					

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603721N / *Environmental Protection*	**Project (Number/Name)** 0817 / *Environmental Sustainability Development (NESDI)*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
- New tasks for multi-spectral weapon impact detection system and underwater low environmental impact munitions breaching technology to better characterize environmental impacts of munitions on training ranges and munitions response sites, which will be extended into and funded in FY17. ***FY 2017 Base Plans:*** FY17 funds support validated knowledge, models, and processes to mitigate environmental impacts, restrictions, and costs of Navy training and test ranges to maximize the availability and utilization of the ranges. - Increase in funding will support new/continuation of tasks related to multi-spectral weapon impact detection system and underwater low environmental impact munitions breaching technology to better characterize environmental impacts of munitions on training ranges and munitions response sites. - Continue x-ray inspection system to demilitarize targets and analysis of the long-term fate of munitions constituents from unexploded ordnance. ***FY 2017 OCO Plans:*** N/A					
Title: Platform Maintenance and Repair With Minimal Environmental Footprint	0.725	1.263	1.376	0.000	1.376
Articles:	-	-	-	-	-
FY 2015 Accomplishments: Provided aviation sustainment projects related to chrome alternatives and cadmium reductions, continue the elimination of overspray in shipbuilding and facilities maintenance operations. Started investigation of improved epi-seal materials for use in general purpose bombs and trivalent chromium conversion coating enhanced coloration of aluminum substrates. Continued investigation of low volatile organic compound and low hazardous air pollutant wipe solvent and paint thinner validation, mobile pier facility wastewater treatment system and advanced non-chromate primers and coatings. ***FY 2016 Plans:*** FY16 funding will be applied to the substantial backlog to: - Continue all aviation sustainment projects related to chrome alternatives and cadmium reductions, and the elimination of overspray in shipbuilding and facilities maintenance operations and projects on trivalent chromium conversion coating-enhanced coloration of aluminum substrates. - Start new tasks for the projects mobile pier facility waste water treatment system and advanced nonchromate primers and coatings.					

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603721N / *Environmental Protection*	**Project (Number/Name)** 0817 / *Environmental Sustainability Development (NESDI)*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
- Initiate cadmium and chromium elimination and aqueous cleaning projects. ***FY 2017 Base Plans:*** Continue all aviation sustainment projects related to chrome alternatives and cadmium reductions, continue the elimination of overspray in shipbuilding and facilities maintenance operations. Continue low volatile organic compound, low hazardous air pollutant wipe solvent and paint thinner validation, trivalent chromium conversion coating enhanced coloration of aluminum substrates, non-isocyanate polyurethane free formulation for aircraft and support equipment, and multi-functional surface preparation technology for maintenance painting in shipyards. ***FY 2017 OCO Plans:*** N/A					
Title: Support Shore Readiness within Environmental Constraints	0.995	1.939	1.833	0.000	1.833
Articles:	-	-	-	-	-
FY 2015 Accomplishments: Provided systems and processes to minimize regulated emissions, and discharged hazardous material usage resulting specifically from waterfront support, aviation support, and other base operations. Continued oil boom biofouling control, dry dock sediment management, biofouling reduction of ship cooling water systems. Started closed-loop cooling water system to accommodate ship cooling water needs and evaluation of compliance options for Clean Water Act permits for cooling water intake structures. ***FY 2016 Plans:*** - Continue providing systems and processes to minimize regulated emissions, discharges and hazardous material usage resulting specifically from waterfront support, aviation support, and other base operations. Continue oil boom fouling control. - Start dry dock sediment management, treatment of ship heavy metal contaminated oily waste and the evaluation of compliance options for NPDES permits for cooling water intake structures. ***FY 2017 Base Plans:*** Continue providing systems and processes to minimize regulated emissions, discharges and hazardous material usage resulting specifically from waterfront support, aviation support, and other base operations. Continue biofouling reduction of ship cooling water systems, closed-loop cooling water system to accommodate ship cooling water needs, evaluation of compliance options for Clean Water Act permits for cooling water intake structures, optimization of ship to shore regulated garbage management, improved dewatering of dredge					

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603721N / *Environmental Protection*	**Project (Number/Name)** 0817 / *Environmental Sustainability Development (NESDI)*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
sediment, diverless deployment system for in-situ sediment samplers, and quantification of Polychlorinated Biphenyl (PCB) paint volatilization from ship cutting operations. ***FY 2017 OCO Plans:*** N/A					
Title: Cost-Effective Management of Environmental Regulatory Requirements	1.402	1.683	2.279	0.000	2.279
Articles:	-	-	-	-	-
FY 2015 Accomplishments: Continued providing validated knowledge, models, processes and systems to improve environmental monitoring and reporting, and reduced the cost of compliance with regulations applicable to coastal contamination and contaminated sediments. Continued emissions capture and measurement technology for oxy-fuel hull cutting operations, low impact development demonstrations, and aerobic bioaugmentation for remediation of research department explosive (RDX) contaminated groundwater. Started pierside in-situ discharge monitoring for collection and holding tank contaminants, improved method for quantifying algal biomass to meet nutrient compliance.					
FY 2016 Plans: FY16 funding will be applied to: - Continued provision of 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. - Tasks for sustainable remediation of low pH aquifers and aquifers with a continuing contaminant source using proton reduction technology, aerobic bio-augmentation for remediation of RDX contaminated groundwater, reduce the cost of compliance with coastal contamination and contaminated sediment and demonstration of improved method for quantifying algae biomass to meet nutrient numeric endpoint permit compliance. - Initiate projects for coral reef assessment technology, vapor intrusion prevention and improved treatment of contaminated storm-water.					
FY 2017 Base Plans: FY17 funds support 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.					

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603721N / *Environmental Protection*	**Project (Number/Name)** 0817 / *Environmental Sustainability Development (NESDI)*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
- In compliance with environmental policy and regulations, funding supports storm-water sampling and treatment demonstrations, perfluorochemicals from DoD sites conceptual site model development, autonomous benthic ecology monitoring system, and management tools for radiological compounds in environmental media. - Provide funding for coral reef assessment technology project, vapor intrusion prevention and improved treatment of contaminated storm-water. ***FY 2017 OCO Plans:*** N/A					
Accomplishments/Planned Programs Subtotals	3.712	5.604	6.822	0.000	6.822

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

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 are often procured directly through the base operating budget. Equipment products for Shipyards and other Navy Working Capital Fund (NWCF) activities costing over $250K are procured through their Capital Investment Program (CIP). For both types of activities, equipment products costing less than $250K, and process changes not requiring the purchase of new equipment such as consumable material or product 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 (MILCON) 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 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603721N / *Environmental Protection*	**Project (Number/Name)** 0817 / *Environmental Sustainability Development (NESDI)*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
EEC 2	Various	EXWC : PT HUENEME, CA	4.700	0.490	Oct 2014	0.395	Jun 2016	0.902	Oct 2016	-		0.902	Continuing	Continuing	Continuing
EEC 2	Various	SSC : SAN DIEGO, CA	5.125	0.100	Oct 2014	0.324	Mar 2016	0.432	Oct 2016	-		0.432	Continuing	Continuing	Continuing
EEC 3	WR	NAWC : PATUXENT RIVER, MD	1.581	0.100	Oct 2014	0.235	Apr 2016	0.212	Jul 2017	-		0.212	Continuing	Continuing	Continuing
EEC 3	Various	NSWC : BETHESDA, MD	3.334	0.100	Oct 2014	0.196	Feb 2016	0.264	May 2017	-		0.264	Continuing	Continuing	Continuing
EEC 3b	Various	EXWC : PT HUENEME, CA	1.257	0.000		0.050	Jun 2016	0.128	May 2017	-		0.128	Continuing	Continuing	Continuing
EEC 4	Various	EXWC : PT HUENEME, CA	6.231	0.400	Dec 2014	1.149	Oct 2015	0.733	Mar 2017	-		0.733	Continuing	Continuing	Continuing
EEC 4	Various	NSWC : BETHESDA, MD	2.708	0.500	Dec 2014	0.605	Mar 2016	0.700	Oct 2016	-		0.700	Continuing	Continuing	Continuing
EEC 4a	Various	SSC : SAN DIEGO, CA	2.950	0.100	Dec 2014	0.185	Apr 2016	0.400	Jan 2017	-		0.400	Continuing	Continuing	Continuing
EEC 5	Various	EXWC : PT HUENEME, CA	2.029	0.450	Nov 2014	0.507	Mar 2016	0.720	Jan 2017	-		0.720	Continuing	Continuing	Continuing
EEC 5	Various	SSC : SAN DIEGO, CA	0.705	0.425	Nov 2014	0.410	Oct 2015	0.330	Feb 2017	-		0.330	Continuing	Continuing	Continuing
EEC 5	Various	NAWC : PATUXENT RIVER, MD	1.042	0.000		0.145	May 2016	0.172	Jun 2017	-		0.172	Continuing	Continuing	Continuing
EEC 5	Various	NSWC : BETHESDA, MD	0.933	0.322	Feb 2015	0.495	Oct 2015	0.655	Jan 2017	-		0.655	Continuing	Continuing	Continuing
EEC 5	WR	NAWCWD : CHINA LAKE, CA	0.994	0.075	Nov 2014	0.076	Feb 2016	0.262	Oct 2016	-		0.262	Continuing	Continuing	Continuing
EEC 5	WR	NAWC : LAKE HURST, NJ	0.616	0.050	Nov 2014	0.050	Apr 2016	0.140	Nov 2016	-		0.140	Continuing	Continuing	Continuing
EEC 3	WR	FRC - SE : JACKSONVILLE, FL	0.470	0.400	Oct 2014	0.435	Mar 2016	0.460	Feb 2017	-		0.460	Continuing	Continuing	Continuing
EEC 3	Various	NSWC : San Diego, CA	0.000	0.000		0.000	Mar 2016	0.075	Jun 2017	-		0.075	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603721N / *Environmental Protection*	**Project (Number/Name)** 0817 / *Environmental Sustainability Development (NESDI)*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
EEC 3	WR	FRC - CE : Cherry Point, NC	0.145	0.100	Nov 2014	0.075	Mar 2016	0.075	Jun 2017	-		0.075	Continuing	Continuing	Continuing
EEC 3	Various	FRC-SW : San Diego, CA	0.216	0.100	Oct 2014	0.272	Oct 2015	0.162	Mar 2017	-		0.162	Continuing	Continuing	Continuing
		Subtotal	35.036	3.712		5.604		6.822		-		6.822	-	-	-

Remarks

Performing Activities: Naval Surface Warfare Center, Carderock Division (NSWC/CD); Engineering and Expeditionary Warfare Center (EXWC), Port Hueneme, CA; Naval Surface Warfare Center, Indian Head Division (NSWC/IH); Space and Warfare Systems Center, San Diego (SSC/SD); Naval Air Warfare Center Aircraft Division Patuxent River (NAWCAD/PAX); Naval Air Warfare Center (NAWCWD/China Lake); Naval Air Warfare Center Aircraft Division Lakehurst (NAWCAD/Lakehurst); Fleet Readiness Center Southeast, Jacksonville FL (FRC-SE); Fleet Readiness Center Southwest, San Diego (FRC-SW), Fleet Readiness Center East, Cherry Point (FRC-CE). Total Prior Years Cost: Subtotal does not include performing activities from prior years that are no longer performing activities. Award Dates: About 55% of the project is executed via contracts awarded by the performing activities.

	Prior Years	FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	35.036	3.712		5.604		6.822		-		6.822	-	-	-

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603721N / *Environmental Protection*	**Project (Number/Name)** 0817 / *Environmental Sustainability Development (NESDI)*

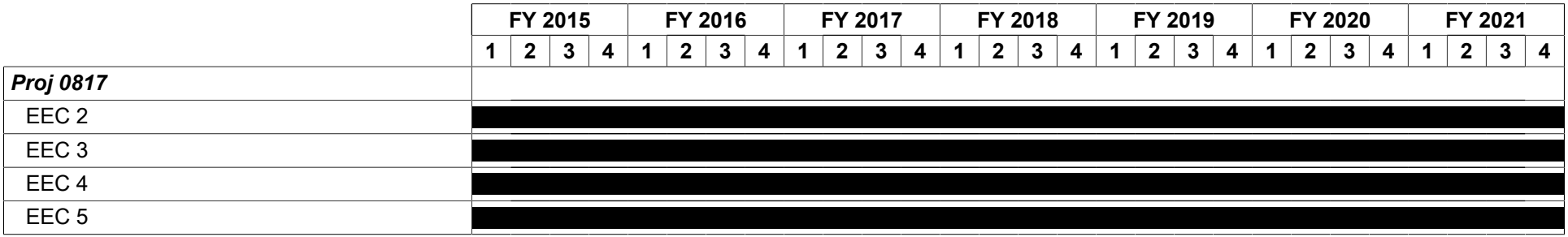


Exhibit R-4A, RDT&E Schedule Details: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603721N / *Environmental Protection*	**Project (Number/Name)** 0817 / *Environmental Sustainability Development (NESDI)*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 0817				
EEC 2	1	2015	4	2021
EEC 3	1	2015	4	2021
EEC 4	1	2015	4	2021
EEC 5	1	2015	4	2021

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603721N / *Environmental Protection*	Project (Number/Name) 9204 / *Marine Mammal Research*	

COST ($ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
9204: *Marine Mammal Research*	37.601	3.876	5.292	5.326	-	5.326	5.590	5.462	5.350	5.455	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

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, killing or biologically significant disturbance of marine animals by the use of intense underwater sound. Since Fleet operation and training areas coincide with known or probable habitats, migration routes, or breeding areas of marine mammals and other protected marine species, 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) and Endangered Species Act (ESA).
These areas are (1) Marine Ecology and Population Dynamics - determine the likelihood of the presence of marine mammals or other protected species by developing habitat and ecological models. Refine marine animal survey techniques to optimize the accuracy of abundance estimates in small ocean regions of Navy interest.
(2) Criteria, Thresholds, and Mitigation - Establish criteria and thresholds from which to measure potential impact on marine mammals and other marine species 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) Mitigation Methodologies - Determine the observation, detection and classification measures required to develop effective monitoring and mitigation procedures for Fleet and SYSCOM use. Focus on improving marine animal monitoring capabilities over current methods by developing new technologies or improving existing technologies that improve monitoring and mitigation effectiveness, reduce cost and minimize impacts on readiness activities.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Title: Marine Ecology and Population Dynamics	0.735	0.707	0.871	0.000	0.871
Articles:	-	-	-	-	-
FY 2015 Accomplishments:					

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603721N / *Environmental Protection*	**Project (Number/Name)** 9204 / *Marine Mammal Research*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
The MMR program continued research on the ecosystem status and habitat use by marine species of Navy interest, with a priority emphasis on the population structure of beaked whales and other sound sensitive species in the vicinity of Navy training ranges. This included the development and testing of new sensors such as, acoustic listening devices and tags that provide the scientists with tools to study these animals as well as work with the Navy Marine Species Densitydata program, to develop data standards and data management standards consistent with the best standards of the expert community which was closed out in FY15. As a result of the budget reduction in FY15, funding levels were reduced in the other two topics to preserve the level of funding in this topic. The reduction in FY15 funding caused delays in the projects funded under the Criteria and Thresholds, Physiology and Behavior, and Effects of Sound and Mitigation Methodologies: Monitoring, New Technology, and Risk Assess topics. Also, due to limited funding, several new starts were delayed in FY15 to FY17. The delay in the projects and tools in development, resulted in increased costs to the legally required Fleet and SYSCOM's monitoring programs because they had to use more costly methods.					
FY 2016 Plans: Continue research on ecosystems status and habitat use by marine species of Navy interest; sensor and tag development; with a priority emphasis on the population structure of beaked whales in the vicinity of Navy training ranges. Work with the Navy Marine Species Density data program to develop tools and methods to improve the abundance estimates and density distribution data, consistent with the best standards of the expert community.					
FY 2017 Base Plans: Funding within this topic area will increase slightly in FY17 to continue research on the ecology and habitat of marine species of Navy interest, with a priority emphasis on the population structure of beaked whales and other sound sensitive species in the vicinity of Navy training ranges. Continue to develop tools and methods to improve the abundance estimates and density distribution data including passive acoustic based density estimates, consistent with the best standards of the expert community. Two additional projects that were delayed in FY15 and FY16 will allow the development of new tools to assess the population size and study marine mammal habitat necessary for Navy environmental compliance in southern California. These projects will enable the Fleets and SYSCOMS to collect future data required for environmental compliance at reduced costs. Funding in this topic areas, allows the Navy to meet environmental compliance requirements for impact analysis and avoid costly litigation. Funding in this topic area is particularly important because baseline habitat and movement patterns were a focus of litigation for the HSTT EIS. Plaintiffs sued the Navy for not adequately identifying and avoiding biologically important areas to marine mammals. Continued funding in these topic areas is necessary to support					

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603721N / *Environmental Protection*	**Project (Number/Name)** 9204 / *Marine Mammal Research*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
future compliance documents and is also a requirement of a settlement agreement with the California Coastal Commission for the Hawaii - Southern California Training and Testing (HSTT) EIS/OEIS. Any reduction in funding would result in non-compliance with the settlement agreement and would subject the Navy to costly litigation. ***FY 2017 OCO Plans:*** N/A					
Title: Criteria and Thresholds, Physiology and Behavior, and Effects of Sound	1.113	1.760	2.732	0.000	2.732
Articles:	-	-	-	-	-
FY 2015 Accomplishments: As a result of reduced MMR funding in FY15, three major projects had their budgets reduced and their overall completion deadline extended. This included the Southern California (SOCAL) Behavioral Response Study (BRS). As a result of reduced funding, there was more limited time on the water to conduct the research trials, which resulted in less data being collected on the behavioral response of whales to tactical sonars. Due to reduced data collection, the project will need to be extended through FY17 instead of being completed in FY16 in order to obtain an adequate sample size. The reduction in funding resulted in more limited data available to generate behavioral response criteria and thresholds with NMFS to support our Phase III compliance permits. This in turn will result in additional costs to the Fleets/SYSCOMs in terms of increased compliance documentation costs, litigation risks, operational restrictions, and/or increased mitigation burden. Overall, the program continued research is to determine what constitutes behavioral response to Navy-generated sound on individuals with respect to disruption of natural behavior patterns, and studying the short and long-term effects of such disturbance. Research related to anatomically derived hearing properties for large whales will also continue since this is of interest to the regulator. ***FY 2016 Plans:*** Funding will be applied to the required focus area to support the refinement of criteria and thresholds for our at-sea training and testing permits which are required in FY18. Projects are often 1-2 year efforts and must be initiated in FY16 or they would jeopardize the ability to obtain authorization from regulatory agencies to conduct training and testing activities. Additional funding is required for the Navy's Southern California Behavioral Response project to support the close out and final analysis of field data collected over the past five years. Overall, the program will continue research to determine what constitutes biologically significant behavioral response to Navy-generated sound on individuals with respect to the disruption of natural behavior patterns, ascertaining the short and long-term effects of such disruptions and documenting avoidance behaviors.					

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603721N / *Environmental Protection*	**Project (Number/Name)** 9204 / *Marine Mammal Research*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Research regarding anatomically derived hearing properties for large whales will also continue since this is a priority of the regulator. Funding in these focus areas allows the Navy to meet environmental compliance requirements for impacts analysis and avoid costly litigation. ***FY 2017 Base Plans:*** Funding within this topic area will increase significantly in FY17 to continue to support research necessary to develop new criteria and thresholds for our Phase IV permits. These criteria and thresholds will need to be negotiated with the regulatory agencies in 2020. Since Projects are often 3-5 year efforts, they must be initiated and/or continued in FY17 in order to support this deadline. Any delay or reduction in funding in FY17 would jeopardize the Navy ability to develop appropriate criteria and thresholds needed to obtain authorization from regulatory agencies to continue to conduct training and testing activities. Additional funding is also required for the Navy Southern California Behavioral Response Study to support the additional year of effort that resulted from reduced funding in FY15. Funding in FY17 will support the analysis/synthesis of field data collected over the past five years and the development of a summary report on the behavioral effects of tactical sonar on marine mammals. Overall, the program will continue research to determine what constitutes behavioral response to Navy-generated sound on individuals with respect to the disruption of natural behavior patterns, and studying the short and long-term effects of such disturbance. Funding in this topic area is particularly important because of criteria and thresholds the effect of behavioral harassment on marine mammals are the focus litigation against Navy training and testing activities. Continued funding in these topics areas is a requirement of a settlement agreement with the California Coastal Commission for the Hawaii - Southern California Training and Testing (HSTT) EIS/OEIS. Any reduction in funding would result in non-compliance with the settlement agreement and would subject the Navy to costly litigation. ***FY 2017 OCO Plans:*** N/A					
Title: Mitigation Methodologies: Monitoring, New Technology, and Risk Assess	2.028	2.825	1.723	0.000	1.723
Articles:	-	-	-	-	-
FY 2015 Accomplishments: Due to a reduction in the MMR program budget in FY15, existing ongoing projects were delayed or their funding reduced to try to survive the funding shortfall. In particular, an active project developing automated tools for passive acoustic monitoring on Navy ranges had its funding delayed in FY15 to FY16. Also, due to limited funding several new starts were delayed in FY15 to FY16. The reduction in effort in this focus area will result in increased operational costs to the Fleets and SYSCOMs to conduct monitoring and continued cost growths in monitoring programs due to the lack of new, lower cost monitoring capabilities to meet the permit requirements.					

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603721N / *Environmental Protection*	**Project (Number/Name)** 9204 / *Marine Mammal Research*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
For instance, reduced investment in the M3R system impeded the ability to transition this program to the Fleets and SYSCOMs. MMR had to delay and extend the transition of M3R to the Fleets and SYSCOMs to FY16. This resulted in increased costs to the MMR program to continue to support its transition, as well as increased costs to the Fleets and SYSCOMs because they will have to rely on other more costly alternatives to monitoring until this system is available. While FY15 budget reductions to the MMR program only resulted in delays to the development and transition of technologies it created an increased financial burden to the Fleets and SYSCOMs to absorb higher monitoring costs and affected compliance with our monitoring permit requirements through the lack of necessary tools to adequate assess our impacts. In general, the reduced funding resulted in a delay in the development of all other monitoring technology projects, resulted in an overall increased operation cost to the Fleet monitoring program by not enabling them with efficient tools.					
FY 2016 Plans: To support our ongoing permit requirements to monitor the effects of at-sea training and testing activities, increased investment is required in this focus area to remain in compliance. Overall, the LMR program will continue to fund monitoring capabilities of marine animals to include the development of new technologies and improvements to existing technologies. In particular, investment in the use of UUV and AAVs will increase as these platforms have recently become more mature and are able to be leveraged to meet monitoring requirements with some modifications to their hardware. The Navy is also working to refine the High-Frequency Recording Package (HARP) which is our most common passive acoustic recording system in Navy-wide use for acoustic monitoring. Improvements to this system will increase the duration of deployments, increase the bandwidth and accuracy of recordings and reduce lifecycle maintenance costs. Increased funding in FY16 will be used to accelerate the transition of new or improved lower cost monitoring technologies to the Fleets and SYCOMs to reduce the impacts on readiness activities that current monitoring and mitigation technologies have.					
FY 2017 Base Plans: Funding within this topic area will decrease in FY17 as a result of the intended transition of costs associated with aspects of the M3R system to the Fleets and SYSCOMS and a shift in priority to accelerate projects funded under the Criteria and Thresholds, Physiology and Behavior, and Effects of Sound topic. To support our ongoing permit requirements to monitor the effects of at-sea training and testing activities, continued investment is required in this focus area to remain in compliance. Overall, the MMR program will continue to fund monitoring capabilities of marine animals to include the development of new technologies and improvements to existing technologies. In particular, investment in the use of UUV and AAVs will increase as these platforms have recently become more mature and are able to be leveraged to meet monitoring requirements with some modifications to their hardware. The Navy is also working to refine the High-Frequency Recording Package (HARP) which is our most common passive acoustic recording system in Navy-wide use for acoustic monitoring.					

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603721N / *Environmental Protection*	**Project (Number/Name)** 9204 / *Marine Mammal Research*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Improvements to this system will increase the duration of deployments, increase the bandwidth and accuracy of recordings, and reduce lifecycle maintenance costs. Continued funding in FY17 will be used to accelerate the transition of new or improved lower cost monitoring technologies to the Fleets and SYCOMs to reduce the impacts on readiness activities that current monitoring and mitigation technologies have. Funding in this topic area is particularly important because of the Navy lack of additional mitigation tools beyond lookouts were a focus of litigation for the HSTT EIS. Continued funding in these topics areas is necessary to support future compliance documents and is also a requirement of a settlement agreement with the California Coastal Commission for the Hawaii - Southern California Training and Testing (HSTT) EIS/OEIS. Any reduction in funding would result in non-compliance with the settlement agreement and would subject the Navy to costly litigation. ***FY 2017 OCO Plans:*** N/A					
Accomplishments/Planned Programs Subtotals	3.876	5.292	5.326	0.000	5.326

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

(U) RDTEN Contracts are Competitive Procurements.

E. Performance Metrics

Quarterly Program Reviews

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603721N / *Environmental Protection*	Project (Number/Name) 9204 / *Marine Mammal Research*	

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Mgmt (Mar Ecol & Pop Dynamics)	WR	EXWC : Port Hueneme, CA	1.022	0.300	Dec 2014	0.550	Oct 2015	0.550	Oct 2016	-		0.550	Continuing	Continuing	Continuing
Criteria & Thresholds	SS/CPFF	NMMF : San Diego, CA	0.000	0.000		0.000		0.135	Oct 2016	-		0.135	0.000	0.135	-
Mitigation Methods	SS/CPFF	SDSU : San Diego, CA	0.000	0.000		0.000		0.216	Oct 2016	-		0.216	0.000	0.216	-
Criteria & Thresholds	SS/CPFF	SEAMARCO : Netherlands	0.000	0.000		0.000		0.276	Oct 2016	-		0.276	0.000	0.276	-
Mitigation Methods	WR	OASIS Technologies, Inc. : Lexington, MA	0.427	0.329	Dec 2014	0.354	Jan 2016	0.228	Oct 2016	-		0.228	Continuing	Continuing	Continuing
Criteria & Thresholds	SS/CPFF	U Saint Andrews : United Kingdom	0.000	0.000		0.000		0.163	Oct 2016	-		0.163	0.000	0.163	-
Mitigation Methods	SS/CPFF	Biowaves : San Diego, CA	0.000	0.000		0.000		0.139	Oct 2016	-		0.139	0.000	0.139	-
Mitigation Methods	WR	SPAWAR : San Diego, CA	0.000	0.169	Dec 2014	0.692	Jan 2016	0.127	Jan 2017	-		0.127	Continuing	Continuing	Continuing
Mitigation Methods	SS/CPFF	Scripps Institute : San Diego, CA	0.000	0.250	Jan 2015	0.250	Oct 2015	0.251	Jan 2017	-		0.251	Continuing	Continuing	Continuing
Mitigation Methods	SS/CPFF	Oregon State Univ : OR & HI	0.000	0.285	Jan 2015	0.321	Jan 2016	0.148	Jan 2017	-		0.148	Continuing	Continuing	Continuing
Mar Ecol & Pop Dynamics	WR	NAVAIR : Lakehurst, NJ	0.000	0.220	Jan 2015	0.082	Oct 2015	0.075	Oct 2016	-		0.075	Continuing	Continuing	Continuing
Mar Ecol & Pop Dynamics	SS/CPFF	BMC Inc. : Chicago, IL	0.000	0.215	Jan 2015	0.075	Jan 2016	0.151	Jan 2017	-		0.151	Continuing	Continuing	Continuing
Mitigation Methods	WR	NUWC : Newport, RI	8.363	0.560	Nov 2014	1.120	Jan 2016	0.614	Jan 2017	-		0.614	Continuing	Continuing	Continuing
Mar Ecol & Pop Dynamics	WR	NPGS : Monterey, CA	3.519	0.000		0.030	Oct 2015	0.030	Oct 2016	-		0.030	Continuing	Continuing	Continuing
Mar Ecol & Pop Dynamics	MIPR	NOAA SWFSC : La Jolla, CA	3.411	0.000		0.035	Oct 2015	0.065	Jan 2017	-		0.065	Continuing	Continuing	Continuing
Mitigation Methods	SS/CPFF	Scripps Institute : La Jolla, CA	9.435	0.280	Dec 2014	0.000		0.000		-		0.000	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603721N / *Environmental Protection*	Project (Number/Name) 9204 / *Marine Mammal Research*	

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Mitigation Methods	SS/CPFF	Oregon State Univ. : Corvallis, OR	1.853	0.155	Nov 2014	0.058	Jan 2016	0.000		-		0.000	Continuing	Continuing	Continuing
Criteria & Thresholds	SS/CPFF	SPAWAR : San Diego, CA	3.133	0.000		0.642	Jan 2016	0.000		-		0.000	Continuing	Continuing	Continuing
Criteria & Thresholds	SS/CPFF	Cascadia Research Collective : Olympia, WA	4.194	1.113	Nov 2014	1.083	Oct 2015	1.859	Oct 2016	-		1.859	Continuing	Continuing	Continuing
Criteria & Thresholds	SS/CPFF	San Diego State Univ : San Diego, CA	2.244	0.000		0.000		0.299	Oct 2016	-		0.299	Continuing	Continuing	Continuing
		Subtotal	37.601	3.876		5.292		5.326		-		5.326	-	-	-

Remarks

Major performers in the projects will develops techniques for studying and collecting data on marine mammals. Several projects will provide methods to derive animal density from passive acoustics based technology. Other major projects include data standards development, signal processing technology development to accelerate analysis of large monitoring data sets and reduce cost, and data to support next-generation risk criteria based on improved and expanded hearing and behavioral response data.

	Prior Years	FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	37.601	3.876		5.292		5.326		-		5.326	-	-	-

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603721N / *Environmental Protection*	**Project (Number/Name)** 9204 / *Marine Mammal Research*

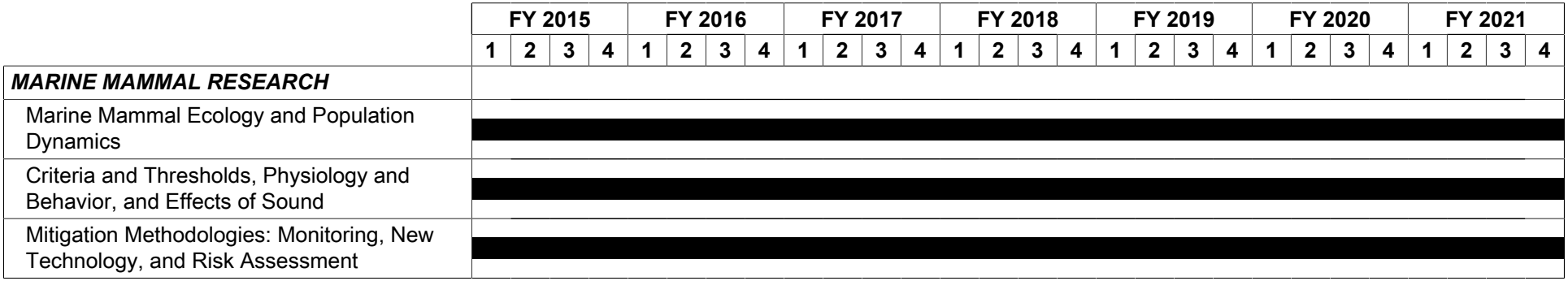


Exhibit R-4A, RDT&E Schedule Details: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603721N / *Environmental Protection*	**Project (Number/Name)** 9204 / *Marine Mammal Research*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
MARINE MAMMAL RESEARCH				
Marine Mammal Ecology and Population Dynamics	1	2015	4	2021
Criteria and Thresholds, Physiology and Behavior, and Effects of Sound	1	2015	4	2021
Mitigation Methodologies: Monitoring, New Technology, and Risk Assessment	1	2015	4	2021

Exhibit R-2, RDT&E Budget Item Justification: PB 2017 Navy											Date: February 2016	
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 4: *Advanced Component Development & Prototypes (ACD&P)*					R-1 Program Element (Number/Name) PE 0603724N *I Navy Energy Program*							
COST ($ in Millions)	**Prior Years**	**FY 2015**	**FY 2016**	**FY 2017 Base**	**FY 2017 OCO**	**FY 2017 Total**	**FY 2018**	**FY 2019**	**FY 2020**	**FY 2021**	**Cost To Complete**	**Total Cost**
Total Program Element	208.472	62.413	56.391	52.479	-	52.479	50.613	49.561	50.301	52.454	Continuing	Continuing
0829: *ENERGY CONSERVATION (ADV)*	43.373	16.094	8.278	9.674	-	9.674	10.490	10.859	11.166	12.522	Continuing	Continuing
0838: *Mobility Fuels (ADV)*	56.292	10.570	11.739	12.973	-	12.973	12.711	12.165	12.313	12.565	Continuing	Continuing
0928: *Directed Energy Research*	42.050	6.683	1.519	1.957	-	1.957	1.965	1.870	1.905	1.943	Continuing	Continuing
0996: *Aircraft Energy Conservation*	66.757	29.066	22.355	27.875	-	27.875	25.447	24.667	24.917	25.424	Continuing	Continuing
9999: *Congressional Adds*	0.000	0.000	12.500	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	12.500

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) examine 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; 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.

JUSTIFICATION FOR BUDGET ACTIVITY: This program is funded under ADVANCED COMPONENT DEVELOPMENT AND PROTOTYPES because it includes all efforts necessary to evaluate integrated technologies, representative models or prototype systems in a high fidelity and realistic operating environment.

B. Program Change Summary ($ in Millions)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Previous President's Budget	63.804	47.761	62.919	-	62.919
Current President's Budget	62.413	56.391	52.479	-	52.479
Total Adjustments	-1.391	8.630	-10.440	-	-10.440
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-3.870			
• Congressional Rescissions	-	-			
• Congressional Adds	-	12.500			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-1.392	0.000			
• Program Adjustments	0.000	0.000	-10.612	-	-10.612
• Rate/Misc Adjustments	0.001	0.000	0.172	-	0.172

Exhibit R-2, RDT&E Budget Item Justification: PB 2017 Navy	Date: February 2016
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 0603724N *I Navy Energy Program*

Congressional Add Details ($ in Millions, and Includes General Reductions)

	FY 2015	FY 2016
Project: 9999: *Congressional Adds*		
Congressional Add: *Navy Energy Increase*	0.000	12.500
Congressional Add Subtotals for Project: 9999	0.000	12.500
Congressional Add Totals for all Projects	0.000	12.500

Change Summary Explanation

FY 2017 decrease in Navy Energy RDTEN by $0.081M as required for the Department of the Navy to comply with the Bipartisan Budget Act of 2015.

Schedule:

0838 - Conduct Research, Development, Test, and Evaluation in Support of Field-Identified Deficiencies from 1Qtr 2017 through 4Qtr 2021. This work has been a basic objective of the program since its inception, but the efforts have been minimized for the last 6 years as alternative fuels test and qualification took priority. As test and qualification activities begin to slow, the program will focus on field-identified deficiencies.

Technical: Not applicable.

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy											Date: February 2016	
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0603724N / *Navy Energy Program*				Project (Number/Name) 0829 / *ENERGY CONSERVATION (ADV)*			
COST ($ in Millions)	**Prior Years**	**FY 2015**	**FY 2016**	**FY 2017 Base**	**FY 2017 OCO**	**FY 2017 Total**	**FY 2018**	**FY 2019**	**FY 2020**	**FY 2021**	**Cost To Complete**	**Total Cost**
0829: *ENERGY CONSERVATION (ADV)*	43.373	16.094	8.278	9.674	-	9.674	10.490	10.859	11.166	12.522	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:

The Energy Conversation Advanced Project is designed to develop and implement energy and maintenance saving improvements into existing Fleet assets. This energy conservation project, managed through NAVSEA 05T, will identify mature potential energy saving areas, by involvement with Fleet representatives, Life-Cycle Managers (LCMs), NAVSEA Technical Warrant Holders, In-Service Engineering Agents (ISEAs), PEOs, TMA/TMI, Industry, and Academia. The project directly supports SECNAV and CNO goals to reduce energy consumption. Potential technology target areas will include: Power Generation and Storage systems, Hull Hydrodynamics, Underwater Hull Husbandry, Heating, Ventilation & Air Conditioning (HVAC) Systems, Thermal Management, Main Propulsion Systems, Electrical Systems, Auxiliary Systems, and Energy Monitoring & Assessment. Potential energy saving proposals, Energy Conservation Concepts (ECC), are developed each FY for evaluation by functional category. Based on review of a business case and a technical community review projects are selected for development. Not all proposed ECCs are pursued and changes to planned funding between functional categories or fiscal years can occur based on the technology maturity level, ship schedule changes, or other factors affecting the projected development or testing timeline.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	**FY 2015**	**FY 2016**	**FY 2017 Base**	**FY 2017 OCO**	**FY 2017 Total**
Title: Power Generation and Storage Project	1.229	0.000	0.200	0.000	0.200
Articles:	-	-	-	-	-
Description: 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 energy conservation technologies these improvements.					
FY 2015 Accomplishments: Issued Request for Information (RFI) to industry and received inputs from several sources. The inputs received are being evaluated to identify next phase of developing proposals pending availability of funding. Continue to identify new fuel saving technologies in Power Generation & Storage for Gas Turbine, Diesel and Steam ships. Prepare proposals and business case analyses (BCA) for promising technologies with potential to reduce fossil fuel consumption.					
FY 2016 Plans: N/A					
FY 2017 Base Plans:					

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603724N / *Navy Energy Program*	**Project (Number/Name)** 0829 / *ENERGY CONSERVATION (ADV)*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Conduct investigation of alternative energy sources based on prior year responses to RFI that can be used to store energy and power shipboard equipment as an energy saving measure. Continue to identify new fuel saving technologies in Power Generation & Storage for Gas Turbine, Diesel and Steam ships. Prepare proposals and business case analyses (BCA) for promising technologies with potential to reduce fossil fuel consumption. ***FY 2017 OCO Plans:*** N/A					
Title: Hull Hydrodynamic Sub Project	1.357	0.468	2.347	0.000	2.347
Articles:	-	-	-	-	-
Description: (U) Hull Hydrodynamic Sub Project - This project area will accomplish prototype development, modeling, laboratory and Fleet testing of ship modifications to propellers such as fouling release coatings and/or hull appendages to determine overall mission and cost effectiveness of these improvements. ***FY 2015 Accomplishments:*** Fabrication of bow bulb in support of installation on USS KIDD (DDG 100) is in process. Availability will start 9 July 2015 and installation of the bow bulb will commence 20 August and complete 15 Nov 2015. Initiated studies to examine energy saving alternatives for hull form/propeller modifications applicable to various ship classes; advanced electric ship demonstrator modifications to assist in testing Energy Conservation Concepts (ECCs); feasibility study for installing an 18' diameter propeller on DDG 51 Class ships; and a data acquisition study to examine methods for measuring actual fuel savings achieved from various hydrodynamic ECCs installed. Continue to identify additional fuel saving technologies in Hull Hydrodynamic systems and prepare proposals and business case analyses for promising technologies with potential to reduce fossil fuel consumption. ***FY 2016 Plans:*** Post availability performance trial (powering and maneuvering) to evaluate performance of bow bulb installation on KIDD will be delayed until FY17 due to availability of ship. Efforts in FY16 will focus on conducting planning efforts in support of FY17 post availability sea trial. Continue to identify additional fuel saving technologies in Hull Hydrodynamic systems and prepare proposals and business case analyses for promising technologies with potential to reduce fossil fuel consumption. ***FY 2017 Base Plans:*** As result of cancellation of installation on USS KIDD in FY15/16 conduct planning, pre-trial as necessary and installation of bow bulb on alternate DDG 51 Flight IIA ship. Continue to identify additional fuel saving					

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603724N / *Navy Energy Program*	**Project (Number/Name)** 0829 / *ENERGY CONSERVATION (ADV)*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
technologies in Hull Hydrodynamic domain to reduce drag, and prepare proposals and business case analyses for promising technologies with potential to reduce fossil fuel consumption. ***FY 2017 OCO Plans:*** N/A					
Title: Hull Husbandry Sub Project ***Articles:*** ***Description:*** (U) 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 to reduce hydrodynamic drag on the hull and thereby increase fuel efficiency. ***FY 2015 Accomplishments:*** Initiated improvements to hydrodynamic drag coefficient tool which will allow the most accurate estimate of fuel savings associated with good propeller coating performance. Completion of project had to be delayed due to priorities associated with Ohio Replacement Program that required the services of the subject matter expert. It will be evaluated for restart when funding is available. Continue to identify new fuel saving initiatives in Hull Husbandry and prepare proposals and business case analyses for promising technologies with potential to reduce fossil fuel consumption. ***FY 2016 Plans:*** N/A ***FY 2017 Base Plans:*** N/A ***FY 2017 OCO Plans:*** N/A	0.300 -	0.000 -	0.000 -	0.000 -	0.000 -
Title: Heating , Ventilation and Air Conditioning (HVAC) Sub Project ***Articles:*** ***Description:*** (U) HVAC Sub Project - Project funds will be utilized to accomplish prototype development, land and shipboard testing to determine cost effectiveness of improvements aimed at more efficient climate control of shipboard spaces. ***FY 2015 Accomplishments:***	2.675 -	2.258 -	0.153 -	0.000 -	0.153 -

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603724N / *Navy Energy Program*	**Project (Number/Name)** 0829 / *ENERGY CONSERVATION (ADV)*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Installation planning for Thermal Management Control System (TMCS) for LHD class ships has proceeded on schedule. SCD 16402 has been approved and added to the Letter of Authorization for LHD 2; material has been procured with delivery scheduled in Aug 2015; system requirements specification and Ship Installation Drawings (SIDs) have been developed. Planning is continuing for prototype installation in FY16. Initiated tasking for test and evaluation of Air Conditioning (AC) Plant improvements aimed at lowering compressor operating discharge pressure control point on DDG 51 Class ships and completed ship visits to capture data on 5 DDG 51 Class ships. Data from ship visits is being evaluated and procurement of an Erasable Programmable Read-Only Memory (EPROM) is in process to incorporate system operating modifications that will be demonstrated shipboard. Continue to identify additional fuel saving technologies in HVAC Systems and prepare proposals and business case analyses for promising technologies with potential to reduce fossil fuel. ***FY 2016 Plans:*** Continue phase II LHD TMCS development for laboratory testing of system and installation on board selected ship for test and evaluation. Provide oversight of installation on LHD 2 during scheduled FY 16 availability, monitor and provide program office with status reports of installation progress. Conduct evaluation and provide report. Continue to identify additional fuel saving technologies in HVAC Systems and prepare proposals and business case analyses for promising technologies with potential to reduce fossil fuel. ***FY 2017 Base Plans:*** Conduct post installation testing of TMCS on LHD 2 and prepare report with recommendations for class-wide implementation. Continue to identify additional fuel saving technologies in HVAC Systems and prepare proposals and business case analyses for promising technologies with potential to reduce fossil fuel. ***FY 2017 OCO Plans:*** N/A					
Title: Thermal Management Sub Project	0.100	0.000	0.320	0.000	0.320
Articles:	-	-	-	-	-
Description: (U) 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 shipboard electrical demand on HVAC systems. ***FY 2015 Accomplishments:*** Initiated tasking to examine shipboard application of waste heat recovery methodologies. Issued and received responses from industry to Request for Information (RFI) on waste heat technologies. Continuing to review responses and prepare report of findings for determining potential shipboard applications to provide alternative					

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603724N / *Navy Energy Program*	**Project (Number/Name)** 0829 / *ENERGY CONSERVATION (ADV)*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
energy sources. Also initiated tasking to conduct shipboard energy thermal surveys to map energy usage onboard various ship classes during different seasons of the year. Continue to identify additional fuel saving technologies in Thermal Management that may be applicable to navy ships. Prepare proposals and business case analyses for promising technologies with potential to reduce fossil fuel consumption. ***FY 2016 Plans:*** N/A ***FY 2017 Base Plans:*** Evaluate results of previous year tasking identifying possible shipboard applications for waste heat applications. Develop technical approach to test and evaluate various designs, and identify laboratory/shipboard testing plans. Continue to identify additional fuel saving technologies in Thermal Management that may be applicable to navy ships. Prepare proposals and business case analyses for promising technologies with potential to reduce fossil fuel consumption. ***FY 2017 OCO Plans:*** N/A					
Title: Propulsion Systems Sub Project ***Articles:*** ***Description:*** (U) Propulsion Systems Sub Project - Project funds will be utilized to identify requirements and perform land based and shipboard testing of ship propulsion system improvements on Gas Turbine, Steam, and Diesel Engine systems to reduce overall fuel consumption and lower maintenance costs. ***FY 2015 Accomplishments:*** Developed proposal for converting existing Main Propulsion diesel engines on LPD 17 Class ships to an Electronic Unit Injection Engine design aimed at increased operational efficiency. Developing proposal for a podded propulsion study aimed at identifying applications on naval ships. Continue to identify additional fuel saving technologies in Propulsion Systems and prepare proposals and business case analyses for promising technologies with potential to reduce fossil fuel. ***FY 2016 Plans:*** N/A ***FY 2017 Base Plans:*** Conduct systematic review of all surface ships in the 30 year shipbuilding plan to identify the most promising ship classes for incorporation of podded propulsion based on prior year proposal development. Compile feasible	0.659 -	0.000 -	0.723 -	0.000 -	0.723 -

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603724N / *Navy Energy Program*	**Project (Number/Name)** 0829 / *ENERGY CONSERVATION (ADV)*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
pod configurations and evaluate them for their performance against the platform and mission requirements. Continue to identify additional fuel saving technologies in Propulsion Systems and prepare proposals and business case analyses for promising technologies with potential to reduce fossil fuel. ***FY 2017 OCO Plans:*** N/A					
Title: Electrical Systems SubProject	2.201	0.000	0.412	0.000	0.412
Articles:	-	-	-	-	-
Description: Electrical Systems Sub Project - Project funds will be utilized to identify and perform land based and shipboard testing of ship electrical system improvements to reduce energy consumption. ***FY 2015 Accomplishments:*** Tasking in FY15 focused on developing a Light Emitting Diode (LED) solution to shipboard lighting. A Ship Change Document (SCD) has been developed to install LED lighting fixtures to improve lighting in hangar bays of DDG 51 Class ships. A First Article Test of a LED fixture has been completed and installation on a test ship is planned with installation date not yet finalized. Developed energy saving proposal for Micro-Grid technology on naval ships. Continue to identify additional fuel saving technologies in Electrical Systems and prepare proposals and business case analyses for promising technologies with potential to reduce fossil fuel. ***FY 2016 Plans:*** N/A ***FY 2017 Base Plans:*** Review prior year proposals to conduct study of Micro-Grid technology for shipboard systems application. Smart micro-grid technology is marriage of electrical power systems with information technology (IT) for the improvement of efficiency, resiliency, and energy cost savings. Continue to identify additional fuel saving technologies in Electrical Systems and prepare proposals and business case analyses for promising technologies with potential to reduce fossil fuel. ***FY 2017 OCO Plans:*** N/A					
Title: Auxiliary Systems Sub Project	1.134	0.250	0.000	0.000	0.000
Articles:	-	-	-	-	-

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603724N / *Navy Energy Program*	**Project (Number/Name)** 0829 / *ENERGY CONSERVATION (ADV)*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Description: Auxiliary Systems Sub Project -- Project funds will be utilized to identify, test and evaluate new technologies for shipboard auxiliary systems aimed at reducing fuel consumption. ***FY 2015 Accomplishments:*** Qualification and endurance testing of Advanced Reverse Osmosis (ARO) plant Energy Recovery Device is in progress. Phase II SCD 15632 has been approved for installation in USS COMSTOCK (LSD 45) in Feb 2016. Originally planned installation was delayed from Nov 15 to Feb 16 due to ship schedule. Continue to identify additional fuel saving technologies in auxiliary systems and prepare proposals and business case analyses for promising technologies with potential to reduce fossil fuel. ***FY 2016 Plans:*** In support of ARO installation in COMSTOCK on-board-training will be provided for ship's force. System installation will be monitored for performance and final report with recommendations will be provided. Continue to identify additional fuel saving technologies in auxiliary systems and prepare proposals and business case analyses for promising technologies with potential to reduce fossil fuel. ***FY 2017 Base Plans:*** N/A ***FY 2017 OCO Plans:*** N/A					
Title: Energy Monitoring & Assessment	6.439	5.302	5.519	0.000	5.519
Articles:	-	-	-	-	-
Description: This project area will focus on methods of capturing and displaying energy related data to shipboard personnel as actionable information for ships force to employ energy conservation measures underway and in port as mission requirements permit. ***FY 2015 Accomplishments:*** Completed installation of Shipboard Energy Dashboard on LPD 25 for evaluation. Sea trails completed 24 June and data is being analyzed. Next events are finalizing energy summary report format and monitoring data as it is transmitted to shore. Continued design effort for installation of Shipboard Energy Dashboard (SED) on a Flight I DDG 51 Class ship (DDG 60). Procured fuel flow meters for testing at the Land Based Engineering Station Philadelphia to evaluate performance and prepared drawings and a Ship Change Document (SCD 14060) for installation. Identified requirements for installing an energy dashboard on other classes of ships and initiated tasking to develop a web-based energy dashboard for DDG 51 Class ships to support transitioning					

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
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B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
from the current Integrated Condition Assessment System (ICAS) to the next generation enterprise Remote Monitoring (eRM) system designed to replace ICAS. Also as part of a Fleet/NAVSEA effort to develop a Global Energy Information System (GENISYS) in support of a Great Green Fleet (GGF) demonstration in CY 2016, prepared draft requirement specification documents for Fleet Energy Conservation Dashboard (FECD) and Ship Energy Assessment System (SEAS) as well as Interface Control Documents. Also initiated development of a Fleet Utilization Tool for assessing actual vs planned fuel usage for ships and developed shipboard Electronic Logs undergoing initial testing in July 15. Finally, continued prior year tasking to install a hull performance assessment tool (TRITON) aimed at determining the negative effect of hull/propeller fouling while underway and taking actions to perform condition based hull and propeller cleanings. Installation in DDG 102 is scheduled to begin in June 15 and will continue through August 15. Continue to identify additional fuel saving technologies and monitoring methodologies and prepare proposals and business case analyses for promising technologies with potential to reduce fossil fuel.					
FY 2016 Plans: Continue GENISYS development efforts for Fleet Energy Conservation Dashboard (FECD), Fuel Utilization Tool (FUT), SEAS, eRM aimed at supporting a CY 16 GGF demonstration and initial integration of energy monitoring capability for fleet assets. Conduct post installation evaluation of the TRITON Hull Assessment Tool installed in DDG 102 and monitor performance, analyze data, provide quarterly quick look reports. Monitor performance of SED installed in LPD 25, monitor performance and provide quick look and final report. Continue eRM requirements development and software testing, select test ship, develop SCD, SIDs, and procure material. Continue to identify additional fuel saving technologies and monitoring methodologies and prepare proposals and business case analyses for promising technologies with potential to reduce fossil fuel.					
FY 2017 Base Plans: Continue GENISYS development efforts and shipboard evaluation to support fleet-wide implementation. Continue monitoring shipboard installation of TRITON and provide final report with recommendations for implementation. Continue eRM development efforts and install on test ship for shipboard evaluation, monitor performance, develop report format for eRM data and provide monthly report of performance. Based on efforts for DDG 51 Class, develop eRM requirements for LPD 17 Class ships, conduct initial ship check and determine drawing/material requirements. Initiate development of a shipboard energy dashboard aimed at capturing Combat System Equipment (CSE) performance to monitor energy requirements/consumption and compliment energy dashboard data captured for Hull, Mechanical & Electrical (HM&E) equipment in order to provide operators with a total real-time HM&E and CSE energy profile. Evaluate prior year energy saving proposals for potential funding in FY17. Continue to identify additional fuel saving technologies and monitoring methodologies					

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
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B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
and prepare proposals and business case analyses for promising technologies with potential to reduce fossil fuel. ***FY 2017 OCO Plans:*** N/A					
Accomplishments/Planned Programs Subtotals	16.094	8.278	9.674	0.000	9.674

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

RDT&E Contracts are Competitive Procurements.

E. Performance Metrics

Quarterly Program Reviews

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy			Date: February 2016
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Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Systems Engineering	C/CPAF	NAVSEA HQ : Washington, DC	0.000	0.000		0.000	Jan 2016	0.922	Jan 2017	-		0.922	0.000	0.922	-
Systems Engineering	WR	NSWC DD : Dahlgren, MD	0.000	0.000		0.000		0.100	Nov 2016	-		0.100	0.000	0.100	-
Systems Engineering	WR	NSWC PHila : Philadelphia, PA	0.000	0.000		0.821	Jan 2016	0.834	Nov 2016	-		0.834	0.000	1.655	-
Primary Hardware Development	WR	NSWC Carderock : Bethesda, MD	5.994	2.989	Nov 2014	0.000	Jan 2016	0.000	Nov 2016	-		0.000	0.000	8.983	-
Systems Engineering	WR	NSWC PHD : Port Hueneme, CA	0.000	0.000		0.000		0.100	Nov 2016	-		0.100	0.000	0.100	-
Systems Engineering	C/CPAF	NSWC Carderock : Bethesda, MD	4.941	1.694	Feb 2015	0.000		0.000		-		0.000	0.000	6.635	-
Engineering Development	WR	NSWC Carderock : Bethesda, MD	6.098	1.750	Feb 2015	0.000		0.000		-		0.000	0.000	7.848	-
Demonstration & Evaluation	WR	NSWC Carderock : Bethesda, MD	6.183	1.200	May 2015	0.828	Jan 2016	0.899	Jan 2017	-		0.899	0.000	9.110	-
		Subtotal	23.216	7.633		1.649		2.855		-		2.855	0.000	35.353	-

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Development Support	WR	NSWC Carderock : Bethesda, MD	0.700	2.000	Dec 2014	0.143	Jan 2016	0.000		-		0.000	Continuing	Continuing	Continuing
Software Support	WR	NSWC Carderock : Bethesda, MD	0.450	0.000		0.072	Jan 2016	0.000		-		0.000	Continuing	Continuing	Continuing
Integrated Logistics Support	WR	NSWC Carderock : Bethesda, MD	0.700	0.500	May 2015	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Study Anaylsis	WR	NSWC Carderock : Bethesda, MD	0.700	0.474	Dec 2014	0.000		2.146	Nov 2016	-		2.146	Continuing	Continuing	Continuing
Development Support	C/CPAF	NSWC SSES : Philadelphia, PA	0.000	0.000		0.878	Jan 2016	0.000		-		0.000	0.000	0.878	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy			Date: February 2016
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Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Development Support	C/CPAF	NAVSEA HQ : Washington, DC	0.000	0.000		0.100	Jan 2016	0.000		-		0.000	0.000	0.100	-
Software Support	C/CPAF	NSWC SSES : Philadelphia, PA	0.000	0.000		0.281	Jan 2016	0.000		-		0.000	0.000	0.281	-
Software Support	C/CPAF	NAVSEA HQ : Washington, DC	0.000	0.000		1.200	Jan 2016	0.149	Jan 2017	-		0.149	0.000	1.349	-
		Subtotal	2.550	2.974		2.674		2.295		-		2.295	-	-	-

Remarks

FY16 majority Development and Software support will move to NAVSEA/NSWC SSES from NSWC Carderock.

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation	WR	NSWC Carderock : Bethesda, MD	7.826	2.135	Jun 2015	0.000	Feb 2016	0.153	Nov 2016	-		0.153	Continuing	Continuing	Continuing
Operational Test & Evaluation	WR	NSWC Carderock : Bethesda, MD	4.778	1.900	Jun 2015	1.697	Feb 2016	0.396	Nov 2016	-		0.396	Continuing	Continuing	Continuing
Live Fire Test & Evaluation	WR	NSWC Carderock : Bethesda, MD	0.382	0.000		0.000		0.000		-		0.000	0.000	0.382	-
Developmental Test & Evaluation	C/CPAF	NSWC SSES : Philadelphia, PA	0.000	0.000		0.383	Feb 2016	0.000		-		0.000	0.000	0.383	-
Operational Test & Evaluation	WR	NSWC Caderock : Bethesda, MD	0.000	0.000		0.000		2.347	Nov 2016	-		2.347	0.000	2.347	-
		Subtotal	12.986	4.035		2.080		2.896		-		2.896	-	-	-

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Support	WR	NSWC PHila : Philadelphia, PA	4.110	1.442	Oct 2014	0.628	Oct 2015	0.500	Nov 2016	-		0.500	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy		Date: February 2016
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Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Travel	Allot	NAVSEA HQ : Washington, DC	0.159	0.010	Oct 2014	0.007	Sep 2016	0.013	Nov 2016	-		0.013	Continuing	Continuing	Continuing
Total Assets	WR	NSWC Carderock : Bethesda, MD	0.352	0.000		0.000		0.000		-		0.000	0.000	0.352	-
Program Management Support	C/CPAF	NAVSEA HQ : Washington, DC	0.000	0.000		0.890	Jan 2016	0.790	Jan 2017	-		0.790	0.000	1.680	-
Program Management Support	WR	NSWC Caderock : Bethesda, MD	0.000	0.000		0.350	Oct 2015	0.325	Nov 2016	-		0.325	0.000	0.675	-
		Subtotal	4.621	1.452		1.875		1.628		-		1.628	-	-	-

	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	43.373	16.094		8.278		9.674		-		9.674	-	-	-

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2017 Navy		Date: February 2016
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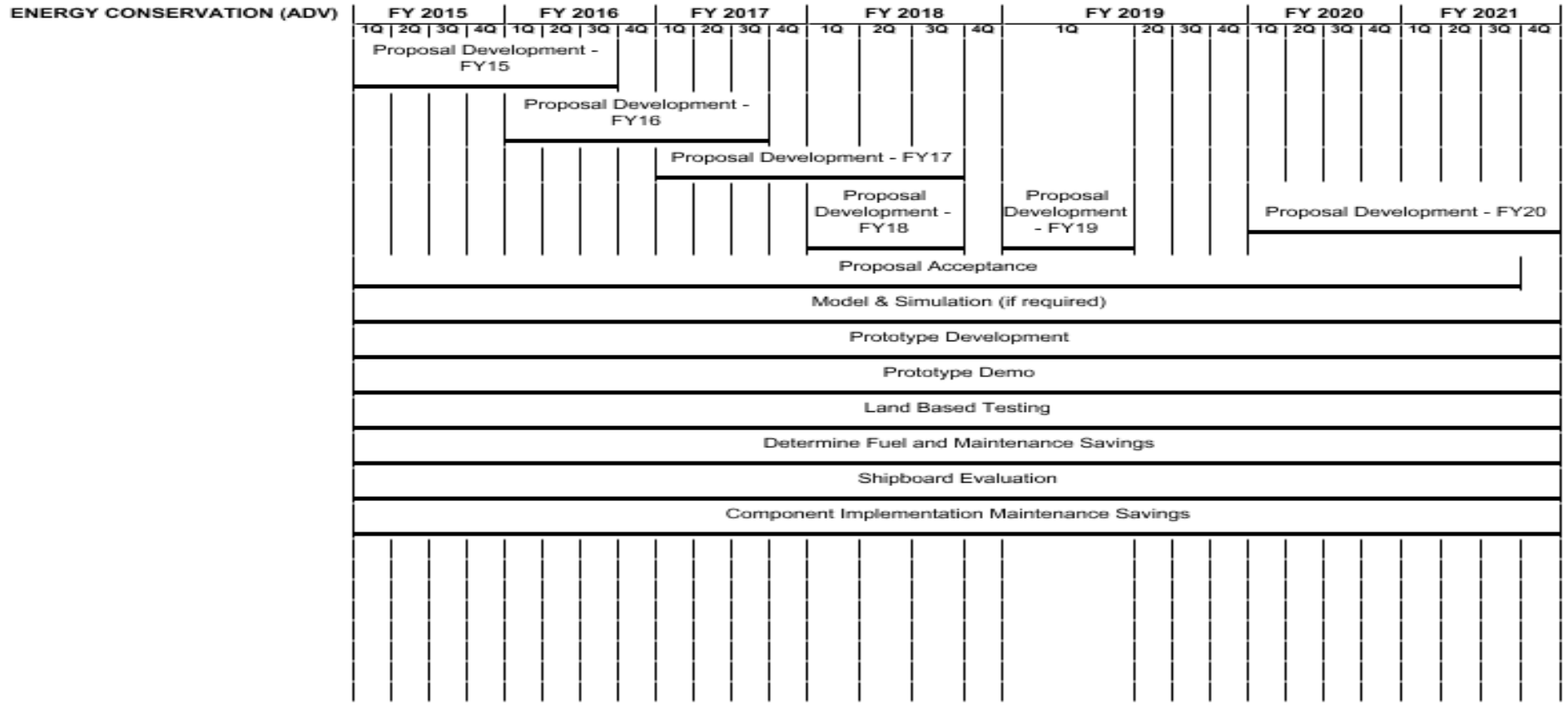

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Exhibit R-4A, RDT&E Schedule Details: PB 2017 Navy		Date: February 2016
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Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
ENERGY CONSERVATION (ADV)				
Proposal Development - FY15	1	2015	3	2016
Proposal Development - FY16	1	2016	3	2017
Proposal Development - FY17	1	2017	3	2018
Proposal Development - FY18	1	2018	3	2018
Proposal Development - FY19	1	2019	1	2019
Proposal Development - FY20	1	2020	4	2021
Proposal Acceptance	1	2015	3	2021
Model & Simulation (if required)	1	2015	4	2021
Prototype Development	1	2015	4	2021
Prototype Demo	1	2015	4	2021
Land Based Testing	1	2015	4	2021
Determine Fuel and Maintenance Savings	1	2015	4	2021
Shipboard Evaluation	1	2015	4	2021
Component Implementation Energy Savings	1	2015	4	2021

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603724N / *Navy Energy Program*	Project (Number/Name) 0838 / *Mobility Fuels (ADV)*	

COST ($ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
0838: *Mobility Fuels (ADV)*	56.292	10.570	11.739	12.973	-	12.973	12.711	12.165	12.313	12.565	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This project provides data through laboratory, component, engine, fuel system, and weapon system tests, which relate the effects of changes in the Navy fuel procurement specification properties and chemistries to the performance and reliability of Naval ship, aircraft, and fuel distribution systems. The information is required to: (a) develop, validate, and execute the test protocols necessary to approve fuels 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 specifications are unavailable or in short supply, (d) technically justify changes to fuel specifications to ensure fuel quality and avoid fleet operating problems while accommodating evolutionary changes in fuel supply, and (e) improve capability to provide fuel quality surveillance in the field. Continued volatility and rapid escalation of the cost of fuel have placed additional pressures on 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 use 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 effects that fuel-related problems can have on ship and aircraft system performance, reliability, and readiness. The program addresses readiness, additional maintenance costs, and the cost of lost equipment. The potential risk of fuel-related problems over the next decade, given the unknown supply, feedstocks, and the introduction of new theaters of operation, will continue to increase.

This project represents the Navy's only investment designed to maintain its capability to operate as a "smart" customer for fuels that cost over $4.0 billion per year for procurement, transport, storage, and consumption, and are essential to fleet operations. Additionally, it is the Navy's only investment in the approval of alternative fuels for tactical applications and directly supports the Navy's energy goals of increased energy security and environmental stewardship.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Title: Naval Tactical Fuels	10.570	11.739	12.973	0.000	12.973
Articles:	-	-	-	-	-
Description: Perform development, test and evaluation work on Naval tactical 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 2015 Accomplishments:					

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
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B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Continue to expand list of qualified renewable sources/production pathways for inclusion into JP-5 and F-76 specifications. Conduct hardware testing on hydroprocessed depolymerized cellulosic. Continue testing on advanced production pathways. ***FY 2016 Plans:*** Continue to expand the list of qualified renewable sources and production pathways for inclusion into the JP-5 and F-76 specifications. Conduct hardware testing on 100% fully synthetic aviation and shipboard fuels. Continue testing on advanced production pathways. ***FY 2017 Base Plans:*** Continue to expand the list of qualified renewable sources and production pathways for inclusion into the JP-5 and F-76 specifications. Continue protocol testing on advanced alternative fuel production pathways. Conduct research, development, test, and evaluation to mitigate field-identified aviation and ship propulsion fuel deficiencies. ***FY 2017 OCO Plans:*** N/A					
Accomplishments/Planned Programs Subtotals	10.570	11.739	12.973	0.000	12.973

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

Alternative Fuel Efforts including testing and fuel procurement efforts will be competitively contracted, and performed under Cost Plus Fixed Fee and Firm Fixed Price 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 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603724N / *Navy Energy Program*	Project (Number/Name) 0838 / *Mobility Fuels (ADV)*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Systems Engineering	WR	NRL : Washington, D.C.	2.867	0.590	Oct 2014	0.500	Jan 2016	0.600	Nov 2016	-		0.600	Continuing	Continuing	Continuing
Systems Engineering	WR	NAWCAD : Patuxent River, MD	10.413	1.750	Oct 2014	1.800	Nov 2015	2.593	Nov 2016	-		2.593	Continuing	Continuing	Continuing
Systems Engineering	WR	NSWC : Philadelphia, PA	2.089	0.987	Oct 2014	0.450	Nov 2015	1.000	Jan 2017	-		1.000	Continuing	Continuing	Continuing
Systems Engineering	WR	NSWC : Bethesda, MD	0.000	0.278	Oct 2014	0.000		0.000		-		0.000	0.000	0.278	-
Systems Engineering	C/FFP	Various : Various	0.000	0.000		0.000		0.847	Mar 2017	-		0.847	0.000	0.847	0.847
Prior year Prod Dev no longer funded in the FYDP	Various	Various : Various	0.161	0.000		0.000		0.000		-		0.000	0.000	0.161	0.161
		Subtotal	15.530	3.605		2.750		5.040		-		5.040	-	-	-

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Test Fuel	C/FFP	Various : Various	2.000	0.000		3.857	Dec 2015	3.000	Apr 2017	-		3.000	0.000	8.857	8.857
Hardware Testing	WR	NAWCAD : Patuxent River, MD	2.999	0.150	Oct 2014	0.700	Feb 2016	0.400	Nov 2016	-		0.400	Continuing	Continuing	Continuing
Hardware Testing	C/CPFF	Life Cycle Engineering : Charleston, SC	4.299	3.389	Dec 2014	2.336	Jan 2016	2.000	Jan 2017	-		2.000	0.000	12.024	12.024
Hardware Testing	SS/CPFF	Rolls Royce : Indianapolis, IN	1.850	0.600	Aug 2015	0.500	May 2016	0.500	May 2017	-		0.500	0.000	3.450	3.450
Hardware Testing	C/CPFF	Univ of Dayton Research Inst : Dayton, OH	0.152	0.282	Feb 2015	0.150	Mar 2016	0.200	Apr 2017	-		0.200	0.000	0.784	0.784
Hardware Testing	WR	US Naval Academy : Annapolis, MD	0.046	0.052	Apr 2015	0.000		0.000		-		0.000	0.000	0.098	-
Hardware Testing	C/CPFF	General Electric : Lynn, MA	0.000	1.237	Jun 2015	0.000		1.300	May 2017	-		1.300	0.000	2.537	2.537

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603724N / *Navy Energy Program*	Project (Number/Name) 0838 / *Mobility Fuels (ADV)*	

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Hardware Testing	WR	NSWC : Philadelphia, PA	0.080	0.000		0.750	Feb 2016	0.000		-		0.000	Continuing	Continuing	Continuing
Hardware Testing	C/FFP	Various : Various	0.756	0.753	Sep 2015	0.000	Jun 2016	0.000		-		0.000	0.000	1.509	1.509
Hardware Testing	WR	TBD : TBD	0.000	0.000		0.200	Jan 2016	0.000		-		0.000	0.000	0.200	-
Fuel Delivery	MIPR	DLA-Energy : Ft. Belvoir, VA	0.000	0.195	Oct 2014	0.000		0.150	Dec 2016	-		0.150	0.000	0.345	-
Fuel Blend Testing	WR	Naval Medical Research Unit : Dayton, OH	0.000	0.042	Oct 2014	0.000		0.000		-		0.000	0.000	0.042	-
Prior year T & E no longer funded in the FYDP	Various	Various : Various	21.212	0.000		0.000		0.000		-		0.000	0.000	21.212	21.212
		Subtotal	33.394	6.700		8.493		7.550		-		7.550	-	-	-

Remarks

FY15 Hardware Testing actual costs were updated and performing activities realigned from 'Various' and Organic to actuals. Required Test Fuel was realigned from 'Various' actual performing activity.

Management Services ($ in Millions)

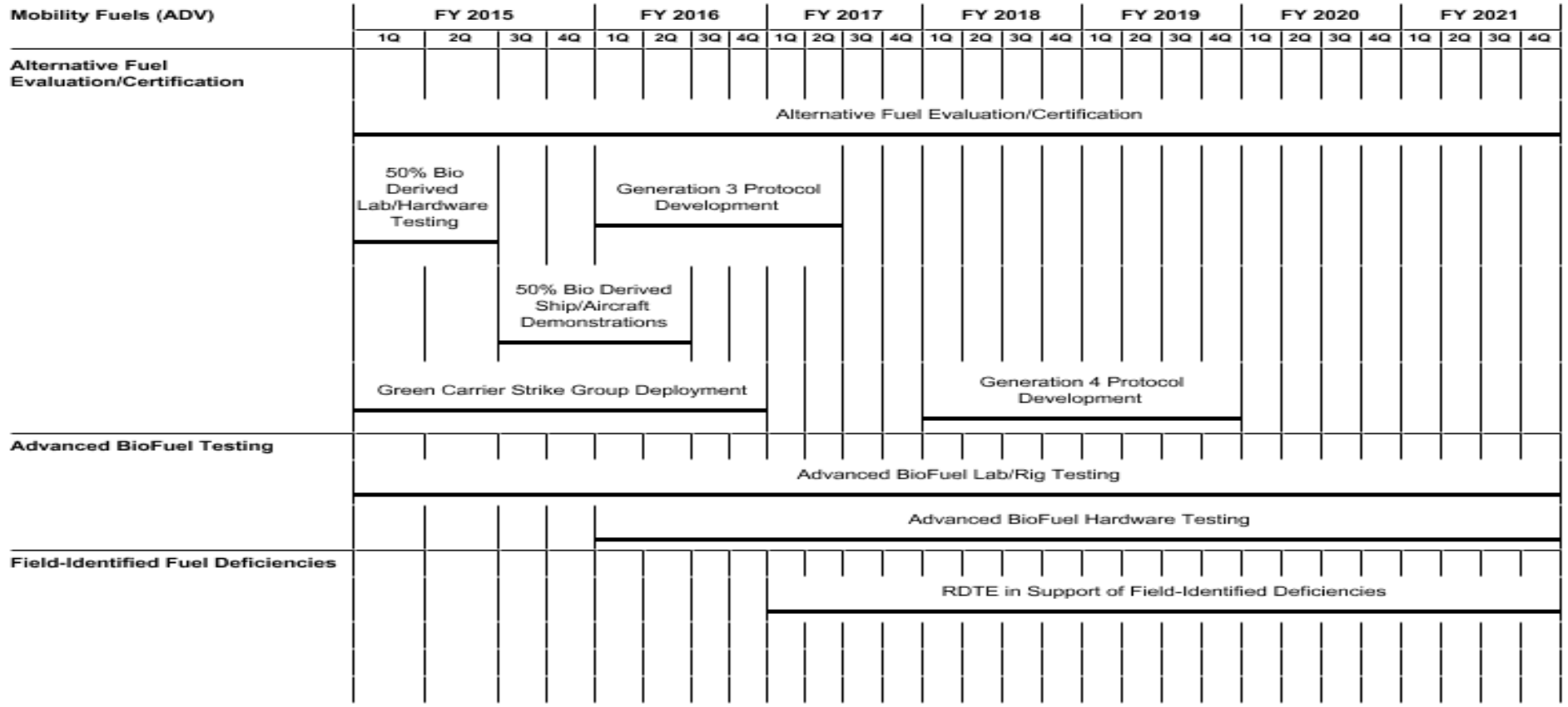
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Support	WR	NAWCAD : Patuxent River, MD	0.753	0.250	Oct 2014	0.481	Nov 2015	0.383	Nov 2016	-		0.383	Continuing	Continuing	Continuing
Program Management Support	WR	NAVSUP : San Diego, CA	0.012	0.005	Nov 2014	0.005	Nov 2015	0.000		-		0.000	Continuing	Continuing	Continuing
Program Management Support	C/FFP	Coord Research Council : Alpharetta, GA	0.020	0.010	Dec 2014	0.010	Dec 2015	0.000		-		0.000	0.000	0.040	0.040
Prior year Mgmt Supp no longer funded in the FYDP	Various	Various : Various	6.583	0.000		0.000		0.000		-		0.000	0.000	6.583	6.583
		Subtotal	7.368	0.265		0.496		0.383		-		0.383	-	-	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603724N / *Navy Energy Program*	Project (Number/Name) 0838 / *Mobility Fuels (ADV)*	

	Prior Years	FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	56.292	10.570		11.739		12.973		-		12.973	-	-	-

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603724N / *Navy Energy Program*	**Project (Number/Name)** 0838 / *Mobility Fuels (ADV)*



2017DON - 0603724N - 0838

Exhibit R-4A, RDT&E Schedule Details: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603724N / *Navy Energy Program*	**Project (Number/Name)** 0838 / *Mobility Fuels (ADV)*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Mobility Fuels (ADV)				
Alternative Fuel Evaluation/Certification: Alternative Fuel Evaluation/Certification	1	2015	4	2021
Alternative Fuel Evaluation/Certification: Generation 3 Protocol Development	1	2016	2	2017
Alternative Fuel Evaluation/Certification: 50% Bio Derived Lab/Hardware Testing	1	2015	2	2015
Alternative Fuel Evaluation/Certification: 50% Bio Derived Ship/Aircraft Demonstrations	3	2015	2	2016
Alternative Fuel Evaluation/Certification: Green Carrier Strike Group Deployment	1	2015	4	2016
Alternative Fuel Evaluation/Certification: Generation 4 Protocol Development	1	2018	4	2019
Advanced BioFuel Testing: Advanced BioFuel Lab/Rig Testing	1	2015	4	2021
Advanced BioFuel Testing: Advanced BioFuel Hardware Testing	1	2016	4	2021
Field-Identified Fuel Deficiencies: RDTE in Support of Field-Identified Fuel Deficiencies	1	2017	4	2021

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy										Date: February 2016		
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0603724N / *Navy Energy Program*				Project (Number/Name) 0928 / *Directed Energy Research*			
COST ($ in Millions)	**Prior Years**	**FY 2015**	**FY 2016**	**FY 2017 Base**	**FY 2017 OCO**	**FY 2017 Total**	**FY 2018**	**FY 2019**	**FY 2020**	**FY 2021**	**Cost To Complete**	**Total Cost**
0928: *Directed Energy Research*	42.050	6.683	1.519	1.957	-	1.957	1.965	1.870	1.905	1.943	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Legislation, Executive Orders (EO), and SECNAV Guidance direct DoN to reduce fossil fuel use and increase renewable energy use. This guidance includes the Energy Policy Act of 2005, which directs agencies to reduce energy intensity 30% by 2015, the National Defense Authorization Act of 2010, which directs DOD to source 25% of its energy from renewable sources by 2025, EO13514, which directs DOD to reduce greenhouse gas emissions by 2020, and SECNAV energy goals, which direct that 50% of DoN's energy come from alternative sources by 2020. Further, studies by the Defense Science Board and others have stressed the dangerous reliance of DOD on vulnerable grid power and unreliable imported oil. Currently, the Navy has limited options for producing energy from renewable sources. Private industry and other federal agencies are developing and testing new technologies. Renewable energy from the ocean such as wave, sea water air conditioning, tidal energy, outer continental shelf wind development, ammonia production and utilization, vortex induced vibration marine hydrokinetic, and compressed air storage for ocean energy, among other technologies have potential to alleviate current Navy island installation dependence on fossil fuel, at comparable costs to projected fossil energy sources. Also, advanced energy management systems have potential to increase installation energy security and enable broader use of renewable energy sources.

This Energy RDT&E Project will test, evaluate, and validate components as well as demonstrate cost-effective and technical viability of energy efficiency and renewable energy, energy storage and Alternative Fuel Vehicle prototypes. All efforts will be coordinated across DOD and with other agencies as appropriate. Specifically, this project aims to pursue three areas of development, testing and evaluation: (A) Renewable Energy to support feasibility evaluation, modeling and possible prototype testing of new energy sources for use at Naval installations with potential for widespread applicability to energy security and renewable energy requirements. Other renewable sources for evaluation, modeling and possible prototype testing may include energy storage (dead-ended fuel cell, zinc air battery, etc.), facility level concentrating solar power, next generation solar heat reflective film, plasma lighting for high wattage applications, micro-inverters for photo-voltaic storage, building level micro-grid, new generation waste heat capture, and other technologies; (B) It will support demonstration and validation of advanced electric grid management systems, known as "Smart Grid" and "Micro Grid" technology, for use at Naval installations to enable improved energy security; (C) Demonstration and Validation of Alternative Energy, Energy Efficiency, Sustainable Building Features, Alternative Fuel Vehicles, and Smart Energy Management Technology: This project will support the testing, demonstration, validation, and application of innovative facility energy efficiency and alternative energy technology.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	**FY 2015**	**FY 2016**	**FY 2017 Base**	**FY 2017 OCO**	**FY 2017 Total**
Title: Directed Energy Research	6.683	1.519	1.957	0.000	1.957
Articles:	-	-	-	-	-
FY 2015 Accomplishments: Performed component testing, prototype development and deployment for alternative energy, advanced lighting, facility cooling, and grid management technology at Naval installations as follows: - Continued evaluation of environmental impacts of ocean renewable energy generation systems.					

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603724N / *Navy Energy Program*	**Project (Number/Name)** 0928 / *Directed Energy Research*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
- Evaluated and tested Wave Energy Systems - Assess and document performance of multiple wave energy devices at the Wave Energy Test Site. - Evaluation, and planning for multiple energy storage technologies, Sea Water Air Conditioning system optimization, and other promising technologies. - Demonstration, testing, deployment, and evaluation of smart and micro grid energy management technology, and begin development of technical specifications. - Demonstration and validation of mature technologies to be transitioned such as advanced lighting, sustainable building technologies, solar PV collection technologies, alternative fuel vehicles, and improved energy storage systems at Naval installations. The FY15 plan includes: - Continued and expanded demonstration, testing, deployment, and evaluation of smart energy and micro-grid management technology. - Continued and expanded demonstration and validation of mature technologies to be transitioned such as alternative fuel vehicles, and improved energy storage systems and integration at Naval installations. - Initiated planning and development of prototypes for the next set of energy storage, grid management, renewable/alternative energy, and efficiency technologies. This included innovative technology development and site planning to prepare for FY16/17 testing and evaluation.					
FY 2016 Plans: FY16 will focus on completing or continuing projects initiated in FY14 and FY15. - Continue evaluation of environmental impacts of ocean renewable energy generation systems. - Continue evaluating and testing Wave Energy Systems. - Complete evaluation for ocean compressed air storage technologies and SWAC optimization. - Initiate demonstration, testing, and evaluation of improved and low cost smart and micro grid energy management technologies. - Demonstration and validation of mature low-cost technologies to be transitioned such as advanced lighting, sustainable building technologies, solar PV collection technologies, alternative fuel vehicles, and improved energy storage systems at Naval installations. The FY16 plan includes: - Continue demonstration, testing, deployment, and evaluation of smart energy and micro-grid management technology; and begin development of technical specifications.					

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603724N / *Navy Energy Program*	**Project (Number/Name)** 0928 / *Directed Energy Research*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
- Continue demonstration and validation of mature technologies to be transitioned such as sustainable building technologies, alternative fuel vehicles, and improved energy storage systems and integration at Naval installations. - The FY16 plan will reduce the number of new technologies evaluated for alternative energy, grid management, efficiency and sustainable building technologies. In addition, the validation will delay development of procurement specifications impacting deployment of these technologies beyond 2020. ***FY 2017 Base Plans:*** FY17 will focus on completing or continuing projects initiated in FY15 and FY16. - Continue evaluating and testing Wave Energy Systems to include power generation, to grid integration and monitoring of environmental effects of these systems. - Continue demonstration, testing, and evaluation of improved and low cost smart and micro grid energy management technologies. -Initiate demonstration and validation of new energy storage, energy efficiency, and renewables technologies. -Defer demonstration of new alternative vehicle technologies and CYBER secure technologies to FY18. ***FY 2017 OCO Plans:*** N/A.					
Accomplishments/Planned Programs Subtotals	6.683	1.519	1.957	0.000	1.957

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

Demonstration and validation are 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

The program will be coordinated across DOD and with other agencies as appropriate to achieve 30% Energy Intensity Reduction by FY2015 and 25% Renewable Energy Increase by 2025.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603724N / *Navy Energy Program*	**Project (Number/Name)** 0928 / *Directed Energy Research*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Renewable Energy	Various	EXWC : Port Hueneme, CA	37.480	3.908	Mar 2015	0.640	Jan 2016	0.432	Oct 2016	-		0.432	Continuing	Continuing	Continuing
Smart Energy	Various	EXWC : Port Hueneme, CA	1.500	1.982	May 2015	0.640	Jan 2016	0.809	Oct 2016	-		0.809	Continuing	Continuing	Continuing
Demonstration/Validation	Various	EXWC : Port Hueneme, CA	3.070	0.793	Jun 2015	0.239	Jan 2016	0.716	Oct 2016	-		0.716	Continuing	Continuing	Continuing
		Subtotal	42.050	6.683		1.519		1.957		-		1.957	-	-	-

Remarks

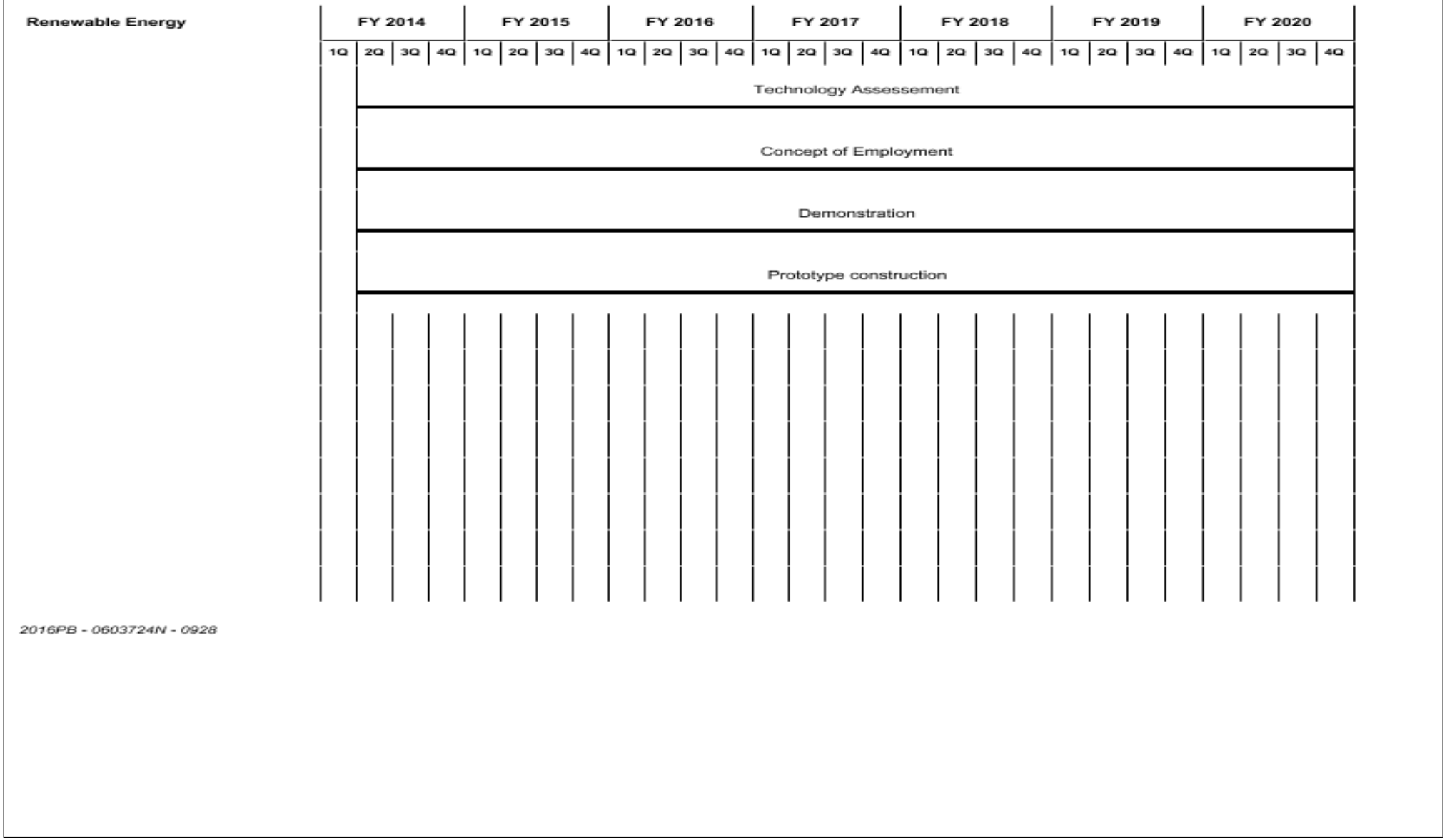
In FY17 the Directed Energy Program will be limited to assessing technologies for renewable energy, energy efficiency and energy reduction.

This technology assessment continues throughout the program life. As these technologies are assessed, they will be incorporated individually into the shore installation by a variety of acquisition strategies including Energy Savings Performance Contract vehicles, Purchase Power Agreements, and globally by changes to design and construction criteria. These, too, will continue throughout the program life. For Smart Energy, and select other technologies, there will be a requirement for component testing and validation. The wave energy systems will include operation and demonstration throughout the FYDP, resulting in development of test and evaluation results and lessons learned. This will be followed by criteria development to transition the technical aspects required to acquire a full scale system targeted to support one of several Naval Bases throughout the testing and evaluation period, deliverables will be required at the end of each Fiscal Year for component test results, validated components, and pilot prototype design and testing.

	Prior Years	FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	42.050	6.683		1.519		1.957		-		1.957	-	-	-

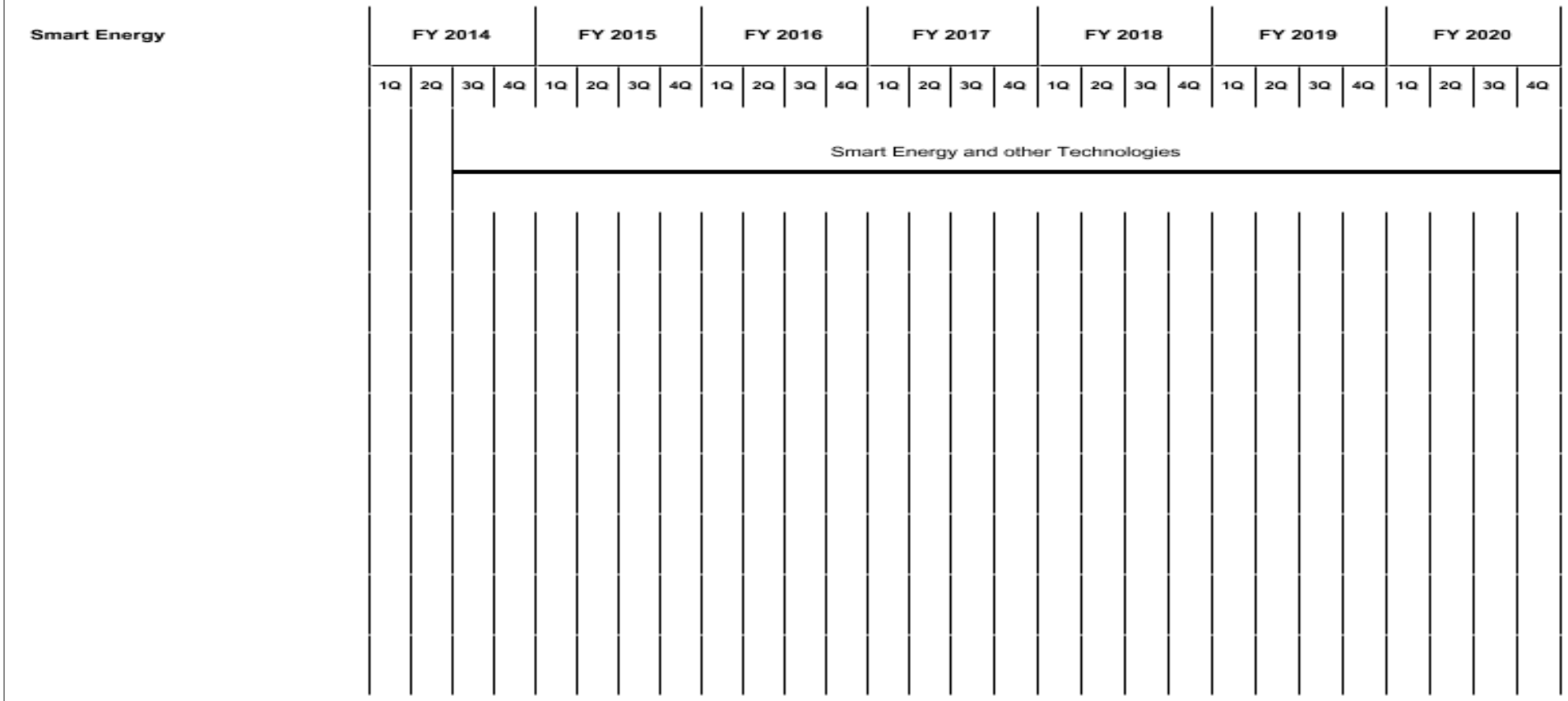
Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603724N / *Navy Energy Program*	**Project (Number/Name)** 0928 / *Directed Energy Research*



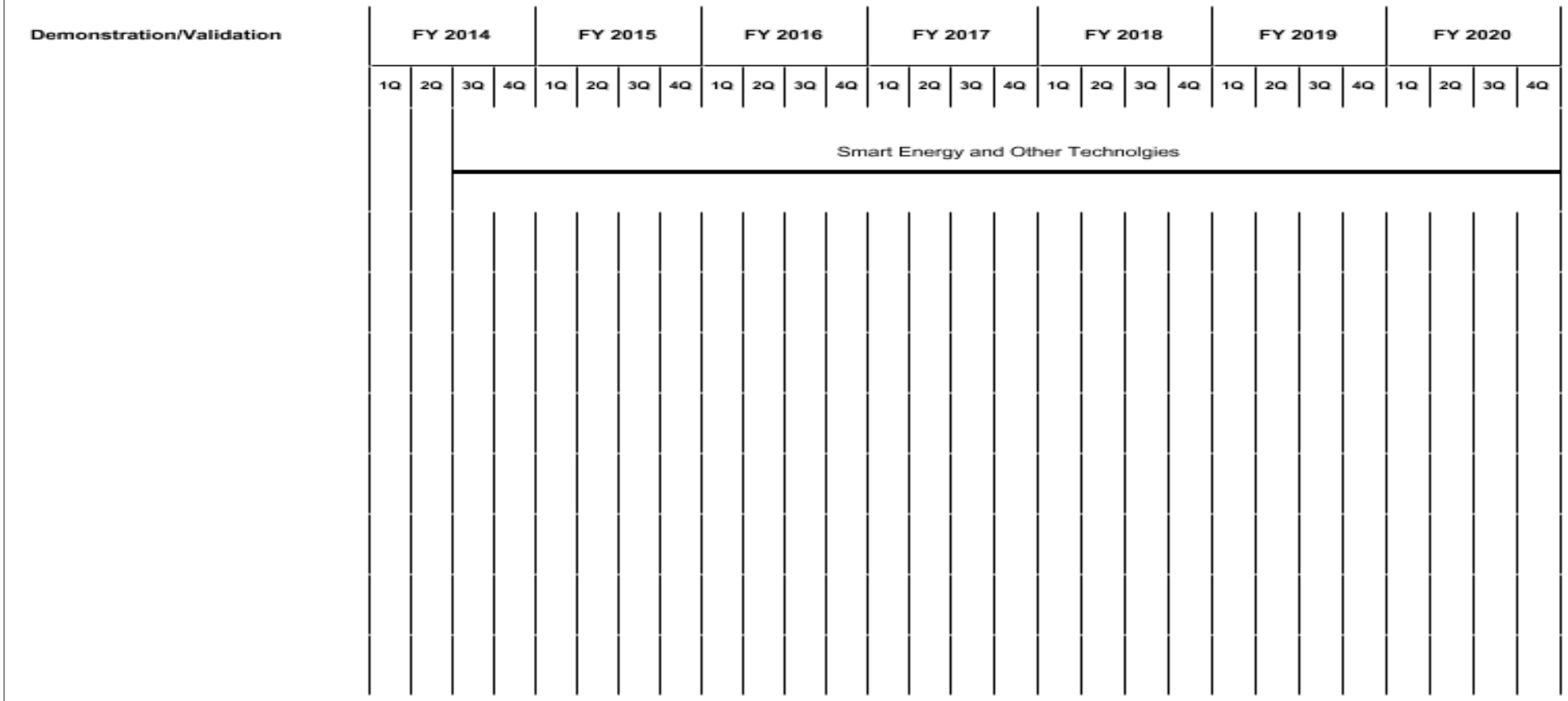
2016PB - 0603724N - 0928

Exhibit R-4, RDT&E Schedule Profile: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603724N / *Navy Energy Program*	**Project (Number/Name)** 0928 / *Directed Energy Research*



2016PB - 0603724N - 0928

Exhibit R-4, RDT&E Schedule Profile: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603724N / *Navy Energy Program*	**Project (Number/Name)** 0928 / *Directed Energy Research*



2016PB - 0603724N - 0928

Exhibit R-4A, RDT&E Schedule Details: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603724N / *Navy Energy Program*	**Project (Number/Name)** 0928 / *Directed Energy Research*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Renewable Energy				
Technology Assessement	1	2015	4	2021
Concept of Employment	1	2015	4	2021
Prototype Construction	1	2015	4	2021
Demonstration	1	2015	4	2021
Smart Energy				
Technology Evaluation (Includes micogrid and CYBER)	1	2015	4	2021
Demonstration/Validation				
Smart Energy and Other Technologies	1	2015	4	2021

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603724N / *Navy Energy Program*	Project (Number/Name) 0996 / *Aircraft Energy Conservation*	

COST ($ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
0996: *Aircraft Energy Conservation*	66.757	29.066	22.355	27.875	-	27.875	25.447	24.667	24.917	25.424	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Aircraft Energy Conservation (AIR-ENCON) program is designed to develop and implement energy and maintenance saving improvements into existing fleet assets. The program identifies, evaluates, and implements energy savings initiatives for potential implementation into Naval aircraft. The objective of the program is to engage technical experts from across Naval aviation, industry, and academia to identify mature potential energy saving opportunities and determine the technical and fiscal viability of implementing them in existing aircraft platforms.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Title: Aircraft Energy Conservation	29.066	22.355	27.875	0.000	27.875
Articles:	-	-	-	-	-
FY 2015 Accomplishments: Complete F135 compressor rig test and conduct Critical Design Review in support of F135 engine fuel burn reduction demonstration. Continue to identify, validate, and institutionalize energy conservation/efficiency concepts into the fleet. Continue validation of aircraft subsystem technologies and advance mission planning and navigation technologies for incorporation into legacy and emerging platforms.					
FY 2016 Plans: Conduct F135 fuel burn reduction engine demonstration. Continue identification, validation, and implementation of energy conservation/efficiency concepts into the fleet. Conduct validation of energy efficiency aircraft subsystem technologies and advanced planning and mission/navigation technologies.					
FY 2017 Base Plans: Complete analysis of F135 fuel burn reduction engine demonstration. Continue identification, validation, and implementation of energy conservation/efficiency concepts into the fleet. Down-select the most promising concepts and award contract in Jan 2017. Some of the concepts under evaluation include efficiency initiations with respect to F/A-18 E/F: conformal tanks, engines; C2/P-3/C-130: engines, advanced mission planning; MH-60 engines, main rotor blades; MV-22: engine. Conduct validation of energy efficiency aircraft subsystem technologies and advanced planning and mission/navigation technologies.					
FY 2017 OCO Plans:					

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603724N / *Navy Energy Program*	**Project (Number/Name)** 0996 / *Aircraft Energy Conservation*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
N/A					
Accomplishments/Planned Programs Subtotals	29.066	22.355	27.875	0.000	27.875

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

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 aircraft demonstration testing.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603724N / *Navy Energy Program*	Project (Number/Name) 0996 / *Aircraft Energy Conservation*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Systems Engineering	WR	NAWCAD : Patuxent River, MD	2.749	1.100	Nov 2014	1.040	Dec 2015	2.500	Nov 2016	-		2.500	Continuing	Continuing	Continuing
Systems Engineering	C/CPFF	Lockheed Martin : Fort Worth, TX	0.505	0.179	Apr 2015	0.000		2.900	Feb 2017	-		2.900	0.000	3.584	3.584
Systems Engineering	C/FFP	The Boeing Co. : St. Louis, MO	0.000	0.400	Apr 2015	0.000		0.000		-		0.000	0.000	0.400	0.400
Systems Engineering	C/CPFF	TBD : TBD	0.064	0.000		0.375	Mar 2016	0.000		-		0.000	0.000	0.439	0.439
Systems Engineering	C/CPFF	The Boeing Company : Seattle, WA	0.000	0.000		0.000		3.000	Jan 2017	-		3.000	0.000	3.000	3.000
Systems Engineering	C/CPFF	Various : Various	0.000	0.000		0.000		13.754	Jan 2017	-		13.754	0.000	13.754	13.754
Prior year Sys Eng no longer funded in the FYDP	Various	Various : Various	2.464	0.000		0.000		0.000		-		0.000	0.000	2.464	2.464
		Subtotal	5.782	1.679		1.415		22.154		-		22.154	-	-	-

Remarks

FY15 Systems Engineering to Lockheed Martin reduced from PB16 submit due to need for more Hardware Testing at Pratt Whitney Associates (PWA).

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Hardware Testing	C/CPFF	PWA : Hartford, CT	54.505	24.093	Feb 2015	15.116	Nov 2015	4.500	Oct 2016	-		4.500	0.000	98.214	98.214
Hardware Testing	WR	NAWCAD : Patuxent River, MD	1.207	0.600	Dec 2014	0.600	Dec 2015	0.900	Nov 2016	-		0.900	Continuing	Continuing	Continuing
Hardware Testing	C/CPFF	Lockheed : Fort Worth, TX	1.300	1.834	Oct 2014	4.554	May 2016	0.000		-		0.000	0.000	7.688	7.688
Prior year T&E no longer funded in the FYDP	Various	Various : Various	0.100	0.000		0.000		0.000		-		0.000	0.000	0.100	0.100
		Subtotal	57.112	26.527		20.270		5.400		-		5.400	-	-	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603724N / *Navy Energy Program*	Project (Number/Name) 0996 / *Aircraft Energy Conservation*

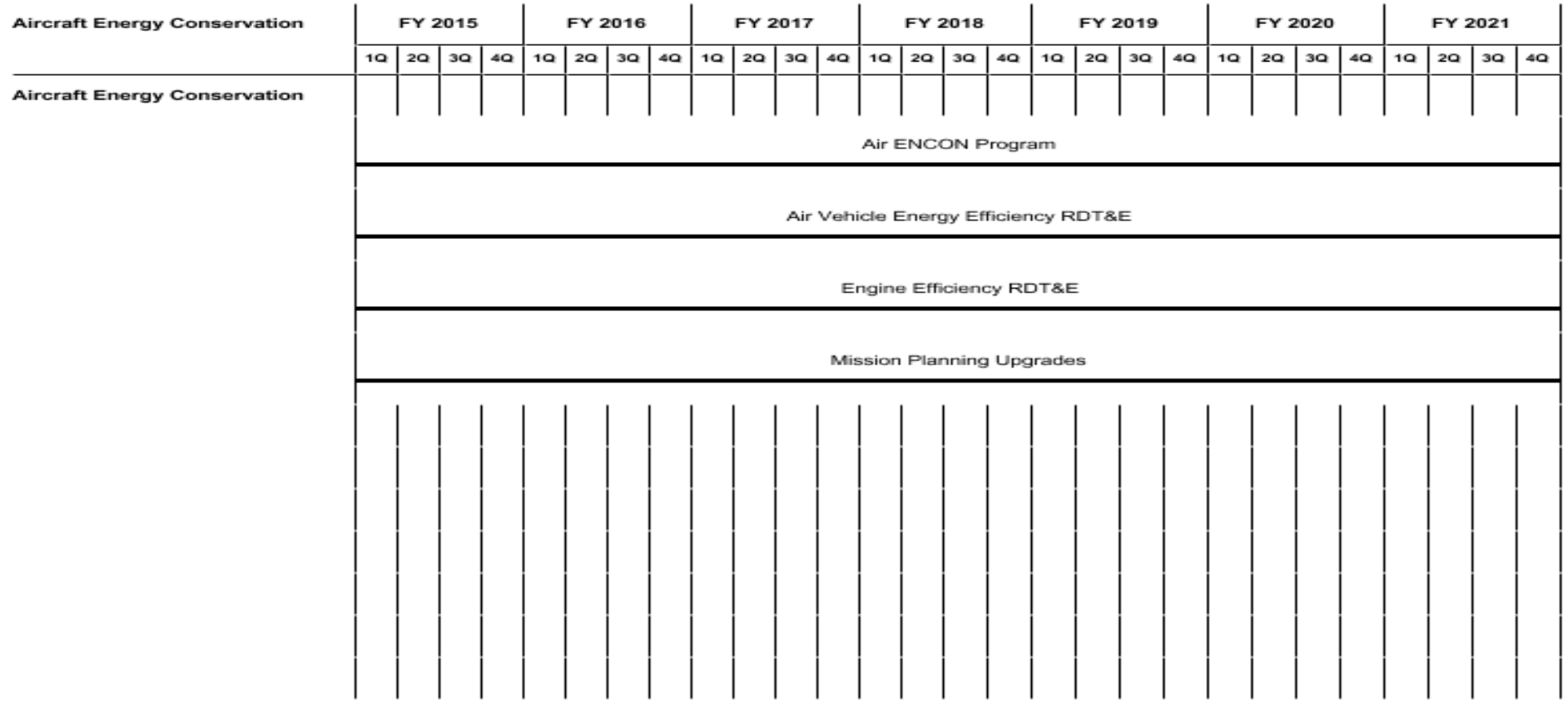
Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Support	WR	NAWCAD : Patuxent River, MD	0.861	0.234	Dec 2014	0.386	Nov 2015	0.321	Nov 2016	-		0.321	Continuing	Continuing	Continuing
Program Management Support	C/FFP	Deloitte Consulting : Alexandria, VA	0.915	0.616	Feb 2015	0.284	Nov 2015	0.000		-		0.000	0.000	1.815	1.815
Program Management Support	WR	NAWCWD : China Lake, CA	0.000	0.010	Mar 2015	0.000		0.000		-		0.000	0.000	0.010	-
Prog Mgnt no longer funded in the FYDP	Various	Various : Various	2.087	0.000		0.000		0.000		-		0.000	0.000	2.087	2.087
		Subtotal	3.863	0.860		0.670		0.321		-		0.321	-	-	-

	Prior Years	FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	66.757	29.066		22.355		27.875		-		27.875	-	-	-

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603724N / *Navy Energy Program*	**Project (Number/Name)** 0996 / *Aircraft Energy Conservation*



2017DON - 0603724N - 0996

Exhibit R-4A, RDT&E Schedule Details: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603724N / *Navy Energy Program*	**Project (Number/Name)** 0996 / *Aircraft Energy Conservation*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Aircraft Energy Conservation				
Aircraft Energy Conservation: Air ENCON Program	1	2015	4	2021
Aircraft Energy Conservation: Air Vehicle Energy Efficiency RDT&E	1	2015	4	2021
Aircraft Energy Conservation: Engine Efficiency RDT&E	1	2015	4	2021
Aircraft Energy Conservation: Mission Planning Upgrades	1	2015	4	2021

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603724N / *Navy Energy Program*	Project (Number/Name) 9999 / *Congressional Adds*	

COST ($ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
9999: *Congressional Adds*	0.000	0.000	12.500	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	12.500
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Congressional Add for Hydrokinetic Energy Research

B. Accomplishments/Planned Programs ($ in Millions)	FY 2015	FY 2016
Congressional Add: Navy Energy Increase	0.000	12.500
FY 2015 Accomplishments: N/A		
FY 2016 Plans: N/A		
Congressional Adds Subtotals	0.000	12.500

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

RDTEN Contracts are Competitive Procurements

E. Performance Metrics

Quarterly Program Reviews

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603724N / *Navy Energy Program*	Project (Number/Name) 9999 / *Congressional Adds*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Hydrokinetic Energy Research & Development	Various	EXWC : Port Hueneme, CA	0.000	0.000		12.500	Sep 2016	0.000		-		0.000	0.000	12.500	-
		Subtotal	0.000	0.000		12.500		0.000		-		0.000	0.000	12.500	-

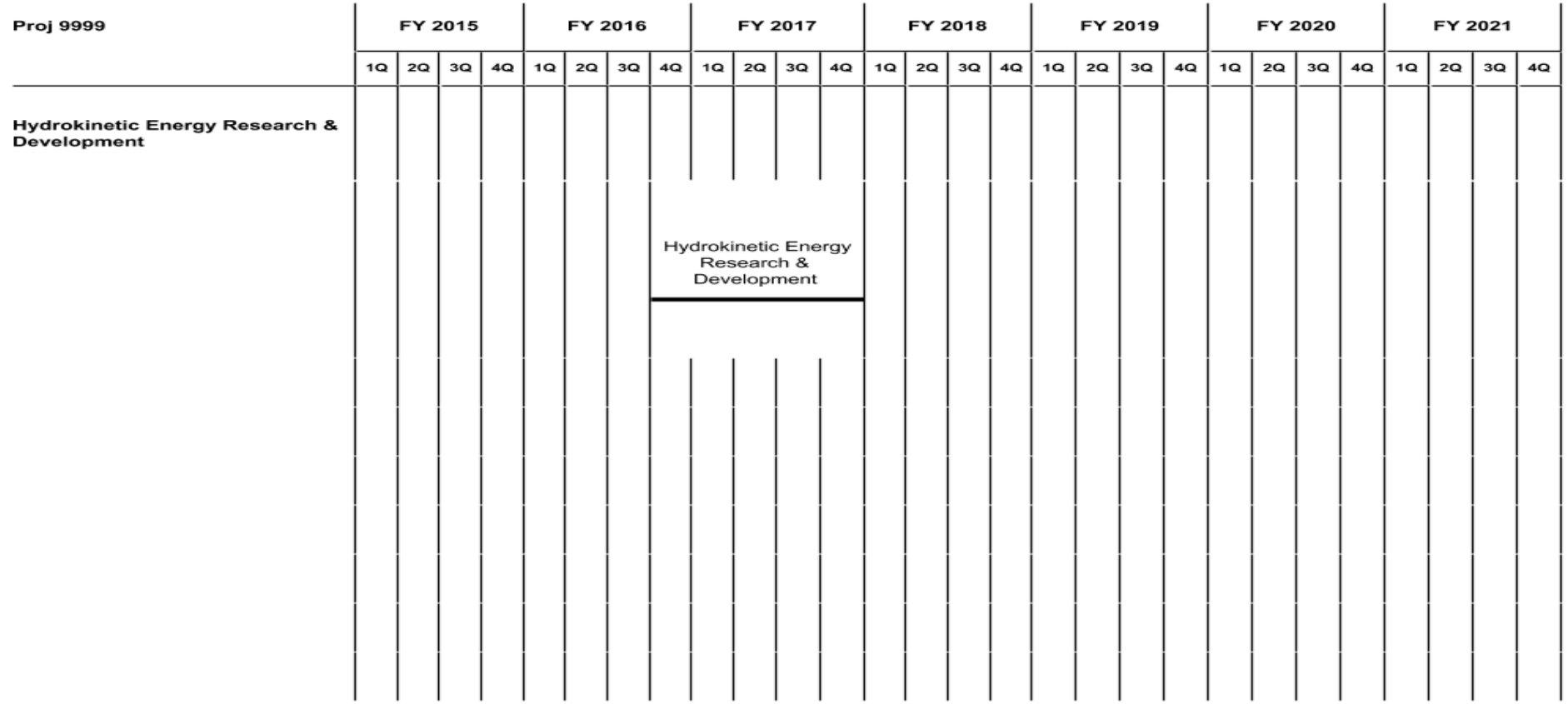
Remarks

Congressional Add Funds Received 2nd Quarter of 2016

	Prior Years	FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	0.000		12.500		0.000		-		0.000	0.000	12.500	-

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603724N / *Navy Energy Program*	**Project (Number/Name)** 9999 / *Congressional Adds*



2017PB - 0603724N - 9999

Exhibit R-4A, RDT&E Schedule Details: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603724N / *Navy Energy Program*	**Project (Number/Name)** 9999 / *Congressional Adds*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 9999				
Hydrokinetic Energy Research & Development: Hydrokinetic Energy Research & Development	4	2016	4	2017

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Exhibit R-2, RDT&E Budget Item Justification: PB 2017 Navy	Date: February 2016
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 0603725N *I Facilities Improvement*

COST ($ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
Total Program Element	6.882	2.588	3.726	5.458	-	5.458	3.772	3.643	3.708	3.780	Continuing	Continuing
0995: *Naval Facilities System*	5.799	0.816	1.154	2.066	-	2.066	2.181	2.130	2.168	2.209	Continuing	Continuing
3155: *Force Protection Ashore*	1.083	1.286	0.575	1.230	-	1.230	1.591	1.513	1.540	1.571	Continuing	Continuing
3347: *Navy Expeditionary Energy Development*	0.000	0.486	1.997	2.162	-	2.162	0.000	0.000	0.000	0.000	0.000	4.645

A. Mission Description and Budget Item Justification

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 2014 through FY 2020: Advance Technology for Waterfront Facilities Repair and Enhancements, Facilities Technologies to Reduce the Cost of Facilities Sustainment, Restoration and Modernization for reducing the total ownership cost (TOC) of future and existing Facilities and addressing natural and catastrophic risk of critical Naval Waterfront Facilities. This project is consistent with recommendations 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."

Started 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 data for the development of competitive performance specifications to acquire the required capabilities. The ATFP project is coordinated with other DOD programs.

Project 3347: The Development of advanced Environmental Control Unit (ECU) for expeditionary force camp shelters project is a transition of a DOE FY12-14 funded project and is a continuation in technology development, and was transitioned to NAVFAC starting FY 2015.

Exhibit R-2, RDT&E Budget Item Justification: PB 2017 Navy					Date: February 2016
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 4: *Advanced Component Development & Prototypes (ACD&P)*		R-1 Program Element (Number/Name) PE 0603725N *I Facilities Improvement*			
B. Program Change Summary ($ in Millions)	**FY 2015**	**FY 2016**	**FY 2017 Base**	**FY 2017 OCO**	**FY 2017 Total**
Previous President's Budget	2.588	5.226	5.171	-	5.171
Current President's Budget	2.588	3.726	5.458	-	5.458
Total Adjustments	0.000	-1.500	0.287	-	0.287
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-1.500			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Rate/Misc Adjustments	0.000	0.000	0.287	-	0.287

Change Summary Explanation

FY 2017 decrease in Facilities Improvement RDTEN by $0.135M as required for the Department of the Navy to comply with the Bipartisan Budget Act of 2015.

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy											Date: February 2016	
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0603725N / *Facilities Improvement*				Project (Number/Name) 0995 / *Naval Facilities System*			
COST ($ in Millions)	**Prior Years**	**FY 2015**	**FY 2016**	**FY 2017 Base**	**FY 2017 OCO**	**FY 2017 Total**	**FY 2018**	**FY 2019**	**FY 2020**	**FY 2021**	**Cost To Complete**	**Total Cost**
0995: *Naval Facilities System*	5.799	0.816	1.154	2.066	-	2.066	2.181	2.130	2.168	2.209	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

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 tested 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 (FSRM). The Duncan Hunter National Defense Authorization Act of 2009 laid down very specific guidelines for the correction of corrosion deficiencies in DoD shore facilities which is estimated to be $1.9B (DOD Annual Cost of Corrosion for the Department of Defense Facilities and Infrastructure July 2010).

Project 0995 addresses two Navy facilities requirements: 1) waterfront facilities repair, upgrade and service life extension; and, 2) validation testing/performance monitoring of critical facilities (such as dry docks, piers, runways, magazines, etc.), testing and evaluation of the performance of alternative materials, and surfacing concepts, and, methods and corrosion technologies to reduce the cost of Sustainment, Restoration and Modernization (SRM).

Waterfront facilities, repair, upgrade and service life extension:
An urgent requirement exists for early identification of strategies and solution recommendations for seismic risk at Naval Facilities, and especially nuclear capable waterfront facilities. Recent Pacific Rim earthquakes have heightened anxiety levels on perceived huge risks to Navy waterfront facilities in the region. The sub-project will provide analysis and solution recommendations for facilities impacted by seismic risk. Waterfront facilities repair and upgrade: About 75% of the Navy's waterfront facilities are over 45 years old. They were designed for a service life of 25 years which was to satisfy the mission requirements existing at that time. The over aged reinforced concrete requires costly and repetitive repairs. Besides providing more pier side ship maintenance and thus reduce dry dock costs, these piers must be strengthened to support concentrated crane loads up to 140 tons when piers were originally not designed for concentrated loads. Piers were previously designed to service one or possibly two particular ship classes. Berthing flexibility is now limited by mooring and utility arrangements. This sub-project addresses new material design methods, and retrofit methods which extends the service life of existing waterfront facilities by an additional 15 or more years. The project also addresses updating the mission based service, environmental, and protection loading requirements imposed by changes in platforms, operations and threats. Other initiatives include: leveraging Building Information Modeling (BIM) technology to provide for enhanced facilities management processes and waterfront utilities service enhancements using models to achieve flexible berthing arrangements consistent with current and future platform mooring configurations and hotel service requirements including Facilities and Infrastructure Integrated Product Support for Acquisition Category (ACAT) Programs.

Technologies to reduce the cost of Sustainment, Restoration and Modernization (SRM):
Technologies to reduce the cost of SRM issues of high operational significance are addressed on a priority basis. The Navy portion of corrosion deficiencies at DoD shore facilities is estimated to be $433M (DOD Annual Cost of Corrosion for the Department of Defense Facilities and Infrastructure July 2010). This effort will

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603725N / *Facilities Improvement*	**Project (Number/Name)** 0995 / *Naval Facilities System*

demonstrate and validate the cost and reliability of advanced corrosion technologies in order to assure their acceptance and implementation in traditionally conservative public works and construction industries. These facility corrosion technologies will accelerate the validation commercialization, and wide-spread implementation required to reduce the cost of correcting, the deficiencies in the Navy SRM backlog. The sub-projects include the continuing effort to validate, test and conduct performance monitoring of enhanced facility designs and coatings for facilities and equipment.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Title: Waterfront facilities, repair, upgrade and service life extension:	0.270	0.300	0.807	0.000	0.807
Articles:	-	-	-	-	-
FY 2015 Accomplishments: Continued waterfront seismic analysis and standard seismic risk mitigation procedures for other dry docks and critical waterfront structures. Continued synthetic line evaluation for ship fendering. Completed development of durable green concrete and initiate transition criteria for integration into unified facilities criteria. Initiated identification and validation of operational and maintenance issues of waterfront facilities associated with supporting the Navy's new class of ships and submarines, including the Ohio Class Replacement Submarine. Initiated performance enhancement for small floating piers. Initiated tsunami loads and effects on critical Navy waterfront structures. Initiated assessing waterfront asset component data through SPIDERS 3D.					
FY 2016 Plans: Plans are to complete waterfront seismic analysis and standard seismic risk mitigation procedures for a CVN/Ship in dry-dock. Continue to identify and validate operational and maintenance issues of waterfront facilities associated with supporting the Navy's new class of ships and submarines, including the Ohio Class Replacement Submarine. Continue with performance enhancement of small floating piers. Complete tsunami load and effects on critical navy waterfront structures. Initiate Sea Level Rise effects on Navy waterfront structures.					
FY 2017 Base Plans: Plans are to: Complete Ultra High Performance Concrete for Structural Repairs and Modular Construction: Identify where to use ultra-high performance concrete (UHPC) for repairs. Test and evaluate repair methods for cost and durability. Findings will transition into unified criteria. Continue Floating Pier Eval hydrodynamics: Conduct failure analysis and develop retrofit methods for floating piers. Conduct field tests of retrofit methods to confirm analysis. Findings will transition into unified criteria.					

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603725N / *Facilities Improvement*	**Project (Number/Name)** 0995 / *Naval Facilities System*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Continue Engineered Cementitious Composite (ECC) for Reinforced Concrete Repairs: Test and evaluate the use of ECC in highly corrosive environments as a repair material for reinforced concrete structures. Findings will transition into unified criteria. Continue Structural numerical joint Analytics: Build numerical models of structural joints subject to wave and tidal motions such as those found in dry docks, piers and wharves. Use models to improve joint design through dynamic analysis and model refinement. Findings will transition into unified criteria. Initiate Sea Level Rise effects on Navy waterfront structures: Use existing forecasts of sea level rise as a basis for modelling wave, tidal and storm surge effects on structures. Model mitigation measures and analyze cost-benefit to identify most effective retrofit methods and systems. Initiate autonomous inspection technologies and systems for waterfront facilities: Define requirements for autonomous inspection technology including use below the waterline. Identify autonomous technologies and systems to test against requirements. Test and evaluate technologies. Findings will transition into unified criteria. ***FY 2017 OCO Plans:*** N/A					
Title: Sustainment, Restoration & Modernization:	0.546	0.854	1.259	0.000	1.259
Articles:	-	-	-	-	-
FY 2015 Accomplishments: Completed cold spray corrosion repair and expedient pipeline repair for petroleum, oil and lubrication (POL) facilities. Initiate verifying the effectiveness of vapor phase corrosion inhibitors in protection of aboveground storage tanks. Continued high temperature pavement design mix optimization to improve cost, performance, and integration with other new aviation platforms such as the MV-22. Continued seismic analysis of Earth Covered Magazines (ECM). Completed testing of locking device System for Modular Storage Magazine. Continued improved concrete construction and crack repair technologies utilizing affordable and green aggregate constituents. ***FY 2016 Plans:*** The projects continued from FY15 are: Continue Corrosion Prevention & Control projects, emphasizing sustainable design and improved lifecycle cost reductions. Complete high temperature pavement design mix					

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603725N / *Facilities Improvement*	**Project (Number/Name)** 0995 / *Naval Facilities System*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
optimization to improve cost, performance, and integration with other new aviation platforms. Complete seismic analysis of Earth Covered Magazines (ECM). Continue with verifying the effectiveness of vapor phase corrosion inhibitors in protection of aboveground storage tanks. ***FY 2017 Base Plans:*** Plans are to: Complete Viscous Elastic Coatings: Evaluate cost effectiveness and durability of coatings to protect fuel and utility pipelines against corrosion. Findings will transition into unified criteria. Complete Durable Concrete Repairs: Evaluate cost effectiveness and durability of coatings to protect reinforced concrete against corrosion. Findings will transition into unified criteria. Complete Verifying the Effectiveness of Vapor Phase Corrosion Inhibitors (VpCI) in Protection of Aboveground Storage Tanks: Evaluate VpCI probes and conduct validation testing. Findings will transition into unified criteria. Complete Water Storage Tank Galvanic Anode Cathodic Protection Controller: Evaluate galvanic anode cathodic protection (GPC) systems at selected installations for cost, installation, performance and durability. Analyze results and recommend performance specifications for GPC systems. Findings will transition into unified criteria. Initiate analysis of additive manufacturing capabilities for facilities and infrastructure for both new and existing assets: Investigate existing and projected applications of additive manufacturing (AM) to facilities and infrastructure. Define requirements for AM technology applications. Procure and evaluate AM technology against requirements in developmental and operational tests. Findings will transition into unified criteria. ***FY 2017 OCO Plans:*** N/A					
Accomplishments/Planned Programs Subtotals	0.816	1.154	2.066	0.000	2.066

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603725N / *Facilities Improvement*	**Project (Number/Name)** 0995 / *Naval Facilities System*

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

The Projects identified in this budget have been carefully selected to respond to both the facilities support for new Acquisition Category Programs, to address TOC considerations of an evolving and aging infrastructure, and to facilitate rational risk based decisions and solutions to protect and decrease risk levels for Department of the Navy-critical infrastructure and facilities. Each project has been assessed to ensure that it is addressing legitimate risks and requirements of the shore establishment. The results of these projects will be the development of design and construction criteria and or components that directly impact the shore facilities.

E. Performance Metrics

Quarterly Program Reviews are conducted with the major performers to include funds status discussion, schedule review, assessment of plan to actual to meet benchmarks at midyear and end-of-year for PY1 and CY, and review of accomplishments and issues to date.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603725N / *Facilities Improvement*	Project (Number/Name) 0995 / *Naval Facilities System*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Waterfront Facilities, Repair, Upgrade and Services Life Extension	Various	NAVFAC EXWC : Pt Hueneme, CA	2.212	0.270	Dec 2014	0.300	Dec 2015	0.807	Oct 2016	-		0.807	Continuing	Continuing	Continuing
Sustainment, Restoration and Modernization	Various	NAVFAC EXWC : Pt Hueneme, CA	3.587	0.546	Dec 2014	0.854	Dec 2015	1.259	Oct 2016	-		1.259	Continuing	Continuing	Continuing
		Subtotal	5.799	0.816		1.154		2.066		-		2.066	-	-	-

	Prior Years	FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	5.799	0.816		1.154		2.066		-		2.066	-	-	-

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603725N / *Facilities Improvement*	**Project (Number/Name)** 0995 / *Naval Facilities System*

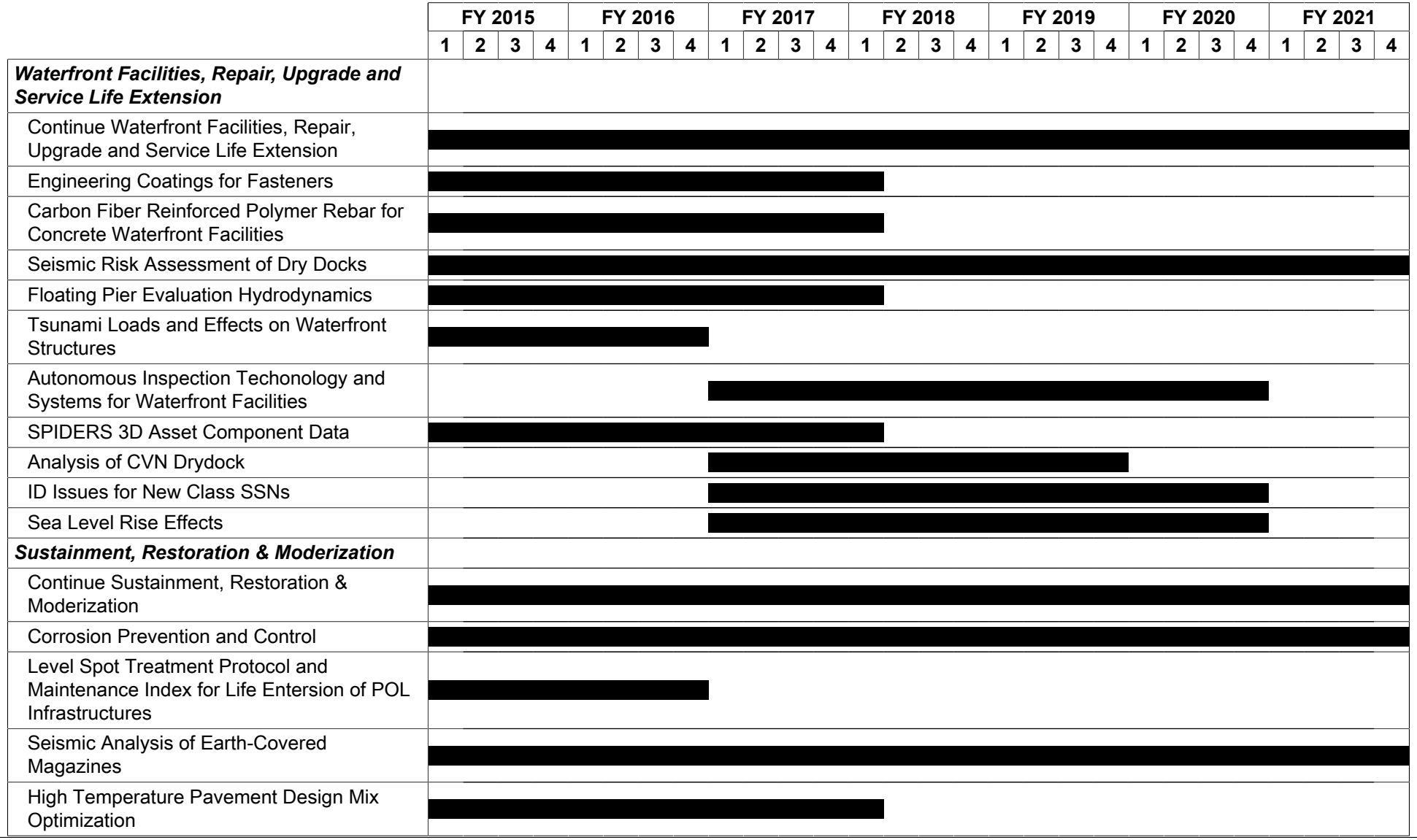

Exhibit R-4, RDT&E Schedule Profile: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603725N / *Facilities Improvement*	**Project (Number/Name)** 0995 / *Naval Facilities System*

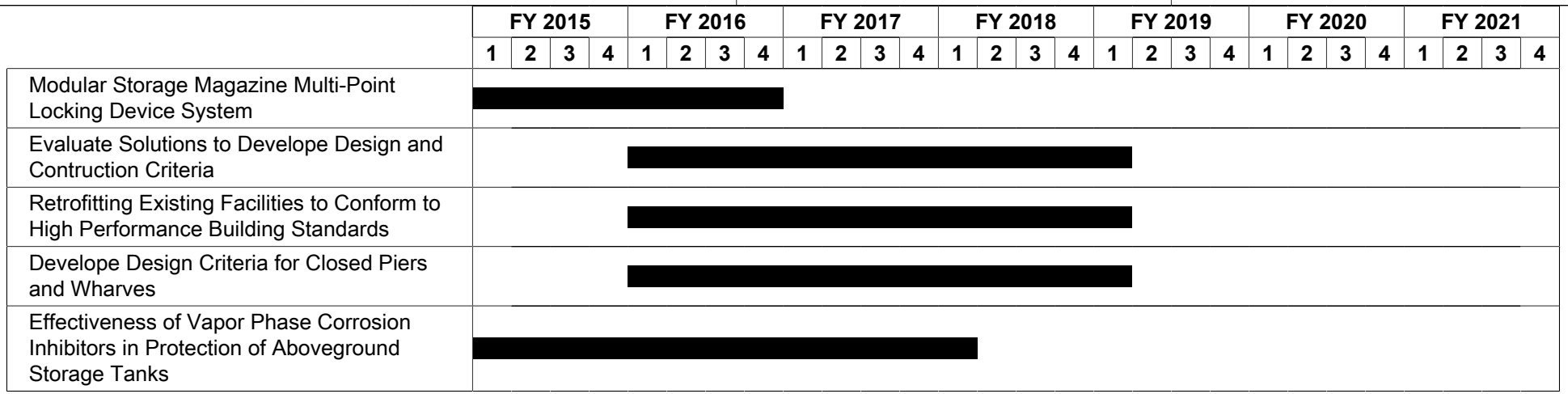

Exhibit R-4A, RDT&E Schedule Details: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603725N / *Facilities Improvement*	**Project (Number/Name)** 0995 / *Naval Facilities System*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Waterfront Facilities, Repair, Upgrade and Service Life Extension				
Continue Waterfront Facilities, Repair, Upgrade and Service Life Extension	1	2015	4	2021
Engineering Coatings for Fasteners	1	2015	1	2018
Carbon Fiber Reinforced Polymer Rebar for Concrete Waterfront Facilities	1	2015	1	2018
Seismic Risk Assessment of Dry Docks	1	2015	4	2021
Floating Pier Evaluation Hydrodynamics	1	2015	1	2018
Tsunami Loads and Effects on Waterfront Structures	1	2015	4	2016
Autonomous Inspection Techonology and Systems for Waterfront Facilities	1	2017	4	2020
SPIDERS 3D Asset Component Data	1	2015	1	2018
Analysis of CVN Drydock	1	2017	4	2019
ID Issues for New Class SSNs	1	2017	4	2020
Sea Level Rise Effects	1	2017	4	2020
Sustainment, Restoration & Moderization				
Continue Sustainment, Restoration & Moderization	1	2015	4	2021
Corrosion Prevention and Control	1	2015	4	2021
Level Spot Treatment Protocol and Maintenance Index for Life Entersion of POL Infrastructures	1	2015	4	2016
Seismic Analysis of Earth-Covered Magazines	1	2015	4	2021
High Temperature Pavement Design Mix Optimization	1	2015	1	2018
Modular Storage Magazine Multi-Point Locking Device System	1	2015	4	2016
Evaluate Solutions to Develope Design and Contruction Criteria	1	2016	1	2019
Retrofitting Existing Facilities to Conform to High Performance Building Standards	1	2016	1	2019
Develope Design Criteria for Closed Piers and Wharves	1	2016	1	2019

Exhibit R-4A, RDT&E Schedule Details: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603725N / *Facilities Improvement*	**Project (Number/Name)** 0995 / *Naval Facilities System*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Effectiveness of Vapor Phase Corrosion Inhibitors in Protection of Aboveground Storage Tanks	1	2015	1	2018

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603725N / *Facilities Improvement*	Project (Number/Name) 3155 / *Force Protection Ashore*	

COST ($ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
3155: *Force Protection Ashore*	1.083	1.286	0.575	1.230	-	1.230	1.591	1.513	1.540	1.571	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Protection of Navy installations against terrorist activities requires deployment of advanced technology for force protection capabilities. This antiterrorism and force protection (AT/FP) ashore project will develop, demonstrate and validate technologies for the following: access control and integrated perimeter security surveillance sensors and intelligent electronic security systems for automated intruder detection (Installation Protection); perimeter security; waterside protection against craft and swimmer intrusion; secure and efficient operations centers and emergency management centers including human and information support systems (Command and Control). Programs currently being evaluated are, standard-based enterprise physical security system integration and automation; Command, Control, and Communications (C3) capabilities for emergency operations; integrated and networked mass notification systems (MNS); Waterside intelligent video security systems; integrated over-the-water sensors and analytics for automated course of action planning; identifying and interdicting malevolent threats - watercraft, swimmers, divers, and unmanned underwater vessels (UUVs) to reduce injury and death to the warfighter and damage to high value units (HVUs)(Waterside Protection). 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. These demonstrations and validations derive advanced technology from science and technology programs of government academia and industry. The technology evaluation and validation produces data for performance specifications used for competitive procurement. All work will be coordinated with other programs and through industry forums as appropriate.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Title: Force Protection Ashore	1.286	0.575	1.230	0.000	1.230
Articles:	-	-	-	-	-
FY 2015 Accomplishments:					
- Completed integration and demonstration of Automated Sensor Assessment and Course of Action Plan (COAP) with EHSS and is underwent transition to NAVSEA. - Developmental Test & Evaluation (DT).					
- Continued Boat Barrier project with a particular focus on environmental resilience and sustainability in an operational setting and integrated with existing Port Security Barriers and remote gate operation devices. - Spiral Development.					
- Completed versatile access control project to develop, integrate and test an access control system that is open architecture, enabled biometrics and handled multiple credentials (driver's license, passport, etc.). (Spiral Development).					
FY 2016 Plans:					

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603725N / *Facilities Improvement*	**Project (Number/Name)** 3155 / *Force Protection Ashore*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Funds will support continue and initiated projects from FY14 and FY15 as follows: - Continue ship-to-shore common information exchange project, focusing on integration of a prototype system with a representative EHSS installation and testing in a controlled test environment. - [$125K] - Developmental Test & Evaluation (DT); SSC-PAC - Continue versatile access control project to integrate and test an enhanced access control approach, leveraging multiple credential types, biometrics and enhancing the detection of vehicles and personnel in and around an Access Control Point. - [$100K] - Developmental Test & Evaluation (DT); NSWC-Dahlgren - Continue Waterside Protection - Boat Barrier Electronic Infrastructure project to assess EHSS performance, environmental, and operational impact and added benefits of next generation boat barriers. - [$350K] - Operational Test & Evaluation (OT); SSC-PAC ***FY 2017 Base Plans:*** Funds will support continued and initiated projects from FY15 and FY 16 as follows: -Complete Waterside Protection - Boat Barriers project to access performance, environmental, and operational impact and added benefits of next generation boat barriers. -[$267K] - Operational Test & Evaluation (OT); CTTSO -Initiate Installation Protection Capability Development - Airborne Threat project to detect, assess and clasisify for the defense against full-scale and man-deployable airborne threats (e.g., UAV, drones, remote-control [R/C] platforms. - [$538K] - Developmental Test & Evaluation (DT); SSC-PAC -Initiate Command and Control Capability Development Virtual Field Support project to improve efficiency, effectiveness and reliability of the recovery of operational availability during critical system failures (corrective maintenance) and specialized routine maintenance (preventive maintenance). - [$425K] - Developmental Test & Evaluation (DT); NSWC Dahlgren ***FY 2017 OCO Plans:*** N/A					
Accomplishments/Planned Programs Subtotals	1.286	0.575	1.230	0.000	1.230

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603725N / *Facilities Improvement*	**Project (Number/Name)** 3155 / *Force Protection Ashore*

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 to include funds status, schedule review and assessment of plan to actual.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603725N / *Facilities Improvement*	Project (Number/Name) 3155 / *Force Protection Ashore*	

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Command and Control Capability Development: Government Engineering Support	Various	SPAWAR : San Diego, CA	0.260	0.239	Nov 2014	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Installation Protection: Airborne Threat	WR	SSC-PAC : SSC-PAC	0.000	0.000		0.000		0.538	Feb 2017	-		0.538	0.000	0.538	-
Command and Control Capability Development: Virtual Field Support	WR	NSWC : Dahlgren, VA	0.000	0.000		0.000		0.425	Feb 2017	-		0.425	0.000	0.425	-
Waterside Protection: Boat Barriers	C/CPFF	Navy Systems Mgmt Acty/CTTSO : Washington, DC	0.000	0.000		0.000		0.267	Feb 2017	-		0.267	0.000	0.267	-
Installation Protection Capability Development - Integrated Physical Security and Access Control Automation: Spiral Development	Various	NSWC : Dahlgren, VA	0.360	0.237	Nov 2014	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Installation Protection Capability Development -Integrated Physical Security and Access Control Automation:Test & Evaluation (DT)	Various	NSWC : Dahlgren, VA	0.260	0.189	Nov 2014	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Installation Protection Capability Development - Integrated Physical Security and Access Control Automation:Test & Evaluation (OT)	Various	SPAWAR : San Diego, CA	0.203	0.129	Nov 2014	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Water Protection - Common Information Exchange Spiral Development	WR	SSC-PAC : SSC-PAC	0.000	0.119	Nov 2014	0.125	Feb 2016	0.000		-		0.000	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603725N / *Facilities Improvement*	Project (Number/Name) 3155 / *Force Protection Ashore*

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Installation Protection - Versatile Access Control Spiral Development	WR	NSWC : Dahlgren, VA	0.000	0.239	Nov 2014	0.100	Feb 2016	0.000		-		0.000	Continuing	Continuing	Continuing
Waterside Protection - Boat Barrier Electronic Infrastructure - Spiral Development	WR	SSC-PAC : SSC-PAC	0.000	0.134	Nov 2014	0.350	Feb 2016	0.000		-		0.000	Continuing	Continuing	Continuing
		Subtotal	1.083	1.286		0.575		1.230		-		1.230	-	-	-

Remarks

As a result of FY16 decrease in funding levels the Installation Protection Capability Development - Incident Management System (IMS) - Spiral Development project is now rescheduled for FY17 and FY18 restoral funds.Installation Protection: Access Control Automation

	Prior Years	FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	1.083	1.286		0.575		1.230		-		1.230	-	-	-

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603725N / *Facilities Improvement*	**Project (Number/Name)** 3155 / *Force Protection Ashore*

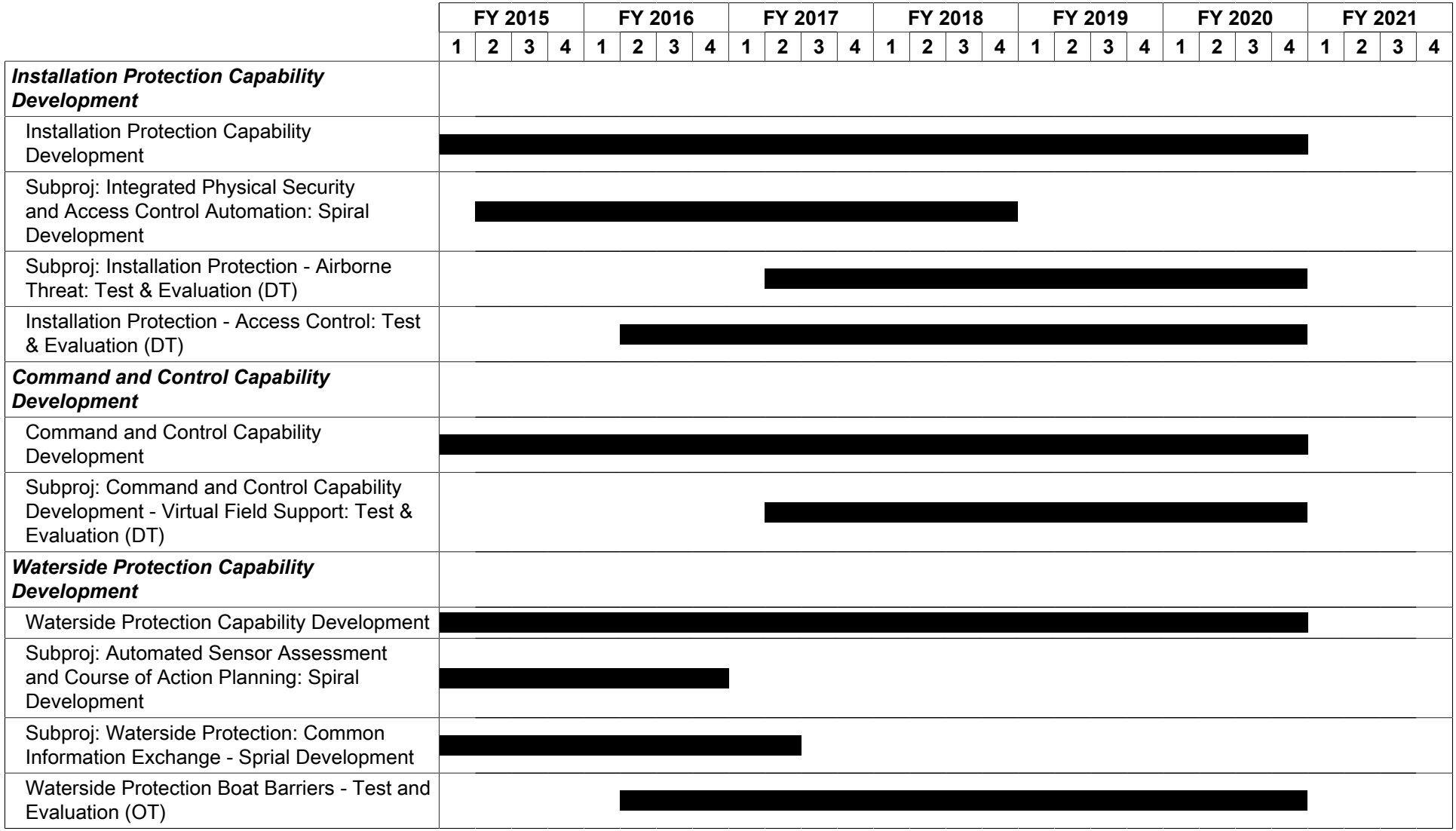

Exhibit R-4A, RDT&E Schedule Details: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603725N / *Facilities Improvement*	**Project (Number/Name)** 3155 / *Force Protection Ashore*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Installation Protection Capability Development				
Installation Protection Capability Development	1	2015	4	2020
Subproj: Integrated Physical Security and Access Control Automation: Spiral Development	2	2015	4	2018
Subproj: Installation Protection - Airborne Threat: Test & Evaluation (DT)	2	2017	4	2020
Installation Protection - Access Control: Test & Evaluation (DT)	2	2016	4	2020
Command and Control Capability Development				
Command and Control Capability Development	1	2015	4	2020
Subproj: Command and Control Capability Development - Virtual Field Support: Test & Evaluation (DT)	2	2017	4	2020
Waterside Protection Capability Development				
Waterside Protection Capability Development	1	2015	4	2020
Subproj: Automated Sensor Assessment and Course of Action Planning: Spiral Development	1	2015	4	2016
Subproj: Waterside Protection: Common Information Exchange - Sprial Development	1	2015	2	2017
Waterside Protection Boat Barriers - Test and Evaluation (OT)	2	2016	4	2020

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603725N / *Facilities Improvement*	Project (Number/Name) 3347 / *Navy Expeditionary Energy Development*	

COST ($ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
3347: *Navy Expeditionary Energy Development*	0.000	0.486	1.997	2.162	-	2.162	0.000	0.000	0.000	0.000	0.000	4.645
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Development of advanced Environmental Control Unit (ECU) for expeditionary force camp shelters will reduce the heating and air-conditioning (HVAC) fuel consumption by 50% and also will reduce fuel transport convoys, and attendant manpower casualties and handling labor.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Title: Expeditionary Environmental Control Unit (EECU)	0.486	1.997	2.162	0.000	2.162
Articles:	-	-	-	-	-
FY 2015 Accomplishments: Conducted engineering analysis and prepared draft solicitation package for full scale prototypes of technologies delivered by Department of Energy (DOE) Advanced Research Projects Agency - Energy (ARPA-E) at Technology Readiness Level (TRL) 6. FY12-FY14 effort to identify and mature technology was resourced by the Assistant Secretary of Defense Office of Operational Energy Plans and Programs.					
FY 2016 Plans: - Develop, design, and fabricate full scale prototypes (TRL 7) for technical and operational testing. One prototype is for an ECU utilizing the exhaust heat from generators which is currently wasted. Second prototype is for a new ECU based on Sterling cycle technology which is projected to reduce energy consumption by 30%.					
FY 2017 Base Plans: Perform technical and operational testing on the prototypes. Prototypes represent technology which will (1) utilize exhaust heat and (2) utilize the Sterling cycle technology.					
FY 2017 OCO Plans: N/A					
Accomplishments/Planned Programs Subtotals	0.486	1.997	2.162	0.000	2.162

C. Other Program Funding Summary ($ in Millions)

N/A

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603725N / *Facilities Improvement*	**Project (Number/Name)** 3347 / *Navy Expeditionary Energy Development*

C. Other Program Funding Summary ($ in Millions)

Remarks

D. Acquisition Strategy

Development of this technology will continue in partnership with ARPA-E in FY17. The Navy is positioned to transition the technology into a procurement program once technologies are operationally test and accepted. Additionally, the Navy is pursuing methods to transition the program to the DoD Program Manager for Mobile Electric Power so that all of DoD can benefit from this latest generation, energy saving technology.

E. Performance Metrics

Quarterly Program Reviews will be conducted with the major performer to include cost, schedule, and performance risks for milestone achievement associated with the full scale prototypes

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603725N / *Facilities Improvement*	**Project (Number/Name)** 3347 / *Navy Expeditionary Energy Development*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Expeditionary Environmental Control Unit (EECU)	Various	EXWC : Port Hueneme, CA	0.000	0.486	Oct 2015	1.997	Dec 2016	2.162	Jan 2017	-		2.162	Continuing	Continuing	Continuing
		Subtotal	0.000	0.486		1.997		2.162		-		2.162	-	-	-

	Prior Years	FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	0.486		1.997		2.162		-		2.162	-	-	-

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603725N / *Facilities Improvement*	**Project (Number/Name)** 3347 / *Navy Expeditionary Energy Development*

	FY 2015				FY 2016				FY 2017				FY 2018				FY 2019				FY 2020				FY 2021			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Proj 3347																												
Expeditionary Environmental Control Unit (ECU)	[redacted]																											

Exhibit R-4A, RDT&E Schedule Details: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603725N / *Facilities Improvement*	**Project (Number/Name)** 3347 / *Navy Expeditionary Energy Development*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 3347				
Expeditionary Environmental Control Unit (ECU)	1	2015	4	2018

Exhibit R-2, RDT&E Budget Item Justification: PB 2017 Navy											Date: February 2016	
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 4: *Advanced Component Development & Prototypes (ACD&P)*					R-1 Program Element (Number/Name) PE 0603734N *I (U)CHALK CORAL*							
COST ($ in Millions)	**Prior Years**	**FY 2015**	**FY 2016**	**FY 2017 Base**	**FY 2017 OCO**	**FY 2017 Total**	**FY 2018**	**FY 2019**	**FY 2020**	**FY 2021**	**Cost To Complete**	**Total Cost**
Total Program Element	0.000	162.900	174.771	245.860	-	245.860	223.929	290.360	306.641	313.548	Continuing	Continuing
1804: *Chalk Coral*	0.000	162.900	174.771	245.860	-	245.860	223.929	290.360	306.641	313.548	Continuing	Continuing

A. Mission Description and Budget Item Justification

This program is reported in accordance with Title 10, United States Code, Section 119(a)(1) in the Special Access Program Annual Report to Congress.

B. Program Change Summary ($ in Millions)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Previous President's Budget	176.301	182.771	152.184	-	152.184
Current President's Budget	162.900	174.771	245.860	-	245.860
Total Adjustments	-13.401	-8.000	93.676	-	93.676
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-8.000			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-8.300	0.000			
• SBIR/STTR Transfer	-5.101	0.000			
• Program Adjustments	0.000	0.000	29.834	-	29.834
• Rate/Misc Adjustments	0.000	0.000	63.842	-	63.842

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Exhibit R-2, RDT&E Budget Item Justification: PB 2017 Navy											Date: February 2016	
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 4: *Advanced Component Development & Prototypes (ACD&P)*					R-1 Program Element (Number/Name) PE 0603739N *I Navy Logistic Productivity*							
COST ($ in Millions)	**Prior Years**	**FY 2015**	**FY 2016**	**FY 2017 Base**	**FY 2017 OCO**	**FY 2017 Total**	**FY 2018**	**FY 2019**	**FY 2020**	**FY 2021**	**Cost To Complete**	**Total Cost**
Total Program Element	40.744	3.355	3.866	3.089	-	3.089	3.243	3.036	3.051	3.109	Continuing	Continuing
2955: *JEDMICS*	38.044	2.570	2.945	2.191	-	2.191	2.288	2.062	2.056	2.094	Continuing	Continuing
3223: *Logistics R&D*	2.700	0.785	0.921	0.898	-	0.898	0.955	0.974	0.995	1.015	Continuing	Continuing

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.

JUSTIFICATION FOR BUDGET ACTIVITY: This program is funded under ADVANCED COMPONENT DEVELOPMENT AND PROTOTYPES because it includes all efforts necessary to evaluate integrated technologies, representative models or prototype systems in a high fidelity and realistic operating environment.

B. Program Change Summary ($ in Millions)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Previous President's Budget	3.473	3.866	3.276	-	3.276
Current President's Budget	3.355	3.866	3.089	-	3.089
Total Adjustments	-0.118	0.000	-0.187	-	-0.187
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.118	0.000			
• Rate/Misc Adjustments	0.000	0.000	-0.187	-	-0.187

Change Summary Explanation

The FY 2017 funding request was reduced by -$0.052 million to account for the availability of prior year execution balances and by -$0.130 million as required for the Department of the Navy to comply with the Bipartisan Budget Act of 2015.

Technical: Not applicable.

Exhibit R-2, RDT&E Budget Item Justification: PB 2017 Navy	Date: February 2016
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 0603739N *I Navy Logistic Productivity*

Schedule: Not applicable.

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603739N / *Navy Logistic Productivity*	Project (Number/Name) 2955 / *JEDMICS*	

COST ($ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
2955: *JEDMICS*	38.044	2.570	2.945	2.191	-	2.191	2.288	2.062	2.056	2.094	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

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 100,000,000 engineering images and has 13,000 authorized users responsible for over 77,000 user sessions per month. Over 1.2 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 5 interoperable sites that service user 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 Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Title: JEDMICS Development	2.518	2.893	2.141	0.000	2.141
Articles:	-	-	-	-	-
Description: 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. These annual releases are necessary to incorporate changes that are essential to keeping the system running within the Navy's Enterprise. They include Service mandated Information Technology changes, storage capability increases for emerging engineering data formats, changes to accommodate commercial hardware and software end-of-life product obsolescence, and defenses for newly recognized Information Assurance vulnerabilities affecting the systems various software applications.					
FY 2015 Accomplishments: Developed and integrated JEDMICS Software Release 3.0.16.					
FY 2016 Plans:					

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603739N / *Navy Logistic Productivity*	**Project (Number/Name)** 2955 / *JEDMICS*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Develop and integrate JEDMICS Software Release 3.0.17. ***FY 2017 Base Plans:*** Develop and integrate JEDMICS Software Release 3.0.18. ***FY 2017 OCO Plans:*** N/A					
Title: JEDMICS Test ***Articles:*** ***Description:*** Conduct test and readiness reviews and functional performance tests on JEDMICS system. ***FY 2015 Accomplishments:*** Completed DT of JEDMICS Software Release 3.0.15. Initiated DT of JEDMICS Software Release 3.0.16. ***FY 2016 Plans:*** Complete DT of JEDMICS Software Release 3.0.16. Initiate DT of JEDMICS Software Release 3.0.17. ***FY 2017 Base Plans:*** Complete DT of JEDMICS Software Release 3.0.17. Initiate DT of JEDMICS Software Release 3.0.18. ***FY 2017 OCO Plans:*** N/A	0.026 -	0.027 -	0.026 -	0.000 -	0.026 -
Title: JEDMICS Evaluation & Review ***Articles:*** ***Description:*** Conduct technical evaluations and configuration control reviews of JEDMICS system. ***FY 2015 Accomplishments:*** Conducted technical evaluations and reviews for JEDMICS Software Release 3.0.17. ***FY 2016 Plans:*** Conduct technical evaluations and reviews for JEDMICS Software Release 3.0.18. ***FY 2017 Base Plans:*** Conduct technical evaluations and reviews for JEDMICS Software Release 3.0.19. ***FY 2017 OCO Plans:***	0.026 -	0.025 -	0.024 -	0.000 -	0.024 -

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603739N / *Navy Logistic Productivity*	**Project (Number/Name)** 2955 / *JEDMICS*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
N/A					
Accomplishments/Planned Programs Subtotals	2.570	2.945	2.191	0.000	2.191

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

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 major embedded Commercial Off-the-Shelf products.
2. Test & integrate system Information Assurance Vulnerability Management software patch upgrades four times.
3. Complete development, testing, & integration of a minimum twenty corrected high-priority software problem reports.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603739N / *Navy Logistic Productivity*	Project (Number/Name) 2955 / *JEDMICS*	

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Development Support	C/IDIQ	Wyle Laboratories, Inc : Huntsville, AL	1.007	0.147	Oct 2014	0.144	Oct 2015	0.145	Oct 2016	-		0.145	Continuing	Continuing	Continuing
Software Development	SS/T&M	Northrop Grumman Information : McLean, VA	32.719	2.371	Nov 2014	2.749	Nov 2015	1.996	Nov 2016	-		1.996	Continuing	Continuing	Continuing
Prior Year Support no Longer Funded in Budget Year or Out years	Various	Various : Various	0.216	0.000		0.000		0.000		-		0.000	0.000	0.216	-
		Subtotal	33.942	2.518		2.893		2.141		-		2.141	-	-	-

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. Funds are for COTS evaulation, integration, and test and evaluation. The common baseline will be maintained 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.

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation	MIPR	WR-ALC/TILAB : Robins AFB, GA	2.495	0.026	Oct 2014	0.027	Oct 2015	0.026	Oct 2016	-		0.026	Continuing	Continuing	Continuing
		Subtotal	2.495	0.026		0.027		0.026		-		0.026	-	-	-

Remarks

Supports testing and evaluation of baseline releases in a user environment.

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Support	WR	Naval Air Warfare Center : NAS Patuxent River, MD	0.266	0.013	Oct 2014	0.014	Oct 2015	0.013	Oct 2016	-		0.013	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603739N / *Navy Logistic Productivity*	Project (Number/Name) 2955 / *JEDMICS*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Travel	Various	Various : Various	0.258	0.013	Jul 2015	0.011	Jul 2016	0.011	Jul 2017	-		0.011	Continuing	Continuing	Continuing
Prior Year Mgmt no Longer Funded in Budget Year or Out years	Various	Various : Various	1.083	0.000		0.000		0.000		-		0.000	0.000	1.083	-
		Subtotal	1.607	0.026		0.025		0.024		-		0.024	-	-	-

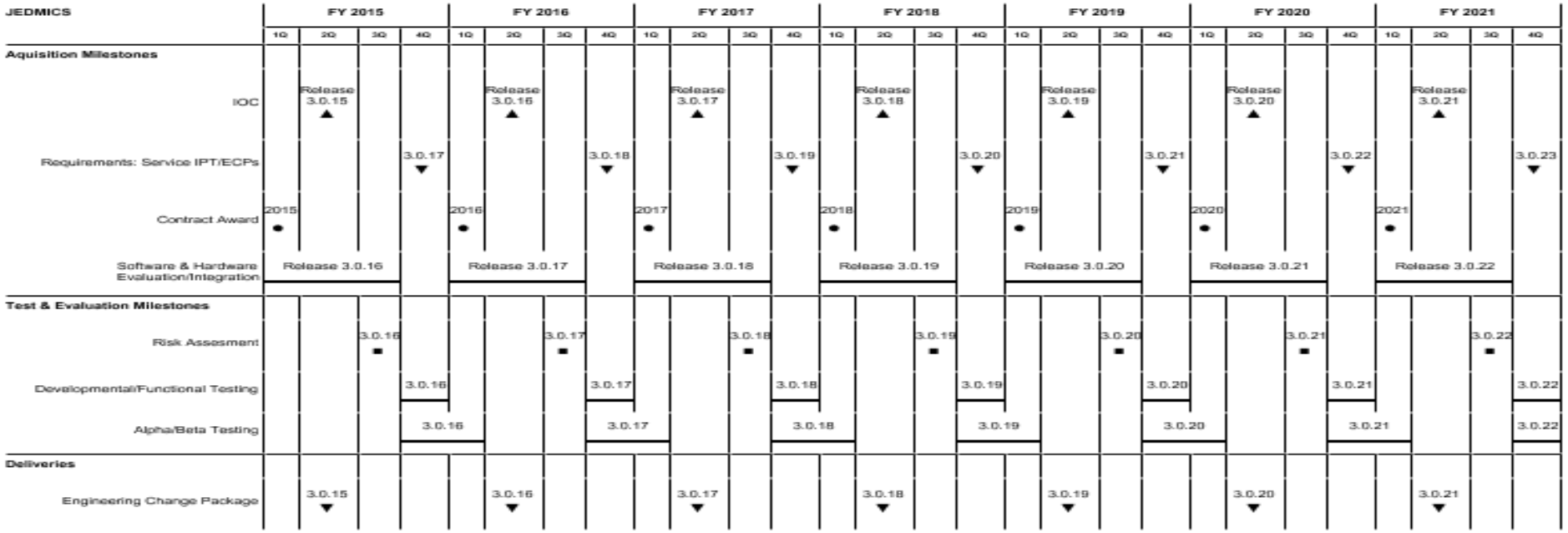
Remarks

Supports program compliance reviews and program related travel by government employees.

	Prior Years	FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	38.044	2.570		2.945		2.191		-		2.191	-	-	-

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603739N / *Navy Logistic Productivity*	**Project (Number/Name)** 2955 / *JEDMICS*



2017OSD - 0603739N - 2955

Exhibit R-4A, RDT&E Schedule Details: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603739N / *Navy Logistic Productivity*	**Project (Number/Name)** 2955 / *JEDMICS*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
JEDMICS				
Aquisition Milestones: IOC: IOC Release 3.0.15	2	2015	2	2015
Aquisition Milestones: IOC: IOC Release 3.0.16	2	2016	2	2016
Aquisition Milestones: IOC: IOC Release 3.0.17	2	2017	2	2017
Aquisition Milestones: IOC: IOC Release 3.0.18	2	2018	2	2018
Aquisition Milestones: IOC: IOC Release 3.0.19	2	2019	2	2019
Aquisition Milestones: IOC: IOC Release 3.0.20	2	2020	2	2020
Aquisition Milestones: IOC: IOC Release 3.0.21	2	2021	2	2021
Aquisition Milestones: Requirements: Service IPT/ECPs: Service IPT/ECPs Release 3.0.17	4	2015	4	2015
Aquisition Milestones: Requirements: Service IPT/ECPs: Service IPT/ECPs Release 3.0.18	4	2016	4	2016
Aquisition Milestones: Requirements: Service IPT/ECPs: Service IPT/ECPs Release 3.0.19	4	2017	4	2017
Aquisition Milestones: Requirements: Service IPT/ECPs: Service IPT/ECPs Release 3.0.20	4	2018	4	2018
Aquisition Milestones: Requirements: Service IPT/ECPs: Service IPT/ECPs Release 3.0.21	4	2019	4	2019
Aquisition Milestones: Requirements: Service IPT/ECPs: Service IPT/ECPs Release 3.0.22	4	2020	4	2020
Aquisition Milestones: Requirements: Service IPT/ECPs: Service IPT/ECPs Release 3.0.23	4	2021	4	2021
Aquisition Milestones: Contract Award: 2015 Contract Award	1	2015	1	2015
Aquisition Milestones: Contract Award: 2016 Contract Award	1	2016	1	2016
Aquisition Milestones: Contract Award: 2017 Contract Award	1	2017	1	2017

Exhibit R-4A, RDT&E Schedule Details: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603739N / *Navy Logistic Productivity*	**Project (Number/Name)** 2955 / *JEDMICS*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Aquisition Milestones: Contract Award: 2018 Contract Award	1	2018	1	2018
Aquisition Milestones: Contract Award: 2019 Contract Award	1	2019	1	2019
Aquisition Milestones: Contract Award: 2020 Contract Award	1	2020	1	2020
Aquisition Milestones: Contract Award: 2021 Contract Award	1	2021	1	2021
Aquisition Milestones: Software & Hardware Evaluation/Integration: Software Hardware Evaluation/Integration Release 3.0.16	1	2015	3	2015
Aquisition Milestones: Software & Hardware Evaluation/Integration: Software Hardware Evaluation/Integration Release 3.0.17	1	2016	3	2016
Aquisition Milestones: Software & Hardware Evaluation/Integration: Software Hardware Evaluation/Integration Release 3.0.18	1	2017	3	2017
Aquisition Milestones: Software & Hardware Evaluation/Integration: Software Hardware Evaluation/Integration Release 3.0.19	1	2018	3	2018
Aquisition Milestones: Software & Hardware Evaluation/Integration: Software Hardware Evaluation/Integration Release 3.0.20	1	2019	3	2019
Aquisition Milestones: Software & Hardware Evaluation/Integration: Software Hardware Evaluation/Integration Release 3.0.21	1	2020	3	2020
Aquisition Milestones: Software & Hardware Evaluation/Integration: Software Hardware Evaluation/Integration Release 3.0.22	1	2021	3	2021
Test & Evaluation Milestones: Risk Assesment: Risk Assessment Release 3.0.16	3	2015	3	2015
Test & Evaluation Milestones: Risk Assesment: Risk Assessment Release 3.0.17	3	2016	3	2016
Test & Evaluation Milestones: Risk Assesment: Risk Assessment Release 3.0.18	3	2017	3	2017
Test & Evaluation Milestones: Risk Assesment: Risk Assessment Release 3.0.19	3	2018	3	2018
Test & Evaluation Milestones: Risk Assesment: Risk Assessment Release 3.0.20	3	2019	3	2019
Test & Evaluation Milestones: Risk Assesment: Risk Assessment Release 3.0.21	3	2020	3	2020
Test & Evaluation Milestones: Risk Assesment: Risk Assessment Release 3.0.22	3	2021	3	2021
Test & Evaluation Milestones: Developmental/Functional Testing: Developmental/ Functional Testing Release 3.0.16	4	2015	4	2015

Exhibit R-4A, RDT&E Schedule Details: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603739N / *Navy Logistic Productivity*	**Project (Number/Name)** 2955 / *JEDMICS*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Test & Evaluation Milestones: Developmental/Functional Testing: Developmental/ Functional Testing Release 3.0.17	4	2016	4	2016
Test & Evaluation Milestones: Developmental/Functional Testing: Developmental/ Functional Testing Release 3.0.18	4	2017	4	2017
Test & Evaluation Milestones: Developmental/Functional Testing: Developmental/ Functional Testing Release 3.0.19	4	2018	4	2018
Test & Evaluation Milestones: Developmental/Functional Testing: Developmental/ Functional Testing Release 3.0.20	4	2019	4	2019
Test & Evaluation Milestones: Developmental/Functional Testing: Developmental/ Functional Testing Release 3.0.21	4	2020	4	2020
Test & Evaluation Milestones: Developmental/Functional Testing: Developmental/ Functional Testing Release 3.0.22	4	2021	4	2021
Test & Evaluation Milestones: Alpha/Beta Testing: Alpha/Beta Testing Release 3.0.16	4	2015	1	2016
Test & Evaluation Milestones: Alpha/Beta Testing: Alpha/Beta Testing Release 3.0.17	4	2016	1	2017
Test & Evaluation Milestones: Alpha/Beta Testing: Alpha/Beta Testing Release 3.0.18	4	2017	1	2018
Test & Evaluation Milestones: Alpha/Beta Testing: Alpha/Beta Testing Release 3.0.19	4	2018	1	2019
Test & Evaluation Milestones: Alpha/Beta Testing: Alpha/Beta Testing Release 3.0.20	4	2019	1	2020
Test & Evaluation Milestones: Alpha/Beta Testing: Alpha/Beta Testing Release 3.0.21	4	2020	1	2021
Test & Evaluation Milestones: Alpha/Beta Testing: Alpha/Beta Testing Release 3.0.22	4	2021	4	2021
Deliveries: Engineering Change Package: Engineering Change Package Release 3.0.15	2	2015	2	2015
Deliveries: Engineering Change Package: Engineering Change Package Release 3.0.16	2	2016	2	2016
Deliveries: Engineering Change Package: Engineering Change Package Release 3.0.17	2	2017	2	2017
Deliveries: Engineering Change Package: Engineering Change Package Release 3.0.18	2	2018	2	2018
Deliveries: Engineering Change Package: Engineering Change Package Release 3.0.19	2	2019	2	2019

Exhibit R-4A, RDT&E Schedule Details: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603739N / *Navy Logistic Productivity*	**Project (Number/Name)** 2955 / *JEDMICS*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Deliveries: Engineering Change Package: Engineering Change Package Release 3.0.20	2	2020	2	2020
Deliveries: Engineering Change Package: Engineering Change Package Release 3.0.21	2	2021	2	2021

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy										Date: February 2016		
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0603739N / *Navy Logistic Productivity*				Project (Number/Name) 3223 / *Logistics R&D*			
COST ($ in Millions)	**Prior Years**	**FY 2015**	**FY 2016**	**FY 2017 Base**	**FY 2017 OCO**	**FY 2017 Total**	**FY 2018**	**FY 2019**	**FY 2020**	**FY 2021**	**Cost To Complete**	**Total Cost**
3223: *Logistics R&D*	2.700	0.785	0.921	0.898	-	0.898	0.955	0.974	0.995	1.015	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

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 and 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, Logistics 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 and technology gaps identified by all activities within the enterprise, and then assesses and prioritizes all proposed Logistics R&D initiatives in accordance with their potential for filling the established gap and generating return on investment.

The established Logistics R&D business management process has currently identified capability/technology gaps in the following general areas: 1) the need to develop formalized energy management techniques that focus on energy and resource conservation; increased energy efficiency of new and existing systems and facilities; and increased use of alternative energy products, 2) the need to modernize quality of life (QOL) services to improve overall services, offer additional desired features and reduce total ownership costs, 3) the need to assess clothing protection for the warfighter in areas of thermal/flame threats, protective footwear, and physical (hearing, vibration, etc.) clothing/accessories, 4) the need to develop logistics data access and information sharing through enhanced Graphical User Interfaces (GUI) and web-based data services, 5) the need to develop a capability that allows Integrated Logistics Support (ILS) repair and modernization tools, 6) the need to leverage breakthrough technologies to improve supply chain processing. This modest R&D investment will establish a NAVSUP Logistics R&D Program to explore additional technologies and significantly increase potential cost savings.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	**FY 2015**	**FY 2016**	**FY 2017 Base**	**FY 2017 OCO**	**FY 2017 Total**
Title: Energy Management Techniques	0.000	0.102	0.099	0.000	0.099
Articles:	-	-	-	-	-
Description: Formalized energy management requires two distinct pieces: 1) installation efforts and 2) alternative fuel efforts. Energy generation options and the availability of energy management techniques are required.					
FY 2015 Accomplishments:					

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603739N / *Navy Logistic Productivity*	**Project (Number/Name)** 3223 / *Logistics R&D*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
N/A ***FY 2016 Plans:*** Identify technologies that will increase recycling, improve electronics stewardship, increase energy usage awareness (e.g. electricity metering), assist in lifetime energy cost evaluations of contracts, promote "green" behavior, improve efficiency and performance of alternative energy sources, analyze and identify personnel and building energy reduction initiatives, and reduce overall petroleum dependency in all aspects of Navy logistics. ***FY 2017 Base Plans:*** Identify technologies that will increase recycling, improve electronics stewardship, increase energy usage awareness (e.g. electricity metering), assist in lifetime energy cost evaluations of contracts, promote "green" behavior, improve efficiency and performance of alternative energy sources, analyze and identify personnel and building energy reduction initiatives, and reduce overall petroleum dependency in all aspects of Navy logistics. ***FY 2017 OCO Plans:*** N/A					
Title: Quality of Life Services Modernization & Cost Reduction	0.785	0.122	0.117	0.000	0.117
Articles:	-	-	-	-	-
Description: NAVSUP Quality of Life (QOL) services include subsistence, retail, postal, laundry, vending, barber shop, household goods and disbursing/Navy Cash. In many cases, these services are inefficient, costly to operate, and lack easy access to comprehensive information required to make informed management decisions impacting execution of routine supporting business processes. ***FY 2015 Accomplishments:*** CACPAY is being developed as an innovative cashless payment system to replace the legacy Navy Cash system. CACPAY provides the required onboard functions and leverages commercially available capabilities to eliminate the use of Government contracted bank support, Stored Value Cards, and an onboard full-time bank agents and system administrators (Disbursing Officer). CACPAY allows utilization of shore support (provided by NAVSUP Global Logistics Support) to facilitate fiduciary responsibilities with DFAS through the applicable Personnel Support Detachment. ***FY 2016 Plans:***					

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603739N / *Navy Logistic Productivity*	**Project (Number/Name)** 3223 / *Logistics R&D*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Enhance data integration of subsistence, retail, postal, laundry, vending, barbershop, household goods and disbursing/Navy Cash to offer additional desired features (such as those which would improve supporting information systems, security, health, etc.) and reduce total ownership costs. ***FY 2017 Base Plans:*** Enhance data integration of subsistence, retail, postal, laundry, vending, barbershop, household goods and disbursing/Navy Cash to offer additional desired features (such as those which would improve supporting information systems, security, health, etc.) and reduce total ownership costs. ***FY 2017 OCO Plans:*** N/A					
Title: Readiness through Logistics Solutions	0.000	0.153	0.152	0.000	0.152
Articles:	-	-	-	-	-
Description: Supply chain improvements are required to support logistics efficiency and Fleet readiness through logistics solution technological improvements. Develop technological capabilities that improve Naval Logistics in part or in its entirety (throughout its life-cycle, from concept to completion "cradle to grave") of a DoD/ DON acquisition program of record (from manufacture, storage, delivery, use, maintenance, and disposal). ***FY 2015 Accomplishments:*** N/A ***FY 2016 Plans:*** Develop technological capabilities that improve Naval Logistics in part or in its entirety (throughout its life-cycle, from concept to completion "cradle to grave") of a DoD/ DON acquisition program of record (from manufacture, storage, delivery, use, maintenance, and disposal). ***FY 2017 Base Plans:*** Develop technological capabilities that improve Naval Logistics in part or in its entirety (throughout its life-cycle, from concept to completion "cradle to grave") of a DoD/ DON acquisition program of record (from manufacture, storage, delivery, use, maintenance, and disposal). ***FY 2017 OCO Plans:*** N/A					
Title: Logistics Data Access and Information Sharing	0.000	0.062	0.062	0.000	0.062
Articles:	-	-	-	-	-

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603739N / *Navy Logistic Productivity*	**Project (Number/Name)** 3223 / *Logistics R&D*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Description: Numerous electronic information technology (IT) systems exist that contain logistics data and information. Very often that data/information can be difficult to: 1) access by individual users, and 2) share between other IT systems. The lack of access and sharing results in inefficient processes and manual work-arounds which impede performance and increase cost. ***FY 2015 Accomplishments:*** N/A ***FY 2016 Plans:*** Identify capabilities to facilitate improved access and use of logistics data by both individual users and between IT systems. Capabilities include, but are not limited to, enhanced Graphical User Interfaces (GUI) and web-based data services and other community-based software tools and technologies that can enable broader exposure and sharing of logistics data based on customer requirements for data representation, metadata, format and delivery. ***FY 2017 Base Plans:*** Identify capabilities to facilitate improved access and use of logistics data by both individual users and between IT systems. Capabilities include, but are not limited to, enhanced Graphical User Interfaces (GUI) and web-based data services and other community-based software tools and technologies that can enable broader exposure and sharing of logistics data based on customer requirements for data representation, metadata, format and delivery. ***FY 2017 OCO Plans:*** N/A					
Title: Breakthrough Technologies to Improve Supply Chain Processing ***Articles:***	0.000 -	0.208 -	0.202 -	0.000 -	0.202 -
Description: There is a distinct need within the DoN to enhance operational fleet readiness, reduce energy consumption, and reduce total ownership costs. Identify opportunities for using breakthrough technologies that will enhance operational fleet readiness, reduce energy consumption, and enable parts on demand manufacturing by defining the Warfighter Payoff and enhanced naval capabilities. Additive Manufacturing (AM) is a technology that is capable of helping the DoN achieve these goals through tighter integration of the maintenance/supply order fulfillment process. The term "additive manufacturing" describes processes that build three dimensional objects layer by layer from a variety of materials including plastics and structural metals. ***FY 2015 Accomplishments:***					

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603739N / *Navy Logistic Productivity*	**Project (Number/Name)** 3223 / *Logistics R&D*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
N/A ***FY 2016 Plans:*** Efforts of interest will continue to focus on assessing opportunities for use of AM technology in Order Fulfillment through timely insertion of AM technology into naval platforms and installations. ***FY 2017 Base Plans:*** Efforts of interest will continue to focus on assessing opportunities for use of AM technology in Order Fulfillment through timely insertion of AM technology into naval platforms and installations. ***FY 2017 OCO Plans:*** N/A					
Title: Clothing Protection for the Warfighter ***Articles:***	0.000 -	0.274 -	0.266 -	0.000 -	0.266 -
Description: Uniforms/protective clothing do not provide adequate protection for the Warfighter in the areas of 1) thermal/flame threats, 2) protective footwear as well as environmental (hot/cold weather, rain, etc.) and 3) physical (hearing, vibration, blunt force, etc.) clothing/accessories. A capability to assess commercial off-the-shelf (COTS) items, identify/develop laboratory test methods to determine applicability of COTS items and address quality assurance measures to allow upgrades to uniform/protective clothing capabilities in a cost effective manner. Enhanced capabilities are required in these areas to make the workforce more efficient. ***FY 2015 Accomplishments:*** N/A ***FY 2016 Plans:*** Identify capabilities to accurately identify the US Navy fit and define the proper "concept of fit" requirement to streamline the uniform issue process, allow the sailor to purchase an off the rack uniform without costly alternations and enhance uniform size forecasting - resulting in having the "needed" sizes in stock. Utilization of "virtual fit" processes will greatly improve the entire uniform management process (ordering, distribution and inventory management). ***FY 2017 Base Plans:*** Identify capabilities to accurately identify the US Navy fit and define the proper "concept of fit" requirement to streamline the uniform issue process, allow the sailor to purchase an off the rack uniform without costly alternations and enhance uniform size forecasting - resulting in having the "needed" sizes in stock. Utilization					

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
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B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
of "virtual fit" processes will greatly improve the entire uniform management process (ordering, distribution and inventory management). ***FY 2017 OCO Plans:*** N/A					
Accomplishments/Planned Programs Subtotals	0.785	0.921	0.898	0.000	0.898

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

NAVSUP R&D executed through firm fixed price negotiated contracts and NAVSUP support. Performance-based reviews conducted quarterly by the Project Management Office.

E. Performance Metrics

Development of capability and technology gaps initiatives are monintored quarterly by the NAVSUP R&D Program Management Office.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603739N / *Navy Logistic Productivity*	Project (Number/Name) 3223 / *Logistics R&D*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Navy Log Productivity Projects	Various	Various : Various	1.786	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Energy Management Techniques	C/BA	Various : Various	0.000	0.000		0.102	Apr 2016	0.099	Apr 2017	-		0.099	0.000	0.201	-
Quality of Life Services Modernization & Cost Reduction	C/BA	Harmonia : Blacksburg, VA	0.000	0.785	Apr 2015	0.122	Apr 2016	0.117	Apr 2017	-		0.117	0.000	1.024	-
Readiness through Logistics Solutions	C/BA	Various : Various	0.475	0.000		0.153	Apr 2016	0.152	Apr 2017	-		0.152	0.000	0.780	-
Breakthrough Technologies to Improve Supply Chain Processing	C/BA	Various : Various	0.157	0.000		0.208	Apr 2016	0.202	Apr 2017	-		0.202	0.000	0.567	-
Clothing Protection for the Warfighter	C/BA	Various : Various	0.222	0.000		0.274	Apr 2016	0.266	Apr 2017	-		0.266	0.000	0.762	-
Logistics Data Access and Information Sharing	C/BA	Various : Various	0.060	0.000		0.062	Apr 2016	0.062	Apr 2017	-		0.062	0.000	0.184	-
		Subtotal	2.700	0.785		0.921		0.898		-		0.898	-	-	-

Remarks

Quality of Life Services Modernization & Cost Reduction(Harmonia/Blacksburg VA - $785K): CACPAY is being developed as an innovative cashless payment system to replace the legacy Navy Cash system. CACPAY provides the required onboard functions and leverages commercially available capabilities to eliminate the use of Government contracted bank support, Stored Value Cards, and an onboard full-time bank agents and system administrators (Disbursing Officer). CACPAY allows utilization of shore support (provided by NAVSUP Global Logistics Support) to facilitate fiduciary responsibilities with DFAS through the applicable Personnel Support Detachment.

	Prior Years	FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	2.700	0.785		0.921		0.898		-		0.898	-	-	-

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603739N / *Navy Logistic Productivity*	**Project (Number/Name)** 3223 / *Logistics R&D*

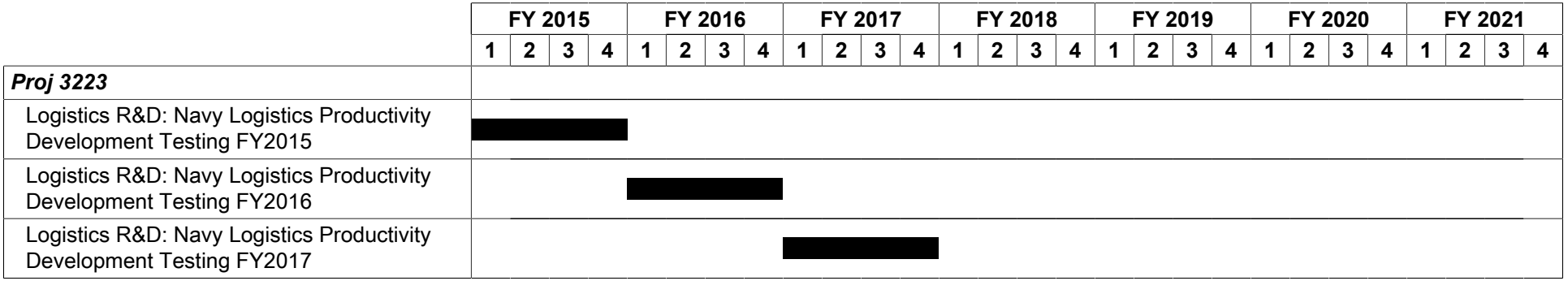

Exhibit R-4A, RDT&E Schedule Details: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603739N / *Navy Logistic Productivity*	**Project (Number/Name)** 3223 / *Logistics R&D*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 3223				
Logistics R&D: Navy Logistics Productivity Development Testing FY2015	1	2015	4	2015
Logistics R&D: Navy Logistics Productivity Development Testing FY2016	1	2016	4	2016
Logistics R&D: Navy Logistics Productivity Development Testing FY2017	1	2017	4	2017

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Exhibit R-2, RDT&E Budget Item Justification: PB 2017 Navy	Date: February 2016
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 0603746N *I (U)RETRACT MAPLE*

COST ($ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
Total Program Element	0.000	346.830	359.856	323.526	-	323.526	223.727	88.100	45.815	47.462	Continuing	Continuing
1906: *Retract Maple*	0.000	346.830	359.856	323.526	-	323.526	223.727	88.100	45.815	47.462	Continuing	Continuing

A. Mission Description and Budget Item Justification

This program is reported in accordance with Title 10, United States Code, Section 119(a)(1) in the Special Access Program Annual Report to Congress.

B. Program Change Summary ($ in Millions)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Previous President's Budget	376.028	360.065	317.148	-	317.148
Current President's Budget	346.830	359.856	323.526	-	323.526
Total Adjustments	-29.198	-0.209	6.378	-	6.378
• Congressional General Reductions	-	-0.209			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-18.753	0.000			
• SBIR/STTR Transfer	-10.445	0.000			
• Program Adjustments	0.000	0.000	20.010	-	20.010
• Rate/Misc Adjustments	0.000	0.000	-13.632	-	-13.632

Change Summary Explanation

Technical: Not applicable.

Schedule: Not applicable.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2017 Navy	Date: February 2016
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 0603748N *I (U)LINK PLUMERIA*

COST ($ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
Total Program Element	0.000	260.179	237.376	318.497	-	318.497	306.728	296.409	285.277	139.586	Continuing	Continuing
1978: *Link Plumeria*	0.000	260.179	237.376	318.497	-	318.497	306.728	296.409	285.277	139.586	Continuing	Continuing

A. Mission Description and Budget Item Justification

This program is reported in accordance with Title 10, United States Code, Section 119(a)(1) in the Special Access Program Annual Report to Congress.

B. Program Change Summary ($ in Millions)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Previous President's Budget	260.096	237.416	294.497	-	294.497
Current President's Budget	260.179	237.376	318.497	-	318.497
Total Adjustments	0.083	-0.040	24.000	-	24.000
• Congressional General Reductions	-	-0.040			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	8.600	0.000			
• SBIR/STTR Transfer	-8.517	0.000			
• Program Adjustments	0.000	0.000	51.380	-	51.380
• Rate/Misc Adjustments	0.000	0.000	-27.380	-	-27.380

Change Summary Explanation

Technical: Not applicable.

Schedule: Not applicable.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2017 Navy											Date: February 2016	
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 4: *Advanced Component Development & Prototypes (ACD&P)*					R-1 Program Element (Number/Name) PE 0603751N *I (U)RETRACT ELM*							
COST ($ in Millions)	**Prior Years**	**FY 2015**	**FY 2016**	**FY 2017 Base**	**FY 2017 OCO**	**FY 2017 Total**	**FY 2018**	**FY 2019**	**FY 2020**	**FY 2021**	**Cost To Complete**	**Total Cost**
Total Program Element	0.000	32.889	37.700	52.834	-	52.834	48.930	46.903	46.691	44.570	Continuing	Continuing
2003: *Retract Elm*	0.000	32.889	37.700	52.834	-	52.834	48.930	46.903	46.691	44.570	Continuing	Continuing

A. Mission Description and Budget Item Justification

This program is reported in accordance with Title 10, United States Code, Section 119(a)(1) in the Special Access Program Annual Report to Congress.

B. Program Change Summary ($ in Millions)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Previous President's Budget	42.233	37.944	25.209	-	25.209
Current President's Budget	32.889	37.700	52.834	-	52.834
Total Adjustments	-9.344	-0.244	27.625	-	27.625
• Congressional General Reductions	-	-0.244			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-8.100	0.000			
• SBIR/STTR Transfer	-1.244	0.000			
• Program Adjustments	0.000	0.000	27.688	-	27.688
• Rate/Misc Adjustments	0.000	0.000	-0.063	-	-0.063

Change Summary Explanation

Technical: Not applicable.

Schedule: Not applicable.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2017 Navy	Date: February 2016
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 0603764N *I (U)LINK EVERGREEN*

COST ($ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
Total Program Element	0.000	44.894	47.312	48.116	-	48.116	48.982	0.000	0.000	0.000	0.000	189.304
1972: *Link Evergreen*	0.000	44.894	47.312	48.116	-	48.116	48.982	0.000	0.000	0.000	0.000	189.304

A. Mission Description and Budget Item Justification

This program is reported in accordance with Title 10, United States Code, Section 119(a)(1) in the Special Access Program Annual Report to Congress.

B. Program Change Summary ($ in Millions)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Previous President's Budget	46.504	47.312	48.116	-	48.116
Current President's Budget	44.894	47.312	48.116	-	48.116
Total Adjustments	-1.610	0.000	0.000	-	0.000
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-1.610	0.000			

Change Summary Explanation

Technical: Not applicable.
Schedule: Not applicable.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2017 Navy	Date: February 2016
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 0603787N *I (U)SPECIAL PROCESSES*

COST ($ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
Total Program Element	0.000	24.336	17.392	13.619	-	13.619	12.360	12.860	13.201	13.471	Continuing	Continuing
0000: *UNDIST*	0.000	0.071	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	0.071
0116: *Linear Tank*	0.000	24.265	17.392	13.619	-	13.619	12.360	12.860	13.201	13.471	Continuing	Continuing

A. Mission Description and Budget Item Justification

This program is reported in accordance with Title 10, United States Code, Section 119(a)(1) in the Special Access Program Annual Report to Congress.

B. Program Change Summary ($ in Millions)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Previous President's Budget	25.109	17.408	13.690	-	13.690
Current President's Budget	24.336	17.392	13.619	-	13.619
Total Adjustments	-0.773	-0.016	-0.071	-	-0.071
• Congressional General Reductions	-	-0.016			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.773	0.000			
• Rate/Misc Adjustments	0.000	0.000	-0.071	-	-0.071

Change Summary Explanation

Technical: Not applicable.

Schedule: Not applicable.

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603787N / *(U)SPECIAL PROCESSES*	Project (Number/Name) 0000 / *UNDIST*	

COST ($ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
0000: *UNDIST*	0.000	0.071	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	0.071
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This program is reported in accordance with Title 10, United States Code, Section 119(a)(1) in the Special Access Program Annual Report to Congress.

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603787N / *(U)SPECIAL PROCESSES*	Project (Number/Name) 0116 / *Linear Tank*	

COST ($ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
0116: *Linear Tank*	0.000	24.265	17.392	13.619	-	13.619	12.360	12.860	13.201	13.471	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This program is reported in accordance with Title 10, United States Code, Section 119(a)(1) in the Special Access Program Annual Report to Congress.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2017 Navy											Date: February 2016	
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 4: *Advanced Component Development & Prototypes (ACD&P)*					R-1 Program Element (Number/Name) PE 0603790N *I NATO Research and Deve*							
COST ($ in Millions)	**Prior Years**	**FY 2015**	**FY 2016**	**FY 2017 Base**	**FY 2017 OCO**	**FY 2017 Total**	**FY 2018**	**FY 2019**	**FY 2020**	**FY 2021**	**Cost To Complete**	**Total Cost**
Total Program Element	55.608	8.659	8.320	9.867	-	9.867	10.548	10.199	10.336	10.703	Continuing	Continuing
2293: *NATO Cooperative R & D*	55.608	8.659	8.320	9.867	-	9.867	10.548	10.199	10.336	10.703	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.

The North Atlantic Treaty Organization (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 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Previous President's Budget	9.659	9.359	10.972	-	10.972
Current President's Budget	8.659	8.320	9.867	-	9.867
Total Adjustments	-1.000	-1.039	-1.105	-	-1.105
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-1.039			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-1.000	0.000			
• SBIR/STTR Transfer	-	-			
• Program Adjustments	0.000	0.000	-0.026	-	-0.026
• Rate/Misc Adjustments	0.000	0.000	-1.079	-	-1.079

Change Summary Explanation

Decrease in North Atlantic Treaty Organization (NATO) Research and Development by $0.4M as required for the Department of the Navy to comply with the Bipartisan Budget Act of 2015.

Exhibit R-2, RDT&E Budget Item Justification: PB 2017 Navy	Date: February 2016
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 0603790N *I NATO Research and Deve*

The FY 2016 funding request was reduced by $1.4 million to account for the availability of prior year execution balances.

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603790N / *NATO Research and Deve*	Project (Number/Name) 2293 / *NATO Cooperative R & D*	

COST ($ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
2293: *NATO Cooperative R & D*	55.608	8.659	8.320	9.867	-	9.867	10.548	10.199	10.336	10.703	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

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.

FY2017 increase is to fund additional international projects such as Direct Energy Systems (DEPS) US and United Kingdom, Electromagnetic (EM) Silencing US and United Kingdom, and Undersea Power and Data Station (UPODS) US and Korea among others.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Title: NATO Cooperative R & D	8.659	8.320	9.867	0.000	9.867
Articles:	-	-	-	-	-
FY 2015 Accomplishments: -Continue to support FY2014 approved Cooperative projects. Plan and support approved FY2015 Cooperative projects. -Advance Electric Power and Propulsion U.S. and United Kingdom (UK) -Advance Material Propeller U.S. and Australia -Australia/U.S. Expeditionary Modeling & Simulation Project Arrangement (AUSEMS) U.S. and Australia -Biomass to Fuel U.S. and Chile -Dynamic System Mechanics Advanced Simulation-Shallow Confined Waters (DYSMAS-SCW) U.S.and Germany -High-Speed Multi-Hull Vessel Optimization (HSMVO) U.S.and Japan -Hull Treatment U.S. and United Kingdom (UK) -Large Displacement Unmanned Undersea Vehicles (LD UUV)U.S.and Korea -Mine Counter-Measures Vessel (MCMV) U.S. and Finland -Optical Laser Capability (OLC)U.S.and United Kingdom (UK) -Pro-Simon U.S. and Netherlands (NL) -Sub Sonar Telemetry U.S.and United Kingdom (UK)					

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603790N / *NATO Research and Deve*	**Project (Number/Name)** 2293 / *NATO Cooperative R & D*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
-Submarine Hydrodynamics U.S.and Australia -Super Quantum Small Electromagnetic Sensor(QSES)U.S.and Australia -Ultra HeavyLift Amphibious Connector(UHAC) U.S.and Singapore -Waterside Rapid Deployment U.S.,Australia,and Canada (CA)					
FY 2016 Plans: -Continue to support approved Cooperative projects from FY2014/FY2015. Plan and support approved FY2016 Cooperative projects. -Advance Material Propeller U.S. and Australia -Australia/U.S. Expeditionary Modeling & Simulation Project Arrangement (AUSEMS) U.S. and Australia -Biomass to Fuel U.S. and Chile -Dynamic System Mechanics Advanced Simulation-Shallow Confined Waters (DYSMAS-SCW) U.S. and Germany -Hull Treatments U.S. and United Kingdom (UK) -Large Displacement Unmanned Undersea Vehicles (LD UUV) U.S. and Korea -Optical Laser Capability (OLC) U.S. and United Kingdom (UK) -Super Quantum Small Electromagnetic Sensor (QSES) U.S. and Australia -Ultra HeavyLift Amphibious Connector (UHAC) U.S. and Singapore -Submarine Hydrodynamics U.S. and Australia					
FY 2017 Base Plans: -Continue to support approved Cooperative projects from FY2015/FY2016. Plan and support approved FY2017 Cooperative projects. -Large Displacement Unmanned Undersea Vehicles (LD UUV)U.S. and Korea -Hull Treatments U.S. and United Kingdom (UK) -Biomass to Fuel U.S. and Chile -Low-Band Geolocation U.S. and Australia -ALQ-227 U.S. and Australia -Compact Wide-Band Optics for Multispectral IR Imaging (CIRIS) U.S. and United Kingdom (UK) -Undersea Power and Data Station (UPODS) U.S. and Korea -Electromagnetic (EM) Silencing U.S. and United Kingdom (UK) -Australia/U.S. Expeditionary Modeling & Simulation Project Arrangement (AUSEMS) U.S. and Australia -Super Quantum Small Electromagnetic Sensor (QSES) U.S. and Australia					

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603790N / *NATO Research and Deve*	Project (Number/Name) 2293 / *NATO Cooperative R & D*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
-Direct Energy Power Systems (DEPS) U.S. and United Kingdom					
FY 2017 OCO Plans: N/A					
Accomplishments/Planned Programs Subtotals	8.659	8.320	9.867	0.000	9.867

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

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%.

This program historically does not meet established execution benchmarks. The North Atlantic Treaty Organization (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.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603790N / *NATO Research and Deve*	Project (Number/Name) 2293 / *NATO Cooperative R & D*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Developmental Test and Evaluation	C/FP	NAVSEA : Washington Navy Yard, DC	18.089	5.124	Nov 2014	2.913	Nov 2015	0.500	Jan 2017	-		0.500	Continuing	Continuing	Continuing
Developmental Test and Evaluation	C/FP	NSWC : West Bethesda, MD	13.621	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Developmental Test and Evaluation	C/FP	NUWC : Newport, RI	2.252	0.100	Feb 2015	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Developmental Test and Evaluation	C/FP	SPAWAR : San Diego, CA	4.353	0.000		0.500	Jan 2016	0.500	Dec 2016	-		0.500	Continuing	Continuing	Continuing
Developmental Test and Evaluation	C/FP	NAVAIR : Patuxent River, MD	2.136	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Developmental Test and Evaluation	C/FP	NRL : Washington, DC	2.484	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Developmental Test and Evaluation	C/FP	NAWC : Point Mugu, CA	5.500	0.000		0.600	Mar 2016	1.000	Jan 2017	-		1.000	Continuing	Continuing	Continuing
Developmental Test and Evaluation	C/FP	Miscellaneous : Philadelphia, PA	7.124	0.000		2.407	Apr 2016	7.492	Apr 2017	-		7.492	Continuing	Continuing	Continuing
Deveiopmental Test and Evaulation	C/FP	MARCOR : Washington.DC	0.000	0.900	Jan 2015	0.300	Dec 2015	0.000		-		0.000	0.000	1.200	-
Developmental Test and Evaulation	C/FP	NSWCCD : Carderock, MD	0.000	2.035	Jan 2015	0.000		0.000		-		0.000	0.000	2.035	-
Developmental Test and Evaulation	C/FP	ONR : Washington DC	0.000	0.500	May 2015	1.600	Jan 2016	0.375	May 2017	-		0.375	0.000	2.475	-
Need Item Text	C/BA	Not Specified : Not Specified	0.000	0.000		0.000		0.000		-		0.000	0.000	0.000	-
		Subtotal	55.559	8.659		8.320		9.867		-		9.867	-	-	-

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
ACQ Workforce Fund	Various	Various : Various	0.049	0.000		0.000		0.000		-		0.000	0.000	0.049	-
		Subtotal	0.049	0.000		0.000		0.000		-		0.000	0.000	0.049	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603790N / *NATO Research and Deve*	Project (Number/Name) 2293 / *NATO Cooperative R & D*	

	Prior Years	FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	55.608	8.659		8.320		9.867		-		9.867	-	-	-

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603790N / *NATO Research and Deve*	**Project (Number/Name)** 2293 / *NATO Cooperative R & D*

	FY 2015				FY 2016				FY 2017				FY 2018				FY 2019				FY 2020				FY 2021			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Proj 2293																												
International Agreements									[redacted]																			

Exhibit R-4A, RDT&E Schedule Details: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603790N / *NATO Research and Deve*	**Project (Number/Name)** 2293 / *NATO Cooperative R & D*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 2293				
International Agreements	1	2017	4	2017

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Exhibit R-2, RDT&E Budget Item Justification: PB 2017 Navy											Date: February 2016	
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 4: *Advanced Component Development & Prototypes (ACD&P)*					R-1 Program Element (Number/Name) PE 0603795N *I Land Attack Tech*							
COST ($ in Millions)	**Prior Years**	**FY 2015**	**FY 2016**	**FY 2017 Base**	**FY 2017 OCO**	**FY 2017 Total**	**FY 2018**	**FY 2019**	**FY 2020**	**FY 2021**	**Cost To Complete**	**Total Cost**
Total Program Element	14.274	0.310	0.887	6.015	-	6.015	15.608	19.044	15.771	22.239	Continuing	Continuing
2038: *ADVANCED MINOR CALIBER GUN*	14.274	0.310	0.887	0.573	-	0.573	0.000	0.000	0.000	0.000	0.000	16.044
3370: *Railgun*	0.000	0.000	0.000	5.442	-	5.442	15.608	19.044	15.771	22.239	Continuing	Continuing

A. Mission Description and Budget Item Justification

The Advanced Minor Caliber Gun will support non-recurring engineering, component integration, and testing efforts required for capability upgrades to the MK38 Mod 2, a minor caliber gun weapon system.

Project 3370 Railgun is not a new Start. Hyper Velocity Projectile was budgeted under the railgun program element and project. The funding has been realigned to Land Attack Tech and the project title will be renamed in future submissions.

Funding for the Hyper Velocity Projectile (HVP) has been realigned from PE 0603925N (Directed Energy and Electric Weapon Systems) to PE 0603795N (Land Attack Tech) under the, currently shared with Railgun, PRJ code 3370.

Efforts within this budget fund Phase 1 of HVP development will implement technologies increasing effective range and lethality of Naval Surface Fire Support (NSFS) and integration with the 5'/62 Mk 45 MOD 4 Gun and Mk 160 Gun Component System.

B. Program Change Summary ($ in Millions)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Previous President's Budget	0.318	0.887	0.591	-	0.591
Current President's Budget	0.310	0.887	6.015	-	6.015
Total Adjustments	-0.008	0.000	5.424	-	5.424
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.008	0.000			
• Rate/Misc Adjustments	0.000	0.000	5.424	-	5.424

Change Summary Explanation

Decrease in Land Attack Tech by $0.023M as required for the Department of the Navy to comply with the Bipartisan Budget Act of 2015.

Exhibit R-2, RDT&E Budget Item Justification: PB 2017 Navy	Date: February 2016
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 0603795N *I Land Attack Tech*

Project 3370: In FY17 ($+5.442M) funding realigned from 3370 RAILGUN PE PE 0603925N / Directed Energy and Electronic Weapon Systems program to 3370 RAILGUN PE 0603795 to support Hyper Velocity Projectile (HVP).

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603795N / *Land Attack Tech*	Project (Number/Name) 2038 / *ADVANCED MINOR CALIBER GUN*	

COST ($ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
2038: *ADVANCED MINOR CALIBER GUN*	14.274	0.310	0.887	0.573	-	0.573	0.000	0.000	0.000	0.000	0.000	16.044
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Advanced Minor Caliber Gun project will support non-recurring engineering, component integration, testing and qualification efforts required for the capability upgrades to the MK38 Mod 2, a minor caliber gun weapon system. The new configuration (MOD 3) creates a near term improvement to address ship based, close range solutions to defeat the Fast Attack Craft (FAC)/Fast In-Shore Attack Craft (FIAC) threat. The MK38 Mod 2 was developed in FY04 under Chief of Naval Operations (CNO) direction to outfit near term deployers to counter small boat threats.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Title: Systems Engineering and Testing	0.310	0.887	0.573	0.000	0.573
Articles:	-	-	-	-	-
FY 2015 Accomplishments: Completed final system qualification effort in order to obtain Weapon System Explosive Safety Review Board (WSESRB) deployment concurrence.					
FY 2016 Plans: Implement system improvement based on qualification/Sea Trials results.					
FY 2017 Base Plans: Revise engineering change based on results from revisions from sea trial.					
FY 2017 OCO Plans: N/A					
Accomplishments/Planned Programs Subtotals	0.310	0.887	0.573	0.000	0.573

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

The hardware improvements for MOD 3 were integrated into new production orders and separate kits for backfit in FY15.

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603795N / *Land Attack Tech*	**Project (Number/Name)** 2038 / *ADVANCED MINOR CALIBER GUN*

E. Performance Metrics

Quarterly program reviews and semi-annual product certification panel reviews.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603795N / *Land Attack Tech*	Project (Number/Name) 2038 / *ADVANCED MINOR CALIBER GUN*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Primary Product Integration	SS/BOA	BAE Systems : Minneapolis MN	11.927	0.135	Dec 2014	0.000		0.527	Apr 2017	-		0.527	0.200	12.789	-
		Subtotal	11.927	0.135		0.000		0.527		-		0.527	0.200	12.789	-

Remarks

ECPs spiral development - Electro Optical Site (EOS) capabilities

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Government Engineering Services	WR	NSWC, DD : Dahlgren, VA	1.713	0.072	Dec 2014	0.621	Dec 2015	0.000		-		0.000	1.000	3.406	-
Government Engineering Services	WR	NSWC, IHD : Picatinny, NJ	0.300	0.072	Dec 2014	0.266	Dec 2015	0.046	Oct 2016	-		0.046	0.278	0.962	-
		Subtotal	2.013	0.144		0.887		0.046		-		0.046	1.278	4.368	-

Remarks

Configuration Management (CM) work engineering tech manuals updates.

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Support Services	C/CPFF	ALION : Washington, DC	0.334	0.031	Jan 2015	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
		Subtotal	0.334	0.031		0.000		0.000		-		0.000	-	-	-

	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	14.274	0.310		0.887		0.573		-		0.573	-	-	-

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603795N / *Land Attack Tech*	**Project (Number/Name)** 2038 / *ADVANCED MINOR CALIBER GUN*

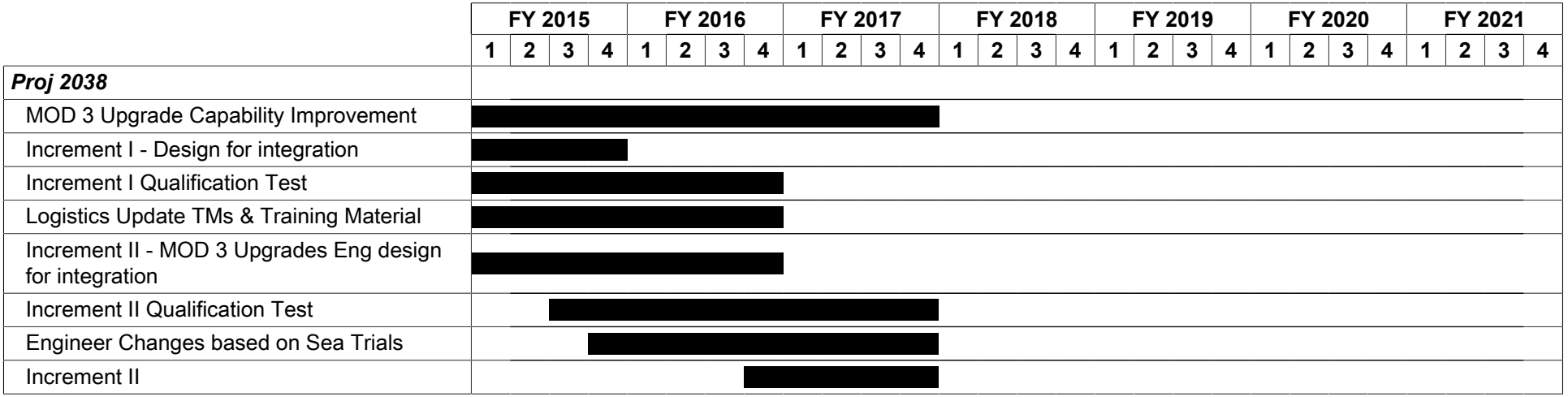

Exhibit R-4A, RDT&E Schedule Details: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603795N / *Land Attack Tech*	**Project (Number/Name)** 2038 / *ADVANCED MINOR CALIBER GUN*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 2038				
MOD 3 Upgrade Capability Improvement	1	2015	4	2017
Increment I - Design for integration	1	2015	4	2015
Increment I Qualification Test	1	2015	4	2016
Logistics Update TMs & Training Material	1	2015	4	2016
Increment II - MOD 3 Upgrades Eng design for integration	1	2015	4	2016
Increment II Qualification Test	3	2015	4	2017
Engineer Changes based on Sea Trials	4	2015	4	2017
Increment II	4	2016	4	2017

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603795N / *Land Attack Tech*	Project (Number/Name) 3370 / *Railgun*	

COST ($ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
3370: *Railgun*	0.000	0.000	0.000	5.442	-	5.442	15.608	19.044	15.771	22.239	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Hyper Velocity Projectile (HVP) effort will double the range of the current 5-inch Mk 45 MOD 4 Gun, meeting Naval Surface Fire Support (NSFS) operational requirements for support of combat troops ashore. This project executes pre MS-B activities for Engineering and Manufacturing Development Phase. Phase 1 of HVP development will implement technologies increasing effective range and lethality of Naval Surface Fire Support (NSFS) and integration with the 5"/62 Mk 45 MOD 4 Gun and Mk 160 Gun Computer System. Phase 1 includes airframe and sabot development to improve weight and volume allocations, definition of government controlled sub-section interfaces, and the development of an High Explosive (HE) warhead. Phases 2-3 are oriented at expansion of the capabilities of HVP beyond NSFS currently addressed in this Budget Item. The Hyper Velocity Projectile project was previously funded under the PE 0603925N / Directed Energy and Electronic Weapon Systems

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Title: Systems Engineering and Testing	0.000	0.000	5.442	0.000	5.442
Articles:	-	-	-	-	-
FY 2015 Accomplishments: (The Hyper Velocity Projectile technology development was previously funded under the PE 0603925N / Directed Energy and Electronic Weapon Systems) Defined interface and control requirements. Defined and designed projectile critical components. Developed/conducted flight simulations. Conducted lethality analyses and developed/designed projectile electronics components/subsystems.					
FY 2016 Plans: (The Hyper Velocity Projectile technology development was previously funded under the PE 0603925N / Directed Energy and Electronic Weapon Systems) Complete critical design efforts. Conduct integration testing for sub-systems. Continue development for the improved Naval Surface Fire Support (NSFS) capabilities and their interface to the AEGIS Combat System.					

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603795N / *Land Attack Tech*	**Project (Number/Name)** 3370 / *Railgun*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Continue the development and qualification process for the Mk 34 GWS Ordnance Alteration (ORDALT) and propellant to support HVP use by existing gun systems. ***FY 2017 Base Plans:*** Technology development/establishment of technical requirements for 5-inch HVP. Preparation of acquisition documentation in preparation for Milestone B, including Acquisition Program Baseline (APB), Capabilities Development Document (CDD), Should Cost Report, Systems Engineering Plan (SEP), and Test & Evaluation Master Plan (TEMP). Prepare and publish Request for Proposals for E&MD award. Complete Cost and Technology Assisted Review. ***FY 2017 OCO Plans:*** N/A					
Accomplishments/Planned Programs Subtotals	0.000	0.000	5.442	0.000	5.442

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

Leveraging the sponsored ONR Future Naval Capabilities project and Gov't developed Interface Control Drawings and specifications, establish a competitive solicitation for E&MD Phase.

E. Performance Metrics

Quarterly Program Reviews, Monthly Reports, and Periodic Design Reviews.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603795N / *Land Attack Tech*	Project (Number/Name) 3370 / *Railgun*	

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Government Enginerring Services	WR	NSWC, DD : Dahlgren, VA	0.000	0.000		0.000		4.000	Jan 2017	-		4.000	0.000	4.000	-
Government Enginerring Services	WR	NSWC, Indian Head : Indian Head, MD	0.000	0.000		0.000		1.442	Jan 2017	-		1.442	Continuing	Continuing	Continuing
		Subtotal	0.000	0.000		0.000		5.442		-		5.442	-	-	-

	Prior Years	FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	0.000		0.000		5.442		-		5.442	-	-	-

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603795N / *Land Attack Tech*	**Project (Number/Name)** 3370 / *Railgun*

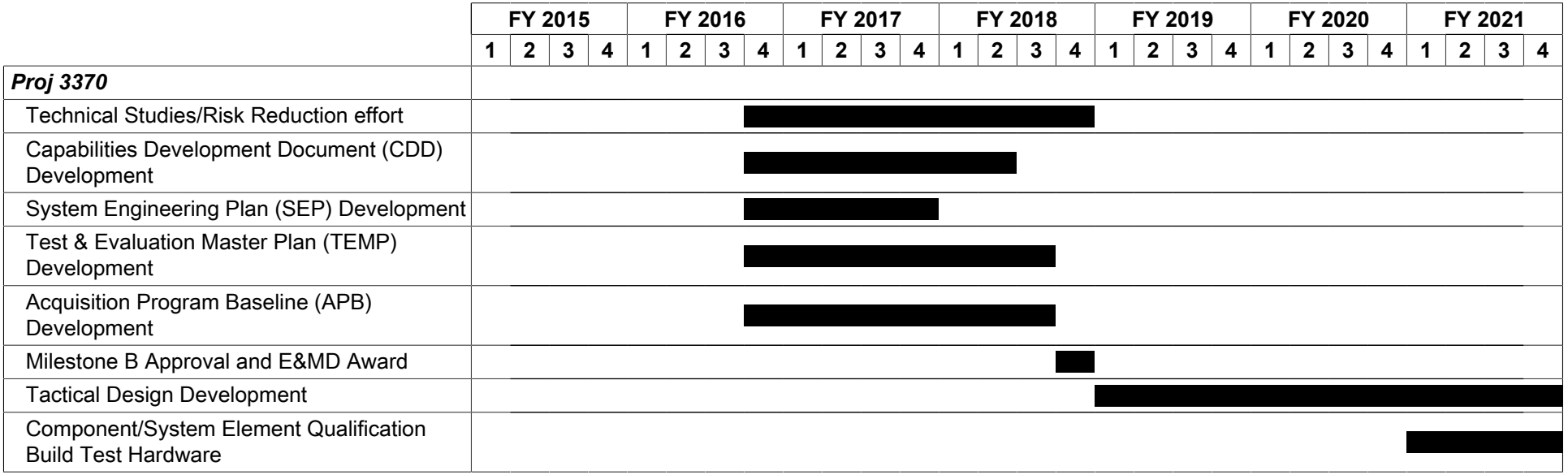

Exhibit R-4A, RDT&E Schedule Details: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603795N / *Land Attack Tech*	**Project (Number/Name)** 3370 / *Railgun*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 3370				
Technical Studies/Risk Reduction effort	4	2016	4	2018
Capabilities Development Document (CDD) Development	4	2016	2	2018
System Engineering Plan (SEP) Development	4	2016	4	2017
Test & Evaluation Master Plan (TEMP) Development	4	2016	3	2018
Acquisition Program Baseline (APB) Development	4	2016	3	2018
Milestone B Approval and E&MD Award	4	2018	4	2018
Tactical Design Development	1	2019	4	2021
Component/System Element Qualification Build Test Hardware	1	2021	4	2021

Exhibit R-2, RDT&E Budget Item Justification: PB 2017 Navy											Date: February 2016	
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 4: *Advanced Component Development & Prototypes (ACD&P)*					R-1 Program Element (Number/Name) PE 0603851M *I Joint Non-Lethal Weapons Testing*							
COST ($ in Millions)	**Prior Years**	**FY 2015**	**FY 2016**	**FY 2017 Base**	**FY 2017 OCO**	**FY 2017 Total**	**FY 2018**	**FY 2019**	**FY 2020**	**FY 2021**	**Cost To Complete**	**Total Cost**
Total Program Element	460.165	32.955	29.444	27.904	-	27.904	29.698	30.546	31.400	32.084	Continuing	Continuing
2319: *Non-Lethal Weapons*	460.165	32.955	29.444	27.904	-	27.904	29.698	30.546	31.400	32.084	Continuing	Continuing

A. Mission Description and Budget Item Justification

The DoD Non-Lethal Weapons Program was established by the FY96 National Defense Authorization Act. The Office of the Secretary of Defense designated the Commandant of the Marine Corps (CMC) as the DoD NLW Executive Agent (EA). The EA exercises centralized responsibility for joint research and development of non-lethal weapons and technology through the Joint Non-Lethal Weapons Program (JNLWP). The Office of the Under Secretary of Defense for Acquisition, Technology and Logistics serves as the OSD Principal Staff Assistant and oversees, in consultation with the Under Secretary of Defense for Policy, the DoD NLW Executive Agent.

The efforts described in this Program Element (PE) reflect Joint Service research and development (R&D) investment decisions provided by the Joint Non-Lethal Weapons Integrated Product Team, a multi-service flag level corporate board that provides executive oversight and management of the JNLWP for the EA. Research conducted is based on the needs and capabilities of the Services, the Special Operations Command and the Coast Guard, as identified in JROC-approved Joint Non-Lethal Effects Initial Capabilities Documents. This coordinated joint R&D development approach addresses mutual capability gaps and assures the best non-lethal technologies, capabilities and equipment are provided to the operating forces while eliminating duplicative Service investment. Advanced Component Development and Prototypes initiatives provide non-lethal capabilities which directly support the three pillars of the current Quadrennial Defense Review and comprise a fundamental part of DoD's security cooperation efforts to build partner capacity. The resulting capabilities will facilitate a fully integrated non-lethal competency as a complement to lethal firepower, providing force application options for short-of-lethal scenarios.

This PE funds Joint Service research, development, test, and evaluation of non-lethal weapons, devices, munitions and technologies which provide a non-lethal capability to minimize significant injuries as well as undesired damage to property and the environment. Counter-personnel and counter-materiel capability investment areas include directed energy (lasers, millimeter wave and high power microwave), multi-sensory suppression/incapacitation initiatives (acoustics, optical, electro-muscular incapacitation), and other emergent technologies transitioning from coordinated JNLWP Science and Technology PE initiatives. Investments also focus on Joint and allied experimentation, exercise, demonstration and assessment of advanced component and prototype initiatives in order to assist transition of suitable and effective capabilities to both joint and allied operational applications.

The Joint Non-Lethal Weapons Directorate is designated as a R&D organization and was established by the EA to manage the day to day research and development activities of the DoD's JNLWP. Each Service is responsible for their procurement and operating support costs.

Exhibit R-2, RDT&E Budget Item Justification: PB 2017 Navy					Date: February 2016
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 4: *Advanced Component Development & Prototypes (ACD&P)*		R-1 Program Element (Number/Name) PE 0603851M *I Joint Non-Lethal Weapons Testing*			
B. Program Change Summary ($ in Millions)	**FY 2015**	**FY 2016**	**FY 2017 Base**	**FY 2017 OCO**	**FY 2017 Total**
Previous President's Budget	35.627	29.448	29.151	-	29.151
Current President's Budget	32.955	29.444	27.904	-	27.904
Total Adjustments	-2.672	-0.004	-1.247	-	-1.247
• Congressional General Reductions	-	-0.004			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-1.864	0.000			
• SBIR/STTR Transfer	-0.808	0.000			
• Rate/Misc Adjustments	0.000	0.000	-1.247	-	-1.247

Change Summary Explanation

The funding decrease from FY16 to FY17 is attributed to programmatic adjustments to advisory and assistance services contracts.

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603851M / *Joint Non-Lethal Weapons Testing*	Project (Number/Name) 2319 / *Non-Lethal Weapons*	

COST ($ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
2319: *Non-Lethal Weapons*	460.165	32.955	29.444	27.904	-	27.904	29.698	30.546	31.400	32.084	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This project develops non-lethal weapon (NLW) capabilities that minimize fatal or permanent injuries and undesired damage to property and the environment. These capabilities are designed to stun, incapacitate, or hinder movement of individuals, crowds or equipment. The availability of NLW 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 Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Title: Counter-Personnel Advanced Component Development and Prototypes	16.572	14.810	14.036	0.000	14.036
Articles:	-	-	-	-	-

FY 2015 Accomplishments:

- Continued coordination and requirements development for Service counter-personnel (CP) prototyping initiatives within the JNLWP. This includes SOCOM and USCG.
- Continued development and assessment of Service-led CP NL prototype initiatives.
- Continued maturation of CP directed energy technologies to increase system efficiencies and reduce system size, weight and cost in preparation for transition to joint acquisition programs of record.
- Continued the advanced development of CP emerging technologies to support Service capability gaps and priorities as they support the Combatant Commanders.
- Continued technology maturation and risk reduction of competing approaches to inform decisions for Service capability development.
- Continued prototype development and assessment of advanced payloads for technological capabilities relevant to emerging counter-personnel capability gaps.
- Continued prototype development and demonstration for the most promising technologies employing multisensory stimuli. Specifically, completed prototype development of the multi-bang flashbang grenade and the Distributed Sound and Light Array (DSLA).
- Continued program management support for CP efforts.

FY 2016 Plans:

- Continue all efforts from FY 2015 except those noted as completed.

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603851M / *Joint Non-Lethal Weapons Testing*	**Project (Number/Name)** 2319 / *Non-Lethal Weapons*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
- Initiate munitions testing and acquisition documentation of NL capability to deny, move and suppress individuals at long ranges from currently fielded weapons systems. ***FY 2017 Base Plans:*** - Continue all efforts from FY 2016 except those noted as completed. ***FY 2017 OCO Plans:*** N/A					
Title: Counter-Materiel Advanced Component Development and Prototypes	11.667	10.427	9.883	0.000	9.883
Articles:	-	-	-	-	-
FY 2015 Accomplishments: - Continued coordination and requirements development for Service counter-material (CM) prototyping initiatives within the JNLWP. This includes SOCOM and USCG. - Continued development and assessment of Service-led CM NL prototype initiatives. - Continued maturation of CM directed energy technologies to increase system efficiencies and reduce system size, weight and cost in preparation for transition to joint acquisition programs of record. - Continued the advanced development of Counter-Materiel emerging technologies to support Service capability gaps and priorities as they support the Combatant Commanders. - Continued technology maturation and risk reduction of competing approaches to inform decisions for Service capability development. - Continued prototype development and assessment of advanced payloads for technological capabilities relevant to emerging counter-materiel capability gaps. - Continued program management support for CM efforts. ***FY 2016 Plans:*** - Continue all efforts from FY 2015 except those noted as completed. - Initiate development of the conceptual design of non-lethal Directed Energy (DE) vessel-stopping capability, including electro-magnetic and engagement modeling, platform feasibility and integration studies, and target characterization and validation. - Mission Payload Module (MPM) Engineer and Manufacturing Development contract terminated for convenience and returned to Technology Maturation and Risk Reduction acquisition phase. ***FY 2017 Base Plans:*** - Continue all efforts from FY 2016 except those noted as completed.					

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603851M / *Joint Non-Lethal Weapons Testing*	**Project (Number/Name)** 2319 / *Non-Lethal Weapons*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
- Initiate production qualification testing of a Service-endorsed pre-emplaced, counter-materiel, counter vehicle stopping capability. ***FY 2017 OCO Plans:*** N/A					
Title: Joint and Allied Exercise, Experimentation, Demonstration and Assessment	4.716	4.207	3.985	0.000	3.985
Articles:	-	-	-	-	-
FY 2015 Accomplishments: - Continued modeling and simulation (M&S) of NLWs in warfighter training/gaming models and performance effects data collection/population to demonstrate/analyze NL effects and support optimization of training. - Continued evaluation of NLWs by Service warfighting laboratories and Joint Staff, J7, Joint and Coalition Warfighting for direct user feedback of various non-lethal (NL) technologies and munitions to include policy and strategy and strategic communication. - Continued engagement with NATO on cooperative security efforts, to include providing input for Systems Analysis and Studies (SAS) Panels and NATO assessment of NLW in appropriate allied scenarios and exercises. Specifically, completed the 2015 NATO Non-Lethal Technology Exercise - Maritime (NNTEX-15M). - Continued interaction with Combatant Commander staffs to evaluate emerging NLW capabilities and their utility in theater operations and Defense of the Homeland missions. - Continued effort to assess the utility, effect, and effectiveness of technologies for incapacitating personnel, clearing facilities, stopping vehicles and vessels, and denying enemy access to protected areas. - Continued to identify, test, and evaluate newly developed commercial products that may meet Joint service requirements for specific non-lethal capability set common items. Specifically, certified a two-way translation device for Service capability sets. - Continued program management support for Joint and Allied Exercise, Experimentation, Demonstration and Assessment efforts. ***FY 2016 Plans:*** - Continue all efforts from FY 2015 except those noted as completed. - Initiate support of 3 Combatant Commanders with demonstrating and assessing NLW capabilities for port opening operations; Humanitarian Assistance and Disaster Relief (HA/DR) and Counter-Transnational Organized Crime (CTOC) operations; and harbor and in-transit security operations. ***FY 2017 Base Plans:*** - Continue all efforts from FY 2016 except those noted as completed.					

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603851M / *Joint Non-Lethal Weapons Testing*	**Project (Number/Name)** 2319 / *Non-Lethal Weapons*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
- Initiate support of two services with demonstrating and assessing NLW capabilities for expeditionary warfare experimentation and security of strategic systems exercises. ***FY 2017 OCO Plans:*** N/A					
Accomplishments/Planned Programs Subtotals	32.955	29.444	27.904	0.000	27.904

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
• PE 0602651M: *Joint Non-Lethal Weapons Applied Research*	5.728	6.119	6.327	-	6.327	6.425	6.425	6.425	6.425	Continuing	Continuing
• PE 0603651M: *Joint Non-Lethal Weapons Advanced Technology Development*	11.163	12.745	13.117	-	13.117	13.448	13.387	13.387	13.387	Continuing	Continuing

Remarks

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 state-of-the-art technology investment, experimentation, and modeling and simulation. 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 support each Service's RDT&E joint application efforts.

E. Performance Metrics

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603851M / *Joint Non-Lethal Weapons Testing*	**Project (Number/Name)** 2319 / *Non-Lethal Weapons*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
NLW Product Development	MIPR	ARDEC : Picatinny, NJ	52.499	1.148	Oct 2014	1.022	Oct 2015	1.010	Oct 2016	-		1.010	Continuing	Continuing	Continuing
NLW Product Development	MIPR	SOCOM : McDill AFB, FL	25.574	0.241	Oct 2014	0.250	Oct 2015	0.275	Oct 2016	-		0.275	Continuing	Continuing	Continuing
NLW Product Development	Various	NSWC : Various	31.795	5.539	Oct 2014	4.930	Oct 2015	4.688	Oct 2016	-		4.688	Continuing	Continuing	Continuing
NLW Product Development	MIPR	USAF : Ft. Sam Houston AFB, TX	56.734	0.775	Oct 2014	0.707	Oct 2015	0.670	Oct 2016	-		0.670	Continuing	Continuing	Continuing
NLW Product Development	Various	MCSC : Quantico, VA	26.523	4.510	Oct 2014	1.254	Oct 2015	1.432	Oct 2016	-		1.432	Continuing	Continuing	Continuing
NLW Product Development	Various	Uniformed Services : Various	145.320	11.329	Oct 2014	12.500	Oct 2015	10.918	Oct 2016	-		10.918	Continuing	Continuing	Continuing
Prior Year NLW Product Development	Various	Various : Various	65.401	0.000		0.000		0.000		-		0.000	0.000	65.401	-
		Subtotal	403.846	23.542		20.663		18.993		-		18.993	-	-	-

Remarks

Joint Program funds are distributed amongst the USA, USAF, USN, USMC, SOCOM, and USCG in support of NLW research and development efforts. Each Cost Category Item does not correlate to an individual project/effort. They fund multiple non-lethal projects/efforts that are incrementally funded throughout the fiscal year as each service identifies the project/effort requiring funding. October award dates reflect the start of incremental funding and does not indicate that the full amount will be awarded in October.

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
NLW Support Cost	WR	NSWC : Dahlgren, VA	15.598	0.600	Oct 2014	0.600	Oct 2015	0.600	Oct 2016	-		0.600	Continuing	Continuing	Continuing
		Subtotal	15.598	0.600		0.600		0.600		-		0.600	-	-	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603851M / *Joint Non-Lethal Weapons Testing*	**Project (Number/Name)** 2319 / *Non-Lethal Weapons*

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
JNLW Management Support	Various	MCSC : Quantico, VA	0.000	8.813	Oct 2014	8.181	Oct 2015	8.311	Oct 2016	-		8.311	Continuing	Continuing	Continuing
Prior Year Management Services	Various	Various : Various	40.721	0.000		0.000		0.000		-		0.000	0.000	40.721	-
		Subtotal	40.721	8.813		8.181		8.311		-		8.311	-	-	-

Remarks

The JNLW Management Support was previously incorporated into the various cost categories instead of being displayed in the corresponding section of the R-3. The Management Services section of the R-3 now reflects the amounts for civilian salaries and contractor program management. The funding fluctuates across the R-2A categories based on the demand signals of the Services, USSOCOM, and the USCG.

	Prior Years	FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	460.165	32.955		29.444		27.904		-		27.904	-	-	-

Remarks

Joint Program funds are distributed amongst the USA, USAF, USN, USMC, SOCOM, and USCG in support of NLW research and development efforts. Each Cost Category Item does not correlate to an individual project/effort. They fund multiple non-lethal projects/efforts that are incrementally funded throughout the fiscal year as each service identifies the project/effort requiring funding. October award dates reflect the start of incremental funding and does not indicate that the full amount will be awarded in October.

Exhibit R-4, RDT&E Schedule Profile: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603851M / *Joint Non-Lethal Weapons Testing*	**Project (Number/Name)** 2319 / *Non-Lethal Weapons*

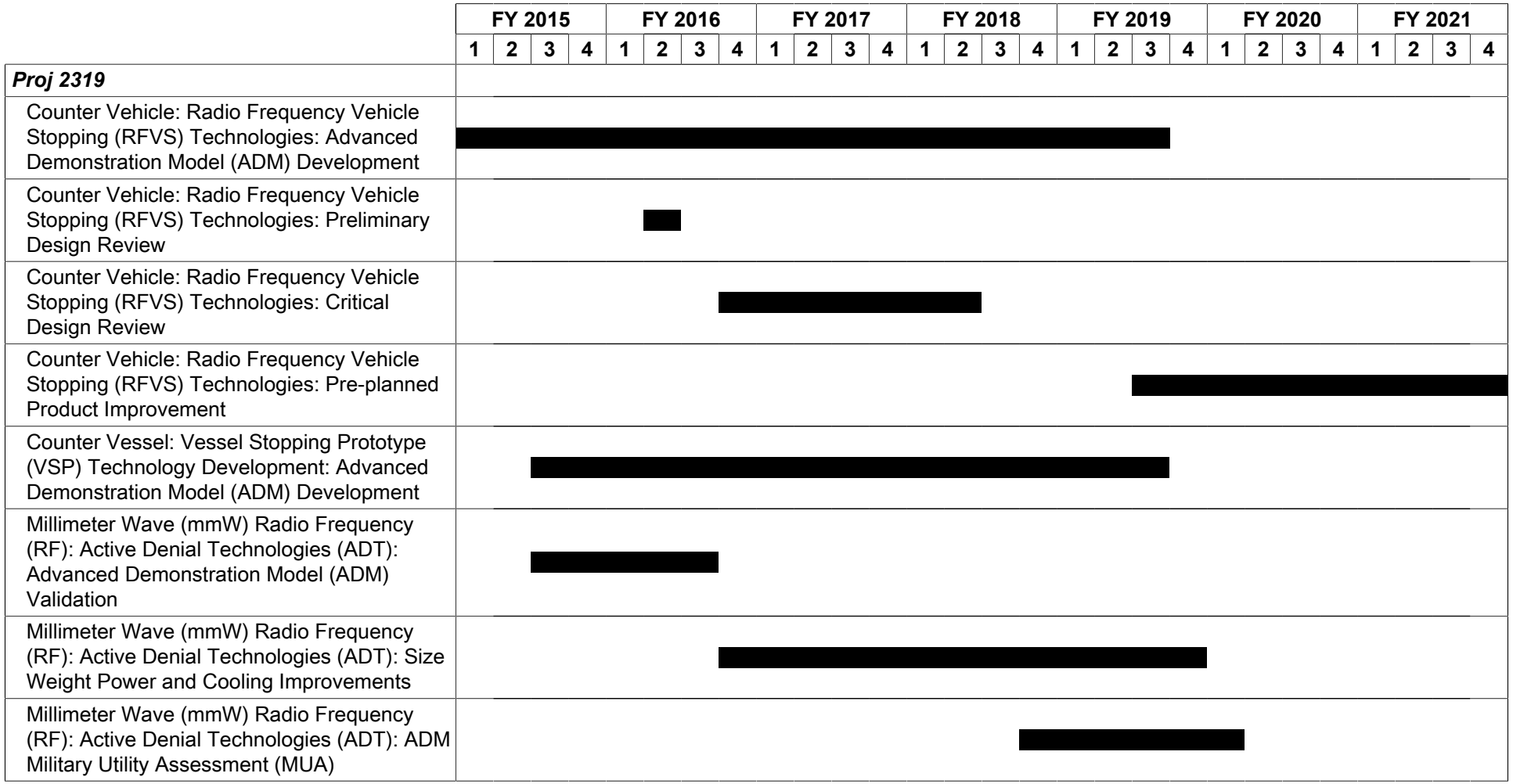

Exhibit R-4, RDT&E Schedule Profile: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603851M / *Joint Non-Lethal Weapons Testing*	**Project (Number/Name)** 2319 / *Non-Lethal Weapons*

	FY 2015				FY 2016				FY 2017				FY 2018				FY 2019				FY 2020				FY 2021			
	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
Sound & Light Spectrum: Laser and Acoustic Technologies: Advanced Demonstration Model (ADM) Development									[redacted]																			

Exhibit R-4A, RDT&E Schedule Details: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603851M / *Joint Non-Lethal Weapons Testing*	**Project (Number/Name)** 2319 / *Non-Lethal Weapons*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 2319				
Counter Vehicle: Radio Frequency Vehicle Stopping (RFVS) Technologies: Advanced Demonstration Model (ADM) Development	1	2015	3	2019
Counter Vehicle: Radio Frequency Vehicle Stopping (RFVS) Technologies: Preliminary Design Review	2	2016	2	2016
Counter Vehicle: Radio Frequency Vehicle Stopping (RFVS) Technologies: Critical Design Review	4	2016	2	2018
Counter Vehicle: Radio Frequency Vehicle Stopping (RFVS) Technologies: Pre-planned Product Improvement	3	2019	4	2021
Counter Vessel: Vessel Stopping Prototype (VSP) Technology Development: Advanced Demonstration Model (ADM) Development	3	2015	3	2019
Millimeter Wave (mmW) Radio Frequency (RF): Active Denial Technologies (ADT): Advanced Demonstration Model (ADM) Validation	3	2015	3	2016
Millimeter Wave (mmW) Radio Frequency (RF): Active Denial Technologies (ADT): Size Weight Power and Cooling Improvements	4	2016	4	2019
Millimeter Wave (mmW) Radio Frequency (RF): Active Denial Technologies (ADT): ADM Military Utility Assessment (MUA)	4	2018	1	2020
Sound & Light Spectrum: Laser and Acoustic Technologies: Advanced Demonstration Model (ADM) Development	1	2017	2	2020

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Exhibit R-2, RDT&E Budget Item Justification: PB 2017 Navy											Date: February 2016	
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 4: *Advanced Component Development & Prototypes (ACD&P)*					R-1 Program Element (Number/Name) PE 0603860N *I JT Precision Approach & Ldg Sys*							
COST ($ in Millions)	**Prior Years**	**FY 2015**	**FY 2016**	**FY 2017 Base**	**FY 2017 OCO**	**FY 2017 Total**	**FY 2018**	**FY 2019**	**FY 2020**	**FY 2021**	**Cost To Complete**	**Total Cost**
Total Program Element	901.794	41.644	81.466	104.144	-	104.144	104.954	102.569	50.679	38.974	Continuing	Continuing
2329: *JPALS*	901.794	41.644	81.466	104.144	-	104.144	104.954	102.569	50.679	38.974	Continuing	Continuing
Program MDAP/MAIS Code: 238												

Note

On 15 June 2014, USD(AT&L) signed the Nunn-McCurdy Acquisition Decision Memorandum (ADM) for the restructured Joint Precision Approach and Landing System (JPALS) Increment 1A program, which certified the program in lieu of termination. Accordingly, the JPALS Milestone B decision of June 2008 was rescinded. JPALS was directed to complete specific development phase tasks of the current program, with the addition of risk reduction efforts to prepare for manned and unmanned auto-land capability. The actual production phase of JPALS Increment 1A was deferred to align with future acquisition of the auto-land capability. The ADM directed the Navy to: continue Increment 1A development that will culminate with completion of developmental testing activities and a Letter of Observation from the Commander, Operational Test and Evaluation Force on the JPALS Increment 1A ship system, and provide a draft Increment 1A Technical Data Package; and continue auto-land trade studies and risk reduction efforts through 3QFY16. The ADM also directed the Navy to return to the Defense Acquisition Board (DAB) for Milestone B approval for the restructured JPALS program not later than 3QFY16.

A. Mission Description and Budget Item Justification

A. Mission Description and Budget Item Justification

The Joint Precision Approach and Landing System (JPALS) is the primary precision approach and landing system for CVN and LH ships to support aircraft without SPN-46 ACLS capability including F-35B, F-35C, UCLASS and future platforms. JPALS ship systems are required to provide CVN and LH ships a precision approach capability down to 200' ceiling and 1/2 nm visibility weather, a coupled approach capability to a 200' decision height and 1/2 nm for LH ships, and coupled approach to the deck (auto-land) capability aboard CVN ships. JPALS also provides the over-the-air inertial alignment capability for CVN and LH ships to support aircraft platforms without Link-4A capability, including F-35, UCLASS and future platforms.

JUSTIFICATION FOR BUDGET ACTIVITY: This program is funded under ADVANCED COMPONENT DEVELOPMENT AND PROTOTYPES because it includes all efforts necessary to evaluate integrated technologies, representative models or prototype systems in high fidelity and realistic operating environment.

Exhibit R-2, RDT&E Budget Item Justification: PB 2017 Navy					Date: February 2016
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 4: *Advanced Component Development & Prototypes (ACD&P)*		R-1 Program Element (Number/Name) PE 0603860N *I JT Precision Approach & Ldg Sys*			
B. Program Change Summary ($ in Millions)	**FY 2015**	**FY 2016**	**FY 2017 Base**	**FY 2017 OCO**	**FY 2017 Total**
Previous President's Budget	41.886	91.479	75.934	-	75.934
Current President's Budget	41.644	81.466	104.144	-	104.144
Total Adjustments	-0.242	-10.013	28.210	-	28.210
• Congressional General Reductions	-	-0.013			
• Congressional Directed Reductions	-	-10.000			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.242	0.000			
• Program Adjustments	0.000	0.000	34.661	-	34.661
• Rate/Misc Adjustments	0.000	0.000	-6.451	-	-6.451

Change Summary Explanation

Technical: Tasking added to the program to reflect additional development, testing, and integration activities to implement and field a JPALS ship system that includes UHF Data Broadcast (UDB), precision approach and auto-land capability for manned and unmanned platforms as directed by the Department of the Navy (DON) Resource and Requirements Review Board (R3B) and certified by the post Nunn-McCurdy USD(AT&L) ADM.

Schedule: Schedule revised to reflect additional development, testing, and integration activities to implement and field a JPALS ship system that includes UDB, precision approach and auto-land capability for manned and unmanned platforms as directed by the DON R3B and certified by the post Nunn-McCurdy USD(AT&L) ADM.

Financial: The Department added FY 17 funding to finance additional development, testing, and integration activities to implement and field a JPALS ship system that includes UDB, precision approach and auto-land capability for manned and unmanned platforms as directed by the DON R3B and certified by the post Nunn-McCurdy USD(AT&L) ADM.

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603860N / *JT Precision Approach & Ldg Sys*	Project (Number/Name) 2329 / *JPALS*	

COST ($ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
2329: *JPALS*	901.794	41.644	81.466	104.144	-	104.144	104.954	102.569	50.679	38.974	Continuing	Continuing
Quantity of RDT&E Articles	8	-	-	2	-	2	-	-	-	-		

A. Mission Description and Budget Item Justification

The increase from FY 16 to FY 17 reflects the additional funding added by the Department to finance additional development, testing, and integration activities to implement and field a JPALS ship system that includes UDB, precision approach, and auto-land capability for manned and unmanned platforms. The FY 17 funding request includes two additional Engineering Development Models to support F-35 JPALS early operational capability.

Joint Precision Approach and Landing System (JPALS) provides for development, integration, installation, and test of Sea-Based JPALS on CVN/LHA/LHD ships in accordance with the JPALS Capability Development Document. This requirement supports the JPALS Integration on CVN/LHA/LHD ships and establishes requirements for enabling critical technology for Joint Strike Fighter (JSF) F-35B Marine Corps Short Take-Off and Vertical Landing and F-35C Navy Carrier Variant, and Unmanned Carrier Launched Airborne Surveillance and Strike (UCLASS). Initial JPALS capability is baselined in F-35 Block 3F software.

JPALS Engineering Development Model (EDM) test articles have been delivered to support system development and demonstration, and JPALS ship systems will be installed on CVN/LHA/LHD ships in support of the F-35B/C and UCLASS shipboard testing.

JPALS will continue to invest in software development in direct support of precision approach and auto-land capabilities for the F-35B/C, UCLASS, and future air platforms.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Title: JPALS Ship Systems and Test	35.787	76.316	98.749	0.000	98.749
Articles:	-	-	2	-	2
Description: JPALS provides for development, integration, installation, and test of Sea-Based JPALS on CVN/ LHA/LHD ships.					
FY 2015 Accomplishments: Continue development of JPALS system and activities related to technical maturity and auto-land risk reduction. Continue updating of acquisition and technical documentation in preparation of 3rd quarter FY16 Milestone B. Awarded contract modification for pre-Milestone B efforts in 4th quarter. Continue Prototype Risk Reduction					

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603860N / *JT Precision Approach & Ldg Sys*	**Project (Number/Name)** 2329 / *JPALS*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
testing. Perform System Requirements Review (SRR) in 3rd quarter and Systems Functional Review (SFR) in 4th quarter. ***FY 2016 Plans:*** Complete Integrated Logistics Assessment (ILA) in 1st quarter. Complete required update of acquisition and technical documentation to support Milestone B decision. Complete Preliminary Design Review (PDR) in 2nd quarter. Accomplish Milestone B and award new Engineering Manufacturing and Development contract in 3rd quarter. Continue Prototype Risk Reduction testing in preparation for JPALS Integrated Test (IT) in FY17. Continue auto-land risk reduction activities. ***FY 2017 Base Plans:*** Fund two additional Engineering Development Models (EDM) to support F-35 Early Operational Capability (EOC). Perform Initial Baseline Review (IBR) for the new JPALS Engineering Manufacturing and Demonstration (EMD) contract in the 1st quarter. Perform Critical Design Review (CDR) and install an EDM on a LHD in 2nd quarter. Install EDMs on CVNs for JPALS Integrated Test (IT) and for F-35 operational testing in 4th quarter. ***FY 2017 OCO Plans:*** N/A					
Title: Joint Strike Fighter (JSF) F-35B Marine Corp STOVL and F-35C Navy Carrier Variant Test Support ***Articles:*** ***Description:*** Provide support for F-35B Marine Corps Short Take-Off and Vertical Landing (STOVL) aircraft and F-35C Navy Carrier Variant Developmental Test (DT) and Operational Tests (OT). ***FY 2015 Accomplishments:*** Install Engineering Development Model (EDM) on a CVN in 2nd quarter in support of F-35C Navy Carrier Variant DT-2. Provide support for F-35B Marine Corps STOVL DT-3 on an LHA in 3rd quarter. ***FY 2016 Plans:*** Provide support for F35-B Marine Corps STOVL variant DT-3 on an LHA. Install EDM on a CVN in 4th quarter in support of F-35C Navy Carrier Variant DT-3. ***FY 2017 Base Plans:*** Support testing on CVN and LHA/D of F-35B Marine Corps STOVL variant and F-35C Navy Carrier variant. ***FY 2017 OCO Plans:***	4.157 -	3.750 -	3.973 -	0.000 -	3.973 -

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603860N / *JT Precision Approach & Ldg Sys*	**Project (Number/Name)** 2329 / *JPALS*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
N/A					
Title: Unmanned Carrier-Launched Airborne Surveillance and Strike (UCLASS) Test Support	1.700	1.400	1.422	0.000	1.422
Articles:	-	-	-	-	-
Description: Provide Developmental Test (DT) and Operational Test (OT) support for UCLASS.					
FY 2015 Accomplishments: Provide test planning and other support as required for Unmanned Carrier-Launched Airborne Surveillance and Strike (UCLASS) Developmental Test (DT).					
FY 2016 Plans: Continue development of test documentation and planning in support of UCLASS DT.					
FY 2017 Base Plans: Continue development test support of UCLASS as required.					
FY 2017 OCO Plans: N/A					
Accomplishments/Planned Programs Subtotals	41.644	81.466	104.144	0.000	104.144

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
• OPN/2867: *JPALS*	0.000	0.000	0.000	-	0.000	0.000	58.202	68.534	69.905	Continuing	Continuing

Remarks

D. Acquisition Strategy

Technology Development phase was conducted jointly by NAVAIRSYSCOM (PMA-213), 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 System Development and Demonstration (SDD) phase development. Joint Precision Approach and Landing System (JPALS) reached MS-B on 14 July 2008 and the SDD phase development contract was awarded on 17 July 2008. Tasking consists of sea-based 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. The SDD contract was decided after full and open competition. JPALS is being developed by the Navy with an open system architecture in order to facilitate the compatible integration of many different aircraft and avionics architectures. JPALS provides for development, integration, installation, and test of Sea-Based JPALS to meet Initial

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603860N / *JT Precision Approach & Ldg Sys*	**Project (Number/Name)** 2329 / *JPALS*

Operation Capability of CVN/LHA/LHD ships in accordance with the JPALS Capability Development Document (CDD). Additionally, this requirement provides critical enabling technology for Joint Strike Fighter (JSF) F-35B Marine Corps Short Take-Off and Vertical Landing (STOVL) and F-35C Navy Carrier Variant, ship-based Unmanned Carrier Launched Airborne Surveillance and Strike (UCLASS), and future Navy and Marine Corps air platforms.

As a result of the DON Resource and Requirements Review Board approved PALC Roadmap, the JPALS production phase was deferred to include design improvements to provide manned and unmanned aircraft with autoland capabilities. The current Engineering and Manufacturing Development (EMD) contract was modified in FY14 to add detailed requirements and design trade studies to identify specific system design improvements. An extension for pre-Milestone B efforts was awarded in 4th quarter of FY15.

A Development RFP Release Decision Point (DRRDP) Defense Acquisition Board (DAB) was completed and the RFP was released on 24 November 2015.

E. Performance Metrics

Original Milestone B (June 2008) was rescinded by USD(ATL)-issued Acquisition Decision Memorandum, dtd 15 June 2014. New Milestone B is scheduled for 3rd quarter FY16.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603860N / *JT Precision Approach & Ldg Sys*	Project (Number/Name) 2329 / *JPALS*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Ship Integration	WR	NAWCAD : Pax River, MD	35.091	1.724	Dec 2014	12.650	Dec 2015	9.800	Nov 2016	-		9.800	Continuing	Continuing	Continuing
Primary Hardware Development - EMD Phase I	C/CPAF	Raytheon : Fullerton, CA	355.218	18.839	Jul 2015	19.020	Nov 2015	0.000		-		0.000	0.000	393.077	393.077
Primary Hardware Development - New EMD Contract	TBD	Raytheon : Fullerton, CA	0.000	0.000		8.365	Jun 2016	47.426	Nov 2016	-		47.426	166.040	221.831	221.831
Risk Reduction for Auto-land - ARC-210	C/CPFF	RCI : Cedar Rapids, IA	1.549	1.480	Dec 2014	1.700	Dec 2015	0.000		-		0.000	0.000	4.729	4.729
Risk Reduction for Auto-land - FFRDC Support	FFRDC	JHU : Laurel, MD	0.493	0.000		1.487	Oct 2015	1.502	Nov 2016	-		1.502	0.000	3.482	3.482
Prior Year Prod Dev no longer funded in the FYDP	TBD	Various : Various	249.870	0.000		0.000		0.000		-		0.000	0.000	249.870	-
		Subtotal	642.221	22.043		43.222		58.728		-		58.728	-	-	-

Remarks

The Primary Hardware Development contract with Raytheon is a combined CPAF and CPIF contract. Ship Integration funding in FY17 lower than FY16 due to fewer EDM installations/de-installations. Primary Hardware Development funding increases in FY17 due to contractor production of two Engineering Demonstration Models (EDMs) and commencing new EMD work post MS-B.

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Systems Engineering Support	WR	NAWCAD : Pax River, MD	135.498	8.190	Dec 2014	20.167	Dec 2015	26.393	Nov 2016	-		26.393	Continuing	Continuing	Continuing
Integrated Logistics Support	WR	NAWCAD : Pax River, MD	21.563	1.229	Dec 2014	2.220	Dec 2015	2.250	Nov 2016	-		2.250	Continuing	Continuing	Continuing
Prior Year Support Costs non longer funded in FYDP	Various	Various : Various	21.514	0.000		0.000		0.000		-		0.000	0.000	21.514	-
		Subtotal	178.575	9.419		22.387		28.643		-		28.643	-	-	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603860N / *JT Precision Approach & Ldg Sys*	Project (Number/Name) 2329 / *JPALS*	

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract

Remarks

Ramp up of FY17 Systems Engineering to support Engineering Manufacturing and Development (EMD) Phase II initialization, Critical Design Review (CDR), production of two EDM Early Operational Concept (EOC) units to support F-35 operational testing.

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation	WR	NAWCAD : Pax River, MD	48.016	6.234	Dec 2014	8.853	Dec 2015	9.899	Nov 2016	-		9.899	Continuing	Continuing	Continuing
Operational Test & Evaluation	WR	COMOPTEVFOR : Norfolk, VA	3.247	0.250	Dec 2014	0.650	Dec 2015	0.650	Nov 2016	-		0.650	Continuing	Continuing	Continuing
		Subtotal	51.263	6.484		9.503		10.549		-		10.549	-	-	-

Remarks

Increase of Developmental Test and Evaluation funding between FY16 and FY17 due to scheduled start of JPALS IT-B testing.

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Support	WR	NAWCAD : Pax River, MD	15.938	0.978	Dec 2014	3.584	Dec 2015	3.600	Nov 2016	-		3.600	Continuing	Continuing	Continuing
PM Support-MSS	C/CPFF	Amelex : Pax River, MD	11.518	1.172	Dec 2014	1.200	Dec 2015	1.205	Nov 2016	-		1.205	0.000	15.095	15.095
PM Support-MSS	C/CPFF	Avian : Pax River, MD	1.140	0.452	Dec 2014	0.450	Dec 2015	0.453	Nov 2016	-		0.453	0.000	2.495	2.495
PM Support-MSS	C/CPFF	SAIC : Pax River, MD	1.027	1.026	Dec 2014	1.050	Dec 2015	0.898	Nov 2016	-		0.898	0.000	4.001	4.001
Travel	WR	NAVAIR : Pax River, MD	0.112	0.070	Dec 2014	0.070	Dec 2015	0.068	Nov 2016	-		0.068	Continuing	Continuing	Continuing
		Subtotal	29.735	3.698		6.354		6.224		-		6.224	-	-	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603860N / *JT Precision Approach & Ldg Sys*	Project (Number/Name) 2329 / *JPALS*	

	Prior Years	FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	901.794	41.644		81.466		104.144		-		104.144	-	-	-

Remarks

The significant shifts in funding levels between FY15 and FY16 are due primarily to the program's use of FY14 appropriation for FY15 government labor.

Exhibit R-4, RDT&E Schedule Profile: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603860N / *JT Precision Approach & Ldg Sys*	**Project (Number/Name)** 2329 / *JPALS*

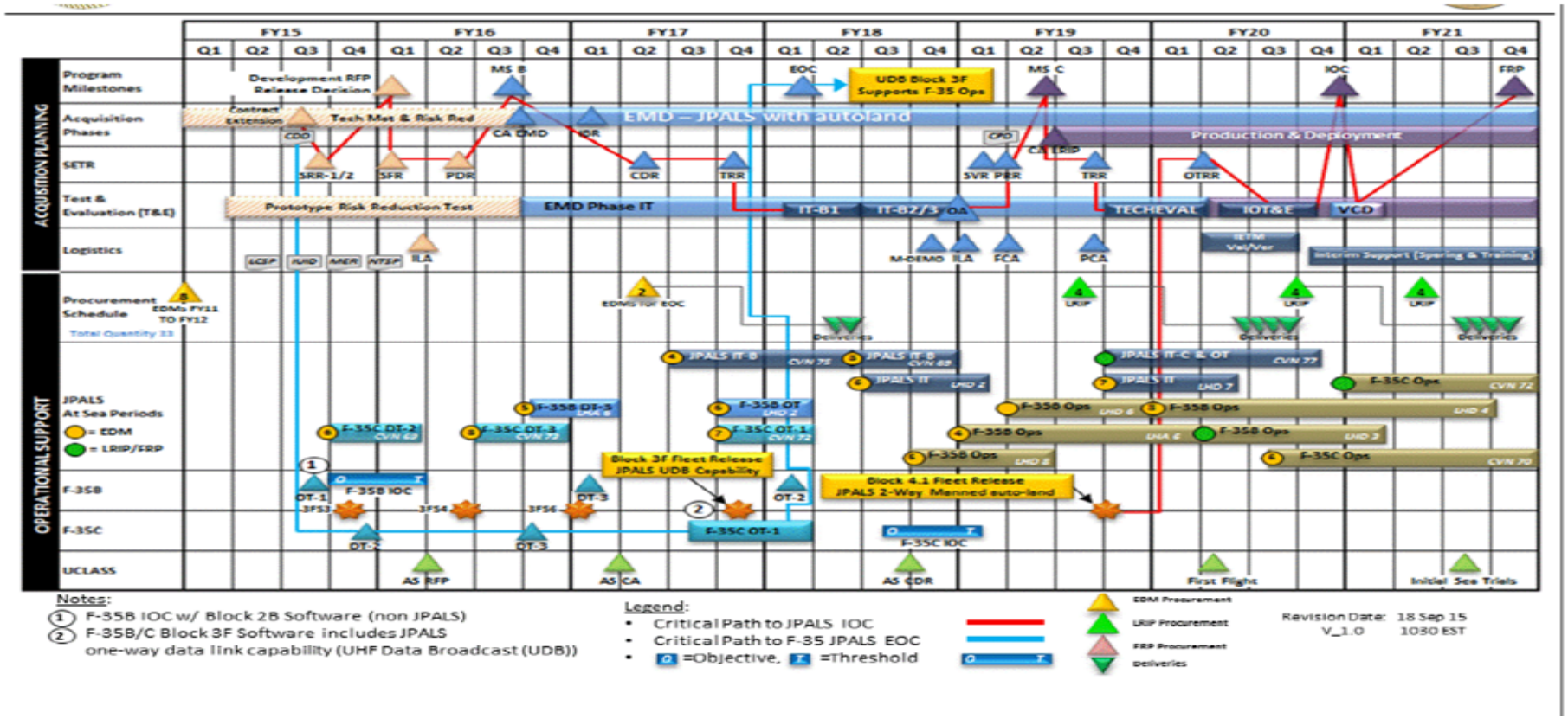

Exhibit R-4A, RDT&E Schedule Details: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603860N / *JT Precision Approach & Ldg Sys*	**Project (Number/Name)** 2329 / *JPALS*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
JPALS INC 1A				
Acquisition Milestones: MS B	3	2016	3	2016
Acquisition Milestones: Development RFP Release Decision Point (DRRDP)	1	2016	1	2016
Acquisition Milestones: MS C	3	2019	3	2019
Acquisition Milestones: Early Operating Concept (EOC)	1	2018	1	2018
Systems Development: Engineering and Manufacturing Development	1	2015	4	2021
Systems Development: Tech Maturity and Risk Reduction in support of Autoland	1	2015	1	2016
Systems Development: New Engineering & Manufacturing Development Implementation	3	2016	4	2021
Systems Development: Reviews: Critical Design Review (CDR)	2	2017	2	2017
Systems Development: Reviews: Preliminary Design Review (PDR)	2	2016	2	2016
Systems Development: Contract Awards: LRIP Contract Award	3	2019	3	2019
Systems Development: Contract Awards: EMD Extension adding pre- MS B efforts	4	2015	4	2015
Systems Development: Contract Awards: New EMD Contract Award	3	2016	3	2016
Test & Evaluation: Operational Test and Evaluation (IOT&E)	2	2020	4	2020
Test & Evaluation: JPALS Operational Test Readiness Review (OTRR)	2	2020	2	2020
Production Milestones: Production Readiness Review (PRR)	1	2019	1	2019
Deliveries: Inital LRIP Deliveries	2	2020	2	2020

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Exhibit R-2, RDT&E Budget Item Justification: PB 2017 Navy	Date: February 2016
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 0603925N *I Directed Energy and Electric Weapon System*

COST ($ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
Total Program Element	4.349	54.154	41.730	32.700	-	32.700	33.828	34.200	34.868	35.575	Continuing	Continuing
3370: *Railgun*	0.000	45.699	32.266	23.776	-	23.776	24.375	24.838	25.309	25.815	Continuing	Continuing
9823: *Lasers for Navy applicat*	4.349	8.455	9.464	8.924	-	8.924	9.453	9.362	9.559	9.760	Continuing	Continuing

A. Mission Description and Budget Item Justification

This program element will transition Directed Energy and Electric Weapon Systems (DE&EWS) technology from Science and Technology (S&T) research through Technology Development into System Development and Demonstration, leading to acquisition initiation for the Surface/Subsurface Navy.

DE&EWS consist of multiple breakthrough technologies including: laser weapons that provide for speed-of-light engagements at tactically significant ranges resulting in savings realized by minimizing the use of defensive missiles and projectiles; electromagnetic launch of projectiles that will significantly increase firing ranges imposing greater cost to adversaries of ballistic and air defense missile engagements; enhance the land attack mission; and fielding of high power radio frequency systems for non-kinetic electronic attack and active denial technology, allowing for non-lethal determination of threat intent beyond small arms fire ranges.

Development of DE&EWS includes: Weapons Grade High Energy Lasers, Electromagnetic Railgun (EMRG) Weapon Systems, High Power Radio Frequency Weapon/ Sensor Systems, and other systems/capabilities.

B. Program Change Summary ($ in Millions)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Previous President's Budget	55.696	67.360	66.865	-	66.865
Current President's Budget	54.154	41.730	32.700	-	32.700
Total Adjustments	-1.542	-25.630	-34.165	-	-34.165
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-25.630			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-0.230	0.000			
• SBIR/STTR Transfer	-1.312	0.000			
• Program Adjustments	0.000	0.000	-27.000	-	-27.000
• Rate/Misc Adjustments	0.000	0.000	-7.165	-	-7.165

Change Summary Explanation

The FY 2017 request was reduced by -$1.6 million as required for the Department of the Navy to comply with the Bipartisan Budget Act of 2015.

Exhibit R-2, RDT&E Budget Item Justification: PB 2017 Navy	Date: February 2016
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 0603925N *I Directed Energy and Electric Weapon System*

The FY 2017 request was reduced by -$27 million due to the cancellation of the railgun demonstration aboard the Joint High Speed Vessel (JHSV) in FY19.

Funding for Hypervelocity Projectile (HVP) ($5.4 million) was realigned to PE 0603795N Land Attack Technology.

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603925N / *Directed Energy and Electric Weapon System*	Project (Number/Name) 3370 / *Railgun*	

COST ($ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
3370: *Railgun*	0.000	45.699	32.266	23.776	-	23.776	24.375	24.838	25.309	25.815	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Electromagnetic Railgun (EMRG): Provides ship-based program/technical development to produce a standard railgun/mount for use onboard Navy warships.

Railgun provides increased capability for the following mission sets: Naval Surface Fire Support (NSFS), Integrated Air and Missile Defense (IAMD), Fast Attack Craft and Fast Inshore Attack Craft (FAC/FIAC), and future potential for Anti-Surface Warfare (ASuW).

The EMRG will launch the Hyper Velocity Projectile (HVP), currently in development as a Future Naval Capability (FNC). The EMRG development will remain in alignment with the time-phased transition of the HVP.

EMRG uses electromagnetic energy, vice traditional chemical propellant (i.e. gun powder), to launch projectiles providing: greatly increased range (110nm vice 13nm for current chemical propellant [gunpowder] guns); increased ammunition storage capacity; increased ship safety; increased layered point defense; and decreased costs when compared to current weapons. The net effect is an increased capacity against multiple simultaneous threats at a lower operational cost to offset a potential adversary's asymmetric missile strategy.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Title: Electromagnetic Railgun	45.699	32.266	23.776	0.000	23.776
Articles:	-	-	-	-	-
Description: Funding supports railgun management and engineering development, integration, and testing, as well as transition development of the Hypervelocity Projectile. The funding for Hypervelocity Projectile (HVP) development was realigned to PE 0603795N Land Attack Technology in FY 2017. ***FY 2015 Accomplishments:*** - Engineered/managed commonality with the OSD Experimental Campaign for mount, power, projectile, weapon, and combat interface/control. - Conducted sensor/shooter engineering trade studies. - Defined interface and control requirements.					

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603925N / *Directed Energy and Electric Weapon System*	**Project (Number/Name)** 3370 / *Railgun*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
- Developed hardware/software for eventual shipboard gun mount, prime and pulsed power components/ subsystems. - Developed battery and charging components/subsystems. - Defined and designed projectile critical components. - Developed/conducted flight simulations. - Initiated transition development of the Hypervelocity Projectile (HVP). - Conducted lethality analyses and airframe simulations and analyses defined/developed projectile electronics components/subsystems ***FY 2016 Plans:*** - Develop and test components of an operational EMRG system. - Continue railgun management, engineering development, integration and testing. - Conduct railgun integration activities. ***FY 2017 Base Plans:*** - Continue railgun management, engineering development, integration, and testing. - Continue railgun critical design efforts at the system level. - Initiate development of a shipboard installation package. - Coordinate efforts to establish other Doctrine, Organization, Training, Material, Leadership and Education, Personnel, and Facilities (DOTMLPF) requirements. ***FY 2017 OCO Plans:*** N/A					
Accomplishments/Planned Programs Subtotals	45.699	32.266	23.776	0.000	23.776

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

Tech maturation and system development efforts will be competitive in nature and are currently focused on establishing the technical requirements for the next round of competition prior to entering the Engineering & Manufacturing Development (E&MD) phase. The focus of the current efforts under cognizance of this PE are to ensure there are a sufficient quantity of qualified vendors at the critical component and system level to ensure a robust competitive environment at Milestone B. This effort is outside the scope of ONR efforts, which are focused on the development of component technologies and government "Smart Buyer" knowledge.

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603925N / *Directed Energy and Electric Weapon System*	**Project (Number/Name)** 3370 / *Railgun*

E. Performance Metrics

Quarterly Reviews, Monthly Reports, Periodic Design Reviews, Test Events and Test Artifacts.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603925N / *Directed Energy and Electric Weapon System*	Project (Number/Name) 3370 / *Railgun*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Hardware - Gun Mount/ Platform Requirements/ Development	C/CPFF	BAE via ARDEC : Washington, D.C.	0.000	6.464	Jan 2015	9.000	Feb 2016	4.988	Feb 2017	-		4.988	Continuing	Continuing	Continuing
Hardware - Gun Mount/ Platform Requirements/ Development	C/CPFF	GRYPHON, GSA : Washington,D.C., Dahlgren, VA	0.000	1.600	Jan 2015	1.100	Jan 2016	1.300	Jan 2017	-		1.300	Continuing	Continuing	Continuing
Hardware - Gun Mount/ Platform Requirements Development	WR	NSWC DD; NSWC Corona : Dahlgren, VA, Corona, CA	0.000	3.745	Mar 2015	2.250	Mar 2016	1.197	Nov 2016	-		1.197	Continuing	Continuing	Continuing
Hardware - Power Conversion	C/CPFF	NAVSEA PMS 320 Contract,ROLLS ROYCE : Washington, D.C.	0.000	0.085	Feb 2015	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Hardware - Power Conversion	WR	NAVSSESS : Philadelphia, PA	0.000	0.000	Feb 2015	0.435	Feb 2016	1.000	Nov 2016	-		1.000	Continuing	Continuing	Continuing
Hardware - Pulsed Power Development	WR	NSWC DD; : Dahlgren, VA	0.000	0.000		1.620	Jan 2016	0.000		-		0.000	Continuing	Continuing	Continuing
Hardware - Pulsed Power Development	C/CPFF	NAVSEA, PMS 320, BAE, RAYTHEON : Washington, D.C.	0.000	6.514	Mar 2015	1.065	Feb 2016	5.000	Feb 2017	-		5.000	Continuing	Continuing	Continuing
Hardware - Battery and Charging Supply Development/Certification	C/CPFF	NAVSEA PMS 320 Various : Washington, D.C.	0.000	4.406	Mar 2015	1.643	Mar 2016	1.250	Mar 2017	-		1.250	Continuing	Continuing	Continuing
Hardware - Battery & Charging Supply Dev/Cert	WR	NAVSSES : Philadelphia, PA	0.000	2.100	Mar 2015	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Hardware - Projectile Development	C/CPFF	Contractor via AFRL, BAE : Rome, NY, Minneapolis, MN	0.000	0.188	Jan 2015	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Hardware - Projectile Development	WR	NSWC/DD : Dahlgren, VA	0.000	2.500	Jan 2015	5.000	Jan 2016	0.000		-		0.000	Continuing	Continuing	Continuing
Software - Combat System & Fire Control Engineering	C/CPFF	MDA : Redstone Arsenal, AL	0.000	0.000		1.000	Mar 2016	0.000		-		0.000	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603925N / *Directed Energy and Electric Weapon System*	**Project (Number/Name)** 3370 / *Railgun*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Software Weapon System	WR	NSWC/DD : Dahlgren, VA	0.000	0.000		0.000		0.750	Nov 2016	-		0.750	Continuing	Continuing	Continuing
Software Weapon System	C/CPFF	MDA : Redstone Arsenal, AL	0.000	0.700	Mar 2015	0.000		1.010	Mar 2017	-		1.010	Continuing	Continuing	Continuing
Software Fire Control System	WR	NSWC/DD, NSWC Corona : Dahlgren, VA, Corona, CA	0.000	3.610	Mar 2015	0.000		0.750	Nov 2016	-		0.750	Continuing	Continuing	Continuing
		Subtotal	0.000	31.912		23.113		17.245		-		17.245	-	-	-

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Systems Engineering/ Management	WR	NSWC/DD : Dahlgren, VA	0.000	4.085	Feb 2015	2.933	Feb 2016	0.750	Nov 2016	-		0.750	Continuing	Continuing	Continuing
System Engineering/ Management	C/CPFF	PSU EOC, BIW, AGS : Washington, D.C.	0.000	1.236	Mar 2015	2.750	Mar 2016	2.996	Mar 2017	-		2.996	Continuing	Continuing	Continuing
		Subtotal	0.000	5.321		5.683		3.746		-		3.746	-	-	-

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Airframe Analysis	WR	NSWC DD, Eglin AFB, Robins AFB : Dahlgren, VA, Robins AFB GA, Eglin AFB	0.000	1.540	Mar 2015	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
High G Electronics Engineering	WR	NSWC DD : Dahlgren, VA	0.000	1.000	Mar 2015	0.300	Mar 2016	0.000		-		0.000	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603925N / *Directed Energy and Electric Weapon System*	**Project (Number/Name)** 3370 / *Railgun*	

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Landbased/Seabased Plan/Install/Conduct	WR	NSWC/DD : Dahlgren, VA, Corona, CA	0.000	1.000	Feb 2015	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Power and Energy Test Bed Development	WR	NAVSSESS; AFRL; Eglin : Philadelphia, PA; Washington, D.C.	0.000	2.785	Feb 2015	0.000		1.000	Nov 2016	-		1.000	Continuing	Continuing	Continuing
		Subtotal	0.000	6.325		0.300		1.000		-		1.000	-	-	-

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Project Engineering/ Management	C/CPFF	SOSSEC; KRATOS : Atkinson, NH; Washington, D.C.	0.000	1.241	Mar 2015	1.170	Mar 2016	1.050	Mar 2017	-		1.050	Continuing	Continuing	Continuing
Project Engineering/ Management	WR	NSWC Dahlgren : Dahlgren, VA	0.000	0.900	Mar 2015	2.000	Mar 2016	0.735	Nov 2016	-		0.735	Continuing	Continuing	Continuing
		Subtotal	0.000	2.141		3.170		1.785		-		1.785	-	-	-

	Prior Years	FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	45.699		32.266		23.776		-		23.776	-	-	-

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603925N / *Directed Energy and Electric Weapon System*	**Project (Number/Name)** 3370 / *Railgun*

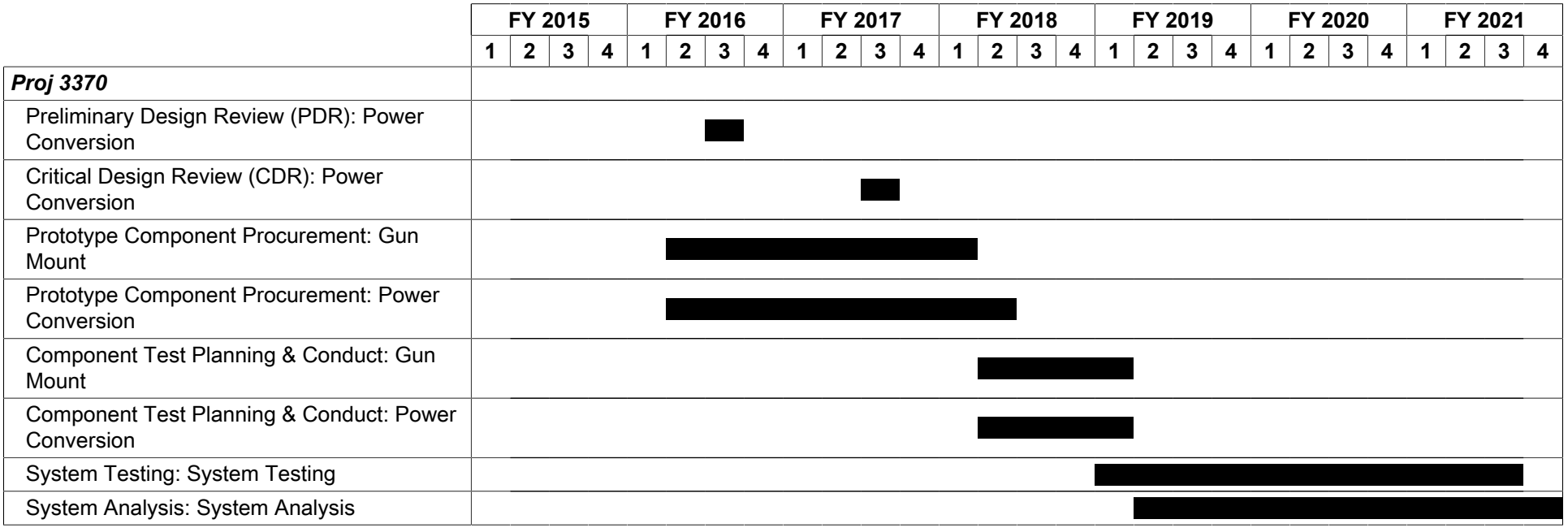

Exhibit R-4A, RDT&E Schedule Details: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603925N / *Directed Energy and Electric Weapon System*	**Project (Number/Name)** 3370 / *Railgun*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 3370				
Preliminary Design Review (PDR): Power Conversion	3	2016	3	2016
Critical Design Review (CDR): Power Conversion	3	2017	3	2017
Prototype Component Procurement: Gun Mount	2	2016	1	2018
Prototype Component Procurement: Power Conversion	2	2016	2	2018
Component Test Planning & Conduct: Gun Mount	2	2018	1	2019
Component Test Planning & Conduct: Power Conversion	2	2018	1	2019
System Testing: System Testing	1	2019	3	2021
System Analysis: System Analysis	2	2019	4	2021

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603925N / *Directed Energy and Electric Weapon System*	Project (Number/Name) 9823 / *Lasers for Navy applicat*	

COST ($ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
9823: *Lasers for Navy applicat*	4.349	8.455	9.464	8.924	-	8.924	9.453	9.362	9.559	9.760	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Lasers for Navy Applications, Solid State Laser (SSL) Low Power Module (LPM) Development: The SSL provides a capability to support existing Gaps (JROC EW ICD 177-09; MAMDJF ICD; IAMD JCD; USPACOM FY 10-15 IPL - Gap 6; SAG V SAG Roadmap; 3rd Fleet IPCLs; 7th Fleet IPCLs; JUONS: Counter-Boat Swarm///UAV) with the ability to dazzle Unmanned Aerial Systems (UASs). SSL LPM leverages the Office of Naval Research (ONR) efforts on the SSL Quick Reaction Capability (QRC) and SSL Technology Maturation (TM) efforts. SSL LPM will transition this capability from Science and Technology (S&T) development to a Program of Record (PoR).

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Title: Solid State Laser (SSL) Low Power Module (LPM) Development	8.455	9.464	8.924	0.000	8.924
Articles:	-	-	-	-	-

Description: Lasers for Navy Applications, Solid State Laser (SSL) Low Power Module (LPM) Development provides the ability to dazzle Unmanned Aerial Systems (UASs).

The funding increase from FY15 to FY16 supports the compilation/assembly of components into a prototype LPM for testing, as well as, additional testing in representative atmospheric conditions. The funding decrease from FY16 to FY17 reflects a decrease in the Product Development engineering.

FY 2015 Accomplishments:
- Procured the modeling and simulation software to be run to determine the operational capabilities for LPM.
- Managed/system engineered product development of the Low Power Module (LPM) Counter-Electro Optic Infra-Red (EO/IR) and MWIR hardware/software/firmware module.
- Developed associated test and control equipment to interface with the Laser Weapon System(s).
- Completed indoor and outdoor sensor effects testing required to characterize laser specific capabilities.

FY 2016 Plans:
- Continue Low Power Module management, engineering, design, development.
- Conduct more rigorous outdoor testing to validate software models.
- Initiate procurement of test bed components.
- Conduct subsystem testing of components.

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603925N / *Directed Energy and Electric Weapon System*	**Project (Number/Name)** 9823 / *Lasers for Navy applicat*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
- Accomplish test planning for preparation/conduct of the LPM prototype. - Plan for integrated testing in FY 17. - Initiate Test & Evaluation Master Plan (TEMP). ***FY 2017 Base Plans:*** - Finalize TEMP. - Continue Low Power Module management, engineering, design, development, procurement and integration of test bed components. - Conduct final integration check out of the LPM. - Initiate land based test of the LPM system at the land based site. ***FY 2017 OCO Plans:*** N/A					
Accomplishments/Planned Programs Subtotals	8.455	9.464	8.924	0.000	8.924

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

The LPM is a primarily government developed system. Competition will be utilized for appropriate efforts. The acquisition strategy will transition the developed LPM capabilities along with ONR and PMS 405 funded efforts using BA-4 Technology Development, which will lead to Engineering & Manufacturing Development and production/fielding in the early 2020's.

E. Performance Metrics

Quarterly Reviews, Monthly Progress/Status Reports, Scheduled Design/Program Reviews.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603925N / *Directed Energy and Electric Weapon System*	Project (Number/Name) 9823 / *Lasers for Navy applicat*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Low Power Module	WR	NSWC DD : DAHLGREN, VA	0.636	2.066	Feb 2015	1.704	Feb 2016	1.500	Feb 2017	-		1.500	Continuing	Continuing	Continuing
Low Power Module	WR	SSC PAC : SAN DIEGO, CA	0.475	0.583	Feb 2015	0.500	Feb 2016	0.500	Feb 2017	-		0.500	Continuing	Continuing	Continuing
Low Power Module	WR	NSWC CRANE : CRANE, IN	0.380	0.600	Feb 2015	0.644	Feb 2016	0.450	Feb 2017	-		0.450	Continuing	Continuing	Continuing
Low Power Module	WR	NRL : WASHINGTON, D.C.	0.045	0.150	Feb 2015	0.150	Feb 2016	0.175	Feb 2017	-		0.175	Continuing	Continuing	Continuing
Low Power Module	C/CPFF	BOEING : SAN DIEGO, CA	1.349	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
MSM Testbed	WR	NSWC DD : DAHLGREN, VA	0.000	1.227	Feb 2015	1.000	Feb 2016	0.850	Feb 2017	-		0.850	Continuing	Continuing	Continuing
MSM Testbed	C/CPFF	PSU EOC : FREEPORT, PA	0.000	0.500	Mar 2015	0.500	Mar 2016	0.350	Mar 2017	-		0.350	Continuing	Continuing	Continuing
Platform Integration	WR	NSWC DD : DAHLGREN, VA	0.000	0.222	Feb 2015	0.297	Feb 2016	0.400	Feb 2017	-		0.400	Continuing	Continuing	Continuing
Platform Integration	WR	SSC PAC : SAN DIEGO, CA	0.000	0.000		0.150	Feb 2016	0.175	Feb 2017	-		0.175	Continuing	Continuing	Continuing
Platform Integration	WR	NSWC CRANE : CRANE, IN	0.000	0.000		0.000		0.150	Feb 2017	-		0.150	Continuing	Continuing	Continuing
Platform Integration	WR	NSWC CARDEROCK : BETHESDA, MD	0.000	0.240	Feb 2015	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
		Subtotal	2.885	5.588		4.945		4.550		-		4.550	-	-	-

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Systems/Mgmt Engineering	C/CPFF	SOSSEC : ATKINSON, NH	0.640	0.182	Mar 2015	1.100	Mar 2016	1.100	Mar 2017	-		1.100	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603925N / *Directed Energy and Electric Weapon System*	**Project (Number/Name)** 9823 / *Lasers for Navy applicat*

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Systems/Mgmt Engineering	WR	NSWC DD : DAHLGREN, VA	0.000	0.100	Jan 2015	0.150	Jan 2016	0.250	Jan 2017	-		0.250	Continuing	Continuing	Continuing
Systems/Mgmt Engineering	C/CPFF	PSU EOC : FREEPORT, PA	0.485	0.422	Mar 2015	0.350	Mar 2016	0.350	Mar 2017	-		0.350	Continuing	Continuing	Continuing
Modeling & Simulation	WR	NSWC DD : DAHLGREN, VA	0.000	0.249	Feb 2015	0.150	Mar 2016	0.150	Mar 2017	-		0.150	Continuing	Continuing	Continuing
		Subtotal	1.125	0.953		1.750		1.850		-		1.850	-	-	-

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Test Planning & Execution	C/CPFF	NSWC DAHGREN : DAHLGREN, VA	0.000	0.000		0.200	Mar 2016	0.250	Mar 2017	-		0.250	Continuing	Continuing	Continuing
Test Planning & Execution	WR	PHD NSWC : PORT HUENEME, CA	0.150	0.030	Feb 2015	0.500	Feb 2016	0.633	Feb 2017	-		0.633	Continuing	Continuing	Continuing
Test Planning & Execution	WR	NSWC DD : DAHLGREN, VA	0.000	0.250	Feb 2015	0.500	Feb 2016	0.633	Feb 2017	-		0.633	Continuing	Continuing	Continuing
Test Planning & Execution	WR	NSWC CRANE : CRANE, IN	0.000	0.214	Feb 2015	0.250	Feb 2016	0.262	Feb 2017	-		0.262	Continuing	Continuing	Continuing
		Subtotal	0.150	0.494		1.450		1.778		-		1.778	-	-	-

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Safety, Product Support, Security, Operations	WR	NSWC DD : DAHLGREN, VA	0.189	1.000	Feb 2015	0.819	Feb 2016	0.446	Feb 2017	-		0.446	Continuing	Continuing	Continuing
Safety, Product Support, Security, Operations	C/CPFF	NSWC DD : DAHGREN, VA	0.000	0.420	Mar 2015	0.500	Mar 2016	0.300	Mar 2017	-		0.300	Continuing	Continuing	Continuing
		Subtotal	0.189	1.420		1.319		0.746		-		0.746	-	-	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603925N / *Directed Energy and Electric Weapon System*	Project (Number/Name) 9823 / *Lasers for Navy applicat*	

	Prior Years	FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	4.349	8.455		9.464		8.924		-		8.924	-	-	-

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603925N / *Directed Energy and Electric Weapon System*	**Project (Number/Name)** 9823 / *Lasers for Navy applicat*

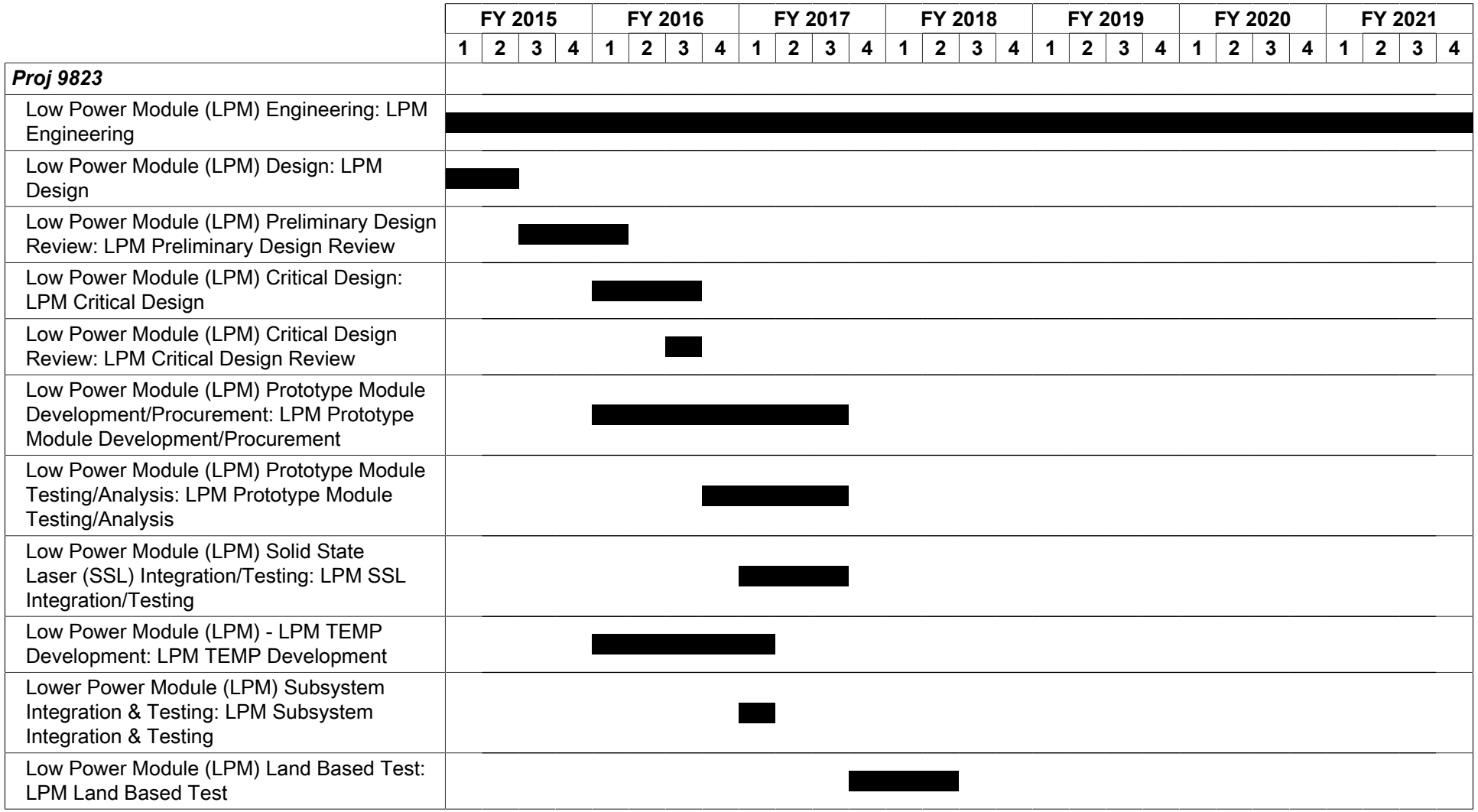

Exhibit R-4, RDT&E Schedule Profile: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603925N / *Directed Energy and Electric Weapon System*	**Project (Number/Name)** 9823 / *Lasers for Navy applicat*

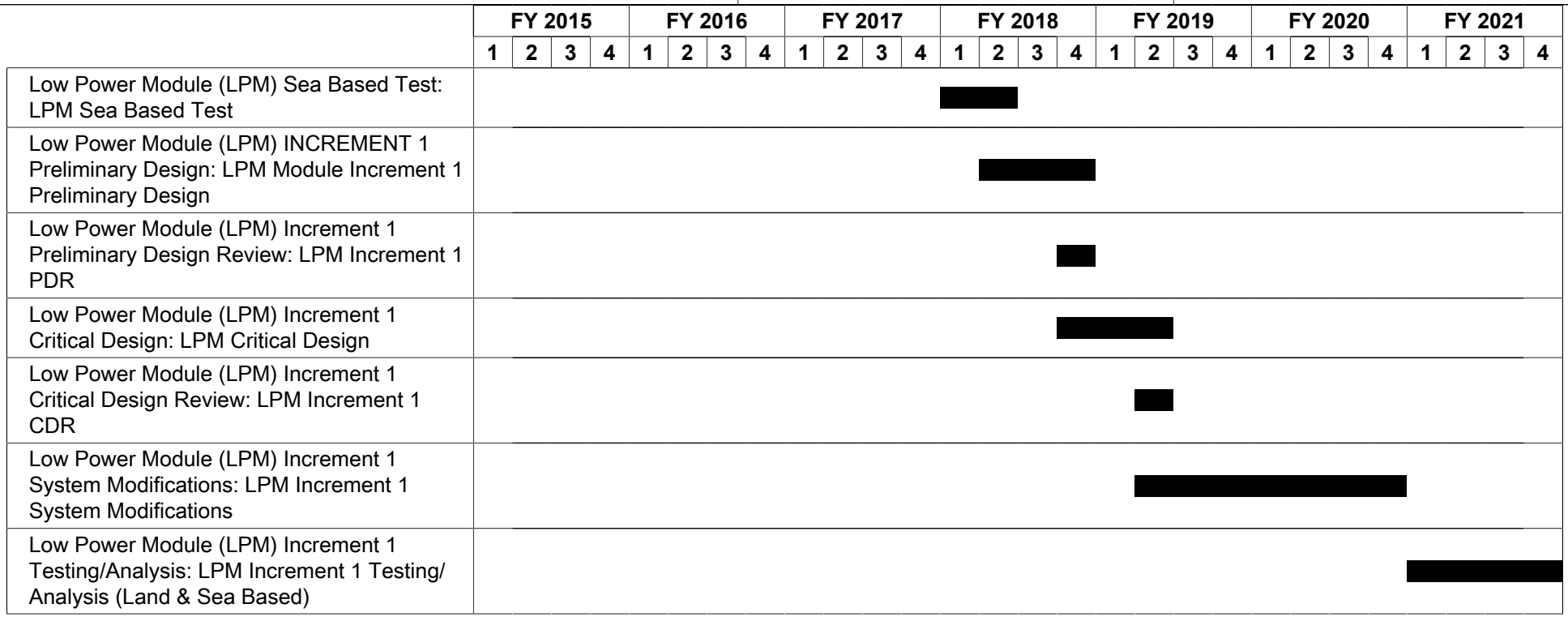

Exhibit R-4A, RDT&E Schedule Details: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603925N / *Directed Energy and Electric Weapon System*	**Project (Number/Name)** 9823 / *Lasers for Navy applicat*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 9823				
Low Power Module (LPM) Engineering: LPM Engineering	1	2015	4	2021
Low Power Module (LPM) Design: LPM Design	1	2015	2	2015
Low Power Module (LPM) Preliminary Design Review: LPM Preliminary Design Review	3	2015	1	2016
Low Power Module (LPM) Critical Design: LPM Critical Design	1	2016	3	2016
Low Power Module (LPM) Critical Design Review: LPM Critical Design Review	3	2016	3	2016
Low Power Module (LPM) Prototype Module Development/Procurement: LPM Prototype Module Development/Procurement	1	2016	3	2017
Low Power Module (LPM) Prototype Module Testing/Analysis: LPM Prototype Module Testing/Analysis	4	2016	3	2017
Low Power Module (LPM) Solid State Laser (SSL) Integration/Testing: LPM SSL Integration/Testing	1	2017	3	2017
Low Power Module (LPM) - LPM TEMP Development: LPM TEMP Development	1	2016	1	2017
Lower Power Module (LPM) Subsystem Integration & Testing: LPM Subsystem Integration & Testing	1	2017	1	2017
Low Power Module (LPM) Land Based Test: LPM Land Based Test	4	2017	2	2018
Low Power Module (LPM) Sea Based Test: LPM Sea Based Test	1	2018	2	2018
Low Power Module (LPM) INCREMENT 1 Preliminary Design: LPM Module Increment 1 Preliminary Design	2	2018	4	2018
Low Power Module (LPM) Increment 1 Preliminary Design Review: LPM Increment 1 PDR	4	2018	4	2018
Low Power Module (LPM) Increment 1 Critical Design: LPM Critical Design	4	2018	2	2019
Low Power Module (LPM) Increment 1 Critical Design Review: LPM Increment 1 CDR	2	2019	2	2019

Exhibit R-4A, RDT&E Schedule Details: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603925N / *Directed Energy and Electric Weapon System*	**Project (Number/Name)** 9823 / *Lasers for Navy applicat*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Low Power Module (LPM) Increment 1 System Modifications: LPM Increment 1 System Modifications	2	2019	4	2020
Low Power Module (LPM) Increment 1 Testing/Analysis: LPM Increment 1 Testing/ Analysis (Land & Sea Based)	1	2021	4	2021

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Exhibit R-2, RDT&E Budget Item Justification: PB 2017 Navy	Date: February 2016
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 0604112N *I (U)Gerald R Ford Cl Nuc Aircraft Carrier CVN 78-80*

COST ($ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
Total Program Element	0.000	46.308	98.105	70.528	-	70.528	96.339	83.499	43.653	26.693	Continuing	Continuing
2208: *CVN 21*	0.000	34.992	35.613	32.843	-	32.843	70.383	67.415	43.653	26.693	Continuing	Continuing
4004: *EMALS*	0.000	11.316	12.492	37.685	-	37.685	25.956	16.084	0.000	0.000	0.000	103.533
9999: *Congressional Adds*	0.000	0.000	50.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	50.000

Program MDAP/MAIS Code:
Project MDAP/MAIS Code(s): 223

A. Mission Description and Budget Item Justification

This Navy program addresses unique technologies on Ford class carriers. The program includes:

- (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.

- (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.

- (C275) - Planning for the Full Ship Shock Trial for the USS Gerald Ford (CVN 78) in accordance with the Acquisition
Decision Memorandum (ADM) dated 7 August 2015.

This Program Element (PE) and associated projects represent a continuation of efforts previously funded under PE 0603512N projects 2208 and 4004 in FY 2014 and earlier.

Exhibit R-2, RDT&E Budget Item Justification: PB 2017 Navy	Date: February 2016
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 0604112N *I (U)Gerald R Ford Cl Nuc Aircraft Carrier CVN 78-80*

B. Program Change Summary ($ in Millions)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Previous President's Budget	43.613	48.105	45.386	-	45.386
Current President's Budget	46.308	98.105	70.528	-	70.528
Total Adjustments	2.695	50.000	25.142	-	25.142
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	50.000			
• Congressional Directed Transfers	-	-			
• Reprogrammings	3.384	0.000			
• SBIR/STTR Transfer	-0.689	0.000			
• Program Adjustments	0.000	0.000	27.000	-	27.000
• Rate/Misc Adjustments	0.000	0.000	-1.858	-	-1.858

Congressional Add Details ($ in Millions, and Includes General Reductions)	FY 2015	FY 2016
Project: 9999: *Congressional Adds*		
Congressional Add: *CVN-78 Shock Trials*	0.000	50.000
Congressional Add Subtotals for Project: 9999	0.000	50.000
Congressional Add Totals for all Projects	0.000	50.000

Change Summary Explanation

PRJ 4004 (EMALS) Cost/Funding
FY 15: Added funding for EMALS land based testing efforts.
FY 17: Added funding to EMALS to support Integrated Test & Evaluation (IT&E) and training development efforts.

PRJ C275 Cost/Funding: Congress added funding in FY 16 to support CVN 78 full ship shock trials testing.

Schedule:
Updated schedule to include EMALS IT&E and adjust for miscellaneous acquisition decisions and the revised test schedule.

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0604112N / *(U)Gerald R Ford Cl Nuc Aircraft Carrier CVN 78-80*	Project (Number/Name) 2208 / *CVN 21*	

COST ($ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
2208: *CVN 21*	0.000	34.992	35.613	32.843	-	32.843	70.383	67.415	43.653	26.693	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

Project MDAP/MAIS Code: 223

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, test and evaluation, manpower and program related studies, and design support systems, such as the Integrated Digital Environment (IDE).

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Title: CVN 78 Class Advanced Technology Design & Development	26.981	10.141	7.455	0.000	7.455
Articles:	-	-	-	-	-
Description: CVN 78 Class Advanced Technology Design & Development - Continue development and transition of technologies to support CVN 78 Class 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. Complete shock qualification for components of all CVN 78 systems.					
FY 2015 Accomplishments: Continued design, development and transition of key technologies to support CVN 21 (CVN 78 Class) KPPs which included sortie generation rate, reductions in manpower, and further recovery of weight and stability service life margins. Continued design activities to integrate new technologies, such as the new propulsion plant and EMALS into the ship. Continued existing studies and commenced new studies required for integrated					

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0604112N / *(U)Gerald R Ford Cl Nuc Aircraft Carrier CVN 78-80*	**Project (Number/Name)** 2208 / *CVN 21*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
warfare system and C4I design, integration, test, and validation efforts. Continued to review Pre-Planned Product Improvement (P3I) technical data packages. Continued CVN 78 class engineering and technical support of aircraft launch and recovery systems. Continued shipbuilder system and cost engineering support to assess ship impacts from selected Engineering Change Requests (ECRs) and changes to the GFE / CFE equipment split. Assessed ship impacts and implemented changes to the Class design. ***FY 2016 Plans:*** Continue transition of key technologies to support CVN 21 (CVN 78 Class) KPPs. Continue design activities to integrate new technologies into the ship. Continue to assess ship impacts and implement changes to the Class design. Continue existing studies and commence new studies required for integrated warfare system and C4I design, integration, test, and validation efforts. Continue review of P3I technical data packages. Continue CVN 78 class engineering and technical support of aircraft launch and recovery systems. Continue shipbuilder system and cost engineering support to assess ship impacts from selected ECRs and changes to the GFE / CFE equipment split. Plan and execute the acceptance and transition of CVN 78 CFE systems to Navy In-Service and Life Cycle Management. Identify and implement cost reduction measures for the CVN 78 Class. ***FY 2017 Base Plans:*** Complete design activities to integrate new technologies into the ship. Complete existing studies required for integrated warfare system and C4I design, integration, test, and validation efforts. Continue CVN 78 class engineering and technical support of aircraft launch and recovery systems, along with providing support to resolve issues identified during shakedown and Post-Shakedown Availability (PSA) on CVN 78 developmental systems. Conduct cyber-security tasks to include elimination of all Windows XP operating system usage to reduce cyber-security vulnerabilities and the completion of Information Technology system Interim Authority to Operate (IATO) remedial actions in order to achieve full Authority to Operate (ATO) certification and accreditation. ***FY 2017 OCO Plans:*** N/A					
Title: CVN 21 - Test & Evaluation (T&E)	8.011	25.472	25.388	0.000	25.388
Articles:	-	-	-	-	-
FY 2015 Accomplishments: Continued to conduct Post Delivery Test and Trials (PDT&T) workshops and to update / refine / maintain the notional PDT&T schedule. Continued the Developmental Test Working Group (DTWG) efforts to collect / analyze DT metrics. Continued the CVN 78 Integrated Test Team (CITT) efforts to coordinate Integrated Testing					

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0604112N / *(U)Gerald R Ford Cl Nuc Aircraft Carrier CVN 78-80*	**Project (Number/Name)** 2208 / *CVN 21*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
(IT) to achieve synergies among DT&E, OT&E, and LFT&E as applicable to optimize CVN 78 test-related costs, schedules and requirements validation; and to maximize the practical use of test results by all participating test communities. Completed DT/IT-3 and commenced DT/IT-4, which included: (1) conducting Combat System Land-based Test events; Dual Band Radar and TPX-42 land-based and shipboard testing; Advanced Weapons Elevator (AWE) Hazards of Electromagnetic Radiation to Ordnance (HERO) / Hazard of Electromagnetic Radiation to Personnel (HERP) / Electromagnetic Interference (EMI); Electromagnetic Aircraft Launch System (EMALS) dead-load testing; Cyber-security Accreditation activities, as well as industrial testing and certifications in support of Crew Move Aboard; and (2) continuing spiral development of the VCVN Model. Commenced Operational Assessment Phase B4 (OT-B4). Obtained Platform (Afloat Site) Interim Authority to Test (IATT). ***FY 2016 Plans:*** Update the Test and Evaluation Master Plan (TEMP) 1610, Revision C. Continue holding the tri-annual PDT&T workshops and updating / maintaining the notional PDT&T schedule. Continue the DTWG efforts, focusing on the collection / analysis of the DT metrics. Continue CITT efforts to coordinate IT to achieve synergies among DT&E, OT&E, and LFT&E. Continue DT/IT-4. Complete OT-B4. ***FY 2017 Base Plans:*** Complete PSA and achieve Initial Operational Capability (IOC). Continue PDT&T, DTWG and CITT efforts in support of DT/IT-4 completion and post-PSA DT/IT-5 integration testing and preparations of Initial Operational Test and Evaluation (IOT&E). DT/IT-5 events include: (1) obtaining post-PSA Platform (Afloat Site) IATO / ATO and post-PSA flight deck certification; (2) conducting Combat Systems Shipboard Developmental Testing (CS SBDT); Radar Cross Section and Infrared measurements; degaussing and de-perming; cyber-security inspections; and aircraft compatibility testing; and (3) continuing spiral development of the VCVN Model and data collection in support of model validation. ***FY 2017 OCO Plans:*** N/A					
Accomplishments/Planned Programs Subtotals	34.992	35.613	32.843	0.000	32.843

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
• RDTEN / 0604567N: *Project Units 3108, 3179, 4007*	21.890	18.595	50.920	-	50.920	53.660	50.678	46.807	45.486	Continuing	Continuing

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0604112N / *(U)Gerald R Ford Cl Nuc Aircraft Carrier CVN 78-80*	**Project (Number/Name)** 2208 / *CVN 21*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
• SCN / 2001: *Carrier Replacement Program*	1,219.425	2,431.929	2,662.567	-	2,662.567	4,361.180	1,650.189	1,734.546	3,095.202	Continuing	Continuing
• SCN / 5300: *Completion of Prior Year Shipbuilding Programs*	663.000	123.760	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	1,374.860
• RDTEN / 0603570N: *Propulsion Plant Development (PU 2692)*	60.459	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	1,526.813
• OMN / 1B2B: *CVN 78 Ford Class Training (12BJ0)*	4.788	38.389	14.111	-	14.111	4.844	3.844	3.918	4.001	Continuing	Continuing
• OPN /5664: *Surface Training Equipment*	0.000	0.000	4.733	-	4.733	4.010	0.000	0.000	0.000	0.000	8.743

Remarks

D. Acquisition Strategy

The CVN 78 is the first ship of the CVN 78 Class of aircraft carriers designed to replace USS ENTERPRISE and the ships of the NIMITZ Class. The CVN 78 will feature a new nuclear propulsion and electrical generation/distribution system, EMALS, advanced arresting gear (AAG) system, all electric auxiliaries, warfare system improvements, survivability
enhancements, improved weapons handling, and improved aircraft servicing. These design features will result in lower manpower and total ownership costs as compared to the NIMITZ Class. Additionally, the following war fighting benefits will be realized: increased sortie generation rate, improved ship self-defense capability, increased launch and recovery
capability/flexibility, increased operational availability, and increased flexibility to support future upgrades.

E. Performance Metrics

Successfully complete development of TEMP 1610, Rev C and route for signature. Successfully complete all PEO C4I TIF testing. Successfully execute SGRA 12 and SGRA 13. Gain acceptance of the FSST Alternative Process as a technically-feasible and cost-effective alternative to the traditional FSST. Successfully complete the NAVAIR PIF testing and
the Consolidated Afloat Networks and Enterprise Services (CANES) testing. 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. Successfully conduct IDC shock testing and reporting in order to finalize IDC R&D efforts. Successfully complete Advanced Weapons Elevator Shock and Electromagnetic Interference (EMI) Test qualifications. Successfully complete Plasma Arc Waste Destruction System (PAWDS) Land-Based Test. Successfully create and deliver 21 Decision
Memorandums (DM) for Bents/Bays 1-21.on the 03 Level (Gallery Deck) with Layer 31 information. 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 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0604112N / *(U)Gerald R Ford Cl Nuc Aircraft Carrier CVN 78-80*	**Project (Number/Name)** 2208 / *CVN 21*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Advanced Design & Development	C/CPAF	HII : VA	0.000	3.446	Nov 2014	3.028	Nov 2015	1.821	Nov 2016	-		1.821	Continuing	Continuing	Continuing
Advanced Design & Development	WR	NSWC CARDEROCK : MD	0.000	1.813	Oct 2014	1.400	Nov 2015	1.109	Oct 2016	-		1.109	Continuing	Continuing	Continuing
Advanced Design & Development	WR	NAWCAD PATUXENT RIVER : MD	0.000	2.002	Oct 2014	1.500	Nov 2015	1.188	Oct 2016	-		1.188	Continuing	Continuing	Continuing
Advanced Design & Development	WR	NSWC DAHLGREN : VA	0.000	2.563	Oct 2014	0.650	Nov 2015	0.515	Nov 2016	-		0.515	Continuing	Continuing	Continuing
Advanced Design & Development	C/CPAF	RAYTHEON : VA	0.000	2.753	Dec 2014	1.500	Dec 2015	1.188	Dec 2016	-		1.188	Continuing	Continuing	Continuing
Advanced Design & Development	C/CPFF	NAVSEA SEAPORT : DC	0.000	5.240	Dec 2014	1.750	Dec 2015	1.386	Dec 2016	-		1.386	Continuing	Continuing	Continuing
Advanced Design & Development	Various	MISCELLANEOUS : VARIOUS	0.000	1.236	Nov 2014	0.313	Nov 2015	0.248	Nov 2016	-		0.248	Continuing	Continuing	Continuing
Advanced Design & Development	WR	NAVSSES PHILADELPHIA : PA	0.000	6.527	Nov 2014	0.000		0.000		-		0.000	0.000	6.527	-
Advanced Design & Development	WR	SPAWAR : CA	0.000	0.661	Nov 2014	0.000		0.000		-		0.000	0.000	0.661	-
Advanced Design & Development	WR	NSWC CORONA : CA	0.000	0.740	Nov 2014	0.000		0.000		-		0.000	0.000	0.740	-
		Subtotal	0.000	26.981		10.141		7.455		-		7.455	-	-	-

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Development Test & Evaluation	C/CPAF	HII : VA	0.000	2.197	Nov 2014	2.797	Nov 2015	0.842	Nov 2016	-		0.842	Continuing	Continuing	Continuing
Development Test & Evaluation	WR	NAWCAD PATUXENT RIVER : MD	0.000	1.070	Nov 2014	3.819	Nov 2015	3.878	Oct 2016	-		3.878	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0604112N / *(U)Gerald R Ford Cl Nuc Aircraft Carrier CVN 78-80*	**Project (Number/Name)** 2208 / *CVN 21*

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Development Test & Evaluation	WR	NSWC DAHLGREN : VA	0.000	2.340	Oct 2014	3.467	Nov 2015	3.911	Oct 2016	-		3.911	Continuing	Continuing	Continuing
Development Test & Evaluation	WR	NSWC CARDEROCK : MD	0.000	0.000		0.749	Nov 2015	0.597	Oct 2016	-		0.597	Continuing	Continuing	Continuing
Development Test & Evaluation	WR	SPAWAR : CA	0.000	0.000		0.874	Nov 2015	0.696	Nov 2016	-		0.696	Continuing	Continuing	Continuing
Development Test & Evaluation	C/CPAF	RAYTHEON : VA	0.000	0.525	Jan 2015	3.096	Dec 2015	1.716	Dec 2016	-		1.716	Continuing	Continuing	Continuing
Development Test & Evaluation	WR	SSC ATLANTIC : SC	0.000	0.025	Dec 2014	0.229	Nov 2015	0.832	Nov 2016	-		0.832	Continuing	Continuing	Continuing
Development Test & Evaluation	Various	MISCELLANEOUS : VARIOUS	0.000	0.145	Jan 2015	5.641	Dec 2015	0.346	Dec 2016	-		0.346	Continuing	Continuing	Continuing
Development Test & Evaluation	C/CPFF	NAVSEA SEAPORT : DC	0.000	0.255	Dec 2015	0.433	Dec 2015	0.000		-		0.000	0.000	0.688	-
Development Test & Evaluation	C/BA	NSWC PORT HUENEME : CA	0.000	0.000		0.000		0.590	Dec 2016	-		0.590	Continuing	Continuing	Continuing
Development Test & Evaluation	C/BA	NSWC CORONA : CA	0.000	0.000		0.000		1.436	Dec 2016	-		1.436	Continuing	Continuing	Continuing
Operational Test & Evaluation	WR	COMOPTEVFOR : VA	0.000	1.454	Nov 2014	4.367	Dec 2015	10.544	Dec 2016	-		10.544	Continuing	Continuing	Continuing
		Subtotal	0.000	8.011		25.472		25.388		-		25.388	-	-	-

	Prior Years	FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	34.992		35.613		32.843		-		32.843	-	-	-

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2017 Navy		**Date:** February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0604112N / *(U)Gerald R Ford Cl Nuc Aircraft Carrier CVN 78-80*	**Project (Number/Name)** 2208 / *CVN 21*

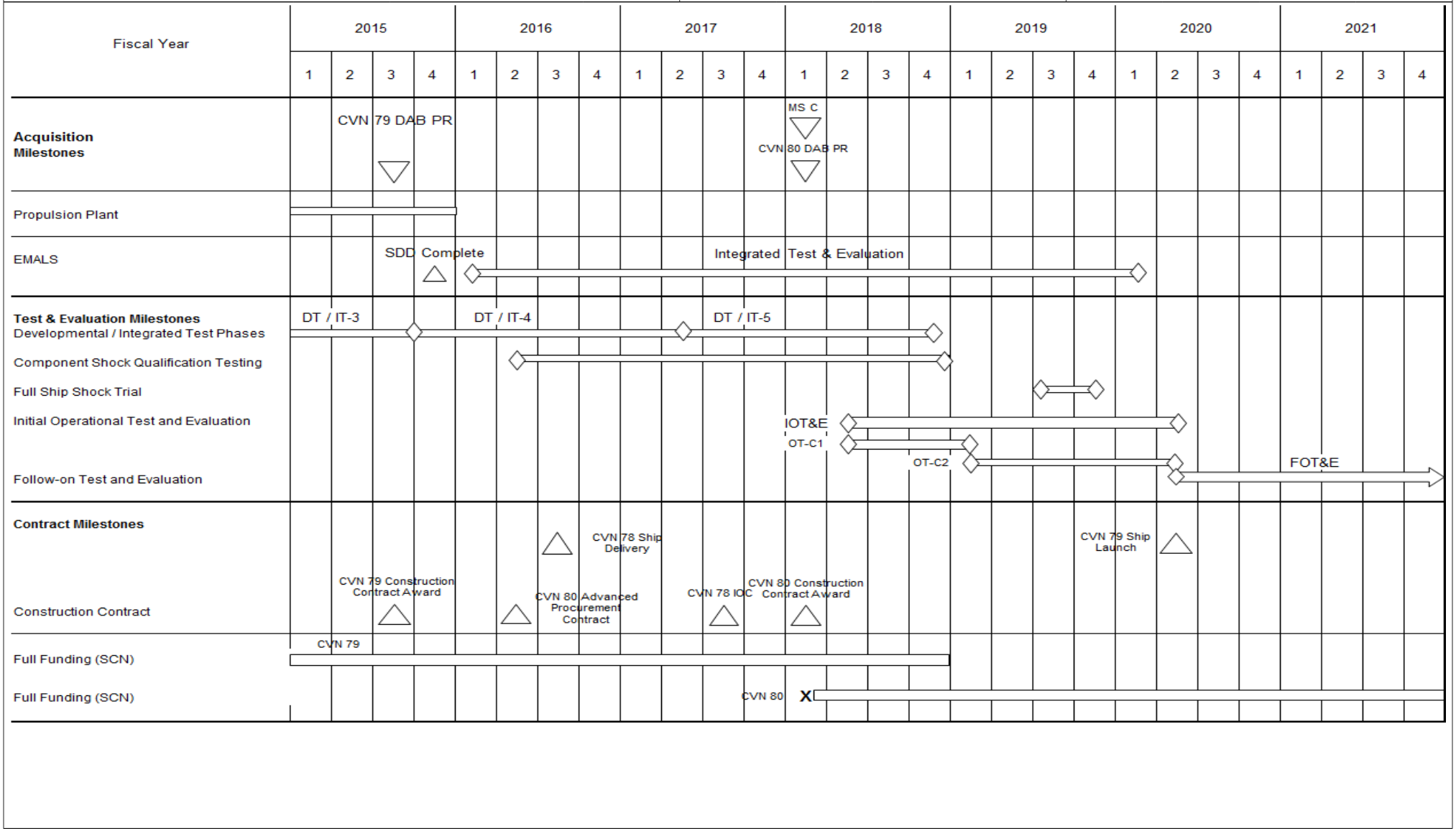


Exhibit R-4A, RDT&E Schedule Details: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0604112N / *(U)Gerald R Ford Cl Nuc Aircraft Carrier CVN 78-80*	**Project (Number/Name)** 2208 / *CVN 21*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 2208				
CVN 79 DAB PR	3	2015	3	2015
CVN 80 DAB PR	1	2018	1	2018
Milestone C	1	2018	1	2018
Propulsion Plant	1	2015	4	2015
EMALS SDD Complete	4	2015	4	2015
EMALS Integrated Test & Evaluation (IT&E)	1	2016	1	2020
DT/IT -3- Developmental Test / Integrated Test Phase 3	1	2015	3	2015
DT/IT -4- Developmental Test / Integrated Test Phase 4	4	2015	2	2017
DT/IT -5- Developmental Test / Integrated Test Phase 5	2	2017	4	2018
Component Shock Qualification Testing	2	2016	4	2018
Full Ship Shock Trial	3	2019	4	2019
Initial Operational Test & Evaluation	2	2018	2	2020
OT -C1 - Initial Operational Test & Evaluation - Phase C1	2	2018	1	2019
OT -C2 - Initial Operational Test & Evaluation - Phase C2	1	2019	2	2020
FOT&E - Follow-On Test & Evaluation	2	2020	4	2021
CVN 78 Ship Delivery	3	2016	3	2016
CVN 78 Initial Operational Capability (IOC)	3	2017	3	2017
CVN 79 Construction Contract Award	3	2015	3	2015
CVN 80 Advanced Procurement Contract Award	2	2016	2	2016
CVN 80 Construction Contract Award	1	2018	1	2018
CVN 79 SCN Full Funding	1	2015	4	2018

Exhibit R-4A, RDT&E Schedule Details: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0604112N / *(U)Gerald R Ford Cl Nuc Aircraft Carrier CVN 78-80*	**Project (Number/Name)** 2208 / *CVN 21*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
CVN 79 Ship Launch	2	2020	2	2020
CVN 80 SCN Full Funding	1	2018	4	2021

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0604112N / *(U)Gerald R Ford Cl Nuc Aircraft Carrier CVN 78-80*	Project (Number/Name) 4004 / *EMALS*	

COST ($ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
4004: *EMALS*	0.000	11.316	12.492	37.685	-	37.685	25.956	16.084	0.000	0.000	0.000	103.533
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

Project MDAP/MAIS Code: 223

A. Mission Description and Budget Item Justification

The increase from FY 16 to FY 17 is due to the Department adding funding for EMALS integrated test and evaluation and to develop and provide interim training for personnel.

This project provides for the development of an advanced technology aircraft launch system in support of the CVN 78 design and construction schedule, as well as Engineering and Life Cycle System (E&LCS) design. The Electromagnetic Aircraft Launch System (EMALS) will be the aircraft catapult for 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.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Title: EMALS	11.316	12.492	37.685	0.000	37.685
Articles:	-	-	-	-	-
Description: EMALS					
FY 2015 Accomplishments: (1) EMALS System Development and Demonstration (SDD) - Continued land-based testing at the System Functional Demonstration (SFD) site. Completed engineering / test support in preparation for F/A-18 aircraft testing, planned component Environmental Qualification Testing (EQT) and contract closeout actions required for transition to the Integrated Test & Evaluation (IT&E) phase. Maintained shore-based test capability to prevent iterative fixes from delaying shipboard operations, verification of logistics products and to conduct interim CVN 78 Pre-Commissioning Unit (PCU) training. (2) EMALS Basic Ordering Agreement (BOA) ILS Order - Continued the execution of the EMALS ILS Development Program. Conducted annual logistics reviews, training in-process review (IPR) and Organizational and Intermediate (O&I) level Technical Manual (TM) IPRs. Based on the development and availability of engineering source data for each of the six (6) EMALS subsystems and allocated resources, updated Failure Mode Effectiveness and Criticality Analyses (FMECAs), the Logistics Management Information (LMI) database,					

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0604112N / *(U)Gerald R Ford Cl Nuc Aircraft Carrier CVN 78-80*	**Project (Number/Name)** 4004 / *EMALS*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Calibration/Measurements Requirements Summary / Instrument Calibration Procedures (CMRS / ICPs), Interactive Electronic Technical Manuals (IETMs), manpower analyses, O&I maintenance plans, provisioning documentation, Post Production Support Planning / Diminishing Manufacturing Sources & Material Shortages (PPSP / DMSMS) screening and analyses, and supported equipment identification and technical data. Continued development of training documents and the Navy Formal Training Course in accordance with NAWCTSD simulation solution. Conducted PCU and Maintenance Demonstration (M-Demo) training at the SFD facility. Completed the Shipboard Facility Requirements Document (FRD) and the Training FRD. Completed all phases of the Reliability Centered Maintenance (RCM) philosophy. ***FY 2016 Plans:*** (1) EMALS BOA ILS Order - Continue the execution of the EMALS ILS Development Program. Conduct annual logistics reviews, training IPR and O & I level Interactive Electronic Technical Manual (IETM) final system level IPR. Deliver the final EMALS O & I level IETM. Procure and deliver remaining quantity of Portable Electronic Maintenance Aids (PEMAs) to the CVN 78 for IETM use. Complete the Reliability Centered Maintenance (RCM) process and the development of Maintenance Requirement Cards (MRCs) and Quality Assurance (QA) cards. (2) EMALS BOA Integrated Test & Evaluation (IT&E) Order - Maintain EMALS shore-based test site to support engineering investigations, software integration, deficiency resolution, component obsolescence, and cyber security vulnerability. Conduct EMALS land-based testing using deadloads and aircraft for the correction of deficiencies, critical reliability growth to achieve fleet operational requirements and to maintain test unit cycles above shipboard cycles. Conduct Environmental Qualification Testing (EQT) for Launch Control Subsystem (LCS) components deferred from SDD. ***FY 2017 Base Plans:*** Conduct EMALS Integrated Test & Evaluation (IT&E) land-based testing using deadloads and aircraft for the correction of deficiencies, critical reliability growth to achieve fleet operational requirements and to maintain test unit cycles above shipboard cycles. Conduct Environmental Qualification Testing (EQT) for Launch Control Subsystem (LCS) components deferred from System Development & Demonstration (SDD) and shock testing. Maintain EMALS shore-based test site to support: engineering investigations, software integration, deficiency					

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0604112N / *(U)Gerald R Ford Cl Nuc Aircraft Carrier CVN 78-80*	**Project (Number/Name)** 4004 / *EMALS*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
resolution, component obsolescence regression test, and cyber security assessment/mitigation. Continue developing formal curriculum for fleet operations and maintenance training and schoolhouse training systems for future Ford class carrier crews. Provide interim training for crews until formal curriculum is completed and approved. ***FY 2017 OCO Plans:*** N/A					
Accomplishments/Planned Programs Subtotals	11.316	12.492	37.685	0.000	37.685

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
• RDTEN / 0604567N: *Project Units 3108, 3179, 4007*	21.890	18.595	50.920	-	50.920	53.660	50.678	46.807	45.486	Continuing	Continuing
• RDTEN / 0603570N: *Propulsion Plant Development (PU 2692)*	60.459	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	1,526.813
• SCN / 2001: *Carrier Replacement Program*	1,219.425	2,431.929	2,662.567	-	2,662.567	4,361.180	1,650.189	1,734.546	3,095.202	Continuing	Continuing
• SCN / 5300: *Completion of Prior Year Shipbuilding Programs*	663.000	123.760	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	1,374.860
• OMN / 1B2B: *CVN 78 Ford Class Training (12BJ0)*	4.788	38.389	14.111	-	14.111	4.844	3.844	3.918	4.001	Continuing	Continuing
• OPN / 0204112N: *BLI 0981 / LT324 CVN 78 Installation & Training Equipment*	0.000	0.000	4.733	-	4.733	4.010	0.000	0.000	0.000	0.000	8.743

Remarks

D. Acquisition Strategy

The CVN 78 is the first ship of the CVN 78 Class of aircraft carriers designed to replace USS ENTERPRISE and the ships of the NIMITZ Class. The CVN 78 will feature a new nuclear propulsion and electrical generation/distribution system, new electromagnetic aircraft launching system (EMALS), advanced arresting gear (AAG) system, all electric auxiliaries, warfare system improvements, survivability enhancements, improved weapons handling, and improved aircraft servicing. These design features will result in lower manpower and total ownership costs as compared to the NIMITZ Class. Additionally, the following war fighting benefits will be realized: increased

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0604112N / *(U)Gerald R Ford Cl Nuc Aircraft Carrier CVN 78-80*	**Project (Number/Name)** 4004 / *EMALS*

sortie generation rate, improved ship self-defense capability, increased launch and recovery capability/flexibility, increased operational availability, and increased flexibility to support future upgrades.

E. Performance Metrics

Successfully complete System Functional Demonstration (SFD) testing. Successfully complete Environmental Qualification Testing (EQT). Successfully complete Shipset Controls Lab testing. Successfully complete Integrated Test and Evaluation (IT&E) including Environmental Qualification Testing (EQT), correction of deficiencies, reliability growth and shock testing.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0604112N / *(U)Gerald R Ford Cl Nuc Aircraft Carrier CVN 78-80*	Project (Number/Name) 4004 / *EMALS*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Aircraft Launch, Recovery & Support	C/CPAF	General Atomics (SDD) : CA	0.000	1.500	Jun 2015	0.000		0.000		-		0.000	0.000	1.500	-
Aircraft Launch, Recovery & Support	C/CPFF	General Atomics (ILS BOA) : CA	0.000	6.472	Oct 2014	2.492	Nov 2015	0.000		-		0.000	0.000	8.964	-
Aircraft Launch, Recovery & Support	C/CPFF	General Atomics (IT&E BOA) : CA	0.000	0.000		5.703	Nov 2015	0.000		-		0.000	0.000	5.703	-
Primary HW Development	WR	NAWCAD Lakehurst : NJ	0.000	0.000		0.000		23.568	Nov 2016	-		23.568	30.515	54.083	-
Training Development	WR	NAWCTSD Orlando : FL	0.000	0.000		0.000		9.200	Nov 2016	-		9.200	7.500	16.700	-
		Subtotal	0.000	7.972		8.195		32.768		-		32.768	38.015	86.950	-

Remarks

New Cost Categories added in FY17 to support Electromagnetic Aircraft Launching System (EMALS) Integrated Test & Evaluation and Training Development efforts.

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Aircraft Launch, Recovery & Support	WR	NAWC Lakehurst : NJ	0.000	3.344	Feb 2015	4.297	Nov 2015	0.000		-		0.000	0.000	7.641	-
Integrated Test & Evaluation	WR	NAWC Lakehurst : NJ	0.000	0.000		0.000		4.917	Nov 2016	-		4.917	4.025	8.942	-
		Subtotal	0.000	3.344		4.297		4.917		-		4.917	4.025	16.583	-

Remarks

New Cost Categories added in FY17 to support Electromagnetic Aircraft Launching System (EMALS) Integrated Test & Evaluation.

	Prior Years	FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	11.316		12.492		37.685		-		37.685	42.040	103.533	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0604112N / *(U)Gerald R Ford Cl Nuc Aircraft Carrier CVN 78-80*	Project (Number/Name) 4004 / *EMALS*	

	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	Cost To Complete	Total Cost	Target Value of Contract

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2017 Navy		**Date:** February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0604112N / *(U)Gerald R Ford Cl Nuc Aircraft Carrier CVN 78-80*	**Project (Number/Name)** 4004 / *EMALS*

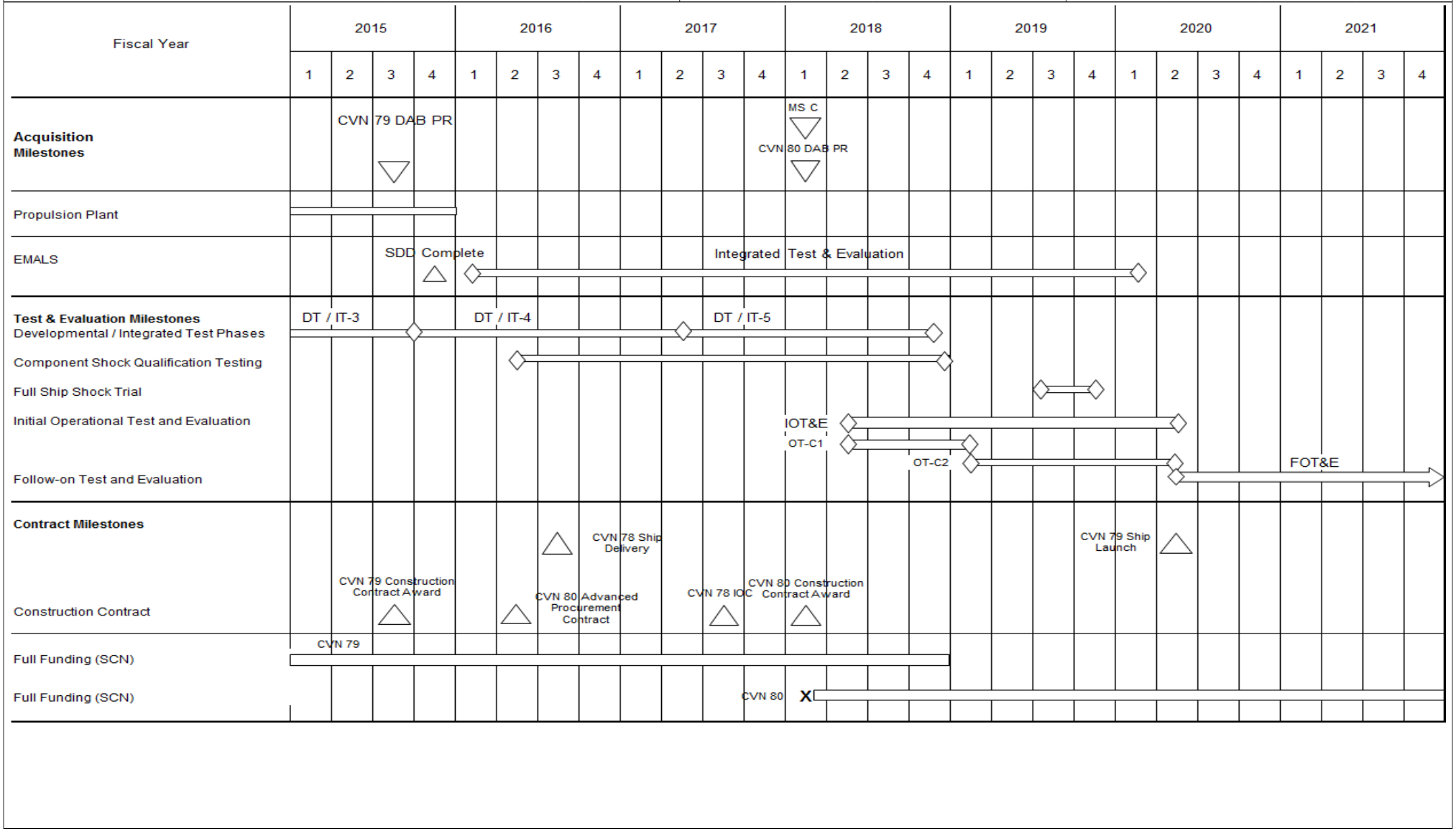


Exhibit R-4A, RDT&E Schedule Details: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0604112N / *(U)Gerald R Ford Cl Nuc Aircraft Carrier CVN 78-80*	**Project (Number/Name)** 4004 / *EMALS*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 4004				
CVN 79 DAB PR	3	2015	3	2015
CVN 80 DAB PR	1	2018	1	2018
Milestone C	1	2018	1	2018
Propulsion Plant	1	2015	4	2015
EMALS SDD Complete	4	2015	4	2015
EMALS Integrated Test & Evaluation (IT&E)	1	2016	1	2020
DT/IT -3- Developmental Test / Integrated Test Phase 3	1	2015	3	2015
DT/IT -4- Developmental Test / Integrated Test Phase 4	4	2015	2	2017
DT/IT -5- Developmental Test / Integrated Test Phase 5	2	2017	4	2018
Component Shock Qualification Testing	2	2016	4	2018
Full Ship Shock Trial	3	2019	4	2019
Initial Operational Test & Evaluation	2	2018	2	2020
OT -C1 - Initial Operational Test & Evaluation - Phase C1	2	2018	1	2019
OT -C2 - Initial Operational Test & Evaluation - Phase C2	1	2019	2	2020
FOT&E - Follow-On Test & Evaluation	2	2020	4	2021
CVN 78 Ship Delivery	3	2016	3	2016
CVN 78 Initial Operational Capability (IOC)	3	2017	3	2017
CVN 79 Construction Contract Award	3	2015	3	2015
CVN 80 Advanced Procurement Contract Award	2	2016	2	2016
CVN 80 Construction Contract Award	1	2018	1	2018
CVN 79 SCN Full Funding	1	2015	4	2018

Exhibit R-4A, RDT&E Schedule Details: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0604112N / *(U)Gerald R Ford Cl Nuc Aircraft Carrier CVN 78-80*	**Project (Number/Name)** 4004 / *EMALS*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
CVN 79 Ship Launch	2	2020	2	2020
CVN 80 SCN Full Funding	1	2018	4	2021

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0604112N / *(U)Gerald R Ford Cl Nuc Aircraft Carrier CVN 78-80*	Project (Number/Name) 9999 / *Congressional Adds*	

COST ($ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
9999: *Congressional Adds*	0.000	0.000	50.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	50.000
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

Project MDAP/MAIS Code: 223

A. Mission Description and Budget Item Justification

This project provides for planning for the Full Ship Shock Trial for the USS Gerald Ford (CVN 78).

B. Accomplishments/Planned Programs ($ in Millions)	FY 2015	FY 2016
Congressional Add: CVN-78 Shock Trials	0.000	50.000
FY 2015 Accomplishments: N/A		
FY 2016 Plans: Begin planning for CVN 78 Class Shock Trial on CVN 78 in accordance with the Acquisition Decision Memorandum (ADM) dated 7 August 2015.		
Congressional Adds Subtotals	0.000	50.000

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
• RDTEN / 0604567N: *Project Units 3108, 3179, 4007*	21.890	18.595	50.920	-	50.920	53.660	50.678	46.807	45.486	Continuing	Continuing
• SCN / 2001: *Carrier Replacement Program*	1,219.425	2,431.929	2,662.567	-	2,662.567	4,361.180	1,650.189	1,734.546	3,095.202	Continuing	Continuing
• SCN / 5300: *Completion of Prior Year Shipbuilding Programs*	663.000	123.760	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	1,374.860
• RDTEN / 0603570N: *Propulsion Plant Development (PU 2692)*	60.459	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	1,526.813
• OMN / 1B2B: *CVN 78 Ford Class Training (12BJ0)*	4.788	38.389	14.111	-	14.111	4.844	3.844	3.918	4.001	Continuing	Continuing
• OPN /5664: *Surface Training Equipment*	0.000	0.000	4.733	-	4.733	4.010	0.000	0.000	0.000	0.000	8.743

Remarks

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0604112N / *(U)Gerald R Ford Cl Nuc Aircraft Carrier CVN 78-80*	**Project (Number/Name)** 9999 / *Congressional Adds*

D. Acquisition Strategy

The CVN 78 is the first ship of the CVN 78 Class of aircraft carriers designed to replace USS ENTERPRISE and the ships of the NIMITZ Class. The CVN 78 will feature a new nuclear propulsion and electrical generation/distribution system, new electromagnetic aircraft launching system (EMALS), advanced arresting gear (AAG) system, all electric auxiliaries, warfare system improvements, survivability enhancements, improved weapons handling, and improved aircraft servicing. These design features will result in lower manpower and total ownership costs as compared to the NIMITZ Class. Additionally, the following war fighting benefits will be realized: increased sortie generation rate, improved ship self-defense capability, increased launch and recovery capability/flexibility, increased operational availability, and increased flexibility to support future upgrades.

E. Performance Metrics

Successfully accomplish pre-Shock Trial planning and preparations in support of the CVN 78 Class Full Ship Shock Trial in accordance with the Acquisition Decision Memorandum of 7 August 2015.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0604112N / *(U)Gerald R Ford Cl Nuc Aircraft Carrier CVN 78-80*	Project (Number/Name) 9999 / *Congressional Adds*	

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation	C/CPAF	HII : VA	0.000	0.000		1.600	Jan 2016	0.000		-		0.000	0.000	1.600	-
Developmental Test & Evaluation	WR	NAWCAD Patuxent River : MD	0.000	0.000		3.500	Jan 2016	0.000		-		0.000	0.000	3.500	-
Developmental Test & Evaluation	WR	NAWCAD Lakehurst : NJ	0.000	0.000		12.300	Jan 2016	0.000		-		0.000	0.000	12.300	-
Developmental Test & Evaluation	WR	NSWC Carderock : MD	0.000	0.000		20.800	Jan 2016	0.000		-		0.000	0.000	20.800	-
Developmental Test & Evaluation	WR	SPAWAR : CA	0.000	0.000		3.900	Jan 2016	0.000		-		0.000	0.000	3.900	-
Developmental Test & Evaluation	C/CPAF	RAYTHEON : VA	0.000	0.000		4.100	Jan 2016	0.000		-		0.000	0.000	4.100	-
Developmental Test & Evaluation	C/T&M	Fleet Logistics Center : VA	0.000	0.000		0.400	Jan 2016	0.000		-		0.000	0.000	0.400	-
Developmental Test & Evaluation	C/CPAF	BOEING : VA	0.000	0.000		0.400	Jan 2016	0.000		-		0.000	0.000	0.400	-
Developmental Test & Evaluation	WR	Miscellaneous : Various	0.000	0.000		3.000	Jan 2016	0.000		-		0.000	0.000	3.000	-
		Subtotal	0.000	0.000		50.000		0.000		-		0.000	0.000	50.000	-

	Prior Years	FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	0.000		50.000		0.000		-		0.000	0.000	50.000	-

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2017 Navy		**Date:** February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0604112N / *(U)Gerald R Ford Cl Nuc Aircraft Carrier CVN 78-80*	**Project (Number/Name)** 9999 / *Congressional Adds*

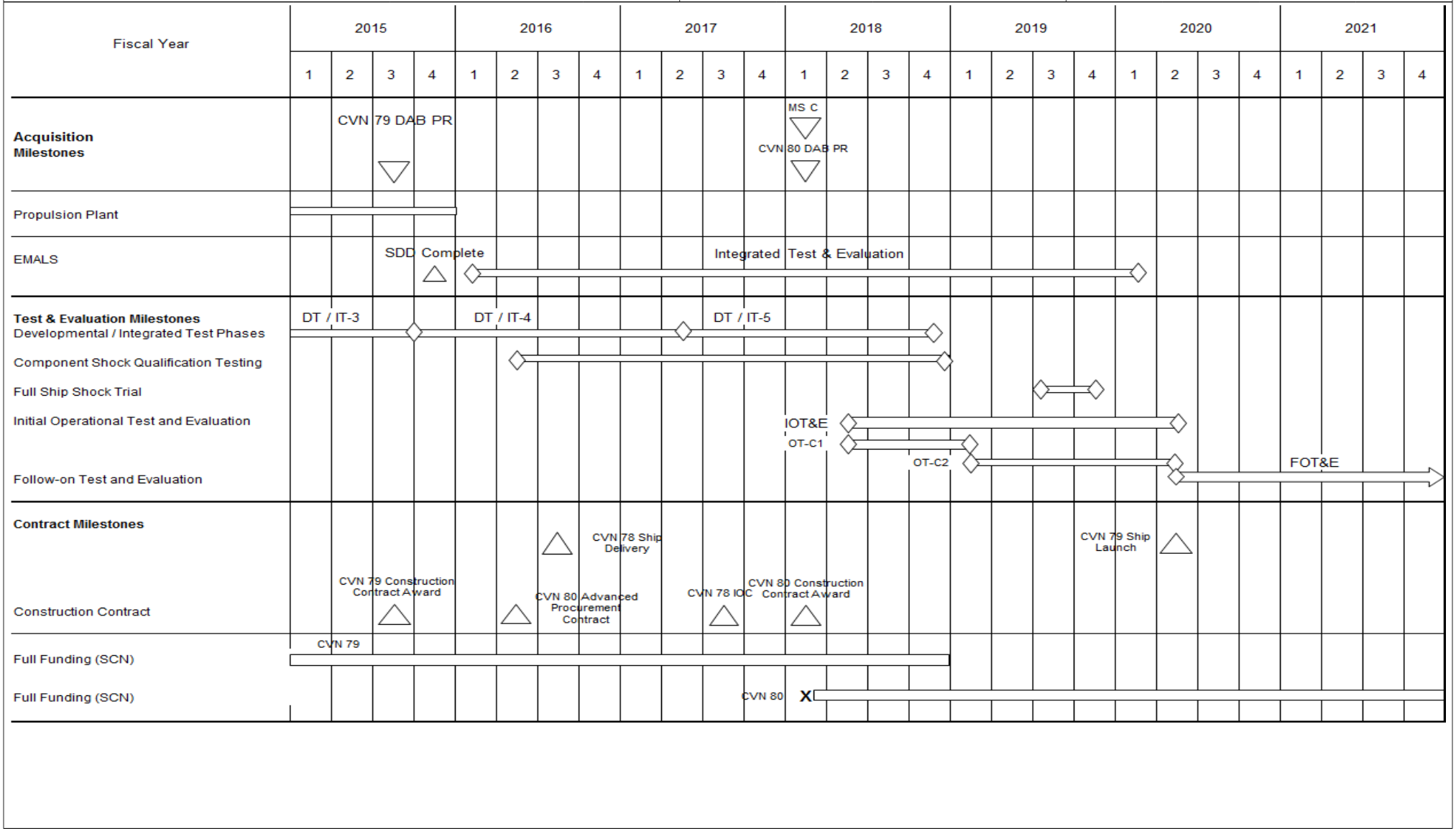


Exhibit R-4A, RDT&E Schedule Details: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0604112N / *(U)Gerald R Ford Cl Nuc Aircraft Carrier CVN 78-80*	**Project (Number/Name)** 9999 / *Congressional Adds*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 9999				
CVN 79 DAB PR	3	2015	3	2015
CVN 80 DAB PR	1	2018	1	2018
Milestone C	1	2018	1	2018
Propulsion Plant	1	2015	4	2015
EMALS SDD Complete	4	2015	4	2015
EMALS Integrated Test & Evaluation (IT&E)	1	2016	1	2020
DT/IT -3- Developmental Test / Integrated Test Phase 3	1	2015	3	2015
DT/IT -4- Developmental Test / Integrated Test Phase 4	4	2015	2	2017
DT/IT -5- Developmental Test / Integrated Test Phase 5	2	2017	4	2018
Component Shock Qualification Testing	2	2016	4	2018
Full Ship Shock Trial	3	2019	4	2019
Initial Operational Test & Evaluation	2	2018	2	2020
OT -C1 - Initial Operational Test & Evaluation - Phase C1	2	2018	1	2019
OT -C2 - Initial Operational Test & Evaluation - Phase C2	1	2019	2	2020
FOT&E - Follow-On Test & Evaluation	2	2020	4	2021
CVN 78 Ship Delivery	3	2016	3	2016
CVN 78 Initial Operational Capability (IOC)	3	2017	3	2017
CVN 79 Construction Contract Award	3	2015	3	2015
CVN 80 Advanced Procurement Contract Award	2	2016	2	2016
CVN 80 Construction Contract Award	1	2018	1	2018
CVN 79 SCN Full Funding	1	2015	4	2018

Exhibit R-4A, RDT&E Schedule Details: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0604112N / *(U)Gerald R Ford Cl Nuc Aircraft Carrier CVN 78-80*	**Project (Number/Name)** 9999 / *Congressional Adds*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
CVN 79 Ship Launch	2	2020	2	2020
CVN 80 SCN Full Funding	1	2018	4	2021

Exhibit R-2, RDT&E Budget Item Justification: PB 2017 Navy											Date: February 2016	
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 4: *Advanced Component Development & Prototypes (ACD&P)*					R-1 Program Element (Number/Name) PE 0604122N *I (U)Remote Minehunting System (RMS)*							
COST ($ in Millions)	**Prior Years**	**FY 2015**	**FY 2016**	**FY 2017 Base**	**FY 2017 OCO**	**FY 2017 Total**	**FY 2018**	**FY 2019**	**FY 2020**	**FY 2021**	**Cost To Complete**	**Total Cost**
Total Program Element	0.000	20.534	17.589	3.001	-	3.001	0.000	0.000	0.000	0.000	0.000	41.124
0260: *Remote Minehunting Systems*	0.000	20.534	17.589	3.001	-	3.001	0.000	0.000	0.000	0.000	0.000	41.124
Program MDAP/MAIS Code: **Project MDAP/MAIS Code(s):** 286												

A. Mission Description and Budget Item Justification

The AN/WLD-1(V)2 Remote Minehunting System (RMS) is a mine reconnaissance system designed for the detection, classification, identification, and localization of bottom and moored mines in shallow and deep water. The RMS will provide the Navy the capability to keep ships and sailors out of the minefield. The RMS is deployed from the Littoral Combat Ship (LCS) as part of the ships' Mine Countermeasure (MCM) Mission Package (MP). The RMS is a fully integrated system consisting of a semi-submersible Remote Multi-Mission Vehicle (RMMV) towing a variable depth sensor, the AN/AQS-20A. This budget line supports the RMMV. The RMMV is a high-endurance, semi-autonomous, low-observable, unmanned, diesel-powered vehicle, operated and maintained from the LCS. Line-of-sight (LOS) and over-the-horizon (OTH) data links provide real time vehicle command and control and mine reconnaissance sensor data transmission to/from LCS.

In FY 2016 two vehicles are being upgraded to the version 6.0 (v6.0) configuration to support LCS integration.

The RMS program is currently under evaluation with the Department's Independent Review Team (IRT). FY 2017 budget focuses on studies and analysis to support RMS IRT recommendations.

B. Program Change Summary ($ in Millions)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Previous President's Budget	21.110	20.089	28.018	-	28.018
Current President's Budget	20.534	17.589	3.001	-	3.001
Total Adjustments	-0.576	-2.500	-25.017	-	-25.017
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-2.500			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.576	0.000			
• Program Adjustments	0.000	0.000	-23.300	-	-23.300
• Rate/Misc Adjustments	0.000	0.000	-1.717	-	-1.717

Exhibit R-2, RDT&E Budget Item Justification: PB 2017 Navy	Date: February 2016
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 0604122N *I (U)Remote Minehunting System (RMS)*

Change Summary Explanation

Decrease in Remote Minehunting System (RMS) by $188 thousand as required for the Department of the Navy to comply with the Bipartisan Budget Act of 2015.

Program Adjustments:
FY15 -$576K Total adjustments; SBIR -$576K.

FY16 -$2,500K Total adjustments; -$2,500K Congressional Mark - Excess support

FY17 $-25,017K Total adjustments; -$23,300K DT Shift/Mod Kit Recolor, -$1,717K Miscellaneous adjustment.

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0604122N / *(U)Remote Minehunting System (RMS)*	Project (Number/Name) 0260 / *Remote Minehunting Systems*	

COST ($ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
0260: *Remote Minehunting Systems*	0.000	20.534	17.589	3.001	-	3.001	0.000	0.000	0.000	0.000	0.000	41.124
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

Project MDAP/MAIS Code: 286

A. Mission Description and Budget Item Justification

The AN/WLD-1(V)2 Remote Minehunting System (RMS) is a mine reconnaissance system designed for the detection, classification, identification, and localization of bottom and moored mines in shallow and deep water. The RMS will provide the Navy the capability to keep ships and sailors out of the minefield. The RMS is deployed from the Littoral Combat Ship (LCS) as part of the ships' Mine Countermeasure (MCM) Mission Package (MP). The RMS is a fully integrated system consisting of a semi-submersible Remote Multi-Mission Vehicle (RMMV) towing a variable depth sensor, the AN/AQS-20A. This budget line supports the RMMV. The RMMV is a high-endurance, semi-autonomous, low-observable, unmanned, diesel-powered vehicle, operated and maintained from the LCS. Line-of-sight (LOS) and over-the-horizon (OTH) data links provide real time vehicle command and control and mine reconnaissance sensor data transmission to/from LCS.

In FY 2016 two vehicles are being upgraded to the version 6.0 (v6.0) configuration to support LCS integration.

The RMS program is currently under evaluation with the Department's Independent Review Team (IRT). FY 2017 budget focuses on studies and analysis to support RMS IRT recommendations.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Title: Product Development	14.996	12.619	0.000	0.000	0.000
Articles:	-	-	-	-	-
FY 2015 Accomplishments: - Implemented hardware/software improvements identified during RMS Developmental Test (DT). - Prepared vehicles for LCS MCM MP test events. - Completed RMMV v6.0 Physical Configuration Audit (PCA), Technical Data Package (TDP), and Interactive Electronic Technical Manual (IETM). - Incorporated v6.0 Engineering Change Proposals (ECPs) on additional v4.2 RMMVs for delivery to the LCS MCM MP. - Awarded a RMMV LRIP 1 Integration/Maintenance contract.					
FY 2016 Plans:					

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0604122N / *(U)Remote Minehunting System (RMS)*	**Project (Number/Name)** 0260 / *Remote Minehunting Systems*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
- Upgrade Pre-Reliability Growth Program (RGP) vehicles (v4.0) to final v6.0 configuration including reliability upgrades and LCS Integration ECPs. - SBIR transition to LRIP 1 for software. ***FY 2017 Base Plans:*** - N/A ***FY 2017 OCO Plans:*** N/A					
Title: Support	2.550	3.920	2.001	0.000	2.001
Articles:	-	-	-	-	-
FY 2015 Accomplishments: - Provided support for RMMV v6.0 PCA, TDP, and IETM. - Provided engineering, logistics, and programmatic support for v6.0 efforts. - Provided engineering, logistics, and programmatic support for RMMV Integration/Maintenance contract. - Conducted quality assurance audits at contractor facility. - Provided on-site engineering support for RMMVs at contractor facility. - Conducted RMMV Ready For Issue (RFI) Inspections. - Provided support for v6.0 DT/IT. ***FY 2016 Plans:*** - Provide engineering, logistics, and programmatic support for v6.0 upgrade efforts. - Conduct post-upgrade inspections. - Provide engineering, logistics, and programmatic support for RMMV Integration/Maintenance contract. - Support S&T transitions to LRIP 1 fleet. - Provide planning support for RMMV Technology Refresh and Overhaul efforts. - Provide engineering support for correction of deficiencies efforts. ***FY 2017 Base Plans:*** - Provide engineering, logistics, and programmatic support for IRT recommendations. ***FY 2017 OCO Plans:*** N/A					
Title: Test and Evaluation (T&E)	2.300	0.000	0.000	0.000	0.000

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0604122N / *(U)Remote Minehunting System (RMS)*	**Project (Number/Name)** 0260 / *Remote Minehunting Systems*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Articles:	-	-	-	-	-
FY 2015 Accomplishments: - Prepared for and supported LCS MCM MP TECHEVAL. - Prepared for and conducted v6.0 DT/IT. ***FY 2016 Plans:*** - N/A ***FY 2017 Base Plans:*** - N/A ***FY 2017 OCO Plans:*** N/A					
Title: Management	0.688	1.050	1.000	0.000	1.000
Articles:	-	-	-	-	-
FY 2015 Accomplishments: - Provided program management and oversight of RMMV v6.0 upgrades. - Awarded LRIP 1 RMMV Integration/Maintenance contract. - Provided program management support for and oversight of LRIP 1 Integration/Maintenance contract. ***FY 2016 Plans:*** - Provide program management and oversight of RMMV v6.0 upgrades. - Provide program management and oversight of RMMV Integration/Maintenance contract. - Support for the Independent Review Team (IRT) ***FY 2017 Base Plans:*** - Provide program management and oversight of IRT recommendations. ***FY 2017 OCO Plans:*** N/A					
Accomplishments/Planned Programs Subtotals	20.534	17.589	3.001	0.000	3.001

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0604122N / *(U)Remote Minehunting System (RMS)*	**Project (Number/Name)** 0260 / *Remote Minehunting Systems*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
• OPN/1605: *Remote Minehunting System (RMS)*	0.000	53.077	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	53.077

Remarks

This program is under review by the Independent Review Team (IRT). Current funding profile may not representative of the final pending report.

D. Acquisition Strategy

An RMMV LRIP 1 Integration/Maintenance Contract was awarded in FY15 to support the integration and maintenance activities of LRIP 1 systems, integration with the LCS Freedom Variant, incorporate Ao improvements, and address obsolescence changes.

E. Performance Metrics

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0604122N / *(U)Remote Minehunting System (RMS)*	Project (Number/Name) 0260 / *Remote Minehunting Systems*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Hardware Development & Integration	Various	LOCKHEED MARTIN : West Palm Beach, FL	0.000	13.318	Nov 2014	11.219	Nov 2015	0.000		-		0.000	0.000	24.537	-
SBIR Transition	Various	Various : Various	0.000	0.678	Nov 2014	1.400	Jan 2016	0.000		-		0.000	0.000	2.078	-
Hardware Development & Integration	C/FPIF	LOOKHEED MARTIN : West Palm Beach, FL	0.000	1.000	Nov 2014	0.000		0.000		-		0.000	0.000	1.000	-
		Subtotal	0.000	14.996		12.619		0.000		-		0.000	0.000	27.615	-

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Engineering/ILS	WR	NSWC/PCD : Panama City, FL	0.000	1.731	Nov 2014	3.474	Oct 2015	1.751	Oct 2016	-		1.751	0.000	6.956	-
Engineering Support	WR	NUWC/NPT : Newport, RI	0.000	0.511	Nov 2014	0.233	Nov 2015	0.250	Nov 2016	-		0.250	0.000	0.994	-
Engineering Support	WR	PORTSMOUTH NSY : Portsmouth, NH	0.000	0.308	Nov 2014	0.213	Nov 2015	0.000		-		0.000	0.000	0.521	-
		Subtotal	0.000	2.550		3.920		2.001		-		2.001	0.000	8.471	-

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
LCS MCM MP Test Events	WR	NSWC/PCD : Panama City, FL	0.000	1.537	Nov 2014	0.000		0.000		-		0.000	0.000	1.537	-
LCS MCM MP Test Events	SS/CPIF	LOCKHEED MARTIN : West Palm Beach, FL	0.000	0.763	Nov 2014	0.000		0.000		-		0.000	0.000	0.763	-
		Subtotal	0.000	2.300		0.000		0.000		-		0.000	0.000	2.300	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0604122N / *(U)Remote Minehunting System (RMS)*	**Project (Number/Name)** 0260 / *Remote Minehunting Systems*

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract

Remarks

LCS MCM MP Test Events will require contractor to groom vehicles prior to testing.
SFTF - South Florida Test Facility for the laying and recovery of mines for the DT/IT event.

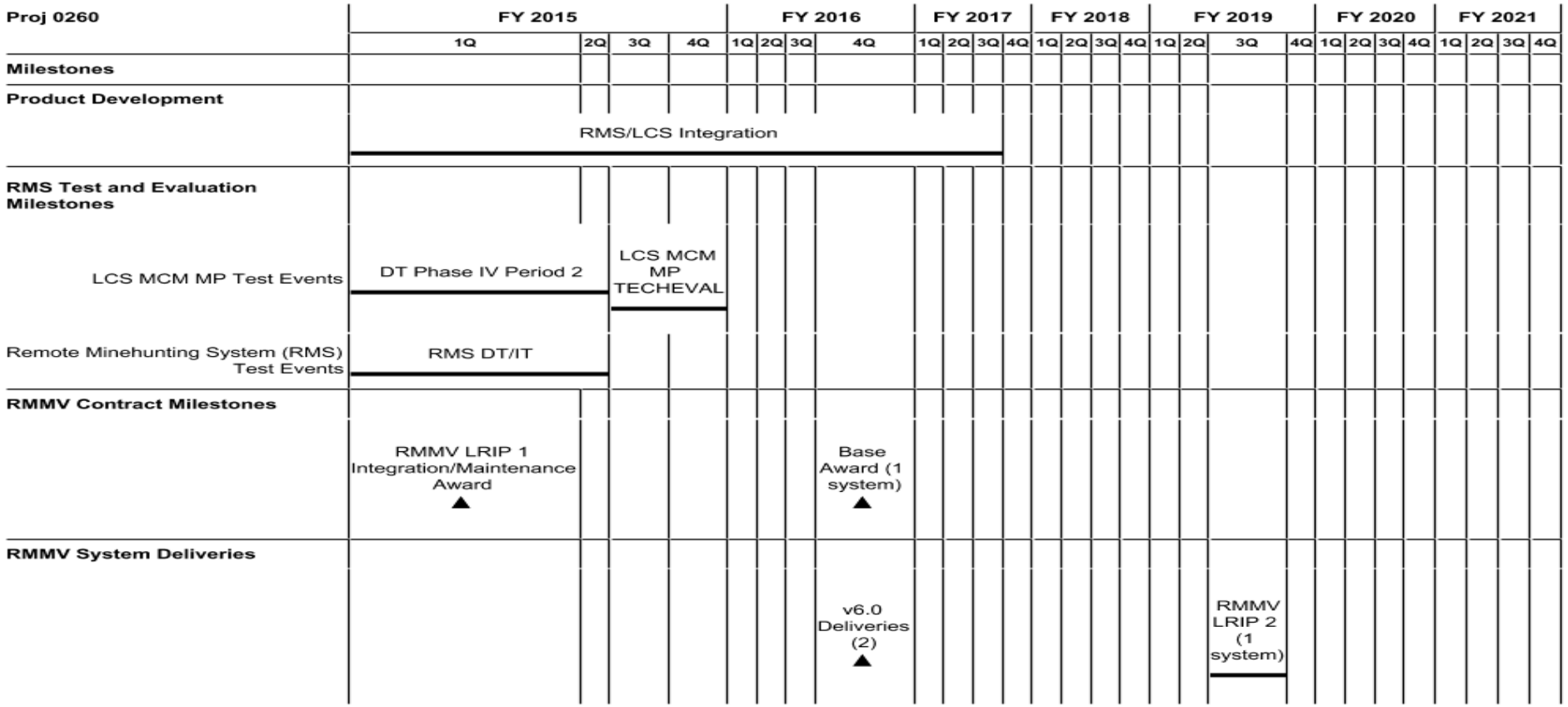
Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Management Support	C/CPFF	TBD : TBD	0.000	0.647	Dec 2014	1.000	Dec 2015	1.000	Dec 2016	-		1.000	0.000	2.647	-
Travel	WR	NAVSEA : WNY, DC	0.000	0.041	Jan 2015	0.050	Jan 2016	0.000		-		0.000	0.000	0.091	-
		Subtotal	0.000	0.688		1.050		1.000		-		1.000	0.000	2.738	-

	Prior Years	FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	20.534		17.589		3.001		-		3.001	0.000	41.124	-

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0604122N / *(U)Remote Minehunting System (RMS)*	**Project (Number/Name)** 0260 / *Remote Minehunting Systems*



2017PB - 0604122N - 0260

Exhibit R-4A, RDT&E Schedule Details: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0604122N / *(U)Remote Minehunting System (RMS)*	**Project (Number/Name)** 0260 / *Remote Minehunting Systems*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 0260				
Product Development: RMS/LCS Integration	1	2015	3	2017
RMS Test and Evaluation Milestones: LCS MCM MP Test Events: DT Phase IV Period 2	1	2015	2	2015
RMS Test and Evaluation Milestones: LCS MCM MP Test Events: LCS MCM MP TECHEVAL	3	2015	4	2015
RMS Test and Evaluation Milestones: Remote Minehunting System (RMS) Test Events: RMS v6.0 Developmental Testing (DT)/Integrated Testing (IT)	1	2015	2	2015
RMMV Contract Milestones: Base Production Award (1 system)	4	2016	4	2016
RMMV Contract Milestones: RMMV LRIP 1 Integration/Maintenance (Legacy Configuration) Award	1	2015	1	2015
RMMV System Deliveries: v6.0 Deliveries (2)	4	2016	4	2016

Exhibit R-2, RDT&E Budget Item Justification: PB 2017 Navy	Date: February 2016
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 0604272N *I Tact Air Dir Infrared CM (TADIRCM)*

COST ($ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
Total Program Element	7.300	5.677	18.969	34.920	37.990	72.910	38.009	38.789	24.331	24.826	249.261	480.072
3304: *CIRCM*	7.300	5.677	18.969	34.920	37.990	72.910	38.009	38.789	24.331	24.826	249.261	480.072

A. Mission Description and Budget Item Justification

Decrease in TACT AIR DIR INFRARED CM (TADIRCM) by $1.515M as required for the Department of the Navy to comply with the Bipartisan Budget Act of 2015.

This element includes development of electronic warfare systems for the United States Navy and United States Marine Corps assault aircraft. This includes the development and testing of advanced infrared countermeasures systems for emerging threats and emergency contingencies for Aircraft Self-Protection Equipement (ASE) suite integration.

FY 2017 OCO funding is required for developmental activities in hardware and software to reduce the size, weight, and power required to achieve a missile warning detection system compatible with mission planning information that stores sensor data for post mission threat analysis.

JUSTIFICATION FOR BUDGET ACTIVITY: This program is funded under ADVANCED COMPONENT DEVELOPMENT AND PROTOTYPES because it includes all efforts necessary to evaluate integrated technologies, representative models or prototype systems in a high fidelity and realistic operating environment.

B. Program Change Summary ($ in Millions)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Previous President's Budget	5.556	18.969	42.013	-	42.013
Current President's Budget	5.677	18.969	34.920	37.990	72.910
Total Adjustments	0.121	0.000	-7.093	37.990	30.897
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	0.300	0.000			
• SBIR/STTR Transfer	-0.179	0.000			
• Program Adjustments	0.000	0.000	-4.363	-	-4.363
• Rate/Misc Adjustments	0.000	0.000	-2.730	37.990	35.260

Change Summary Explanation

Schedule:

Exhibit R-2, RDT&E Budget Item Justification: PB 2017 Navy	Date: February 2016
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 0604272N *I Tact Air Dir Infrared CM (TADIRCM)*

PU 3304 CIRCM: Integrated Operational Test & Evaluation (IOT&E) from 4th Qtr FY18 through 4th Qtr FY19 to 4th Qtr FY19 through 4th Qtr FY20; Navy Development Test & Evaluation EMD (DT&E-EMD) from 2nd Qtr FY16 through 2nd Qtr FY18 to 2nd Qtr FY17 through 1st Qtr FY19; Navy Test Readiness Review (TRR) from 2nd Qtr FY17 to 3rd Qtr FY19; All tasks are on schedule and to be completed by the Army.

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0604272N / *Tact Air Dir Infrared CM (TADIRCM)*	Project (Number/Name) 3304 / *CIRCM*	

COST ($ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
3304: *CIRCM*	7.300	5.677	18.969	34.920	37.990	72.910	38.009	38.789	24.331	24.826	249.261	480.072
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Common Infrared Countermeasures (CIRCM) was a new start for the Navy in FY13. This project includes the development, integration, and testing of a laser-based directed infrared countermeasure system for United States Navy and United States Marine Corps assault aircraft. This infrared countermeasure, when integrated with a missile warning detection system, will be capable of countering current and emerging infrared threats. An Under Secretary of Defense for Acquisition, Technology and Logistics (USD (AT&L)) Acquisition Decision Memorandum (ADM) dated 15 April 2009 designated the Army as the lead service for developing this capability for all rotary-wing, tilt-rotor, and small fixed-wing aircraft across the Department of Defense. It also designated the program as an Aquisition Category (ACAT) ID special interest program. The Army has designated the acquisition effort for this capability as the CIRCM program. Developmental activities in hardware and software will be pursued to reduce the size, weight and power required to achieve a missile warning detection system integrated with an infrared countermeasure. This project develops integrated hardware/software solutions that link on-board integrated Aircraft Survivability Equipment (iASE) that are compatible with mission planning information and stores sensor data for post mission threat analysis. This project also adopts future multi-band, networking capabilities to facilitate real-time transfer of threat information, and off-board queuing and control of onboard sensors.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Title: CIRCM Technology Development (TD)	5.677	18.969	34.920	37.990	72.910
Articles:	-	-	-	-	-
FY 2015 Accomplishments: Achieve MS-B; Engineering Manufacturing Development (EMD) contract award.					
FY 2016 Plans: CIRCM will enter the Engineering Manufacturing Development (EMD) phase in FY16. The EMD Contract was awarded 4QFY15. The CIRCM Critical Design Review is scheduled for 4QFY16.					
FY 2017 Base Plans: Begin Development Test and Evaluation (DT&E) phase of the EMD.					
FY 2017 OCO Plans: N/A					
Accomplishments/Planned Programs Subtotals	5.677	18.969	34.920	37.990	72.910

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0604272N / *Tact Air Dir Infrared CM (TADIRCM)*	**Project (Number/Name)** 3304 / *CIRCM*

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

Common Infrared Countermeasures (CIRCM) was a new start for the Navy in FY13. CIRCM is an Aquisition Category (ACAT) ID Army lead acquisition program for the development, integration and production of an infrared countermeasure for US Army, US Navy, and US Marine Corps assault aircraft. The Army conducted a 21 month competitive prototyping Technology Development (TD) phase with two contractors. During the TD phase the contractors developed TD test articles for various test events with emphasis placed on reliability. Contractors concurrently developed preliminary designs for the CIRCM system; conducted systems requirements review, system functional review, and preliminary design review systems engineering technical review events at appropriate times in the schedule. Upon completion of TD, the Army conducted a competition for award of Engineering Manufacturing Development (EMD) contract(s). The EMD phase will be no more than 26 months and will include critical design reviews, test readiness reviews, 5 EMD test articles and extensive testing. Following EMD there will be Low Rate Initial Production (LRIP) phase where full qualification testing is conducted to support an Army first unit equipped date of FY20. There will be 8 Navy LRIP units delivered in FY18. The Navy's Initial Operational Capability (IOC) will be in FY21.

E. Performance Metrics

FY15:
Achievement of Milestone B. Successful EMD contract award by US Army.

FY16:
Successful critical design review. Successful exercise of Navy option on Army EMD contract for EMD test assets.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0604272N / *Tact Air Dir Infrared CM (TADIRCM)*	**Project (Number/Name)** 3304 / *CIRCM*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Primary HDW Dev CIRCM	C/CPIF	Bell-Boeing : Philadelphia, PA	0.985	0.000		0.000		0.000		-		0.000	0.000	0.985	0.985
Sys Eng Govt CIRCM	WR	NAWC : Patuxent River, MD	2.847	0.980	Dec 2014	2.198	Oct 2015	1.001	Dec 2016	-		1.001	12.534	19.560	-
Contractor Eng Supt CIRCM	C/CPFF	TBD : TBD	0.000	0.595	Mar 2015	2.007	Oct 2015	2.500	Dec 2016	-		2.500	11.032	16.134	16.134
Primary HDW DEV CIRCM	C/CPIF	TBD : TBD	0.000	0.000		5.389	Dec 2015	15.280	Dec 2016	37.990	Dec 2016	53.270	278.202	336.861	336.861
Sys Eng Govt CIRCM	WR	NRL : Washington DC	0.000	1.239	Dec 2014	2.296	Oct 2015	1.300	Dec 2016	-		1.300	4.535	9.370	-
Sys Eng Gov CIRCM	WR	NUWC : Jacksonville, FL	0.000	0.313	Dec 2015	0.273	Oct 2015	0.299	Dec 2016	-		0.299	1.471	2.356	-
		Subtotal	3.832	3.127		12.163		20.380		37.990		58.370	307.774	385.266	-

Remarks

FY 2017 overseas contingency operations funding is required for developmental activities in hardware and software to reduce the size, weight, and power required to achieve a missile warning detection system compatible with mission planning information that stores sensor data for post mission threat analysis.

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Integrated Logistics CIRCM I	WR	NAWC AD : Patuxent River, MD	0.520	0.316	Dec 2014	1.366	Dec 2015	2.570	Dec 2016	-		2.570	4.184	8.956	-
Integrated Logistics CIRCM II	C/CPFF	Wyle Labs : Huntsville, AL	0.263	0.296	Mar 2015	0.972	Mar 2016	2.000	Mar 2017	-		2.000	6.470	10.001	10.001
SW Dev CIRCM	WR	NAWCWD : Pt. Mugu, CA	0.238	1.078	Dec 2014	2.734	Dec 2015	2.143	Dec 2016	-		2.143	5.366	11.559	-
		Subtotal	1.021	1.690		5.072		6.713		-		6.713	16.020	30.516	-

Remarks

Software development increased to create modules that modify the JATAS EW bus interface, build a new RS-485 interface, support avionics bus monitoring of internal navigation system data, and drive the 6-wire ALE-47 discrete interface. Software, material, and electronic combat simulation and evaluation laboratory core funding required to meet DAIRCM test readiness review date.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0604272N / *Tact Air Dir Infrared CM (TADIRCM)*	**Project (Number/Name)** 3304 / *CIRCM*

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Eng & Eval CIRCM	C/CPFF	TBD : TBD	0.316	0.000		0.164	Dec 2015	3.000	Dec 2016	-		3.000	6.286	9.766	9.766
Eng & Eval Govt CIRCM	WR	NAWC : Patuxent River, MD	0.864	0.085	Dec 2014	0.692	Jan 2016	1.678	Jan 2017	-		1.678	7.680	10.999	-
Eng & Eval Govt CIRCM	WR	COTF : VA	0.000	0.000		0.100	Dec 2015	0.455	Jan 2017	-		0.455	1.150	1.705	-
		Subtotal	1.180	0.085		0.956		5.133		-		5.133	15.116	22.470	-

Remarks

Limited COTF support needed for FY16.

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Contractor Eng Supt CIRCM	C/CPFF	TBD : TBD	0.558	0.353	Mar 2015	0.103	Mar 2016	0.194	Mar 2017	-		0.194	6.316	7.524	7.524
Govt Eng Supt CIRCM	WR	NAWCWD : Point Mugu, CA	0.243	0.000		0.428	Dec 2015	2.200	Dec 2016	-		2.200	9.610	12.481	-
Travel CIRCM	WR	NAVAIR : Various	0.090	0.200	Dec 2014	0.200	Dec 2015	0.200	Dec 2016	-		0.200	10.370	11.060	-
Cost Analysis Supt CIRCM	WR	NAWCAD : Patuxent River, MD	0.376	0.222	Dec 2014	0.047	Dec 2015	0.100	Dec 2016	-		0.100	10.010	10.755	-
		Subtotal	1.267	0.775		0.778		2.694		-		2.694	36.306	41.820	-

	Prior Years	FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	7.300	5.677		18.969		34.920		37.990		72.910	375.216	480.072	-

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0604272N / *Tact Air Dir Infrared CM (TADIRCM)*	**Project (Number/Name)** 3304 / *CIRCM*

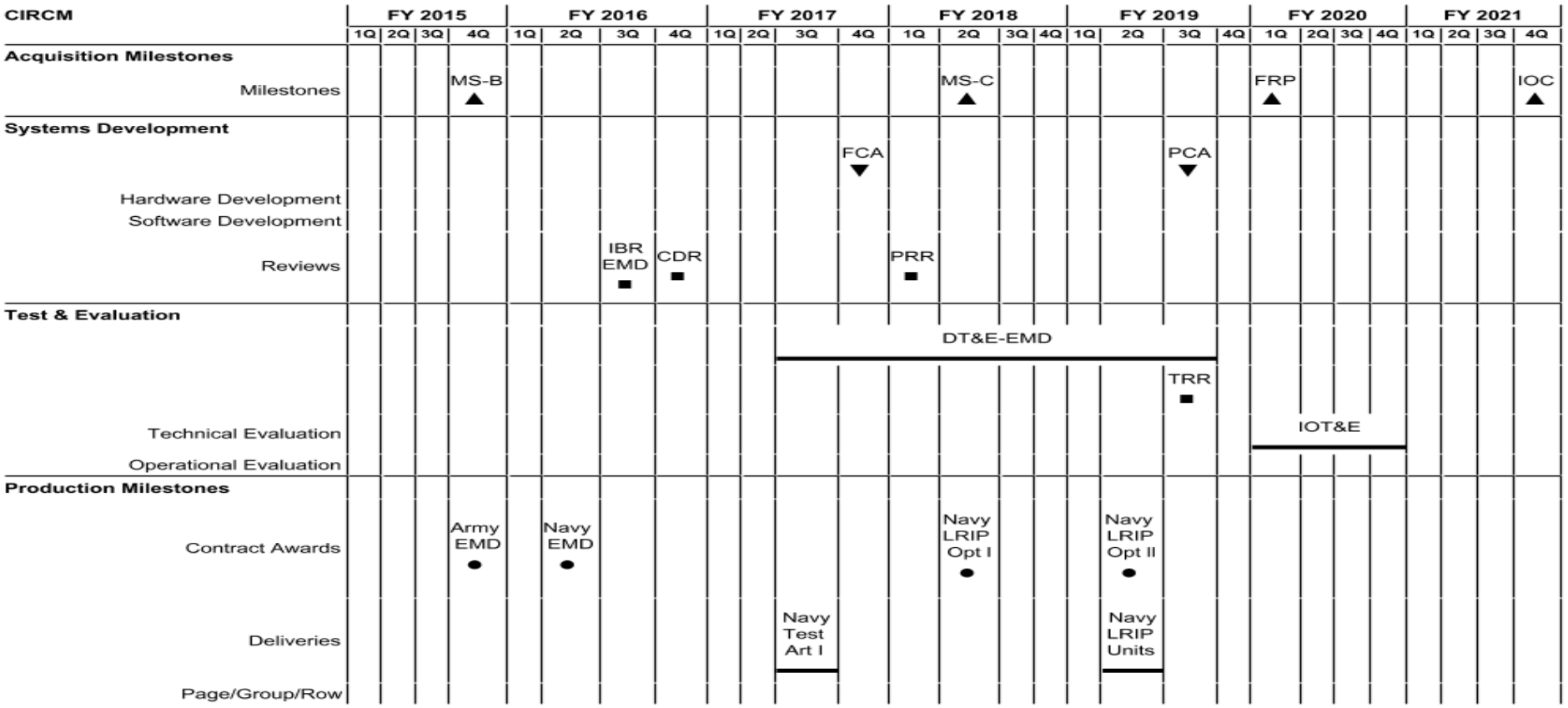


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Exhibit R-4A, RDT&E Schedule Details: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0604272N / *Tact Air Dir Infrared CM (TADIRCM)*	**Project (Number/Name)** 3304 / *CIRCM*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
CIRCM				
Acquisition Milestones: Milestones: Milestone B (MS-B)	4	2015	4	2015
Acquisition Milestones: Milestones: Milestone C (MS-C)	2	2018	2	2018
Acquisition Milestones: Milestones: Common Infrared Countermeasures (CIRCM) Initial Operational Capability (IOC)	4	2021	4	2021
Acquisition Milestones: Milestones: Full Rate Production	1	2020	1	2020
Systems Development: Functional Configuration Audit (FCA)	4	2017	4	2017
Systems Development: Physical Configuration Audit (PCA)	3	2019	3	2019
Systems Development: Reviews: Integrated Baseline Review (IBR EMD)	3	2016	3	2016
Systems Development: Reviews: Critical Design Review (CDR)	4	2016	4	2016
Systems Development: Reviews: Production Readiness Review (PRR)	1	2018	1	2018
Test & Evaluation: Developmental Test & Evaluation - EMD (DT&E-EMD)	3	2017	3	2019
Test & Evaluation: Navy Test Readiness Review (TRR)	3	2019	3	2019
Test & Evaluation: Technical Evaluation: Integrated Operational Test & Evaluation (IOT&E)	1	2020	4	2020
Production Milestones: Contract Awards: Navy EMD Option Contract Award	2	2016	2	2016
Production Milestones: Contract Awards: Navy LRIP Option I	2	2018	2	2018
Production Milestones: Contract Awards: ARMY EMD Contract	4	2015	4	2015
Production Milestones: Contract Awards: Navy LRIP Option II	2	2019	2	2019
Production Milestones: Deliveries: EMD Test Article Deliveries	3	2017	3	2017
Production Milestones: Deliveries: Navy LRIP Units	2	2019	2	2019

Exhibit R-2, RDT&E Budget Item Justification: PB 2017 Navy											Date: February 2016	
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 4: *Advanced Component Development & Prototypes (ACD&P)*					R-1 Program Element (Number/Name) PE 0604279N *I (U)ASE Self Protection Optimization*							
COST ($ in Millions)	**Prior Years**	**FY 2015**	**FY 2016**	**FY 2017 Base**	**FY 2017 OCO**	**FY 2017 Total**	**FY 2018**	**FY 2019**	**FY 2020**	**FY 2021**	**Cost To Complete**	**Total Cost**
Total Program Element	12.790	5.121	7.874	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	25.785
3308: *Technology Development*	1.404	1.498	2.438	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	5.340
3309: *Assault Survivability Optimization*	11.386	3.623	5.436	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	20.445

Note

PE 0604279N consolidated to PE 0604270N beginning in FY17.

A. Mission Description and Budget Item Justification

This element includes development of Aircraft Survivability Equipment (ASE) and Electronic Warfare (EW)/countermeasures solutions for the United States Navy, United States Marine Corps and Coalition Aircraft to include studies and evaluations of current and future aircraft threats, modeling and simulation for improved countermeasure capabilities, and development and testing to address new and emerging threats.

JUSTIFICATION FOR BUDGET ACTIVITY: This program is funded under ADVANCED COMPONENT DEVELOPMENT AND PROTOTYPES because it includes all efforts necessary to evaluate integrated technologies, representative models or prototype systems in a high fidelity and realistic operating environment.

B. Program Change Summary ($ in Millions)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Previous President's Budget	3.921	7.874	6.157	-	6.157
Current President's Budget	5.121	7.874	0.000	-	0.000
Total Adjustments	1.200	0.000	-6.157	-	-6.157
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	1.200	0.000			
• SBIR/STTR Transfer	-	-			
• Program Adjustments	0.000	0.000	-6.157	-	-6.157

Change Summary Explanation

Cost:

Exhibit R-2, RDT&E Budget Item Justification: PB 2017 Navy	Date: February 2016
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 0604279N *I (U)ASE Self Protection Optimization*

PU 3309: FY15 reprogramming action #FY 15-28 PA signed 27 August 2015 to address JUONS #SO-0010 to improve the current system-of-systems detect, declare and defeat solution against newly proliferated advanced Man-portable Air Defense Systems (MANPADS). OCO issued sheet #15-401-R dated 15 October 2015.

Schedule:
Project Unit 3308 / Technology Development:

Release 15 added to 1st Qtr of FY 2016. Release 16 moved from 3rd Qtr FY 2016 to 1st Qtr FY 2017 to better align with Program Related Engineering (PRE) Software releases. This is reflected in the Budget under PE 0604270N. Software Technique Development completion moved from 4th Qtr FY 2016 to 3rd Qtr FY 2015 to annualize effort. FY 2016 Software Technique Development 1st Qtr FY 2016 through 3rd Qtr FY 2016 added to schedule. FY 2015 Integrated Evaluation (IE) moved from 2nd Qtr FY 2015 through 4th Qtr 2015 to 1st Qtr 2016 and reduced to a 1 Qtr event. FY 2016 IE moved from 2 Qtr FY 2016 through 4th Qtr FY 2016 to 4th Qtr FY 2016 as a 1 Qtr event.

Project Unit 3309 / Assault Survivability Optimization:

FY15 F/A-18E/F flight test delayed by one month due to range priorities; testing completed August 2015.
FY15 CH-53E flight test delayed until August 2016 due to test range schedule (other available test ranges could not accommodate required flight test profiles). Schedule revised to include efforts to support JUONS #SO-0010.

Technical: Not applicable.

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0604279N / *(U)ASE Self Protection Optimization*	Project (Number/Name) 3308 / *Technology Development*	

COST ($ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
3308: *Technology Development*	1.404	1.498	2.438	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	5.340
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Project Unit (PU) 3308 Technology Development: Funds efforts that focus on the quick reaction prototyping of tactical Electronic Warfare (EW)/countermeasures solutions for increased survivability providing friendly forces the self protection necessary for successful mission accomplishment. This program directly addresses the operational requirement of strike platforms for optimization of EW/countermeasure solutions across the Department of the Navy. Improved countermeasure capabilities and techniques through modeling and simulation, validated in subsequent field testing to address new and emerging threats, capitalize upon upgrades to Aircraft Survivability Equipment systems capabilities for strike platforms and evaluate new radio frequency countermeasure and infra red countermeasure technologies.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Title: Technology Development	1.498	2.438	0.000	0.000	0.000
Articles:	-	-	-	-	-
FY 2015 Accomplishments: Continue EW vulnerability studies/analysis, product development and test conducted for strike aircraft.					
FY 2016 Plans: Continue EW vulnerability studies/analysis, product development and test conducted for strike aircraft.					
FY 2017 Base Plans: N/A					
FY 2017 OCO Plans: N/A					
Accomplishments/Planned Programs Subtotals	1.498	2.438	0.000	0.000	0.000

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

EW vulnerability studies/analysis, product development and test conducted for strike aircraft across the FYDP.

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0604279N / *(U)ASE Self Protection Optimization*	**Project (Number/Name)** 3308 / *Technology Development*

E. Performance Metrics

Electronic Warfare (EW) vulnerability studies/analysis, product development and test conducted for strike aircraft across the FYDP.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0604279N / *(U)ASE Self Protection Optimization*	Project (Number/Name) 3308 / *Technology Development*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Product Analysis	C/CPFF	GTRI : Atlanta, GA	0.404	0.000		0.000		0.000		-		0.000	0.000	0.404	0.404
		Subtotal	0.404	0.000		0.000		0.000		-		0.000	0.000	0.404	0.404

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Software Dev-ALQ-214 SW Dev	WR	NAWCWD : Point Mugu, CA	0.467	0.530	Nov 2014	0.934	Nov 2015	0.000		-		0.000	0.000	1.931	-
Software Dev-ALQ-214 SW Dev	WR	Various : Various	0.000	0.000		0.644	Oct 2015	0.000		-		0.000	0.000	0.644	-
Software Dev-ALQ-214 SW Dev	C/CPFF	GTRI : Alanta, GA	0.000	0.000		0.240	Jan 2016	0.000		-		0.000	0.000	0.240	-
Prior costs no longer in FYDP	Various	Various : Various	0.072	0.000		0.000		0.000		-		0.000	0.000	0.072	0.072
		Subtotal	0.539	0.530		1.818		0.000		-		0.000	0.000	2.887	-

Test and Evaluation ($ in Millions)

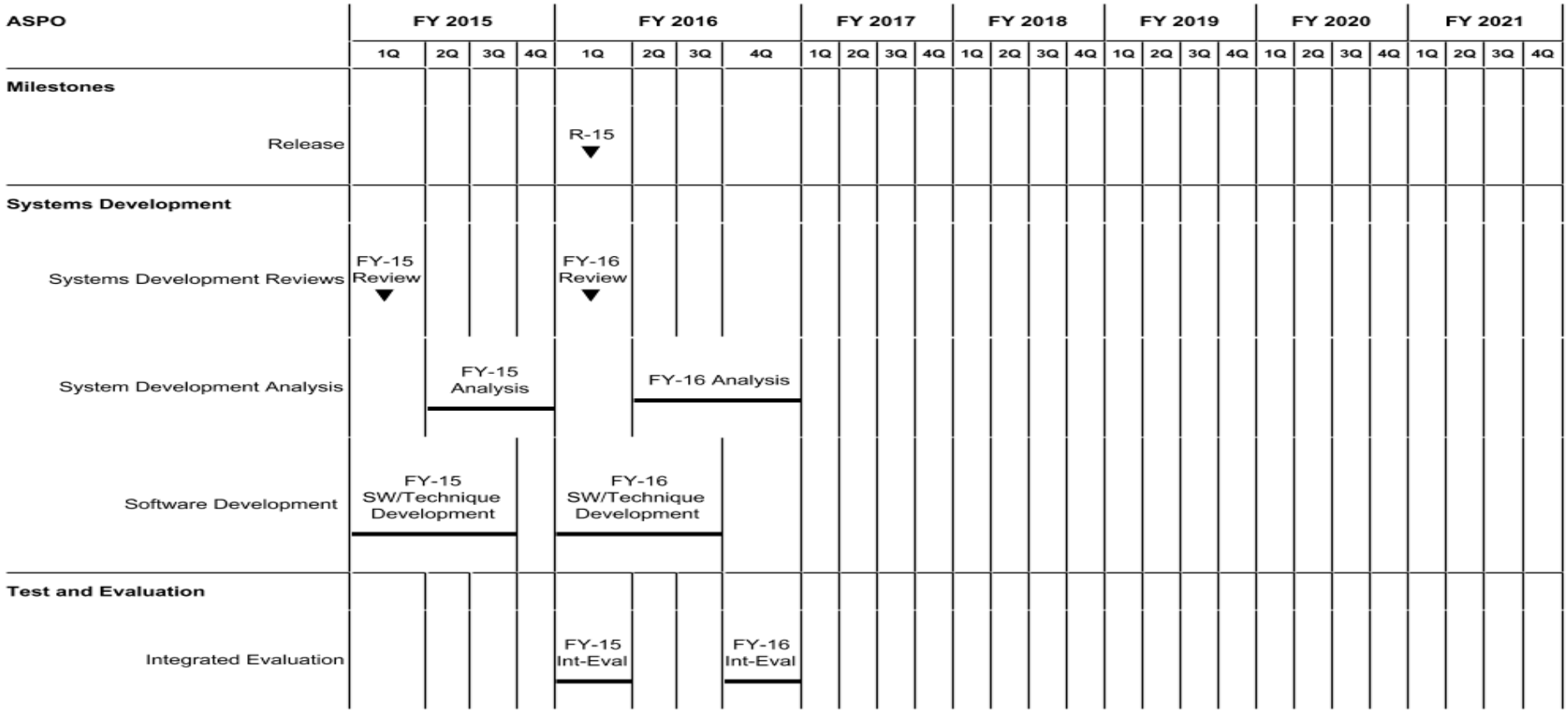
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Engineering & Evaluation	WR	NAWCWD : Point Mugu, CA	0.000	0.968	Oct 2014	0.310	Nov 2015	0.000		-		0.000	0.000	1.278	-
Engineering & Evaluation	WR	NAWCWD : China Lake, CA	0.000	0.000		0.310	Oct 2015	0.000		-		0.000	0.000	0.310	-
Prior years T&E no longer funded in the FYDP	Various	Various : Various	0.461	0.000		0.000		0.000		-		0.000	0.000	0.461	-
		Subtotal	0.461	0.968		0.620		0.000		-		0.000	0.000	2.049	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0604279N / *(U)ASE Self Protection Optimization*	Project (Number/Name) 3308 / *Technology Development*	

	Prior Years	FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	1.404	1.498		2.438		0.000		-		0.000	0.000	5.340	-

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0604279N / *(U)ASE Self Protection Optimization*	**Project (Number/Name)** 3308 / *Technology Development*



2017PB - 0604279N - 3308 Project units in PE 0604279N were moved to PE 0604270N in FY 17 and out.

Exhibit R-4A, RDT&E Schedule Details: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0604279N / *(U)ASE Self Protection Optimization*	**Project (Number/Name)** 3308 / *Technology Development*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
ASPO				
Milestones: Release: Release - 15	1	2016	1	2016
Systems Development: Systems Development Reviews: FY-15 Review	1	2015	1	2015
Systems Development: Systems Development Reviews: FY-16 Review	1	2016	1	2016
Systems Development: System Development Analysis: FY-15 Analysis	2	2015	4	2015
Systems Development: System Development Analysis: FY-16 Analysis	2	2016	4	2016
Systems Development: Software Development: FY-15 SW/Technique Development	1	2015	3	2015
Systems Development: Software Development: FY-16 SW/Technique Development	1	2016	3	2016
Test and Evaluation: Integrated Evaluation: FY-15 Integrated Evaluation	1	2016	1	2016
Test and Evaluation: Integrated Evaluation: FY-16 Integrated Evaluation	4	2016	4	2016

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0604279N / *(U)ASE Self Protection Optimization*	Project (Number/Name) 3309 / *Assault Survivability Optimization*	

COST ($ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
3309: *Assault Survivability Optimization*	11.386	3.623	5.436	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	20.445
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This project funds the development, testing, and rapid fielding of advanced countermeasures and enhanced employment techniques needed to support current and future operations for USN and USMC aircraft. Incorporates capability advancements in Aircraft Survivability Equipment (ASE) and expendable countermeasures to develop and deploy countermeasure responses resulting in increased platform survivability. Resources will be applied to the following areas: 1) studies and evaluations to optimize current countermeasures and ASE capabilities, 2) development and demonstration of advanced expendable countermeasures and countermeasure techniques, 3) testing and evaluation of advanced countermeasures, 4) development of system software for the testing and deployment of advanced countermeasure techniques, and 5) development of and upgrades to modeling tools and specialized equipment required to conduct evaluation of advanced countermeasures.

FY16 flight test effectiveness testing to be conducted using Non-Combat Expenditure Allowance (NCEA) of current countermeasures. Advanced countermeasures procured in FY16 and delivered within 12 months will support flight test for optimized/advanced countermeasures techniques in FY17. The identified countermeasure quantity is required by Air Expendable Countermeasures Test and Evaluation Master Plan #1480 to complete the flight testing for test Mission Data Files (MDF) and optimized/advanced countermeasures techniques.
(RDT&E Articles are advanced air expendable countermeasures.)

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Title: Analysis and Development of Advanced Countermeasures and Countermeasure Techniques	3.623	5.436	0.000	0.000	0.000
Articles:	580	1,500	-	-	-
FY 2015 Accomplishments: Conducted modeling and simulation, developed enhanced countermeasure techniques, and executed flight effectiveness testing for UH-1Y, MH-60R, and F/A-18E/F platforms. Delivered improved dispense patterns to the software support activity to provide MDF updates for enhanced effectiveness. Conducted modeling and simulation of enhanced countermeasure techniques for CH-53E in preparation for flight effectiveness test. Conducted modeling and simulation and developed enhanced countermeasure techniques for MH-60S, MV-22, and UH-1Y in support of JUONS #SO-0010.					
FY 2016 Plans:					

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0604279N / *(U)ASE Self Protection Optimization*	**Project (Number/Name)** 3309 / *Assault Survivability Optimization*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Operational MDF release for F/A-18E/F is scheduled for November 2016 in conjunction with CY16 fleet release. UH-1Y updates to be incorporated in September 2016; MH-60R MDF updates to be incorporated in January 2017. Recommendations from the CH-53E modeling and simulation effort targeting incorporation of range information into the countermeasures response in support of smart dispensing will be evaluated during flight effectiveness testing in FY2016. Conduct modeling and simulation to develop enhanced countermeasure techniques for the P-8A platform in support of FY2016 flight effectiveness testing. Continue development of advanced countermeasure techniques on MV-22 and MH-60S platforms in support of FY2016 flight test evaluations. 1,500 test articles procured in FY16 are advanced expendable countermeasures for flight effectiveness testing/ optimization flight tests in FY17. Perform flight effectiveness testing to evaluate enhanced techniques developed for MH-60S, MV-22, and UH-1Y in support of JUONS #SO-0010. ***FY 2017 Base Plans:*** N/A ***FY 2017 OCO Plans:*** N/A					
Accomplishments/Planned Programs Subtotals	3.623	5.436	0.000	0.000	0.000

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

Acquisition strategy is to leverage improvements in air expendable countermeasures technology and in Aircraft Survivability Equipment (ASE) integration to enhance platform survivability on USN and USMC platforms through more effective dispense techniques, invest in enhancements to modeling and simulation tools to better evaluate countermeasure effectiveness, upgrade test and evaluation equipment to incorporate current and future threats for effectiveness tests and develop and demonstrate advanced concept countermeasures for future threats. Advanced countermeasures procured in FY16 and delivered within 12 months will support flight test for optimized/advanced countermeasure techniques in FY17. New advanced countermeasures are then transitioned to the Procurement of Ammunition Navy and Marine

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0604279N / *(U)ASE Self Protection Optimization*	**Project (Number/Name)** 3309 / *Assault Survivability Optimization*

Corps appropriation for procurement and fielding. New optimized and advanced countermeasure techniques are delivered to government software support activities for fleet release to increase aircraft/aircrew survivability.

E. Performance Metrics

Maintain Air Expendable Countermeasures (AECM) ORD: #512-88-89 dated 28 May 99 requirement to provide operationally effective mixture of countermeasures that can be employed to degrade and/or neutralize the effectiveness of current and projected threats at or above aircraft key performance parameters for survivability. Countermeasure Techniques developed for improved survivability are further supported by Statement of Functionality for Aircraft Survivability Equipment Smart Dispense, dated 19 January 2012. PU 3309 efforts will continue to change in response to this requirement when similar threat proliferation, advances in countermeasures technology and integrated ASE capability advancements are accomplished.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0604279N / *(U)ASE Self Protection Optimization*	**Project (Number/Name)** 3309 / *Assault Survivability Optimization*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Expendable Countermeasure Technique Modeling and Simulation	WR	NSWC CRANE : Crane, IN	5.908	1.661	Oct 2014	1.746	Oct 2015	0.000		-		0.000	0.000	9.315	-
Expendable Countermeasure Technique Modeling and Simulation	SS/CPFF	Georgia Tech Research Institute : Atlanta, GA	0.000	0.000		0.100	Dec 2015	0.000		-		0.000	0.000	0.100	0.100
		Subtotal	5.908	1.661		1.846		0.000		-		0.000	0.000	9.415	-

Remarks

Modeling and simulation to develop advanced countermeasure techniques prior to flight test. JUONS #SO-0010 related modeling and simulation commenced October 2015.

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Test Mission Data File Software Development	WR	FRCSE : Jacksonville, FL	0.585	0.380	Feb 2015	0.360	Nov 2015	0.000		-		0.000	0.000	1.325	-
Prior year Support costs no longer funded in the FYDP	Various	Various : Various	2.610	0.000		0.000		0.000		-		0.000	0.000	2.610	-
		Subtotal	3.195	0.380		0.360		0.000		-		0.000	0.000	3.935	-

Remarks

Software development to create Mission Data Files (MDF) and enhanced operational flight program algorithms for flight effectiveness testing. JUONS #SO-0010 mission data file development commenced October 2015. JUONS test mission data file will be complete February 2016 and Operation MDF will be completed June 2016 for MH-60S.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0604279N / *(U)ASE Self Protection Optimization*	**Project (Number/Name)** 3309 / *Assault Survivability Optimization*

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Developmental T&E Flight Tests	WR	Various : Various	0.000	1.333	Mar 2015	0.800	Nov 2015	0.000		-		0.000	0.000	2.133	-
Advanced Countermeasures for Flight Tests	SS/FP	Esterline Inc. : Camden AR	0.000	0.219	Feb 2016	0.419	Mar 2016	0.000		-		0.000	0.000	0.638	0.419
Engineering and Evaluation for Technology Insertion	WR	NAWCWD : China Lake, CA	0.000	0.030	Oct 2015	0.231	Nov 2015	0.000		-		0.000	0.000	0.261	-
Prior year T&E no longer funded in the FYDP	Various	Various : Various	2.283	0.000		0.000		0.000		-		0.000	0.000	2.283	-
Seeker Test Van Advanced Threat Capability	MIPR	DOTC : Picatinny Arsenal, NJ	0.000	0.000		1.680	Jan 2016	0.000		-		0.000	0.000	1.680	-
		Subtotal	2.283	1.582		3.130		0.000		-		0.000	0.000	6.995	-

Remarks

FY15 developmental T&E effectiveness flight test following modeling and simulation evaluation for UH-1Y and MH-60R completed May 2015 at Eglin AFB. FY15 F/A-18E/F effectiveness flight test scheduled for July 2015 at Naval Air Weapons Station China Lake Edwards AFB was delayed one month due to range priorities and completed August 2015. CH-53E flight test delayed until August 2016 due to test range schedule and availability (other available test ranges could not accommodate flight test profiles).
FY15 OCO JUONS #SO-0010 flight test scheduled for March 2016
FY16 developmental T&E effectiveness flight test following modeling and simulation evaluation will occur for MV-22, P-8A, and MH-60S. FY15 Congressional mark delayed advanced countermeasure procurement until FY16. Flight effectiveness testing/optimization of advanced countermeasures will occur in FY17. FY15 flight effectiveness testing was performed utilizing Non-Combat Expenditure Allowance (NCEA) of current countermeasures. Advanced expendable countermeasures procured in FY16 and delivered within 12 months will support flight effectives testing /optimization flight tests in FY17. FY15 Seeker Test Van (STV) advanced threat capability item was eliminated due to congressional marks thereby delaying critical threat capability upgrades to Smart Dispense Van (SDV), STV, and Expeditionary Smart Dispense Van (ESDV). Equipment procurement required to evaluate advanced countermeasure techniques and integrate new threat systems into SDV, STV, and ESDV for evaluation capability will commence in FY16.

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Travel	WR	FRCSE : Jacksonville, FL	0.000	0.000		0.010	Nov 2015	0.000		-		0.000	0.000	0.010	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0604279N / *(U)ASE Self Protection Optimization*	Project (Number/Name) 3309 / *Assault Survivability Optimization*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Project Management	WR	FRCSE : Jacksonville, FL	0.000	0.000		0.090	Oct 2015	0.000		-		0.000	0.000	0.090	-
		Subtotal	0.000	0.000		0.100		0.000		-		0.000	0.000	0.100	-

Remarks

Project management required to coordinate increased development activities.

	Prior Years	FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	11.386	3.623		5.436		0.000		-		0.000	0.000	20.445	-

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0604279N / *(U)ASE Self Protection Optimization*	**Project (Number/Name)** 3309 / *Assault Survivability Optimization*

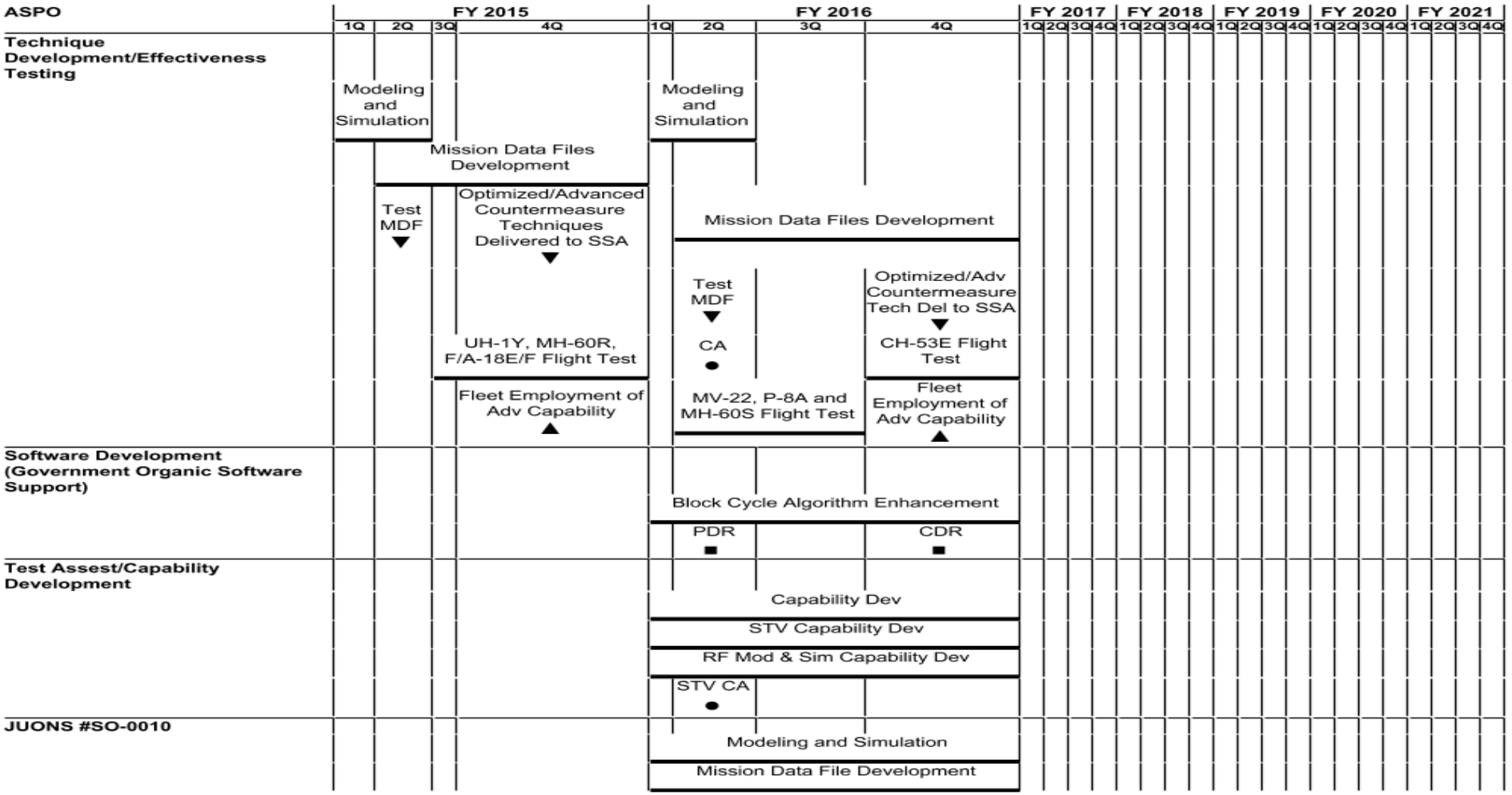
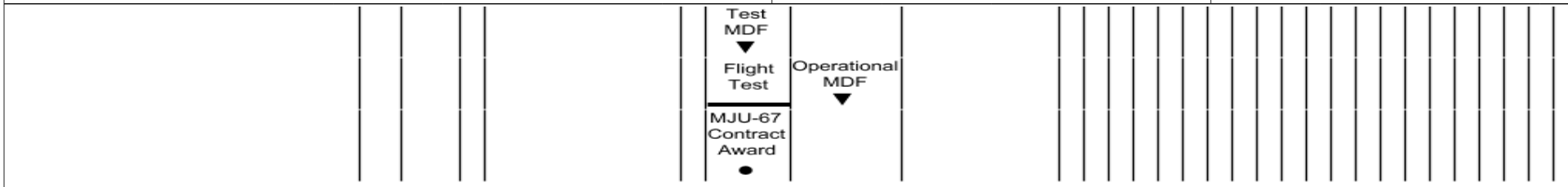


Exhibit R-4, RDT&E Schedule Profile: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0604279N / *(U)ASE Self Protection Optimization*	**Project (Number/Name)** 3309 / *Assault Survivability Optimization*



2017PB - 0604279N - 3309 Project units in PE 0604279N were moved to PE 0604270N in FY 17 and out.

Exhibit R-4A, RDT&E Schedule Details: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0604279N / *(U)ASE Self Protection Optimization*	**Project (Number/Name)** 3309 / *Assault Survivability Optimization*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
ASPO				
Technique Development/Effectiveness Testing: FY15 Modeling and Simulation	1	2015	2	2015
Technique Development/Effectiveness Testing: FY16 Modeling and Simulation	1	2016	2	2016
Technique Development/Effectiveness Testing: FY15 Mission Data Files (MDF) Development	2	2015	4	2015
Technique Development/Effectiveness Testing: FY15 Test MDF	2	2015	2	2015
Technique Development/Effectiveness Testing: FY15 Optimized/Advanced Countermeasure Techniques Delivered to Software Support Activity (SSA) for fleet release	4	2015	4	2015
Technique Development/Effectiveness Testing: FY16 Mission Data Files Development	2	2016	4	2016
Technique Development/Effectiveness Testing: FY16 Test MDF	2	2016	2	2016
Technique Development/Effectiveness Testing: FY16 Optimized/Advanced Countermeasure Techniques Delivered to Software Support Activity (SSA) for fleet release	4	2016	4	2016
Technique Development/Effectiveness Testing: Advanced Countermeasure Procurement for Flight Tests	2	2016	2	2016
Technique Development/Effectiveness Testing: FY15 Flight Test	3	2015	4	2015
Technique Development/Effectiveness Testing: FY15 CH-53E Flight Test	4	2016	4	2016
Technique Development/Effectiveness Testing: FY16 Flight Test	2	2016	3	2016
Technique Development/Effectiveness Testing: FY15 Fleet Employment of Advanced Capability	4	2015	4	2015
Technique Development/Effectiveness Testing: FY16 Fleet Employment of Advanced Capability	4	2016	4	2016

Exhibit R-4A, RDT&E Schedule Details: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0604279N / *(U)ASE Self Protection Optimization*	**Project (Number/Name)** 3309 / *Assault Survivability Optimization*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Software Development (Government Organic Software Support): Block Cycle 10 Algorithm Enhancement	1	2016	4	2016
Software Development (Government Organic Software Support): PDR	2	2016	2	2016
Software Development (Government Organic Software Support): CDR	4	2016	4	2016
Test Assest/Capability Development: SDV/ESDV Capability Development	1	2016	4	2016
Test Assest/Capability Development: STV Capability Development	1	2016	4	2016
Test Assest/Capability Development: RF Mod & Sim Capability Development	1	2016	4	2016
Test Assest/Capability Development: FY16 STV Contract Award	2	2016	2	2016
JUONS #SO-0010: Modeling and Simulation	1	2016	4	2016
JUONS #SO-0010: Mission Data Files Development	1	2016	4	2016
JUONS #SO-0010: Test Mission Data File	2	2016	2	2016
JUONS #SO-0010: Flight Test	2	2016	2	2016
JUONS #SO-0010: Operational Mission Data File	3	2016	3	2016
JUONS #SO-0010: MJU-67 Contract Award	2	2016	2	2016

Exhibit R-2, RDT&E Budget Item Justification: PB 2017 Navy											Date: February 2016	
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 4: *Advanced Component Development & Prototypes (ACD&P)*					R-1 Program Element (Number/Name) PE 0604292N *I (U)MH-XX*							
COST ($ in Millions)	**Prior Years**	**FY 2015**	**FY 2016**	**FY 2017 Base**	**FY 2017 OCO**	**FY 2017 Total**	**FY 2018**	**FY 2019**	**FY 2020**	**FY 2021**	**Cost To Complete**	**Total Cost**
Total Program Element	0.000	3.007	4.516	1.620	-	1.620	1.537	1.556	1.541	1.573	Continuing	Continuing
2934: *MH-XX*	0.000	3.007	4.516	1.620	-	1.620	1.537	1.556	1.541	1.573	Continuing	Continuing

Note

Proj: 2934 MH-XX has been moved from 0604212N per request of congress.

A. Mission Description and Budget Item Justification

The MH-XX project directs developmental activities in support of the replacement of the current inventory of Navy and Marine Corps helicopters in the 2030+ timeframe through the Joint Future Vertical Lift (FVL) family of systems program. Specific developmental activities will include: capability requirements definition, documentation, and approval; support to the Joint Multi-Role Technology Demonstrator (JMR TD) and Joint Future Vertical Lift, including Common Systems Integrated Product Team leadership, open hardware and software reference and objective architectures definition, mission system interoperability, and shipboard compatibility; Analysis of Alternatives planning and execution; and associated affordability studies. These activities will result in completion of all acquisition documentation required for a Material Development Decision in first quarter FY 2017 and MS-A in FY 2019. Follow-on activities support preparation and execution of efforts to develop common systems reference and objective open architectures, and eventual prototype aircraft flight demonstrations in support of the FVL Technology Maturation and Risk Reduction acquisition phase. Activities and technologies developed also have the potential to be leveraged for sustainment of legacy Navy and Marine Corps helicopters. These efforts will enable timely development of a system which provides best value and capability to the Joint Warfighter while maintaining effective and efficient war fighting capability in support of the Navy/Marine Corps 30-year Aviation Plan.

B. Program Change Summary ($ in Millions)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Previous President's Budget	3.055	5.298	1.715	-	1.715
Current President's Budget	3.007	4.516	1.620	-	1.620
Total Adjustments	-0.048	-0.782	-0.095	-	-0.095
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-0.782			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.048	0.000			
• Program Adjustments	0.000	0.000	-0.038	-	-0.038
• Rate/Misc Adjustments	0.000	0.000	-0.057	-	-0.057

Exhibit R-2, RDT&E Budget Item Justification: PB 2017 Navy	Date: February 2016
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 0604292N *I (U)MH-XX*

Change Summary Explanation

Decrease in MH-XX by $0.067M as required for the Department of the Navy to comply with the Bipartisan Budget Act of 2015.

Technical: Not applicable.
Schedule: Not applicable.

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0604292N / *(U)MH-XX*	Project (Number/Name) 2934 / *MH-XX*	

COST ($ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
2934: *MH-XX*	0.000	3.007	4.516	1.620	-	1.620	1.537	1.556	1.541	1.573	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The MH-XX project directs Naval Aviation developmental activities in support of the replacement of the Navy H-60 series helicopters, multi-mission medium lift helicopter capability, in the 2030+ timeframe. These aircraft will be used extensively to protect Joint assets from airborne, surface, and sub-surface threats. Other supported mission areas will include Combat Search and Rescue, Naval Special Warfare, Humanitarian Assistance/Disaster Relief, Logistics, and Medical Evacuation. Specific developmental activities will include: capability requirements definition documentation, and approval; support to the Joint Multi-Role Technology Demonstrator (JMR TD) and Joint Future Vertical Lift (FVL) including Common Systems Integrated Product Team leadership, open hardware and software reference and objective architectures definition, mission system interoperability, and shipboard compatibility; Analysis of Alternatives planning and execution; and associated affordability studies. These activities will result in completion of all pre-system acquisition documentation required for a Material Development Decision in first quarter FY 2017. These efforts will enable timely development of a system which provides best value to the Joint Warfighter and Naval Aviation while maintaining effective and efficient war fighting capability in support of the Navy's 30-year Aviation Plan.

JUSTIFICATION FOR BUDGET ACTIVITY: This program is funded under ADVANCED COMPONENT DEVELOPMENT AND PROTOTYPES because it includes efforts necessary to evaluate integrated technologies, representative models or prototype systems in a high fidelity and realistic operating environment.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Title: MH-XX Requirements Definition and Acquisition Documentation	3.007	4.516	1.620	0.000	1.620
Articles:	-	-	-	-	-
FY 2015 Accomplishments: Continue modeling and simulation; provide support for developmental activities which include capability requirements definition and development of the ICD, Analysis of Alternatives (AOA) Study Guidance and AOA Study Plan.					
FY 2016 Plans: Support to the JMR TD program to identify key maritime technologies; completion of pre-system acquisition activities which include Joint Requirement Capabilities Board (JROC) approval of the ICD and Cost Assessment and Program Evaluation (CAPE) approval of the AOA Study Guidance and AOA Study Plan leading to a Material Development Decision in 1QTR FY 2017.					
FY 2017 Base Plans:					

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0604292N / *(U)MH-XX*	**Project (Number/Name)** 2934 / *MH-XX*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Continue to support the JMR TD program to identify key maritime technologies. Execute AOA in accordance with Cost Assessment and Program Evaluation (CAPE) approved AOA Study Guidance and plan. Initiate Pre-Milestone A planning and documentation leading to a Milestone A decision in second quarter FY 2019. ***FY 2017 OCO Plans:*** N/A					
Accomplishments/Planned Programs Subtotals	3.007	4.516	1.620	0.000	1.620

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

Provide research and development support for Pre-Milestone A activities, predominantly government, to enable replacement of the Navy H-60 series helicopters, multi-mission medium lift helicopter capability, in the 2030+ timeframe.

E. Performance Metrics

Completion of Capability Requirements and Milestone Documentation.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0604292N / *(U)MH-XX*	Project (Number/Name) 2934 / *MH-XX*	

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Government Engineering Support	WR	NAWCAD : Patuxent River, MD	0.000	2.273	Mar 2015	1.921	Jan 2016	0.763	Nov 2016	-		0.763	Continuing	Continuing	Continuing
Trade Studies/ Requirements Analysis	Various	Various : Various	0.000	0.725	Apr 2015	1.502	Feb 2016	0.441	Mar 2017	-		0.441	Continuing	Continuing	Continuing
		Subtotal	0.000	2.998		3.423		1.204		-		1.204	-	-	-

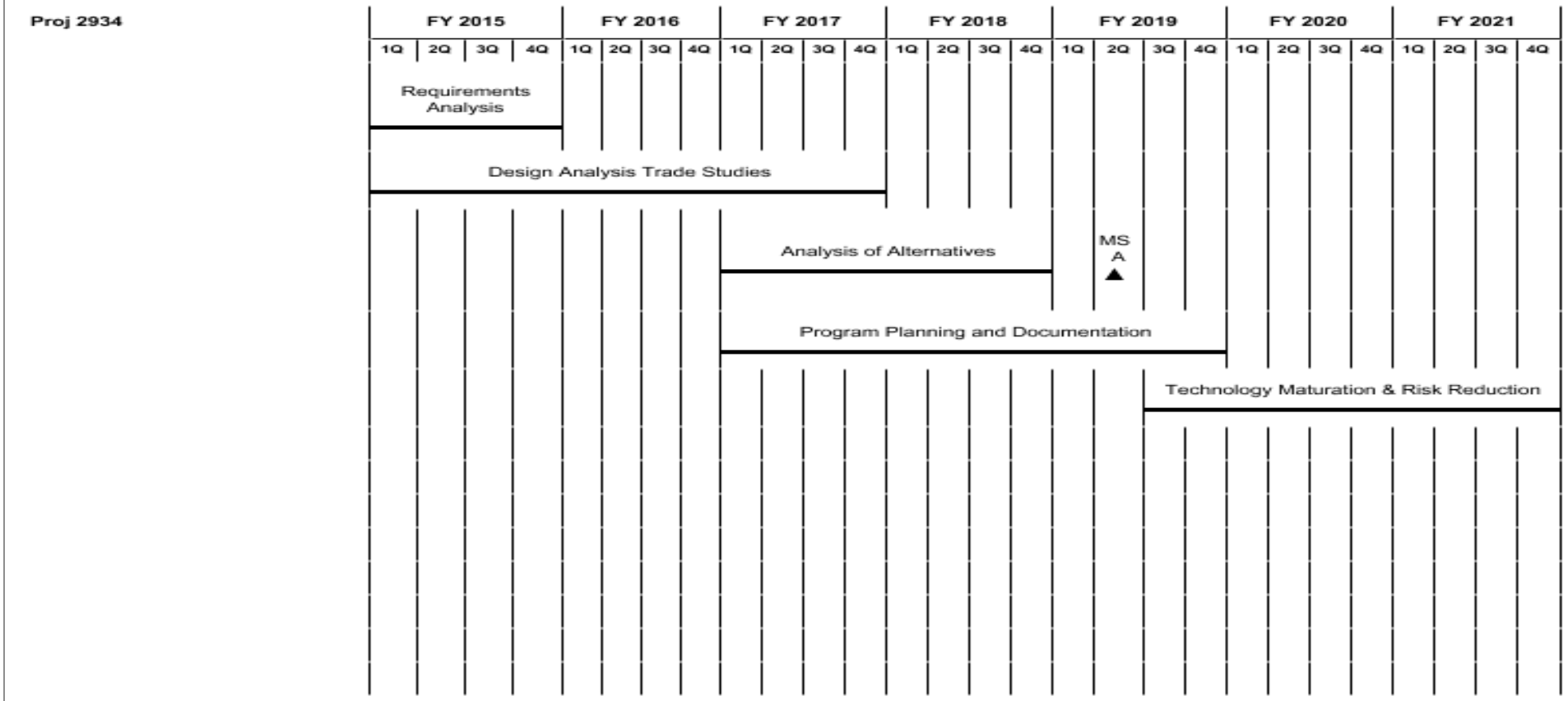
Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management	WR	NAWCAD : Patuxent River, MD	0.000	0.000		1.053	Jan 2016	0.403	Nov 2016	-		0.403	Continuing	Continuing	Continuing
Travel	Various	Various : Various	0.000	0.009	Jan 2015	0.040	Oct 2015	0.013	Oct 2016	-		0.013	Continuing	Continuing	Continuing
		Subtotal	0.000	0.009		1.093		0.416		-		0.416	-	-	-

	Prior Years	FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	3.007		4.516		1.620		-		1.620	-	-	-

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0604292N / *(U)MH-XX*	**Project (Number/Name)** 2934 / *MH-XX*



2017DON - 0604292N - 2934

Exhibit R-4A, RDT&E Schedule Details: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0604292N / *(U)MH-XX*	**Project (Number/Name)** 2934 / *MH-XX*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 2934				
Acquisition Milestones: Planning: Requirements Analysis	1	2015	4	2015
Acquisition Milestones: Planning: Design Analysis Trade Studies	1	2015	4	2017
Analysis of Alternatives	1	2017	4	2018
Milestone A	2	2019	2	2019
Acquisition Milestones: Planning: Program Planning and Documentation	1	2017	4	2019
Acquisition Milestones: Planning: Technology Maturation & Risk Reduction	3	2019	4	2021

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Exhibit R-2, RDT&E Budget Item Justification: PB 2017 Navy											Date: February 2016	
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 4: *Advanced Component Development & Prototypes (ACD&P)*					R-1 Program Element (Number/Name) PE 0604454N *I (U)LX (R)*							
COST ($ in Millions)	**Prior Years**	**FY 2015**	**FY 2016**	**FY 2017 Base**	**FY 2017 OCO**	**FY 2017 Total**	**FY 2018**	**FY 2019**	**FY 2020**	**FY 2021**	**Cost To Complete**	**Total Cost**
Total Program Element	0.000	32.522	75.486	6.354	-	6.354	8.730	4.075	9.387	9.617	Continuing	Continuing
2474: *LX(R) Design & Total Ship Integration*	0.000	32.522	46.486	6.354	-	6.354	8.730	4.075	9.387	9.617	Continuing	Continuing
9999: *Congressional Adds*	0.000	0.000	29.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	29.000
Program MDAP/MAIS Code: 461												

A. Mission Description and Budget Item Justification

2474 - LX(R) is expected to functionally replace LSD-41 Class ships and LSD-49 Class ships for embark, transport, control, insert, sustainment, and extract of Marine Air-Ground Task Force elements and supporting forces by helicopters, landing craft, and amphibious vehicles. Efforts are required to identify viable alternatives, including examining a reduced cost variant of LPD-17 Class. Efforts include Gate and Milestone (MS) reviews/documentation, Capability Development Document (CDD), Indicative/Preliminary/Contract Design (ID/PD/CD), and development of logistics and Test & Evaluation documentation. Program is on track to support FY26 retirement of LSDs.

FY12-FY14 LX(R) efforts previously budgeted in PE 0603564N.

B. Program Change Summary ($ in Millions)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Previous President's Budget	36.859	46.486	28.690	-	28.690
Current President's Budget	32.522	75.486	6.354	-	6.354
Total Adjustments	-4.337	29.000	-22.336	-	-22.336
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	29.000			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-3.305	0.000			
• SBIR/STTR Transfer	-1.032	0.000			
• Program Adjustments	0.000	0.000	-21.877	-	-21.877
• Rate/Misc Adjustments	0.000	0.000	-0.459	-	-0.459

Congressional Add Details ($ in Millions, and Includes General Reductions)	FY 2015	FY 2016
Project: 9999: *Congressional Adds*		
Congressional Add: *Accelerate LX(R)*	0.000	29.000

Exhibit R-2, RDT&E Budget Item Justification: PB 2017 Navy	Date: February 2016
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 0604454N *I (U)LX (R)*

Congressional Add Details ($ in Millions, and Includes General Reductions)	FY 2015	FY 2016
Congressional Add Subtotals for Project: 9999	0.000	29.000
Congressional Add Totals for all Projects	0.000	29.000

Change Summary Explanation

FY 2015 reflects reductions of $3.305 million in support of other department priorities and $1.032 million for SBIR transfers.

FY 2016 increase accounts for a Congressional Add of $29 million to accelerate the LX(R) program.

FY 2017 reductions includes a reduction of $19 million by the Navy as a result of the FY 2016 Congressional Add to accelerate the LX (R) program, $1.8 million reduction to account for prior year available balances, $1.077 million decrease for the Department of the Navy to comply with the Bipartisan Budget Act of 2015, and $0.459 million to account for other rates and miscellaneous adjustments.

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0604454N / *(U)LX (R)*	Project (Number/Name) 2474 / *LX(R) Design & Total Ship Integration*	

COST ($ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
2474: *LX(R) Design & Total Ship Integration*	0.000	32.522	46.486	6.354	-	6.354	8.730	4.075	9.387	9.617	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

2474 - LX(R) is expected to functionally replace LSD-41 Class ships and LSD-49 Class ships for embark, transport, control, insert, sustainment, and extract of Marine Air-Ground Task Force elements and supporting forces by helicopters, landing craft, and amphibious vehicles. Efforts are required to identify viable alternatives, including examining a reduced cost variant of LPD-17 Class. Efforts include Gate and Milestone (MS) reviews/documentation, Capability Development Document (CDD), Indicative/Preliminary/Contract Design (ID/PD/CD), and development of logistics and Test & Evaluation documentation. Program is on track to support FY26 retirement of LSDs.

FY12-FY14 LX(R) efforts previously budgeted in PE 0603564N.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Title: LX(R) DESIGN/TOTAL SHIP INTEGRATION	32.522	46.486	6.354	0.000	6.354
Articles:	-	-	-	-	-
FY 2015 Accomplishments: The indicative design transitioned into Preliminary Design where systems will be distributed and equipment and topside arrangements identified. Core design team members have been collocated to improve communication and enhance efficiency, as the level of participation from shipbuilders, ship design agents, Naval Warfare Centers, PEO C4I, PEO IWS, NAVAIR, and Marine Corps continues to intensify. Acquisition and life cycle affordability trade-off analysis studies continued as the design was developed to meet the draft Capability Development Document (CDD). Decision Memo dated 14 October 2014 signed by Chief of Naval Operations, Commandant of the Marine Corps, and Assistant Secretary of the Navy (Research, Development, and Acquisition) and subsequently approved by the Secretary of the Navy determined that the LPD 17 hull form is the preferred alternative to meet LX(R) operational requirements. The Navy Gate 2 Review, held 18 December 2014, solidified the LPD 17 hull form as the one alternative to carry forward for LX(R). There is a significant level of planning and design maturation required to support a Milestone A or DAE Review, including the Acquisition Strategy (AS), Systems Engineering Plan (SEP), Test and Evaluation Master Plan (TEMP) and a sustainment strategy. The CDD has been submitted for Navy approval and will be submitted for Joint Requirements Oversight Council (JROC) approval.					
FY 2016 Plans:					

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0604454N / *(U)LX (R)*	**Project (Number/Name)** 2474 / *LX(R) Design & Total Ship Integration*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Transitioning from Preliminary Design into Contract Design, requires subsystem level of detail and most significantly a design that supports the development of a specification for a Gate 4, Gate 5, Requirement Decision Point, and System Functional Review (SFR). The Capabilities Development Document (CDD) will be approved by the Joint Requirements Oversight Council (JROC) in early FY 2016, which will further inform the development of the ship specification. The contract design effort will explore innovative and cost saving concepts such as flexible infrastructure, incorporation of commonality products, and a common design environment. Continue participation by Shipbuilders to support affordability trade-offs and informing a producible design. ***FY 2017 Base Plans:*** Continue and complete Contract Design, which requires subsystem level of detail and most significantly a design that supports the development of a specification for a Gate 5, Requirement Decision Point, and System Functional Review (SFR). Develop and finalize technical data package (TDP) in support of a competitive Request for Proposal (RFP) release and Gate 5. ***FY 2017 OCO Plans:*** N/A					
Accomplishments/Planned Programs Subtotals	32.522	46.486	6.354	0.000	6.354

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
• SCN/3010: *Amphibious Ship Replacement LX(R)*	0.000	250.000	0.000	-	0.000	0.000	45.751	1,499.107	0.000	Continuing	Continuing

Remarks

D. Acquisition Strategy

Predecisional, expect competition will be part of the acquisition strategy.

E. Performance Metrics

Predecisional, performance metrics will be developed in parallel with the CDD.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0604454N / *(U)LX (R)*	**Project (Number/Name)** 2474 / *LX(R) Design & Total Ship Integration*

Product Development ($ in Millions)

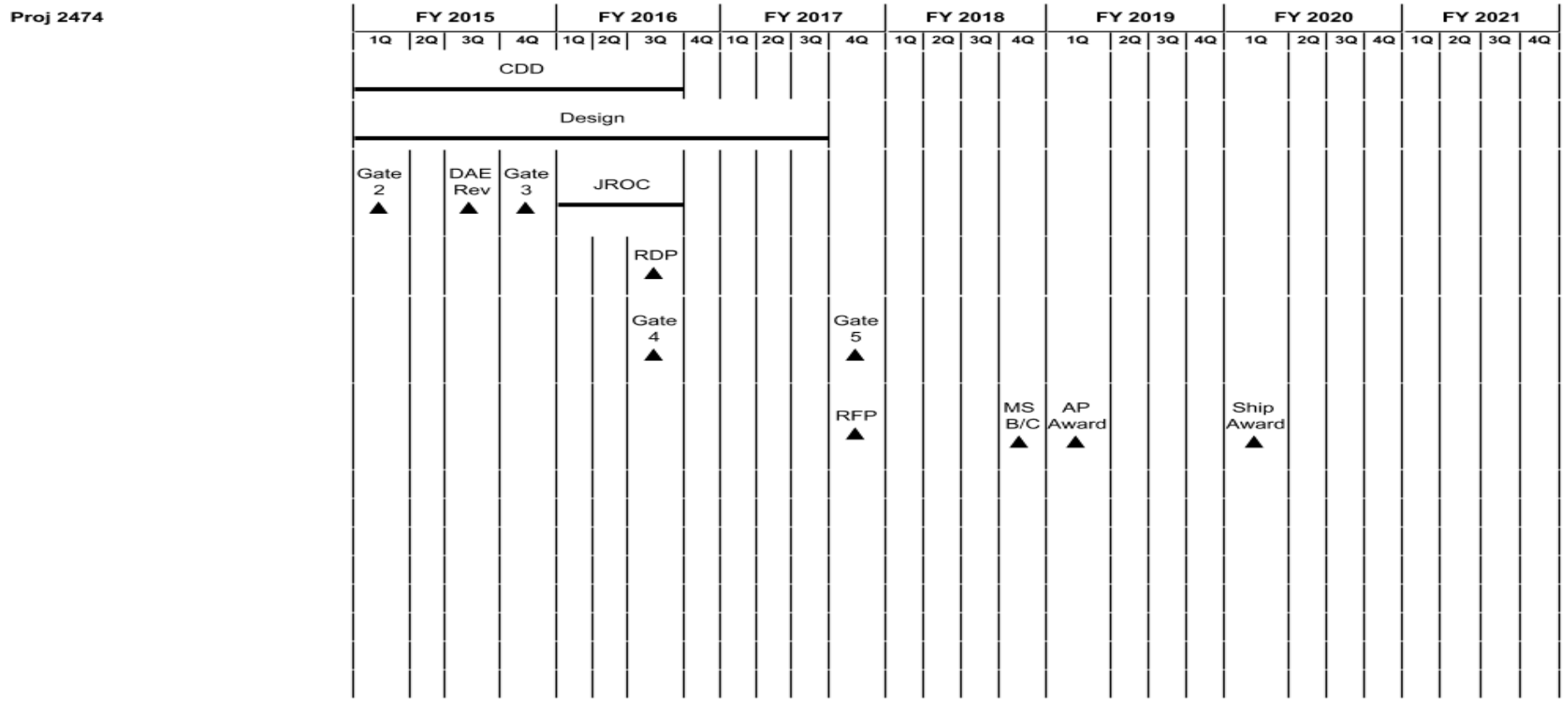
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Design/Systems Integration	C/CPIF	CSC, Alion, ICI : Washington, DC	0.000	12.062	Jan 2015	17.857	Dec 2015	0.000		-		0.000	Continuing	Continuing	Continuing
Design/Systems Integration	WR	NSWC Carderock/ SSES Philadelphia : NSWC Beth, MD/ SSES Philadelphia, PA	0.000	5.742	Jan 2015	8.308	Nov 2015	3.001	Nov 2016	-		3.001	Continuing	Continuing	Continuing
Design/Systems Integration	WR	NSWC Dahlgren : Dahlgren, VA	0.000	0.712	Jan 2015	0.602	Nov 2015	0.689	Nov 2016	-		0.689	Continuing	Continuing	Continuing
Design/Systems Integration	WR	PEO C4I, PEO IWS : Washington, DC	0.000	1.562	Jan 2015	5.544	Nov 2015	1.709	Nov 2016	-		1.709	Continuing	Continuing	Continuing
Design/Systems Integration	WR	NAWC Lakehurst : Lakehurst, NJ	0.000	0.719	Jan 2015	1.057	Nov 2015	0.394	Nov 2016	-		0.394	Continuing	Continuing	Continuing
Design/Systems Integration	C/BA	NSWC, Panama City : Panama City, FL	0.000	0.470	Jan 2015	0.617	Nov 2015	0.268	Nov 2016	-		0.268	0.000	1.355	-
Design/Systems Integration	WR	NSWC, Port Hueneme : Port Hueneme, CA	0.000	0.340	Jan 2015	0.576	Nov 2015	0.293	Nov 2016	-		0.293	Continuing	Continuing	Continuing
Design/Systems Integration	C/CPFF	HII, General Dynamics : Various	0.000	10.915	Feb 2015	11.925	Dec 2015	0.000		-		0.000	Continuing	Continuing	Continuing
		Subtotal	0.000	32.522		46.486		6.354		-		6.354	-	-	-

	Prior Years	FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	32.522		46.486		6.354		-		6.354	-	-	-

Remarks

FY 2017 funding requirements support the continuation and completion of Contract Design (CD) efforts supporting the competitive Request for Proposal (RFP) release.

Exhibit R-4, RDT&E Schedule Profile: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0604454N / *(U)LX (R)*	**Project (Number/Name)** 2474 / *LX(R) Design & Total Ship Integration*



2017PB - 0604454N - 2474

Exhibit R-4A, RDT&E Schedule Details: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0604454N / *(U)LX (R)*	**Project (Number/Name)** 2474 / *LX(R) Design & Total Ship Integration*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 2474				
Capabilities Development Documentation (CDD)	1	2015	3	2016
Indicative/Preliminary Design/Contract Design	1	2015	3	2017
Gate 2	1	2015	1	2015
DAE Review	3	2015	3	2015
Gate 3	4	2015	4	2015
Joint Requirements Oversight Council (JROC) CDD Approval	1	2016	3	2016
Requirements Decision Point (RDP)	3	2016	3	2016
Gate 4	3	2016	3	2016
Gate 5	4	2017	4	2017
RFP Release Decision Point	4	2017	4	2017
Milestone B/C or FRP	4	2018	4	2018
AP and Lead Ship Detail Design Award	1	2019	1	2019
Lead Ship Construction Award	1	2020	1	2020

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0604454N / *(U)LX (R)*	Project (Number/Name) 9999 / *Congressional Adds*	

COST ($ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
9999: *Congressional Adds*	0.000	0.000	29.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	29.000
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

FY16 Congressional Add to accelerate LX(R)

B. Accomplishments/Planned Programs ($ in Millions)	FY 2015	FY 2016
Congressional Add: Accelerate LX(R)	0.000	29.000
FY 2015 Accomplishments: N/A		
FY 2016 Plans: Transitioning from Preliminary Design into Contract Design, requires subsystem level of detail and most significantly a design that supports the development of a specification for a Gate 4, Gate 5, Requirement Decision Point, and System Functional Review (SFR). The Capabilities Development Document (CDD) will be approved by the Joint Requirements Oversight Council (JROC) in early FY 2016, which will further inform the development of the ship specification. The contract design effort will explore innovative and cost saving concepts such as flexible infrastructure, incorporation of commonality products, and a common design environment. Continue participation by Shipbuilders to support affordability trade-offs and informing a producible design.		
Congressional Adds Subtotals	0.000	29.000

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

Predecisional, expect competition will be part of the acquisition strategy.

E. Performance Metrics

Predecisional, performance metrics will be developed in parallel with the CDD.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0604454N / *(U)LX (R)*	**Project (Number/Name)** 9999 / *Congressional Adds*

Product Development ($ in Millions)

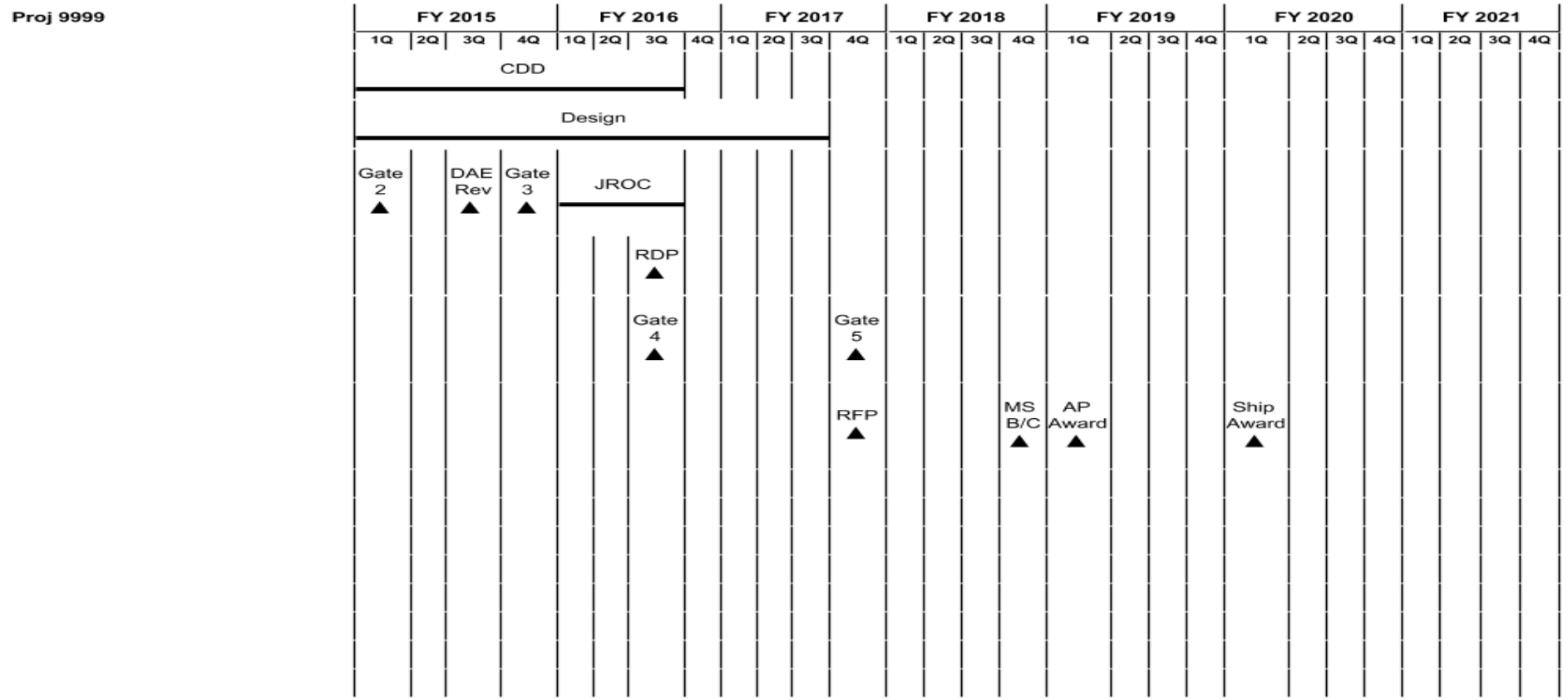
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Design/Systems Integration	C/CPIF	CSC, Alion, ICI : Washington, DC	0.000	0.000		9.051	Feb 2016	0.000		-		0.000	0.000	9.051	-
Design/Systems Integration	WR	NSWC Carderock/ SSES Philadelphia : Bethesda, MD/ Philadelphia, PA	0.000	0.000		7.792	Feb 2016	0.000		-		0.000	0.000	7.792	-
Design/Systems Integration	WR	NSWC Dahlgren : Dahlgren, VA	0.000	0.000		0.839	Feb 2016	0.000		-		0.000	0.000	0.839	-
Design/Systems Integration	WR	PEO C4I, PEO IWS : Washington, DC	0.000	0.000		2.080	Feb 2016	0.000		-		0.000	0.000	2.080	-
Design/Systems Integration	WR	NAWC Lakehurst : Lakehurst, NJ	0.000	0.000		0.480	Feb 2016	0.000		-		0.000	0.000	0.480	-
Design/Systems Integration	WR	NSWC Panama City : Panama City, FL	0.000	0.000		0.326	Feb 2016	0.000		-		0.000	0.000	0.326	-
Design/Systems Integration	WR	NSWC Port Hueneme : Port Hueneme, CA	0.000	0.000		0.357	Feb 2016	0.000		-		0.000	0.000	0.357	-
Design/Systems Integration	C/CPFF	HII, General Dynamics : Various	0.000	0.000		8.075	Feb 2016	0.000		-		0.000	0.000	8.075	-
		Subtotal	0.000	0.000		29.000		0.000		-		0.000	0.000	29.000	-

	Prior Years	FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	0.000		29.000		0.000		-		0.000	0.000	29.000	-

Remarks

FY 2017 funding requirements support the continuation and completion of Contract Design (CD) efforts supporting the competitive Request for Proposal (RFP) release.

Exhibit R-4, RDT&E Schedule Profile: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0604454N / *(U)LX (R)*	**Project (Number/Name)** 9999 / *Congressional Adds*



2017PB - 0604454N - 9999

Exhibit R-4A, RDT&E Schedule Details: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0604454N / *(U)LX (R)*	**Project (Number/Name)** 9999 / *Congressional Adds*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 9999				
Capabilities Development Documentation (CDD)	1	2015	3	2016
Indicative/Preliminary Design/Contract Design	1	2015	3	2017
Gate 2	1	2015	1	2015
DAE Review	3	2015	3	2015
Gate 3	4	2015	4	2015
Joint Requirements Oversight Council (JROC) CDD Approval	1	2016	3	2016
Requirements Decision Point (RDP)	3	2016	3	2016
Gate 4	3	2016	3	2016
Gate 5	4	2017	4	2017
RFP Release Decision Point	4	2017	4	2017
Milestone B/C or FRP	4	2018	4	2018
AP and Lead Ship Detail Design Award	1	2019	1	2019
Lead Ship Construction Award	1	2020	1	2020

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Exhibit R-2, RDT&E Budget Item Justification: PB 2017 Navy											Date: February 2016	
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 4: *Advanced Component Development & Prototypes (ACD&P)*					R-1 Program Element (Number/Name) PE 0604536N *I (U)Advanced Undersea Prototyping*							
COST ($ in Millions)	**Prior Years**	**FY 2015**	**FY 2016**	**FY 2017 Base**	**FY 2017 OCO**	**FY 2017 Total**	**FY 2018**	**FY 2019**	**FY 2020**	**FY 2021**	**Cost To Complete**	**Total Cost**
Total Program Element	0.000	0.000	0.000	78.589	-	78.589	87.844	160.272	117.596	43.877	Continuing	Continuing
3393: *Adv Undersea Prototyping-Remote Command & Control*	0.000	0.000	0.000	10.821	-	10.821	10.902	49.161	43.967	5.541	Continuing	Continuing
3394: *Adv Undersea Prototyping-Vehicles, Propulsion & Navigation*	0.000	0.000	0.000	57.768	-	57.768	41.942	68.111	49.629	22.336	Continuing	Continuing
3395: *Adv Undersea Prototyping-Explosive Payloads*	0.000	0.000	0.000	4.404	-	4.404	27.194	29.010	24.000	16.000	Continuing	Continuing
3396: *Adv Undersea Prototyping-Non-Lethal Payloads*	0.000	0.000	0.000	5.596	-	5.596	7.806	13.990	0.000	0.000	0.000	27.392

A. Mission Description and Budget Item Justification

Advanced undersea prototyping and test of Extra Large Unmanned Undersea Vehicles (XLUUVs) will advance the development of unmanned undersea vehicles systems by leveraging existing ONR UUVs designs that are greater than 54 inches in diameter. Payloads will be customized to meet Navy needs and demonstrate useful capability for the fleet. Utilize fleet demonstrations of XLUUVs to rapidly and affordably capture tactics, techniques, and procedures in operating XLUUVs prior to formal introduction of XLUUV programs of record to the fleet. Demonstrate launch, communications, command and control, navigation, endurance, recovery, payload feasibility, and mission planning and execution for XLUUVs. XLUUV energy prototyping will leverage existing independent research and development in energy-dense technology that meet power requirements for XLUUV missions that are limited by the amount of power currently available. Efforts under this program element include research, development, test, and evaluation of advanced development model energy solutions applicable to XLUUVs for increased energy endurance and efficiency to extend the reach of unmanned undersea systems.

Exhibit R-2, RDT&E Budget Item Justification: PB 2017 Navy					Date: February 2016
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 4: *Advanced Component Development & Prototypes (ACD&P)*			R-1 Program Element (Number/Name) PE 0604536N *I (U)Advanced Undersea Prototyping*		
B. Program Change Summary ($ in Millions)	**FY 2015**	**FY 2016**	**FY 2017 Base**	**FY 2017 OCO**	**FY 2017 Total**
Previous President's Budget	0.000	0.000	0.000	-	0.000
Current President's Budget	0.000	0.000	78.589	-	78.589
Total Adjustments	0.000	0.000	78.589	-	78.589
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Program Adjustments	0.000	0.000	78.589	-	78.589

Change Summary Explanation

Technical: Not applicable.

Schedule: Not applicable.

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0604536N / *(U)Advanced Undersea Prototyping*	Project (Number/Name) 3393 / *Adv Undersea Prototyping-Remote Command & Control*	

COST ($ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
3393: *Adv Undersea Prototyping-Remote Command & Control*	0.000	0.000	0.000	10.821	-	10.821	10.902	49.161	43.967	5.541	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Advanced Undersea energy prototyping will leverage existing independent research and development in energy-dense technology that meets power requirements for Unmanned Undersea Vehicle (UUV) missions, which are limited by the amount of power that they can carry. Efforts under this program element include research, development, test, and evaluation of advanced development model energy solutions applicable to XLUUVs for increased energy endurance and efficiency to extend the reach of unmanned undersea systems.

This project funds risk reduction activities to include advanced development prototyping and demonstrations to accelerate the design and development of commonality and interoperability capabilities for the cross-domain (Aviation, Surface, Sub-Surface, and Ground) requirements of the Navy. Leveraging products provided by the Common Control System, these efforts will demonstrate scalable, adaptable and interoperable warfighting capabilities across the Naval cross-domain environment. The advanced development emphasis will be to encourage innovation and enable rapid integration of UxS capabilities across all domains. These efforts will define, develop and demonstrate capability that advances new technology, hardware and software of Control Systems that could be ship, shore, airborne, or expeditionary based to operate multiple and dissimilar Naval (UxSs). Supports Advanced Development and Prototyping of PE 0305205N: UAS Integration and Interoperability.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Title: Advanced Energy Product Development	0.000	0.000	6.474	0.000	6.474
Articles:	-	-	-	-	-
FY 2015 Accomplishments: N/A					
FY 2016 Plans: N/A					
FY 2017 Base Plans: Develop energy prototype components that leverage existing independent research and development in energy-dense technology to meet power requirements for XLUUV missions. Begin Advanced Development Model prototype development.					
FY 2017 OCO Plans:					

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0604536N / *(U)Advanced Undersea Prototyping*	**Project (Number/Name)** 3393 / *Adv Undersea Prototyping-Remote Command & Control*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
N/A					
Title: Advanced Energy Support	0.000	0.000	0.791	0.000	0.791
Articles:	-	-	-	-	-
FY 2015 Accomplishments: N/A					
FY 2016 Plans: N/A					
FY 2017 Base Plans: Support Navy technical requirements, engineering, analysis, and design necessary to utilize energy technology applicable to fleet needs for increased energy endurance and efficiency to extend reach of unmanned undersea systems.					
FY 2017 OCO Plans: N/A					
Title: Advanced Energy Management	0.000	0.000	3.556	0.000	3.556
Articles:	-	-	-	-	-
FY 2015 Accomplishments: N/A					
FY 2016 Plans: N/A					
FY 2017 Base Plans: Provide technical guidance, project planning for advanced energy prototyping. Provide financial and contracting support. Provide Coordination between prototype developer, test support, engineering, and contractors. Project planning and program management for development of UxS cross-domain common control convergence will begin in FY 2017. FY 2017 plans include initial cross-domain requirements analyses, schedule and cost estimate planning, and planning for advanced development and prototyping activities to include any required studies.					
FY 2017 OCO Plans:					

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0604536N / *(U)Advanced Undersea Prototyping*	**Project (Number/Name)** 3393 / *Adv Undersea Prototyping-Remote Command & Control*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
N/A					
Accomplishments/Planned Programs Subtotals	0.000	0.000	10.821	0.000	10.821

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

Design Advanced Energy components to reach Preliminary Design Review in FY18. Develop and build Advanced Development Model prototype and integrate system. Test Advanced Development Model prototype in FY 2021.

In coordination with UxS platforms, effort will eliminate redundant efforts, encourage innovation, and improve cost control of unmanned systems across multiple domains. Leveraging the available Common Control System (CCS) Vehicle Management (VM) and Mission Management/Mission Planning (MM/MP) capabilities and products, these risk reduction and advanced development efforts will include emerging or legacy platform components to demonstrate commonality and interoperability concepts across Naval operating domains. Using an open system architecture and an incremental development approach to encourage industry innovation and allow for rapid integration, the Advanced Development Directorate will leverage existing competitively-awarded contract vehicles, resources and prototype expertise from the other Naval SYSCOMs (i.e. NAVSEA, SPAWAR), and Naval Research activities (i.e. Office of Naval Research (ONR), Naval Research Laboratory (NRL)).

E. Performance Metrics

Demonstrate use of advanced UUV Energy technology in an Advanced Development Model prototype.

The risk reduction and advanced development efforts will use a Service-Oriented Architecture based on the OSD Unmanned Control Segment (UCS) architecture in order to maximize innovation, flexibility and technology adaptation. Each demonstration will set its respective demonstration goals/objectives and measures of success according to the stakeholder and responsible sponsor requirements

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0604536N / *(U)Advanced Undersea Prototyping*	Project (Number/Name) 3393 / *Adv Undersea Prototyping-Remote Command & Control*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Energy Prototype Contract	SS/CPFF	ARL PSU : State College, PA	0.000	0.000		0.000		6.474	Jan 2017	-		6.474	Continuing	Continuing	Continuing
		Subtotal	0.000	0.000		0.000		6.474		-		6.474	-	-	-

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Energy Prototype Engineering Support 1	SS/CPFF	ARL PSU : State College, PA	0.000	0.000		0.000		0.561	Jan 2017	-		0.561	Continuing	Continuing	Continuing
Energy Prototype Engineering Support 2	WR	NUWC Newport : Newport, RI	0.000	0.000		0.000		0.230	Dec 2016	-		0.230	Continuing	Continuing	Continuing
		Subtotal	0.000	0.000		0.000		0.791		-		0.791	-	-	-

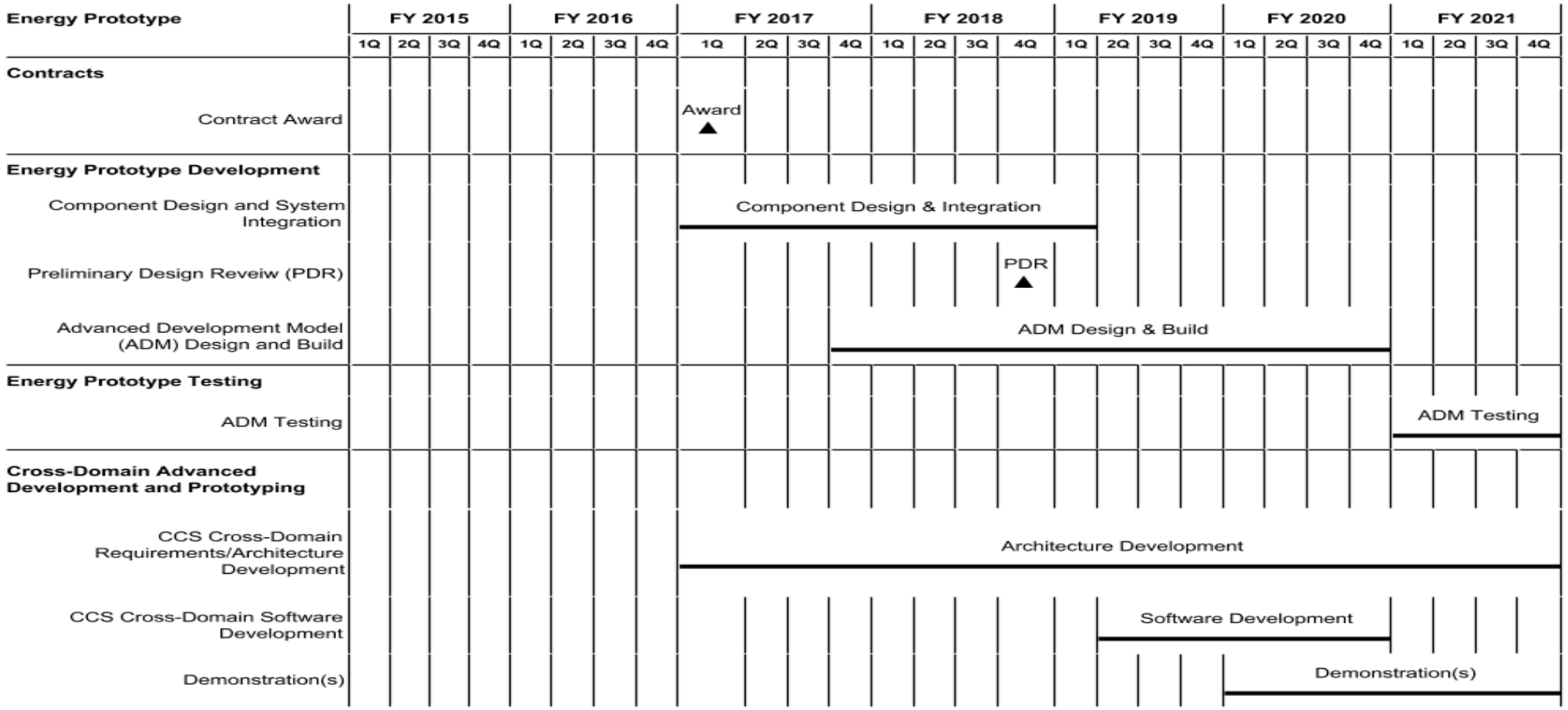
Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Energy Prototype Management	Various	Various : Various	0.000	0.000		0.000		0.098	Dec 2016	-		0.098	Continuing	Continuing	Continuing
Energy Prototype Travel	Various	NAVSEA : Washington, DC	0.000	0.000		0.000		0.008	Jun 2017	-		0.008	Continuing	Continuing	Continuing
Common Control System (CCS)	Various	NAVAIR : Not Specified	0.000	0.000		0.000		3.450	Nov 2016	-		3.450	0.000	3.450	-
		Subtotal	0.000	0.000		0.000		3.556		-		3.556	-	-	-

	Prior Years	FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	0.000		0.000		10.821		-		10.821	-	-	-

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0604536N / *(U)Advanced Undersea Prototyping*	**Project (Number/Name)** 3393 / *Adv Undersea Prototyping-Remote Command & Control*



2017PB - 0604536N - 3393

Exhibit R-4A, RDT&E Schedule Details: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0604536N / *(U)Advanced Undersea Prototyping*	**Project (Number/Name)** 3393 / *Adv Undersea Prototyping-Remote Command & Control*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Energy Prototype				
Contracts: Contract Award: Contract Award	1	2017	1	2017
Energy Prototype Development: Component Design and System Integration: Component Design and System Integration	1	2017	1	2019
Energy Prototype Development: Preliminary Design Reveiw (PDR): Preliminary Design Reveiw (PDR)	4	2018	4	2018
Energy Prototype Development: Advanced Development Model (ADM) Design and Build: Advanced Development Model (ADM) Design and Build	4	2017	4	2020
Energy Prototype Testing: ADM Testing: ADM Testing	1	2021	4	2021
Cross-Domain Advanced Development and Prototyping: CCS Cross-Domain Requirements/Architecture Development: Architecture Development	1	2017	4	2021
Cross-Domain Advanced Development and Prototyping: CCS Cross-Domain Software Development: Software Development	2	2019	4	2020
Cross-Domain Advanced Development and Prototyping: Demonstration(s): Demonstration(s)	1	2020	4	2021

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0604536N / *(U)Advanced Undersea Prototyping*	Project (Number/Name) 3394 / *Adv Undersea Prototyping-Vehicles, Propulsion & Navigation*	

COST ($ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
3394: *Adv Undersea Prototyping-Vehicles, Propulsion & Navigation*	0.000	0.000	0.000	57.768	-	57.768	41.942	68.111	49.629	22.336	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Advanced undersea prototyping and test of Extra Large Unmanned Undersea Vehicle Systems (XLUUVs) will advance the development of unmanned undersea vehicles by leveraging existing Commercial Off The Shelf (COTS) UUVs that are greater than 54 inches in diameter. Payloads will be customized to meet Navy needs and demonstrate useful capability for the fleet. Utilize fleet demonstrations of XLUUVs to rapidly and affordably capture tactics, techniques, and procedures in operating XLUUVs prior to formal introduction of XLUUV programs of record to the fleet. Demonstrate launch, communications, command and control, navigation, endurance, recovery, payload feasibility, and mission planning and execution for XLUUVs. XLUUV energy prototyping will leverage existing independent research and development in energy-dense technology that meet power requirements for XLUUV missions that are limited by the amount of power currently available. Efforts under this program element include research, development, test, and evaluation of advanced development model energy solutions applicable to XLUUVs for increased energy endurance and efficiency to extend the reach of unmanned undersea systems.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Title: XLUUV Product Development	0.000	0.000	52.250	0.000	52.250
Articles:	-	-	-	-	-
FY 2015 Accomplishments: N/A					
FY 2016 Plans: N/A					
FY 2017 Base Plans: Utilize a Commercial off the Shelf (COTS) XLUUV greater than 54 inches in diameter for initial demonstration, and develop a modified COTS prototype XLUUV for demonstration by the fleet. Develop prototype energy source that leverages existing independent research and development in energy-dense technology to meet power requirements for XLUUV missions. Modify COTS UUV payload to meet Navy capability needs.					
FY 2017 OCO Plans: N/A					
Title: XLUUV Support	0.000	0.000	5.000	0.000	5.000

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0604536N / *(U)Advanced Undersea Prototyping*	**Project (Number/Name)** 3394 / *Adv Undersea Prototyping-Vehicles, Propulsion & Navigation*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Articles:	-	-	-	-	-
FY 2015 Accomplishments: N/A ***FY 2016 Plans:*** N/A ***FY 2017 Base Plans:*** Support Navy technical requirements, engineering, analysis, and design necessary to utilize COTS XLUUVs, modified COTS XLUUVs, and energy technology applicable to fleet needs for increased energy endurance and efficiency to extend reach of unmanned undersea systems. Support analysis required for customization of COTS XLUUV payload. ***FY 2017 OCO Plans:*** N/A					
Title: XLUUV Management Services	0.000	0.000	0.518	0.000	0.518
Articles:	-	-	-	-	-
FY 2015 Accomplishments: N/A ***FY 2016 Plans:*** N/A ***FY 2017 Base Plans:*** Provide technical guidance, project planning and travel for XLUUV prototyping, financial and contracting support, and coordinate work with Fleet, test support, engineering support, and contractors. ***FY 2017 OCO Plans:*** N/A					
Accomplishments/Planned Programs Subtotals	0.000	0.000	57.768	0.000	57.768

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0604536N / *(U)Advanced Undersea Prototyping*	**Project (Number/Name)** 3394 / *Adv Undersea Prototyping-Vehicles, Propulsion & Navigation*

D. Acquisition Strategy

Five XLUUV systems will be procured for demonstration both CONUS and in the PACOM theater. Payload developed under projects 3395 and 3394 will be integrated onto these vehicles to be included in fleet experimentation throughout the program to gain experience and develop CONOPS and TTPs. One vehicle will be used for experimentation with integration on surface ship, initially investigating amphibious ships with well deck. Lease Commercial Off The Shelf (COTS) XLUUV for initial fleet demonstrations in FY 2017 and FY 2018. Award sole source modified COTS XLUUV prototype contract in FY 2017.

E. Performance Metrics

Successfully demonstrate XLUUV with Fleet.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0604536N / *(U)Advanced Undersea Prototyping*	Project (Number/Name) 3394 / *Adv Undersea Prototyping-Vehicles, Propulsion & Navigation*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Payload Design documentation	C/BA	Metron : Sterling, VA	0.000	0.000		0.000		0.250	Oct 2016	-		0.250	Continuing	Continuing	Continuing
Fabrication of 5 XLUUVs, battery energy section, Mine warfare payload	C/BA	Various : Not Specified	0.000	0.000		0.000		52.000	Mar 2017	-		52.000	78.000	130.000	-
		Subtotal	0.000	0.000		0.000		52.250		-		52.250	-	-	-

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Design analysis	MIPR	NSWC : Washington, D.C	0.000	0.000		0.000		0.500	Oct 2016	-		0.500	2.500	3.000	-
Payload Analysis	MIPR	NRL : WASHINGTON, D.C.	0.000	0.000		0.000		0.500	Nov 2016	-		0.500	2.500	3.000	-
COTS Vechicle UUV Testing	SS/BA	BOEING : Anaheim, CA	0.000	0.000		0.000		4.000	Mar 2017	-		4.000	12.000	16.000	-
		Subtotal	0.000	0.000		0.000		5.000		-		5.000	17.000	22.000	-

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Test support (openly competed)	C/BA	VARIOUS : TBD	0.000	0.000		0.000		0.000		-		0.000	40.000	40.000	-
Test director	MIPR	SPAWAR : SAN DIEGO, CA	0.000	0.000		0.000		0.000	Oct 2016	-		0.000	3.750	3.750	-
Demonstration of XLUUV off well deck ship (openly competed)	C/BA	VARIOUS : TBD	0.000	0.000		0.000		0.000	Nov 2016	-		0.000	9.000	9.000	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0604536N / *(U)Advanced Undersea Prototyping*	Project (Number/Name) 3394 / *Adv Undersea Prototyping-Vehicles, Propulsion & Navigation*	

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Demonstration of multple XLUUVs in PACOM theater (openly competed)	C/BA	VARIOUS : TBD	0.000	0.000		0.000		0.000		-		0.000	10.000	10.000	-
		Subtotal	0.000	0.000		0.000		0.000		-		0.000	62.750	62.750	-

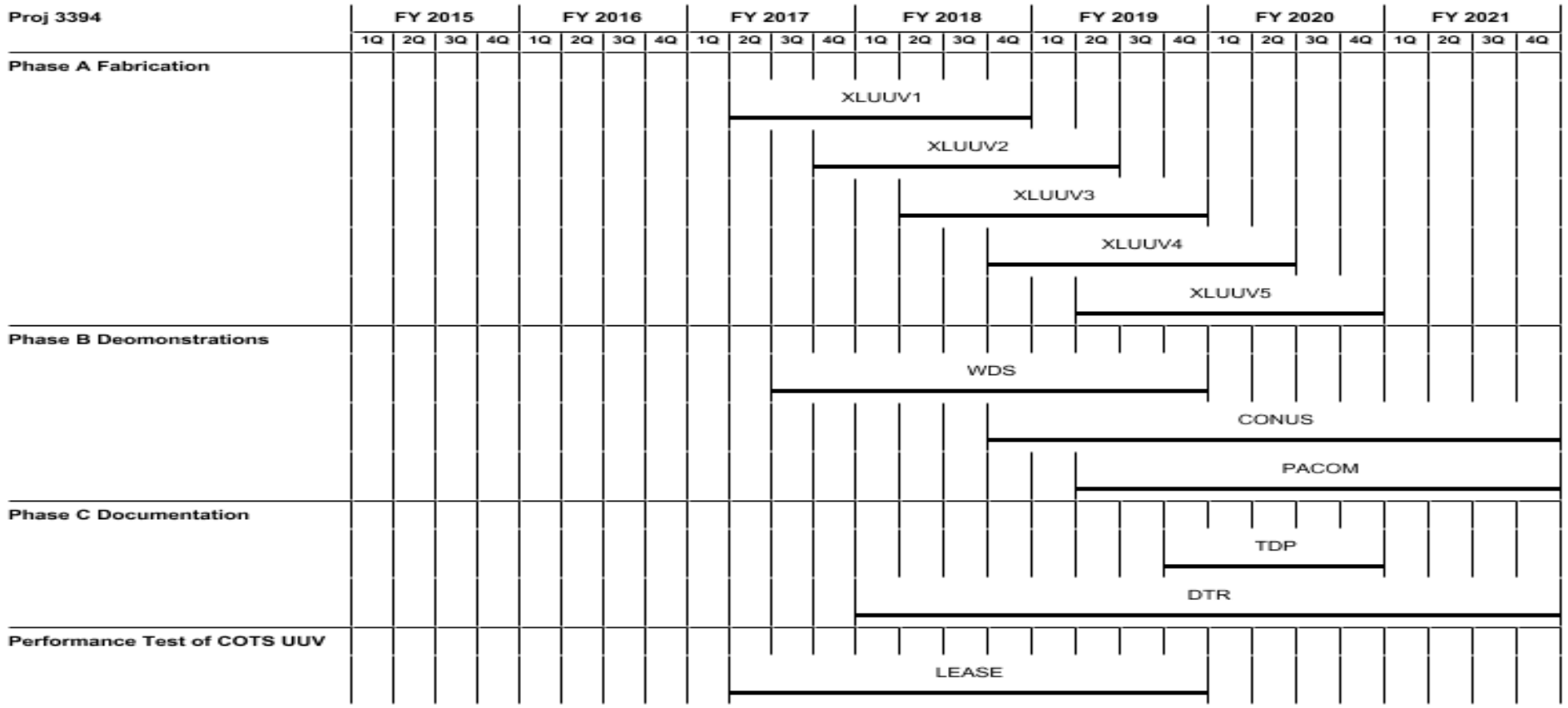
Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Techncal support	MIPR	NSWC : WASHINGTON, D.C.	0.000	0.000		0.000		0.518	Oct 2016	-		0.518	3.000	3.518	-
		Subtotal	0.000	0.000		0.000		0.518		-		0.518	3.000	3.518	-

	Prior Years	FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	0.000		0.000		57.768		-		57.768	-	-	-

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0604536N / *(U)Advanced Undersea Prototyping*	**Project (Number/Name)** 3394 / *Adv Undersea Prototyping-Vehicles, Propulsion & Navigation*



2017PB - 0604536N - 3394

Exhibit R-4A, RDT&E Schedule Details: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0604536N / *(U)Advanced Undersea Prototyping*	**Project (Number/Name)** 3394 / *Adv Undersea Prototyping-Vehicles, Propulsion & Navigation*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 3394				
Phase A Fabrication: Phase A Fabricate XLUUV 1 (vehicle system, CDM payload, large battery energy system)	2	2017	4	2018
Phase A Fabrication: Phase A Fabricate XLUUV 2(vehicle system, CDM payload, large battery energy system)	4	2017	2	2019
Phase A Fabrication: Phase A Fabricate XLUUV 3(vehicle system, CDM payload, large battery energy system)	2	2018	4	2019
Phase A Fabrication: Phase A Fabricate XLUUV 4(vehicle system, CDM payload, large battery energy system)	4	2018	2	2020
Phase A Fabrication: Phase A Fabricate XLUUV 5(vehicle system, CDM payload, large battery energy system)	2	2019	4	2020
Phase B Deomonstrations: Phase B Demonstration - Well deck ship	3	2017	4	2019
Phase B Deomonstrations: Phase B Demonstration - CONUS	4	2018	4	2021
Phase B Deomonstrations: Phase B Demonstration - PACOM	2	2019	4	2021
Phase C Documentation: Phase C Documentation- Technal design package	4	2019	4	2020
Phase C Documentation: Phase C Documentaion- Demonstration Test reports	1	2018	4	2021
Performance Test of COTS UUV: LEASED COTS Vechicle	2	2017	4	2019

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0604536N / *(U)Advanced Undersea Prototyping*	Project (Number/Name) 3395 / *Adv Undersea Prototyping-Explosive Payloads*	

COST ($ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
3395: *Adv Undersea Prototyping-Explosive Payloads*	0.000	0.000	0.000	4.404	-	4.404	27.194	29.010	24.000	16.000	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Advanced undersea prototyping of undersea explosive payloads from XL sized UUVs. Leverage the developments at ONR for undersea weapons to complete analysis of feasibility, policy, lethality, and performance of integrating undersea weapons systems on XLUUVs. The program will design new hardware, investigate and develop new algorithms to increase lethality in the both undersea and surface targets. New C2 algorithms will be developed for advanced targeting.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Title: Explosive Payloads	0.000	0.000	4.404	0.000	4.404
Articles:	-	-	-	-	-
FY 2015 Accomplishments: N/A					
FY 2016 Plans: N/A					
FY 2017 Base Plans: Concept design for XLUUV undersea weapons payload and performance and lethality analysis.					
FY 2017 OCO Plans: N/A					
Accomplishments/Planned Programs Subtotals	0.000	0.000	4.404	0.000	4.404

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

Leverage the knowledge base at the Naval Research and Development Enterprise to complete the feasibility studies that will then lead the development of critical technology. The effort will heavily use the experience resident in the undersea weapons industrial base including Penn State ARL, Naval Undersea Warfare Center, Naval Surface Warfare Center.

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0604536N / *(U)Advanced Undersea Prototyping*	**Project (Number/Name)** 3395 / *Adv Undersea Prototyping-Explosive Payloads*

E. Performance Metrics

Successful launch of undersea weapon from an XLUUV. Detailed metrics are classified.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0604536N / *(U)Advanced Undersea Prototyping*	Project (Number/Name) 3395 / *Adv Undersea Prototyping-Explosive Payloads*	

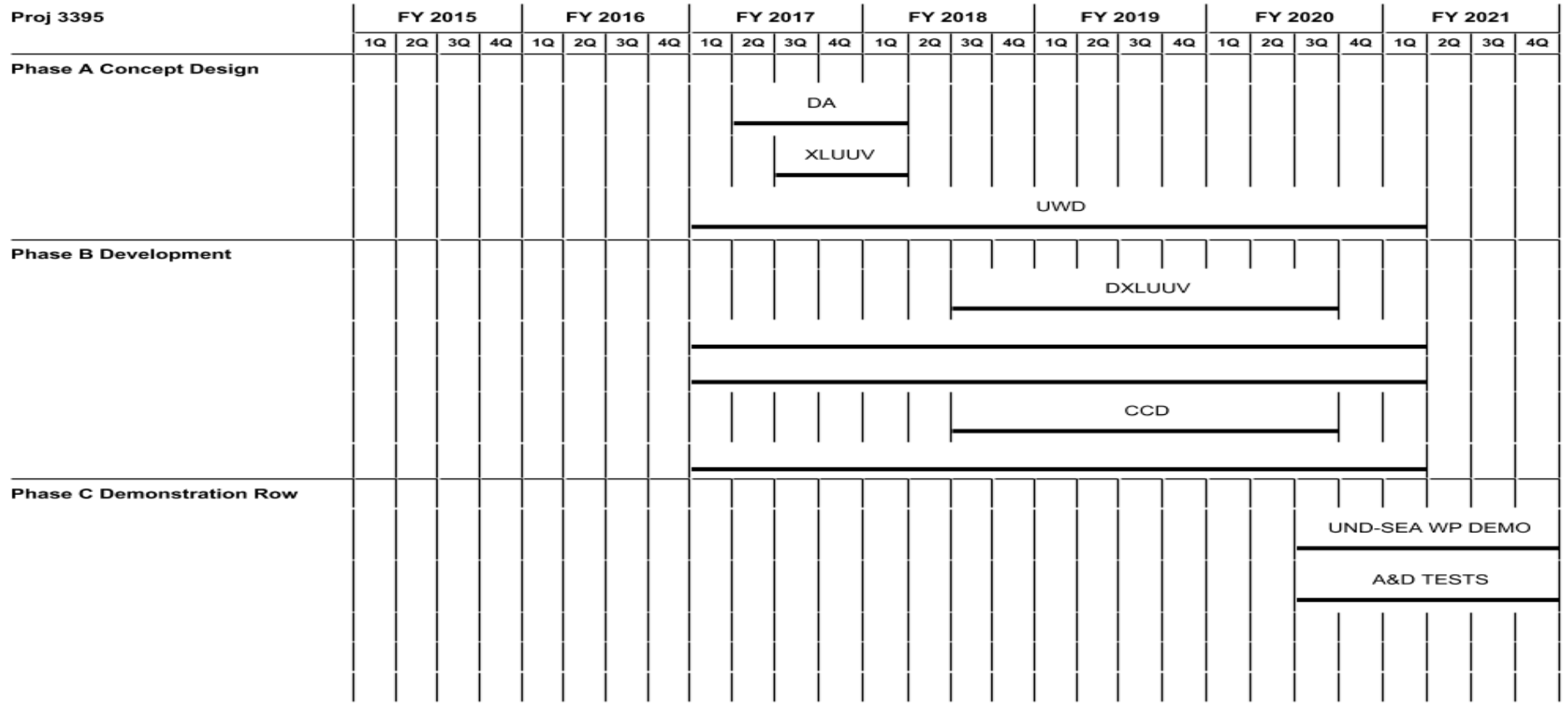
Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
XL PAYLOAD DESIGN AND DEVELOPMENT	C/BA	METRON : STERLING, VA	0.000	0.000		0.000		1.000	Mar 2017	-		1.000	9.000	10.000	-
COMMAND AND CONTROL	MIPR	SPAWAR : SAN DIEGO, CA	0.000	0.000		0.000		0.200	Jan 2017	-		0.200	1.300	1.500	-
PSU ARL	C/BA	State College : PA	0.000	0.000		0.000		3.000	Jan 2017	-		3.000	50.000	53.000	-
DE Technology	MIPR	King of Prussia : PA	0.000	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
NUWC	MIPR	Keyport : WA	0.000	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
NSWC	MIPR	Indian Head : MD	0.000	0.000		0.000		0.204	Jan 2017	-		0.204	25.900	26.104	-
		Subtotal	0.000	0.000		0.000		4.404		-		4.404	-	-	-

	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	0.000		0.000		4.404		-		4.404	-	-	-

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0604536N / *(U)Advanced Undersea Prototyping*	**Project (Number/Name)** 3395 / *Adv Undersea Prototyping-Explosive Payloads*



2017PB - 0604536N - 3395

Exhibit R-4A, RDT&E Schedule Details: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0604536N / *(U)Advanced Undersea Prototyping*	**Project (Number/Name)** 3395 / *Adv Undersea Prototyping-Explosive Payloads*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 3395				
Phase A Concept Design: Phase A Concept Design- Analysis	2	2017	1	2018
Phase A Concept Design: Phase A concept design- XL UUV Interface development	3	2017	1	2018
Phase A Concept Design: Phase A Concept Design - Undersea Weapon development	1	2017	1	2021
Phase B Development: Design of XL UUV payload	3	2018	3	2020
Phase B Development: New algorithms development	1	2017	1	2021
Phase B Development: Undersea weapon hardware development	1	2017	1	2021
Phase B Development: Comand and Control development	3	2018	3	2020
Phase B Development: Developmental in water testing	1	2017	1	2021
Phase C Demonstration Row: Demonstration of undersea weapon on XLUUV	3	2020	4	2021
Phase C Demonstration Row: Analysis and documentation of demonstration tests	3	2020	4	2021

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0604536N / *(U)Advanced Undersea Prototyping*	Project (Number/Name) 3396 / *Adv Undersea Prototyping-Non-Lethal Payloads*	

COST ($ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
3396: *Adv Undersea Prototyping-Non-Lethal Payloads*	0.000	0.000	0.000	5.596	-	5.596	7.806	13.990	0.000	0.000	0.000	27.392
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Advanced Undersea prototyping will experiment and demonstrate non-lethal payloads on XLUUVs. XLUUV are UUVs that are great than 54" in diameter and have long range and endurance. This effort will investigate the possibilities of employing non-lethal payloads from the XLUUV to support ISR and strike missions. The non-kinetic payload provide the warfare commander an option to stop aggressive behavior without escalating the conflict. Non-lethal payloads that will be considered include jamming, EO/IR dazzling, microwave, and other methods.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Title: Non Lethal Payloads	0.000	0.000	5.596	0.000	5.596
Articles:	-	-	-	-	-
FY 2015 Accomplishments: N/A					
FY 2016 Plans: N/A					
FY 2017 Base Plans: Complete the technology study.					
FY 2017 OCO Plans: N/A					
Accomplishments/Planned Programs Subtotals	0.000	0.000	5.596	0.000	5.596

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0604536N / *(U)Advanced Undersea Prototyping*	**Project (Number/Name)** 3396 / *Adv Undersea Prototyping-Non-Lethal Payloads*

D. Acquisition Strategy

A technology study will be completed in the first year to examine the options available and the impact to the warfighter the different technology option bring. This will use a group of experts at the Navy Research and Development Enterprise, UARCS, and FFRDCs. A competition will be held the following year to solicit industry for development of a non-kinetic payload. The payload will be integrated and demonstrated on a Government XLUUV in FY 2019.

E. Performance Metrics

Kinetic payload integrated onto an XLUUV. Detailed metrics are classified.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0604536N / *(U)Advanced Undersea Prototyping*	Project (Number/Name) 3396 / *Adv Undersea Prototyping-Non-Lethal Payloads*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Technology study	C/BA	VARIOUS : TBD	0.000	0.000		0.000		5.500	Oct 2016	-		5.500	0.000	5.500	-
Competition for non leathal payloads	C/BA	VARIOUS : TBD	0.000	0.000		0.000		0.076	Nov 2016	-		0.076	19.000	19.076	-
		Subtotal	0.000	0.000		0.000		5.576		-		5.576	19.000	24.576	-

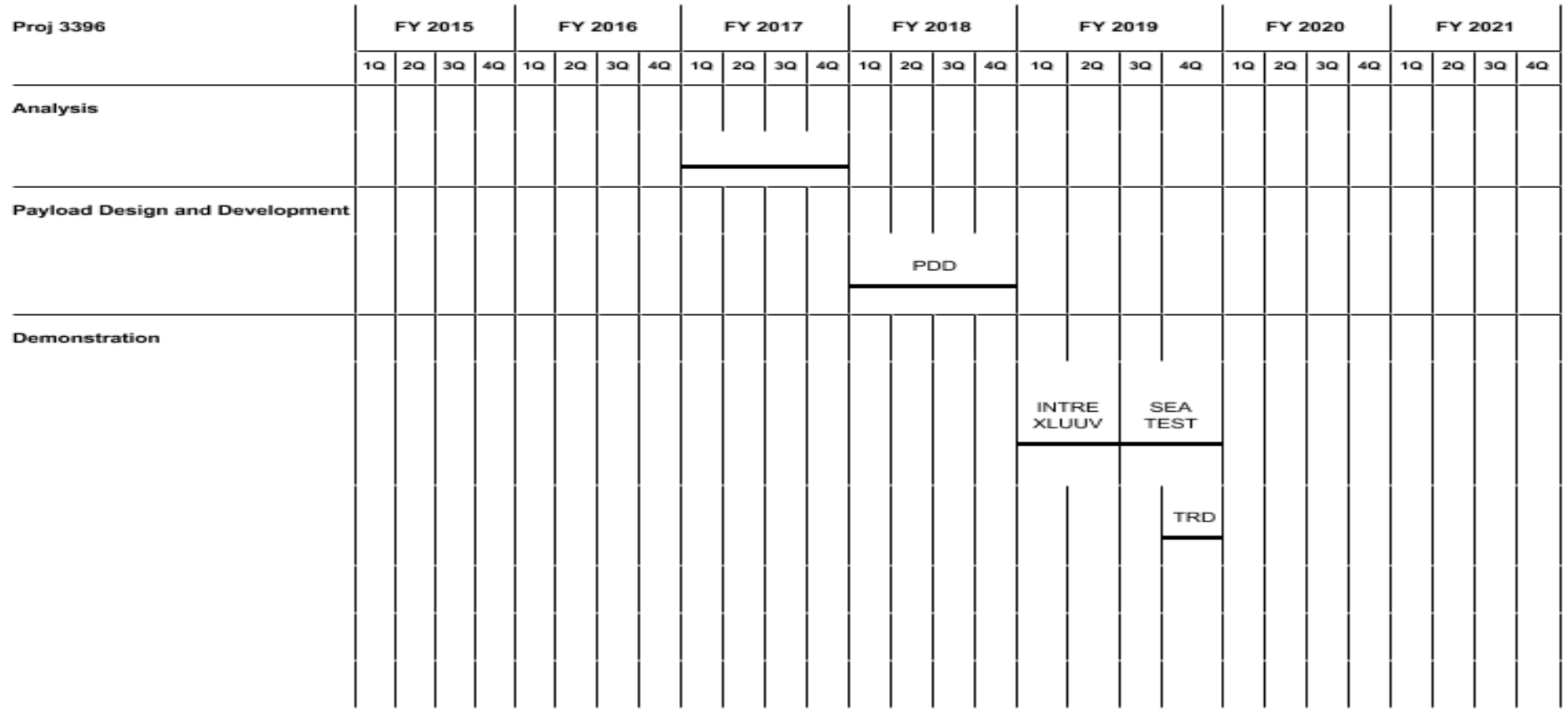
Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
DESIGN ANALYSIS	MIPR	NRL : WASHINGTON, D.C.	0.000	0.000		0.000		0.020	Oct 2016	-		0.020	1.300	1.320	-
		Subtotal	0.000	0.000		0.000		0.020		-		0.020	1.300	1.320	-

	Prior Years	FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	0.000		0.000		5.596		-		5.596	20.300	25.896	-

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0604536N / *(U)Advanced Undersea Prototyping*	**Project (Number/Name)** 3396 / *Adv Undersea Prototyping-Non-Lethal Payloads*



2017PB - 0604536N - 3396

Exhibit R-4A, RDT&E Schedule Details: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0604536N / *(U)Advanced Undersea Prototyping*	**Project (Number/Name)** 3396 / *Adv Undersea Prototyping-Non-Lethal Payloads*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 3396				
Analysis: PHASE A	1	2017	4	2017
Payload Design and Development: PHASE B	1	2018	4	2018
Demonstration: Integration onto XLUUV	1	2019	2	2019
Demonstration: At sea testing on XLUUV	3	2019	4	2019
Demonstration: Test analysis, report, and documentation	4	2019	4	2019

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Exhibit R-2, RDT&E Budget Item Justification: PB 2017 Navy	Date: February 2016
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 0604653N *I JT Cntr Radio Controlled IED Elec War (JCREW)*

COST ($ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
Total Program Element	213.604	14.987	3.790	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	232.381
3177: *Joint Counter Radio-Controlled IED Elec Warfare*	213.604	14.987	3.790	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	232.381

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. 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 an evolving global threat.

PE 0604653N consolidated into PE 0603654N FY 2017 and out.

B. Program Change Summary ($ in Millions)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Previous President's Budget	15.197	3.817	5.444	-	5.444
Current President's Budget	14.987	3.790	0.000	-	0.000
Total Adjustments	-0.210	-0.027	-5.444	-	-5.444
• Congressional General Reductions	-	-0.027			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.210	0.000			
• Program Adjustments	0.000	0.000	-5.444	-	-5.444

Change Summary Explanation

PE 0604653N consolidated into PE 0603654N FY 2017 and out.

Technical: Not applicable.

Schedule: Not applicable.

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0604653N / *JT Cntr Radio Controlled IED Elec War (JCREW)*	Project (Number/Name) 3177 / *Joint Counter Radio-Controlled IED Elec Warfare*	

COST ($ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
3177: *Joint Counter Radio-Controlled IED Elec Warfare*	213.604	14.987	3.790	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	232.381
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

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. Utilizes Joint requirements to provide a System of Systems (SoS) approach for a suite of equipment for mounted, dismounted, and fixed site operations; provides for Joint Counter Radio Controlled Improvised Explosive Device Electronic Warfare (JCREW) system development and equipment, procedures, and tactical aids to make rapid improvements to performance, supportability and affordability, while maintaining pace with a evolving global threat.

The JCREW system, Increment 1 Block 1 (I1B1) is the next generation of counter RCIED systems. This family of systems includes fixed site, mounted and dismounted units, which provide countermeasures against the global RCIED threat. Key system design features include significant performance increases over current legacy systems, a modular open-architecture system to address current and future advanced threats, robust information assurance and security, and is net-capable for improved Communications and Control (C2). JCREW I1B1 supports global deployment and sustainment for all combatant commands providing increased protection to Warfighter against the evolving worldwide RCIED threats.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Title: Joint Counter Radio-Controlled IED Elec Warfare	14.987	3.790	0.000	0.000	0.000
Articles:	-	-	-	-	-
Description: Supports 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 Engineering Manufacturing and Development (EMD) Phase. The JCREW SoS approach includes three distinct capabilities that shall be developed and will 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, combat systems (mounted) and semi-permanent geographical area (fixed) systems.					
FY 2015 Accomplishments:					

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0604653N / *JT Cntr Radio Controlled IED Elec War (JCREW)*	**Project (Number/Name)** 3177 / *Joint Counter Radio-Controlled IED Elec Warfare*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Conducted Initial Operational Test and Evaluation (IOT&E) and completed productionization Engineering Change Proposal (ECP). ***FY 2016 Plans:*** Initiate Technology Refresh and transition of technologies developed under ONR Technology Transition Agreements (TTAs). ***FY 2017 Base Plans:*** N/A ***FY 2017 OCO Plans:*** N/A					
Accomplishments/Planned Programs Subtotals	14.987	3.790	0.000	0.000	0.000

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
• OPN/5509: *Explosive Ordnance Disposal Equip*	107.466	2.929	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	214.325

Remarks

PE 0604653N consolidated into PE 0603654N FY17 and out.

D. Acquisition Strategy

FY15 LRIP will support IOC, setup and maintain warm Production Line and OEM Depot Line until FRP decision in FY16. FRP Production Line Start Up and Ramp Up and FRP Organic Depot Line Startup and Ramp Up in FY17. Spares support and OEM Depot will be utilized during LRIP phase. Establishment of Organic Depot capability during LRIP phase in support of FRP Decision Review with Weapons System Support Center Mechanicsburg as Primary Inventory Control Activity (PICA). Full Rate Production contract will be full and open competition using LRIP final Tech Data Package (TDP) with unlimited data rights.

E. Performance Metrics

LRIP contract awarded September 2015. Validated Technical Data Package (TDP) for Full Rate Production (FRP). Request for Proposal (RFP) will release in June 2016.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0604653N / *JT Cntr Radio Controlled IED Elec War (JCREW)*	Project (Number/Name) 3177 / *Joint Counter Radio-Controlled IED Elec Warfare*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Primary Hardware Development	Various	Exelis : NJ	12.137	0.000		0.000		0.000		-		0.000	0.000	12.137	Continuing
Software Development	Various	Exelis : NJ	10.515	0.000		0.000		0.000		-		0.000	0.000	10.515	Continuing
Systems Engineering	Various	Exelis : NJ	7.200	0.000		0.000		0.000		-		0.000	0.000	7.200	Continuing
System Integration	Various	Exelis : NJ	3.965	0.000		0.000		0.000		-		0.000	0.000	3.965	Continuing
Primary Hardware Development	Various	NGC : CA	29.703	1.015	Nov 2014	0.303	Nov 2015	0.000		-		0.000	0.000	31.021	Continuing
Software Development	Various	NGC : CA	16.129	0.505	Nov 2014	0.152	Nov 2015	0.000		-		0.000	0.000	16.786	Continuing
Systems Engineering	Various	NGC : CA	15.223	0.379	Nov 2014	0.152	Nov 2015	0.000		-		0.000	0.000	15.754	Continuing
ILS	Various	NGC : CA	7.626	0.000		0.000		0.000		-		0.000	0.000	7.626	Continuing
System Integration	Various	NGC : CA	8.816	0.468	Nov 2014	0.152	Nov 2015	0.000		-		0.000	0.000	9.436	Continuing
Loadset Development	Various	NGC : CA	5.282	0.000		0.000		0.000		-		0.000	0.000	5.282	Continuing
		Subtotal	116.596	2.367		0.759		0.000		-		0.000	0.000	119.722	-

Remarks

Contract type is hybrid CPIF and CPAF.

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Loadset Development	FFRDC	JHU/APL, MITRE : Laurel, MD	4.212	0.922	Nov 2014	0.500	Nov 2015	0.000		-		0.000	0.000	5.634	Continuing
Systems Engineering	WR	NSWC : Various	5.962	1.854	Nov 2014	1.606	Nov 2015	0.000		-		0.000	0.000	9.422	Continuing
Program Management Support	WR	IHEODTD : Indian Head, MD	12.446	1.317	Nov 2014	0.431	Nov 2015	0.000		-		0.000	0.000	14.194	Continuing
System Integration	WR	NSWC : Various	2.313	0.724	Nov 2014	0.000		0.000		-		0.000	0.000	3.037	Continuing
Training Development	C/CPFF	SDI, GOV'T SOLUTIONS : LaPlata, MD	4.403	0.000		0.000		0.000		-		0.000	0.000	4.403	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0604653N / *JT Cntr Radio Controlled IED Elec War (JCREW)*	**Project (Number/Name)** 3177 / *Joint Counter Radio-Controlled IED Elec Warfare*	

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Integrated Logistics Support	WR	NSWC : Various	10.432	1.976	Nov 2014	0.000		0.000		-		0.000	0.000	12.408	Continuing
Configuration Management	WR	NSWC : Various	3.971	0.593	Nov 2014	0.000		0.000		-		0.000	0.000	4.564	Continuing
Technical Data	WR	NSWC : Various	6.156	0.889	Nov 2014	0.000		0.000		-		0.000	0.000	7.045	Continuing
		Subtotal	49.895	8.275		2.537		0.000		-		0.000	0.000	60.707	-

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Development Test & Evaluation	WR	NSWC : Various	33.133	0.000	Dec 2014	0.000		0.000		-		0.000	0.000	33.133	Continuing
Operational Test & Evaluation	MIPR	Various : Various	8.675	3.553	Dec 2014	0.000		0.000		-		0.000	0.000	12.228	Continuing
		Subtotal	41.808	3.553		0.000		0.000		-		0.000	0.000	45.361	-

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Support	C/CPFF	Cydecor : Various	0.000	0.592	Nov 2014	0.250	Nov 2015	0.000		-		0.000	0.000	0.842	Continuing
Miscellaneous	WR	NSWC : Various	5.305	0.200	Nov 2014	0.244	Nov 2015	0.000		-		0.000	0.000	5.749	Continuing
		Subtotal	5.305	0.792		0.494		0.000		-		0.000	0.000	6.591	-

	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	213.604	14.987		3.790		0.000		-		0.000	0.000	232.381	-

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0604653N / *JT Cntr Radio Controlled IED Elec War (JCREW)*	**Project (Number/Name)** 3177 / *Joint Counter Radio-Controlled IED Elec Warfare*

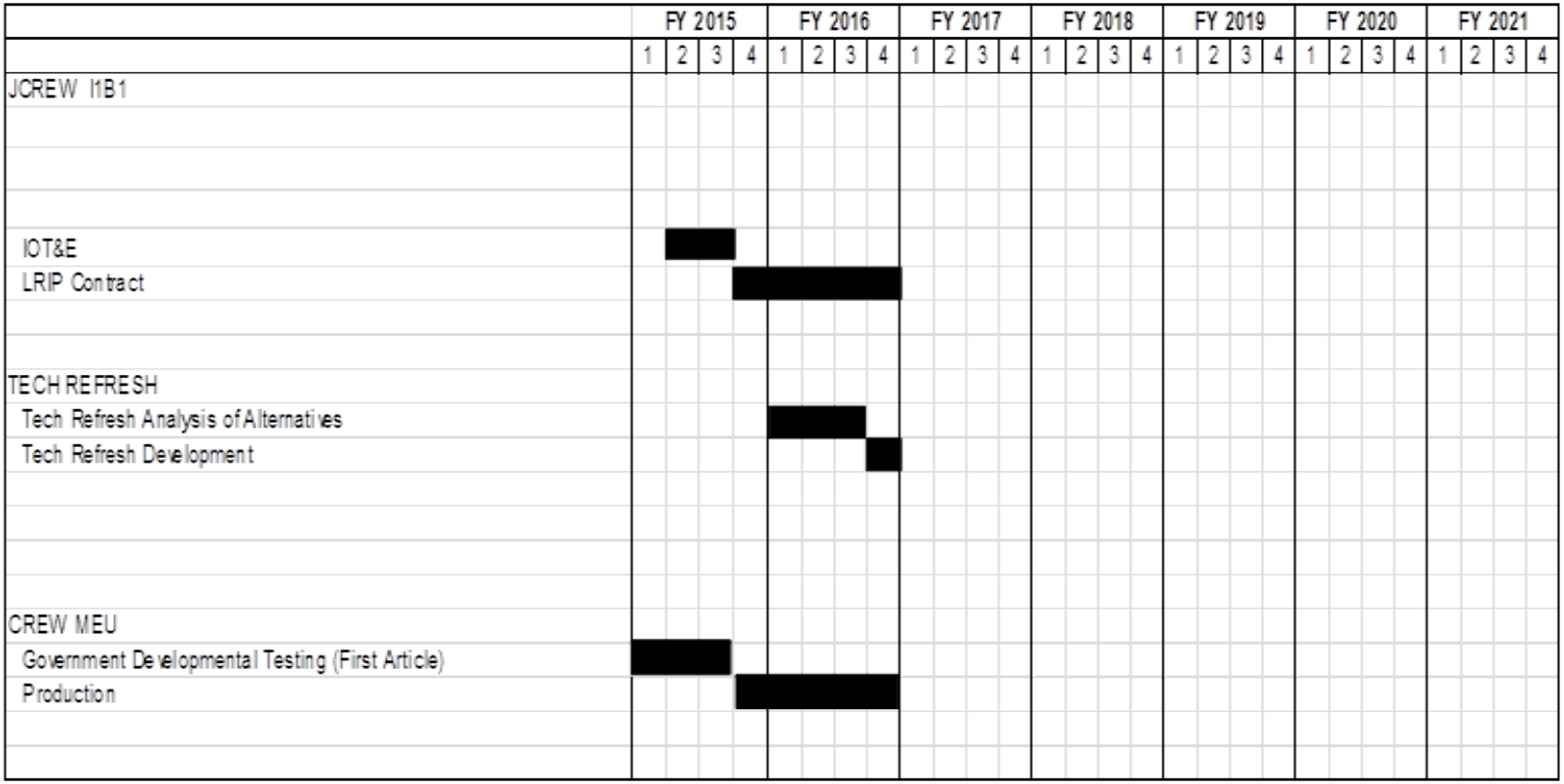

Exhibit R-4A, RDT&E Schedule Details: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0604653N / *JT Cntr Radio Controlled IED Elec War (JCREW)*	**Project (Number/Name)** 3177 / *Joint Counter Radio-Controlled IED Elec Warfare*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 3177				
JCREW I1B1	1	2015	4	2016
IOT&E	2	2015	3	2015
LRIP Contract	4	2015	4	2016
TECHNOLOGY REFRESH (I)	1	2016	4	2016
Tech Refresh Analysis of Alternatives (I)	1	2016	3	2016
Tech Refresh Development (I)	4	2016	4	2016
CREW MEU	1	2015	4	2016
Government Developmental Testing (First Article)	1	2015	3	2015
Production	4	2015	4	2016

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Exhibit R-2, RDT&E Budget Item Justification: PB 2017 Navy	Date: February 2016
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 0604659N *I (U)Precision Strike Weapons Development Program*

COST ($ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
Total Program Element	0.000	0.000	9.595	9.910	-	9.910	45.088	65.094	125.097	135.108	Continuing	Continuing
3378: *Next Generation Land Attack Weapon (NGLAW)*	0.000	0.000	9.595	9.910	-	9.910	45.088	65.094	125.097	135.108	Continuing	Continuing

Note

FY16 and later funding for the Next Generation Land Attack Weapon has moved from Program Element 0204229N (Tomahawk Mission Planning Center) to 0604659N (Precision Strike Weapons Development Program) under the same Project Unit of 3378.

A. Mission Description and Budget Item Justification

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 to provide enhanced anti-surface and land strike capabilities in a demanding Anti-Access Area-Denial environment. This program provides for the development of weapon and weapon system technologies to address future requirements for enhanced and alternative weapon system capability requirements that include selectable output weapons, low collateral damage weapons, precision lethality weapons, area weapons, alternative warhead technology, Insenstive Munitions (IM), scaled munitions, DoD fuzing systems, sensors, extended range weapons and precision guided training round technology.

The Precision Strike Weapons Development Program Element (PE) supports the Next Generation Strike Capability (NGSC) by funding Next Generation Land Attack Weapon (NGLAW); a surface/submarine fired survivable, long range, multi-mission, multi-platform conventional strike capability fielding in the 2028-2030 timeframe. The Next Generation Strike Capability (NGSC) strategy will address future threats in time to replace or update legacy weapons while bringing next generation technology to Department of the Navy (DoN) standoff conventional strike (Land Attack & ASuW). Within NGSC, NGLAW will be capable of attacking land and maritime, stationary and mobile targets while supporting two of the Navy's primary mission areas: 'Power Projection' (land attack from the sea/undersea) and 'Sea Control' against enemy surface action groups/combatants. To the maximum extent possible, NGSC will utilize common components and component technologies (e.g. navigation; communications; seeker; guidance and control) across the air-launched and sea-launched missile variants to reduce cost, shorten development timelines, and promote interoperability.

JUSTIFICATION FOR BUDGET ACTIVITY: This program is funded under ADVANCED COMPONENT DEVELOPMENT AND PROTOTYPES because it includes all efforts necessary to evaluate integrated technologies, representative models or prototype systems in a high fidelity and realistic operating environment.

Exhibit R-2, RDT&E Budget Item Justification: PB 2017 Navy					Date: February 2016
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 4: *Advanced Component Development & Prototypes (ACD&P)*			R-1 Program Element (Number/Name) PE 0604659N *I (U)Precision Strike Weapons Development Program*		
B. Program Change Summary ($ in Millions)	**FY 2015**	**FY 2016**	**FY 2017 Base**	**FY 2017 OCO**	**FY 2017 Total**
Previous President's Budget	0.000	9.595	65.243	-	65.243
Current President's Budget	0.000	9.595	9.910	-	9.910
Total Adjustments	0.000	0.000	-55.333	-	-55.333
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Program Adjustments	0.000	0.000	-20.000	-	-20.000
• Rate/Misc Adjustments	0.000	0.000	-35.333	-	-35.333

Change Summary Explanation

Schedule: PU 3378

Analysis of Alternatives (AoA) changed from 1Q FY16-2Q FY17 to 2Q FY16-2Q FY18 due to revised Cruise Missile Strategy required to complete definition of requirements analysis.

Added ICD Staffing 1Q FY16-2Q FY16 to reflect pre Analysis of Alternative activities.

Added Initial Capabilities Document (ICD) Approval to 2Q FY16 to reflect approval of pre-Analysis of Alternatives acquisition documentation.

Added Technology Maturation & Risk Reduction (TMRR) phase 2Q FY18-4Q FY21 due to updated Cruise Missile Strategy that includes a FY28-FY30 Initial Operational Capability.

Moved Material Solution Analysis from 1Q FY16-4Q FY18 to 3Q FY16-2Q FY18 due to updated Systems Engineering Technical Review (SETR) Strategy.

System Readiness Review (SRR), Preliminary Design Review (PDR), Milestone B, Engineering Manufacturing and Development (EMD) phase and Critical Design Review (CDR) removed due to updated Cruise Missile Strategy that includes a FY28-FY30 Initial Operational Capability (IOC) versus a FY24 IOC.

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0604659N / *(U)Precision Strike Weapons Development Program*	Project (Number/Name) 3378 / *Next Generation Land Attack Weapon (NGLAW)*	

COST ($ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
3378: *Next Generation Land Attack Weapon (NGLAW)*	0.000	0.000	9.595	9.910	-	9.910	45.088	65.094	125.097	135.108	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Funding is provided for the Next Generation Land Attack Weapon (NGLAW) that includes a survivable, long range, multi-mission, multi-platform (surface and subsurface) conventional strike capability in the FY28-FY30 timeframe. NGLAW will address future threats while bringing ship/submarine Next Generation Strike Capability (NGSC) to Department of the Navy (DoN) standoff conventional strike (land and maritime attack). NGLAW will be capable of attacking land and maritime, stationary and mobile targets while supporting two of the Navy's primary mission areas: 'Power Projection' (land attack from the sea/undersea) and 'Sea Control' against enemy surface action groups/combatants. To the maximum extent possible, the Navy will utilize common components and component technologies (e.g. navigation; communications; seeker; guidance and control) to reduce cost, shorten development timelines, and promote interoperability.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Title: Next Generation Land Attack Weapon (NGLAW)	0.000	9.595	9.910	0.000	9.910
Articles:	-	-	-	-	-
FY 2015 Accomplishments: N/A					
FY 2016 Plans: Conduct NGLAW AoA assessing weapons systems, emergent technologies, and industry Internal Research and Development (IRAD) activities/proposals that can be used across multiple mission areas to reduce risk, development time and cost. Conduct threat assessments based on current and future scenarios and environments to inform performance requirements and relevant technology. Additionally, these technologies will be assessed for their maturity and applicability to fielded and future weapons to address expanded target sets to include mobile and moving land/maritime targets. Results of the analysis will inform the requirement and acquisition approach to deliver an affordable, long term Strike Weapon.					
FY 2017 Base Plans: Continue NGLAW AoA assessing weapons systems, emergent technologies, and industry Internal Research and Development (IRAD) activities/proposals that can be used across multiple mission areas to reduce risk, development time, and cost. Complete threat assessments based on current and future scenarios and environments to inform performance requirements and relevant technology. The AoA will identify critical					

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0604659N / *(U)Precision Strike Weapons Development Program*	**Project (Number/Name)** 3378 / *Next Generation Land Attack Weapon (NGLAW)*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
technologies that require maturation and these technologies will require investment to mature to a Technology Readiness Level (TRL) 6, appropriate for current and future acquisition programs. ***FY 2017 OCO Plans:*** N/A					
Accomplishments/Planned Programs Subtotals	0.000	9.595	9.910	0.000	9.910

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

Acquisition strategy will be influenced by the output of the AoA and the Material Development Decision (MDD).

E. Performance Metrics

Conduct NGLAW AoA.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0604659N / *(U)Precision Strike Weapons Development Program*	**Project (Number/Name)** 3378 / *Next Generation Land Attack Weapon (NGLAW)*

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Development Support	WR	NAWC-WD : China Lake, CA	0.000	0.000		3.838	Nov 2015	4.641	Nov 2016	-		4.641	Continuing	Continuing	Continuing
Development Support- AIR 4.0M	WR	NAWC-AD : Patuxent River, MD	0.000	0.000		3.838	Nov 2015	4.370	Nov 2016	-		4.370	Continuing	Continuing	Continuing
Development Support	WR	JHU/APL : Patuxent River, MD	0.000	0.000		1.919	Nov 2015	0.899	Nov 2016	-		0.899	Continuing	Continuing	Continuing
		Subtotal	0.000	0.000		9.595		9.910		-		9.910	-	-	-

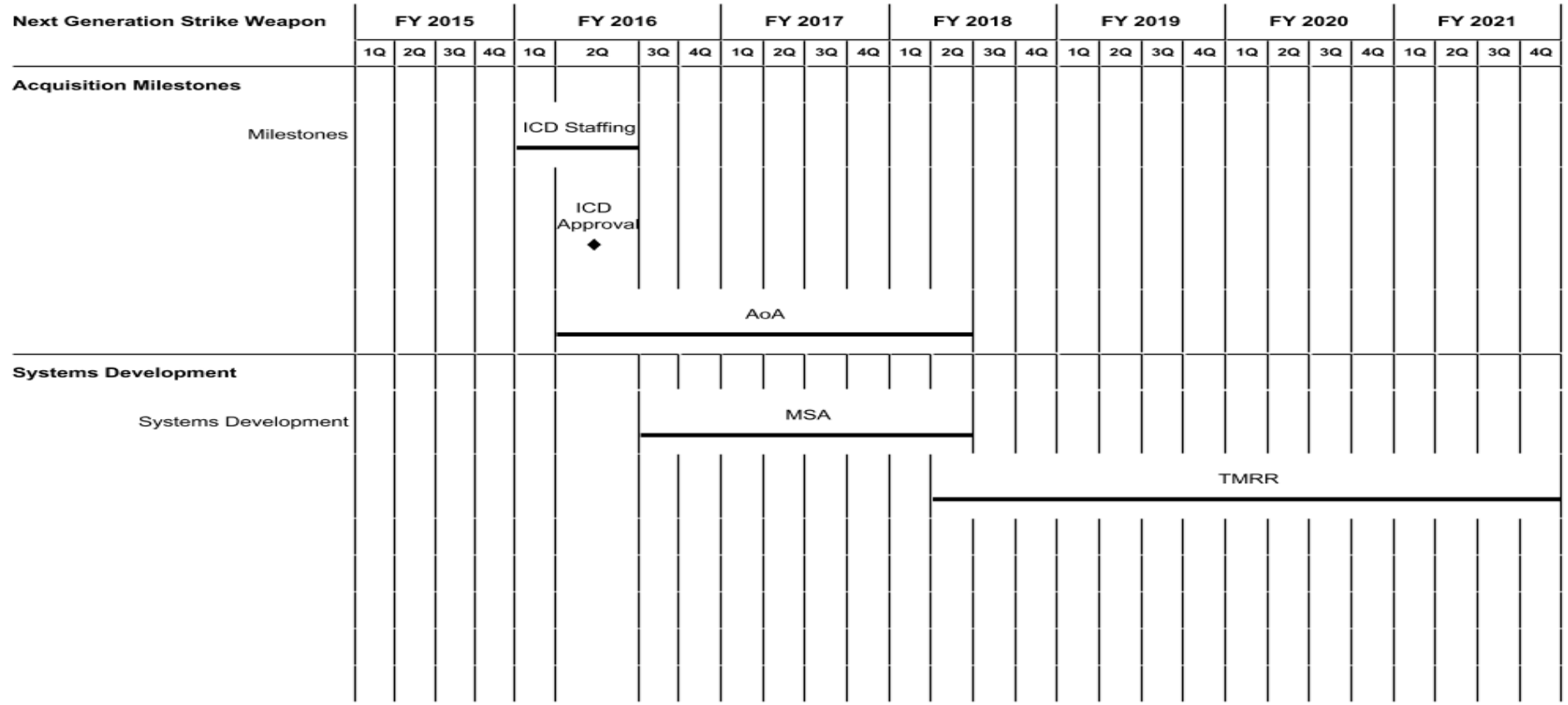
Remarks

Development Support- funding in FY17 required to complete requirements definition and acquisition approach associated with NGLAW.

	Prior Years	FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	0.000		9.595		9.910		-		9.910	-	-	-

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0604659N / *(U)Precision Strike Weapons Development Program*	**Project (Number/Name)** 3378 / *Next Generation Land Attack Weapon (NGLAW)*



2017PB - 0604659N - 3378

Exhibit R-4A, RDT&E Schedule Details: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0604659N / *(U)Precision Strike Weapons Development Program*	**Project (Number/Name)** 3378 / *Next Generation Land Attack Weapon (NGLAW)*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Next Generation Strike Weapon				
Acquisition Milestones: Milestones: ICD Staffing	1	2016	2	2016
Acquisition Milestones: Milestones: ICD Approval	2	2016	2	2016
Acquisition Milestones: Milestones: Analysis of Alternatives	2	2016	2	2018
Systems Development: Systems Development: Material Solution Analysis	3	2016	2	2018
Systems Development: Systems Development: Technology Maturation & Risk Reduction	2	2018	4	2021

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Exhibit R-2, RDT&E Budget Item Justification: PB 2017 Navy											Date: February 2016	
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 4: *Advanced Component Development & Prototypes (ACD&P)*					R-1 Program Element (Number/Name) PE 0604707N / *SEW Architecture/Eng Support*							
COST ($ in Millions)	**Prior Years**	**FY 2015**	**FY 2016**	**FY 2017 Base**	**FY 2017 OCO**	**FY 2017 Total**	**FY 2018**	**FY 2019**	**FY 2020**	**FY 2021**	**Cost To Complete**	**Total Cost**
Total Program Element	279.392	21.915	20.203	23.971	-	23.971	25.233	24.423	24.791	25.060	Continuing	Continuing
0798: *Allied/Coalition Interoperability and Information Dominance (ACIID)*	31.236	0.730	0.649	0.953	-	0.953	1.091	1.072	1.088	1.006	Continuing	Continuing
2144: *Space & Elec Warfare Engineering*	188.361	11.045	7.300	13.175	-	13.175	13.726	12.752	12.916	13.083	Continuing	Continuing
2147: *ISR Architecture*	0.000	0.000	0.000	1.523	-	1.523	1.587	1.587	1.587	1.587	Continuing	Continuing
2356: *Maritime Concept Generation & Development*	13.980	5.161	3.390	8.320	-	8.320	8.829	9.012	9.200	9.384	Continuing	Continuing
3319: *Fleet Experimentation*	45.815	4.979	8.864	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	59.658

A. Mission Description and Budget Item Justification

This Program Element (PE) includes the following projects: Maritime Concept Generation and Development (CGCD), Allied/Coalition Interoperability and Information Dominance (ACIID),Fleet Experimentation, Intelligence, Surveillance, and Reconnaissance (ISR) Architecture and Space and Electronic Warfare (SEW) Engineering.

The CGCD project (2356) focuses on the generation, development and validation of warfighting concepts, Concept of Operations (CONOPS) and doctrine in order to eliminate war fighting gaps. NWDC also manages the Fleet Experimentation program (formerly Sea Trial) under the guidance of Commander USFF and COMPACFLT. In FY2017 the project will execute a number of new experimentations to include the Undersea Warfare Vision 2025 Experimentation Campaign, Undersea Innovation Seminar War Game, Unmanned Systems Experimentations and Trident Warrior At-Sea Experimentation.

The FLEX project (3319) (formerly Sea Trial) develops new or improved warfighter capabilities through the experimentation of high payoff initiatives, technologies and concepts, Fleet Concepts of Operations (CONOPS), doctrine, and new tactics, techniques and procedures (TTP). The objective of FLEX is to produce recommended changes in doctrine, organization, training, materiel, leadership development, personnel, facilities, and policy (DOTMLPF-P) actions, with an emphasis on non-materiel solutions. Focusing on war fighting capability improvement through experimentation aimed at delivering potential solutions in support of current Operations Plans (OPLANs), FLEX spans both operational and tactical levels of warfare and reaches across the full range of military operations to enhance war fighting capabilities or fill current or future capability gaps. In FY17, project 3319 moves to 0606355N.

The ACIID 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

Exhibit R-2, RDT&E Budget Item Justification: PB 2017 Navy	Date: February 2016
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 0604707N *I SEW Architecture/Eng Support*

war fighting 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 Information Dominance and the Navy's contribution to the Global Information Grid (GIG).

The ISR Architecture project (2147) is intended to guide system of systems capability development and promote interoperability across Navy ISR programs, as well as interoperability and alignment with Department of Defense (DoD)-wide enterprise initiatives including Joint Information Environment (JIE) and Intelligence Community (IC) Information Technology Environment (ITE). As tasked by the Navy's ISR Council, this effort to develop integrated ISR architectures will also help instill systems engineering discipline and standardization across the Navy ISR Enterprise and provide a means by which to assess ISR POR progress in conforming to a single Navy architecture.

B. Program Change Summary ($ in Millions)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Previous President's Budget	18.749	29.581	34.251	-	34.251
Current President's Budget	21.915	20.203	23.971	-	23.971
Total Adjustments	3.166	-9.378	-10.280	-	-10.280
• Congressional General Reductions	-	-0.041			
• Congressional Directed Reductions	-	-9.335			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	3.652	-0.002			
• SBIR/STTR Transfer	-0.485	0.000			
• Program Adjustments	0.000	0.000	-11.210	-	-11.210
• Rate/Misc Adjustments	-0.001	0.000	0.930	-	0.930

Change Summary Explanation

Decrease in SEW Architecture/Eng Support by $1.0M as required for the Department of the Navy to comply with the Bipartisan Budget Act of 2015.

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0604707N / *SEW Architecture/Eng Support*	Project (Number/Name) 0798 / *Allied/Coalition Interoperability and Information Dominance (ACIID)*	

COST ($ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
0798: *Allied/Coalition Interoperability and Information Dominance (ACIID)*	31.236	0.730	0.649	0.953	-	0.953	1.091	1.072	1.088	1.006	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Allied/Coalition Interoperability and Information Dominance (ACIID) program advances Information Warfare (IW) (to include Command, Control, Communications, Computers; Intelligence, Surveillance and Reconnaissance (C4ISR); Electronic Warfare (EW); and Cyber Warfare), interoperability with Australia, Canada, New Zealand, United Kingdom, United States (AUSCANNZUKUS), North Atlantic Treaty Organization (NATO), and other Allied and Coalition partners. The program determines maritime operational gaps with our allies, identifies Doctrine, Organization, Training, Material, Leadership, Personnel, and Facilities (DOTMLPF) solutions with the potential to fill those gaps, and assesses these solutions and associated concepts of operation in laboratory and at-sea environments. The ACIID program includes integration and testing in support of joint and Allied war fighting capabilities, including interoperability testing of IW equipment. Allied and joint interoperability is critical for future maritime operations, especially as the United States Navy (USN) expands Internet Protocol (IP) networking throughout the fleet via Consolidated Afloat Networks and Enterprise Services (CANES), Next Generation Networks (NGEN), Mission Partner Environment/Future Mission Network (MPE/FMN), the U.S. Battlefield Information Collection and Exploitation System - eXtended (BICES-X), and with the Joint Information Environment (JIE). Currently, IP connectivity with AUSCANNZUKUS and other Allied/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 Network Operations Without Shore (NOWS), Maritime Domain Awareness (MDA), and to counter Anti-Access Area Denial (A2/AD) threats. Increases in data throughput are required for the effective exchange of rich Information Dominance (ID) data sets and services via Service Oriented Architectures (SOA) within the limitations of High Frequency (HF), Ultra-High Frequency (UHF), and other portions of the radio frequency spectrum, coupled with appropriate Information Assurance and Computer Network Defense (IA/CND) mechanisms. Development and assessment of potential solutions will integrate improved IP capabilities with the Advanced Digital Network Systems (ADNS) and existing international standards (e.g. Allied Communications Publication 200, NATO Standardization Agreements 5066 and 4691). The continued development and refinement of advanced tactical networking technologies and protocols, to include Low Probability of Intercept (LPI), Low Probability of Detection (LPD), and Anti-Jam (AJ) capabilities as well as automatic link establishment (ALE) standards, will provide for a significant improvement in secure data sharing within, and between, coalition maritime elements.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Title: Advanced Relay Capabilities	0.730	0.649	0.953	0.000	0.953
Articles:	-	-	-	-	-
FY 2015 Accomplishments:					

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0604707N / *SEW Architecture/Eng Support*	**Project (Number/Name)** 0798 / *Allied/Coalition Interoperability and Information Dominance (ACIID)*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
- Continued the development and refinement of advanced networking and communication capabilities that promoted Allied interoperability and countered A2/AD environments via task group-centric tactical networking in Satellite Communications (SATCOM)-Restricted and SATCOM-Denied environments (SRE/SDE) and NOWS. Solutions addressed higher bandwidth technologies across the Radio Frequency (RF) and Optical spectrum, such as wide-band High Frequency (HF), High Data Rate Ultra-High Frequency (UHF), and other high-data rate wireless technologies. - Developed and assessed secure and interoperable multi-bearer routing, distributed application and service architectures and advanced Information Assurance and Computer Network Defense (IA/CND) solutions that support tactical networking and counter Anti-Access Area Denial (A2/AD) environments. The overarching goal was to maximize interoperability and network efficiency using multiple, dissimilar bearers and integrate these advanced solutions into a counter-A2/AD, Allied/Coalition tactical networking environment that could also include tactical data links, such as Link-22. - Assessed Information Warfare (IW) interoperability gaps with Australia, Canada, New Zealand, United Kingdom, and United States (AUSCANNZUKUS) nations, to include Intelligence Surveillance and Reconnaissance (ISR), Position, Navigation and Timing (PNT), Electronic Warfare (EW), and Cyber, in appropriate venues. This included assured PNT and Unmanned aerial vehicle (UAV) interoperability and IA/CND Blue Teaming in Satellite Communications (SATCOM)-Denied/Restricted environments. - Continued to progress the standardization and operationalization of North Atlantic Treaty Organization (NATO) Maritime Relayed Line of Sight Network (MARLIN) Standardization Agreements (STANAG 4691) and High Frequency Internet Protocol (STANAG 5066 Edition 3). - Increased Allied IW interoperability with other joint and maritime multi-national forums, such as the Combined Communications Electronics Board (CCEB), Multinational Maritime Information-system Interoperability Steering Group (M2I2), the Mission Partner Environment (MPE), and the Joint Information Environment (JIE) forums. - Exploited venues of opportunity, such as Fleet Experimentation (FLEX), to assess and validate the individual technologies, integrated solutions, and associated Doctrine, Organization, Training, Materiel, Leadership and Education, Personnel and Facilities (DOTMLPF) through experimentation, trials, and demonstrations with AUSCANNZUKUS and other Allied/Coalition partners.					
FY 2016 Plans: - Continue the development and refinement of advanced networking and communication capabilities that promote Allied interoperability, task group-centric operations in SATCOM-Restricted and SATCOM-Denied environments, and support the defeat of A2/AD. Solutions will address higher bandwidth technologies across the RF and Optical spectrum, such as wide-band HF, UHF, and other high-data rate wireless technologies.					

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0604707N / *SEW Architecture/Eng Support*	**Project (Number/Name)** 0798 / *Allied/Coalition Interoperability and Information Dominance (ACIID)*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
- Develop and assess secure and interoperable multi-bearer routing, distributed application, and service architectures and advanced IA/CND solutions that support tactical networking and A2/AD requirements. The overarching goal is to maximize interoperability and network efficiency using multiple, dissimilar bearers and integrate these advanced solutions into an Allied/Coalition tactical networking environment that will defeat A2/AD. - Continue to progress the standardization and operationalization of North Atlantic Treaty Organization (NATO) Maritime Relayed Line of Sight Network Standardization Agreements (STANAG 4691) and High Frequency Internet Protocol (STANAG 5066 Edition 3). - Increase Allied Information Warfare (IW) interoperability with other joint and maritime multi-national forums, such as the Combined Communications Electronics Board (CCEB), Multinational Maritime Information-system Interoperability Steering Group (M2I2), Mission Partner Environment (MPE), Future Mission Network (FMN), and the Joint Information Environment (JIE) forums. - Venues of opportunity, such as Fleet Experimentation (FLEX), will be exploited to assess and validate the individual technologies, integrated solutions, and associated Doctrine, Organization, Training, Materiel, Leadership and Education, Personnel and Facilities (DOTMLPF) through limited experimentation, trials, and demonstrations with Australia, Canada, New Zealand, United Kingdom, United States (AUSCANNZUKUS) and other Allied/Coalition partners.					
FY 2017 Base Plans: - Develop and refine advanced networking and communication capabilities that counter Anti-Access Area Denial (A2/AD) environments and promote Allied interoperability and task group-centric operations. Solutions will address higher bandwidth, Low Probability of Intercept (LPI)/Low Probability of Detection (LPD)/Anti-Jam (AJ) technologies across the Radio Frequency (RF) and Optical spectrum and include airborne capabilities. - Develop and assess secure and interoperable technologies and capabilities that counter A2/AD environments, to include multi-bearer routing, MPE/FMN architectures that support distributed applications and service architectures, the use of cross-domain and data labeling solutions in maritime tactical networking environments (e.g. the U.S. Battlefield Information Collection and Exploitation System - extended (BICES-X) Trusted Network Engine, or TNE) and advanced Information Assurance and Computer Network Defense (IA/CND) solutions. The overarching goal is to maximize interoperability and network and application efficiency using multiple, dissimilar bearers and integrate these advanced solutions into an Allied/Coalition networking capability capable of countering A2/AD environments and integrated with MPE/FMN architectures. - Assess BICES-X technologies and associated interoperability issues in Satellite Communications (SATCOM) denied or degraded environments.					

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0604707N / *SEW Architecture/Eng Support*	**Project (Number/Name)** 0798 / *Allied/Coalition Interoperability and Information Dominance (ACIID)*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
- Increase Allied IW interoperability with other joint and maritime multi-national forums, such as the CCEB, M2I2, MPE, FMN, and JIE forums. - Assess and validate individual technologies, integrated solutions, and associated DOTMLPF through experimentation, trials and demonstrations with AUSCANNZUKUS and other Allied/Coalition partners during operational venues such as RIMPAC or Joint Warrior. ***FY 2017 OCO Plans:*** N/A					
Accomplishments/Planned Programs Subtotals	0.730	0.649	0.953	0.000	0.953

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

Allied/Coalition Interoperability and Information Dominance (ACIID) is a non-acquisition program that promotes United States Navy (USN) interoperability with allied and coalition forces to achieve the Chief of Naval Operations (CNO) vision by facilitating maritime interoperability in both processes and communications systems, including emerging capabilities, to counter growing high-end asymmetric threats, and is a key enabler of the force multiplying benefits achieved through cooperation among the Australia, Canada, New Zealand, United Kingdom, United States (AUSCANNZUKUS), North Atlantic Treaty Organization (NATO), and other partner nations. Activities include acquiring intellectual capital in emerging technical areas through contracts providing technical engineering expertise and surge capacity for emerging tasks.

E. Performance Metrics

Advanced Relay Capabilities: The ACIID 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 Anti-Access Area Denial (A2/AD) environments, Network Operations Without Shore (NOWS), Maritime Domain Awareness (MDA), Mission Partner Environment (MPE)/Future Mission Networks (FMN), Joint Information Environment (JIE), and other aspects of Information Dominance (ID). These assessments will report on identified capability gaps, link capability gaps to technology/DOTMLPF gaps, identify technologies and DOTMLPF solutions considered ready for deployment, transition to a program of record to enhance Fleet war fighting capability, and enhance Allied interoperability.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0604707N / *SEW Architecture/Eng Support*	**Project (Number/Name)** 0798 / *Allied/Coalition Interoperability and Information Dominance (ACIID)*	

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Advanced Relay Capabilities	Various	Various : Various	12.226	0.091	Jan 2015	0.080	Jan 2016	0.117	Jan 2017	-		0.117	Continuing	Continuing	Continuing
Advanced Relay Capabilities	WR	SSC PAC : San Diego	2.895	0.555	Jan 2015	0.494	Jan 2016	0.726	Jan 2017	-		0.726	Continuing	Continuing	Continuing
Advanced Relay Capabilities	C/CPFF	SAIC : McLean, VA	0.090	0.084	Jan 2015	0.075	Jan 2016	0.110	Jan 2017	-		0.110	Continuing	Continuing	Continuing
Interoperability Requirements	Various	Various : Various	3.266	0.000		0.000		0.000		-		0.000	0.000	3.266	-
T & E Tools Development	Various	Various : Various	0.429	0.000		0.000		0.000		-		0.000	0.000	0.429	-
Systems Int. & Interop. Testing (LBTN)	Various	Various : Various	3.862	0.000		0.000		0.000		-		0.000	0.000	3.862	-
Interoperability Validation	Various	Various : Various	2.748	0.000		0.000		0.000		-		0.000	0.000	2.748	-
Joint Interoperability	Various	Various : Various	1.174	0.000		0.000		0.000		-		0.000	0.000	1.174	-
Testing OTH-T Systems	Various	Various : Various	3.069	0.000		0.000		0.000		-		0.000	0.000	3.069	-
		Subtotal	29.759	0.730		0.649		0.953		-		0.953	-	-	-

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Support	Various	Various : Various	1.468	0.000		0.000		0.000		-		0.000	0.000	1.468	-
ACQ Workforce Fund	Various	Various : Various	0.009	0.000		0.000		0.000		-		0.000	0.000	0.009	-
		Subtotal	1.477	0.000		0.000		0.000		-		0.000	0.000	1.477	-

	Prior Years	FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	31.236	0.730		0.649		0.953		-		0.953	-	-	-

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0604707N / *SEW Architecture/Eng Support*	**Project (Number/Name)** 0798 / *Allied/Coalition Interoperability and Information Dominance (ACIID)*

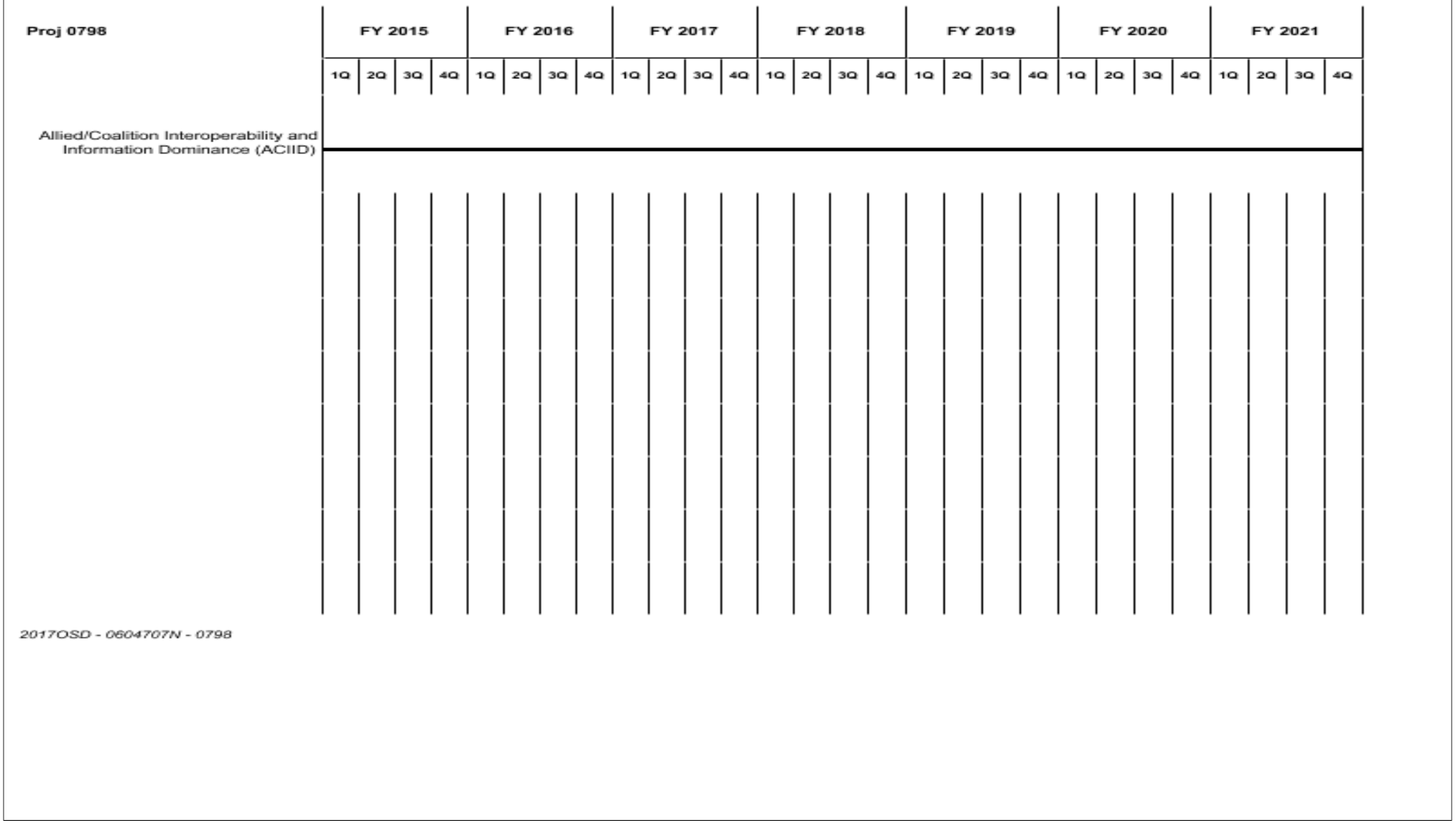

Exhibit R-4A, RDT&E Schedule Details: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0604707N / *SEW Architecture/Eng Support*	**Project (Number/Name)** 0798 / *Allied/Coalition Interoperability and Information Dominance (ACIID)*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 0798				
Allied/Coalition Interoperability and Information Dominance (ACIID):	1	2015	4	2021

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0604707N / *SEW Architecture/Eng Support*	Project (Number/Name) 2144 / *Space & Elec Warfare Engineering*	

COST ($ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
2144: *Space & Elec Warfare Engineering*	188.361	11.045	7.300	13.175	-	13.175	13.726	12.752	12.916	13.083	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

OPNAVINST 3050.25 outlines the policy to use Warfighting Capability, Capacity, and Wholeness assessments to support the Navy's Planning Programming Budgeting and Execution (PPBE) process. Command, Control, Communications, Computers, Intelligence, Surveillance, and Reconnaissance (C4ISR) integrated architectures serve as key components in assessing capability and capacity gaps, enabling analysis of individual platforms and System of Systems (SoS) capabilities in order to achieve the desired war fighting effect.

Office of the Secretary of Defense (OSD) has defined several key programs, initiatives, and policies that drive Navy requirements prioritization and impact Navy programs of record. Major efforts include Joint Information Environment (JIE), and the Intelligence Community Information Technology Environment (IC ITE). Space and Naval Warfare Systems Command (SPAWAR) responsibilities for Information Technology (IT) Technical Authority (TA), Information Assurance (IA) TA, and the Information Dominance Enterprise Architecture (IDEA) will guide Navy's alignment with and implementation of these key, external requirements.

Additionally, Office of the Chief of Naval Operations (OPNAV) N2/N6 Information Dominance (ID) objectives for Assured Command and Control (C2), Battlespace Awareness, and Integrated Fires capabilities require significant changes and improvements to the Navy's approach for managing its information infrastructure, content, and effects. Potential adversaries will exploit perceived United States (U.S.) space and cyberspace vulnerabilities which could impact U.S. information-handling capabilities and wartime readiness. To realize the ID vision, SPAWAR as the Navy's ID Systems Command, will need to support and enforce implementation of IT and IA TA architectures, specifications, standards, and profiles to ensure Navy cyber capabilities are a warfighting asset, not a liability.

The Space and Electronic Warfare (SEW) provides three main functions:
1) Perform SoS and platform technical evaluations to establish the alignment with the OPNAV N2/N6 ID vision for the Navy and identify performance and operational risks associated with the integration of multiple systems to provide a robust, mission based capability; 2) Develop C4ISR/IT/ID integrated architecture products; and 3) Support development of and compliance with C4ISR/IT/ID systems engineering processes and standards. The integrated architecture products are used to support the Navy's budget process by providing a current baseline and a target end state to inform decision-making and prioritization for how the acquisition system will deliver new capabilities to the war fighter. The systems engineering processes and standards provide the construct for Assured C2, Battlespace Awareness and Integrated Fires interoperability requirements analyses to identify capability shortfalls/gaps and to compare/test alternatives in a joint end-to end environment while identifying associated Navy-wide C4ISR/IT/ID implications. Processes include developing and applying criteria for use in Systems Engineering Technical Reviews (SETRs) and Gate Reviews, and providing technical inputs and assessments to governance bodies. 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 efforts/programs are defined and matured, the Navy's C4ISR integrated architectures are refined in-turn, and the supporting C4ISR systems engineering processes and standards work to engineer and enact C4ISR implementations Navy-wide across all C4ISR mission areas.

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0604707N / *SEW Architecture/Eng Support*	**Project (Number/Name)** 2144 / *Space & Elec Warfare Engineering*

Products provided:
1) C4ISR, IT, IA, and ID integrated architectures to reflect current, as-programmed and future, target states
-Fit for Purpose/Department of Defense Architecture Framework (DoDAF) compliant architecture views
-Systems Command (SYSCOM) Technical Authority (TA) specifications, standards and profiles
-Common engineering processes and tools
2) Supporting Command, Control, Communications, Computers, Intelligence, Surveillance, and Reconnaissance (C4ISR)/Information Technology (IT)/Information Dominance (ID) systems engineering processes
-Technical standards, architectures, design guidance tools, and policies support to SYSCOMs developing IT systems and connecting to the Navy Enterprise Network afloat, ashore & aloft
-Documentation of IT interfaces to Navy Networks
-Certifications of systems and applications connected to the Navy Enterprise Network
-Gaps Analysis, Analysis of Alternatives, 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; joint/coalition interoperability demonstrations; interoperability assessments and metrics; and interoperability studies via the Coalition Warrior Interoperability eXploration, eXperimentation, eXamination, eXercise (CWIX). United States Navy (USN) provides funding to the general CWIX operating budget and participates by operating a USN demonstration site
-Technical analyses for Navy cloud computing options, including cloud deployment models (utility/data), mission context, warfighting and cost implications and possible implementation options for ashore and afloat capabilities
-Integration and Interoperability (I&I) - Support Assistant Secretary of the Navy for Research, Development, and Acquisition (ASN(RDA)) and Office of the Chief of Naval Operations (OPNAV) I&I initiatives to ensure integration and interoperability across Assured Command and Control (C2), Battlespace Awareness and Integrated Fires to deliver ID to Navy warfighters. Conduct analyses and engineering activities that provide an operational, mission-driven context to the assessment of capability gaps and interoperability seams between Navy System of Systems (SoS) capabilities that better enable acquisition programs to deliver fully integrated and interoperable warfighting capabilities. Provide I&I support in Systems Engineering Technical Reviews (SETRs) and provide recommendations for updates to acquisition policies and guidance

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Title: C4ISR Systems Engineering	2.728	2.627	2.973	0.000	2.973
Articles:	-	-	-	-	-
FY 2015 Accomplishments: -Continued C4ISR and ID Transformation/Strategic Planning within Navy/Joint/Department of Defense (DoD) Framework: Assessed existing and emerging capabilities; developed and evaluated Navy-wide policies, plans, requirements, and compliance; developed integration and investment strategies; and accelerated innovation,					

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
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B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
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 and ID capability. -Continued to establish, develop, and validate interoperability requirements: Continued to perform SETRs utilizing validated assessment tools, system engineering methodologies and SETR checklists tracing system design to standards and requirements (e.g., Information Assurance (IA), data strategy, architecture, modeling, Open Architecture, Configuration Management (CM), Service Oriented Architecture (SOA) development, Anti-tamper, etc.) ensuring interoperability compliance to statutory and regulatory directives and guidance. -Continued to ensure continuous improvement of Systems Engineering Technical Reviews (SETRs) Checklists by incorporating the latest policy, guidance, standards, and specifications. -Continued to perform System of Systems (SoS) and platform technical evaluations to integrate the alignment with the N2/N6 Information Dominance (ID) vision and identify performance, interoperability, and operational risks associated with the integration of multiple systems to provide a robust, mission based capability. -Continued to conduct document reviews (of Acquisition Strategies, Systems Engineering Plans, Information Support Plans, IA Strategies, Initial Capabilities Documents, Capabilities Development Documents, Capabilities Production Documents, Enterprise Architectures, etc.) for Office of the Chief of Naval Operations (OPNAV), Assistant Secretary of the Navy for Research, Development and Acquisition (ASN(RDA)), and the Program Executive Offices (PEOs), and other services to ensure sound systems engineering analysis and design principles have been applied to system planning requirements, design, testing, and supportability. -Continued to perform engineering evaluation and provided buy/no-buy decisions for proposed Deviations from Specification for afloat platforms to determine performance and operational impacts of the proposed changes and their effects on the platform's mission. -Continued to provide engineering evaluation and validation of Business Information Technology (IT) applications and IT infrastructure in order to combine, consolidate, and eliminate unnecessary or underutilized business systems for the Naval Enterprise. -Continued to provide engineering evaluation and validation of programs and ensured adherence to technical standards in the following technical domains-communications, networks, Information Storage and Retrieval/ Information Surveillance Reconnaissance/Information Operations, afloat platforms (both large and small decks), submarines, shore and Maritime Operations Center capability, command and control, and space systems. -Continued to conduct Command, Control, Communications, Computers, Intelligence, Surveillance, and Reconnaissance (C4ISR) Certifications through design and testing analysis ensuring C4ISR delivery to the platform (shore, surface ship, submarine) was validated to meet the operational need and was interoperable with platform, force level, joint/allied/coalition forces.					

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
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B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
-Continued to provide technical support to the Department of the Navy Chief Information Office (DoN CIO) assessment of compliance with Department of Navy Enterprise Architecture (DoN EA) as part of Title 40/Clinger-Cohen Act confirmation process.					
FY 2016 Plans: -Continue Command, Control, Communications, Computers, Intelligence, Surveillance, and Reconnaissance (C4ISR) and Information Dominance (ID) Transformation/Strategic Planning within Navy/Joint/Department of Defense (DoD) Framework: Assess existing and emerging capabilities; develop and evaluate Navy-wide policies, plans, requirements, and compliance; develop integration and investment strategies; and accelerate innovation, testing, assessment and fielding of materiel and non-materiel solutions for enhanced operational capability, joint/allied/coalition interoperability and application/enforcement of enterprise requirements/ architectures/standards toward greater Net-Centric Operations/Warfare and ID capability. -Continue to establish, develop, and validate interoperability requirements: Continue to perform Systems Engineering Technical Reviews (SETRs) on Acquisition Category (ACAT) I,II, and III programs utilizing validated assessment tools, system engineering methodologies and SETR checklists tracing system design to standards and requirements (e.g., Information Assurance (IA), data strategy, architecture, modeling, Open Architecture, Configuration Management (CM), Service Oriented Architecture (SOA) development, Anti-tamper, etc.) ensuring interoperability compliance to statutory and regulatory directives and guidance. -Ensure continuous improvement on SETR Checklists for ACAT I,II, and III programs by incorporating the latest policy, guidance, standards, and specifications, including specific criteria for effective implementation of and compliance with Information Technology (IT) and IA Technical Authority (TA) architectures, specifications, standards and profiles. -Continue to perform System of Systems (SoS) and platform technical evaluations to assess alignment with the Office of the Chief of Naval Operations (OPNAV) N2/N6 ID vision, and identify technical performance, interoperability, and operational risks associated with the integration of capabilities across multiple systems to provide a robust, mission-based capability. -Continue to provide document reviews (of Acquisition Strategies, Systems Engineering Plans, Information Support Plans, IA Strategies, Initial Capabilities Documents, Capabilities Development Documents, Capabilities Production Documents, Enterprise Architectures, etc.) for OPNAV, Assistant Secretary of the Navy for Research, Development, and Acquisition (ASN(RDA)), Program Executive Offices (PEOs), and other Services to ensure the application of sound systems engineering analysis and design principles to system planning requirements, design, testing, and supportability.					

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B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
-Continue to perform engineering evaluations for afloat platforms to determine performance and operational impacts of proposed deviations from specification and provide buy/no-buy recommendations. -Continue to provide engineering evaluations and validation of Business IT applications and IT infrastructure in order to combine, consolidate, and eliminate unnecessary or underutilized business systems for the Naval Enterprise Network. -Continue to provide engineering evaluations and validation of programs and ensure adherence to technical standards in the following technical domains: communications, networks, Information Storage and Retrieval/ Information Surveillance Reconnaissance/Information Operations, afloat platforms (both large and small decks), submarines, shore and Maintenance Operations Center capability, command and control, and space systems. -Continue to provide Command, Control, Communications, Computers, Intelligence, Surveillance, and Reconnaissance (C4ISR) Certifications through design and testing analysis ensuring C4ISR delivery to the platform (shore, surface ship, submarine) is validated to meet the operational need and is interoperable with platform, force level, joint/allied/coalition forces. -Continue to provide technical support to the Department of the Navy Chief Information Office (DoN CIO) assessment of compliance with Department of Navy Enterprise Architecture (DoN EA) as part of Title 40/Clinger-Cohen Act certification process.					
FY 2017 Base Plans: -Continue C4ISR and Information Dominance (ID) Transformation/Strategic Planning within Navy/Joint/ Department of Defense (DoD) Framework: Perform a deeper dive into existing capabilities with an emphasis on emerging capabilities; develop and evaluate Navy-wide policies, plans, requirements, and compliance; develop integration and investment strategies; accelerating innovation, testing, assessment and fielding of materiel and non-materiel solutions for enhanced operational capability, joint/allied/coalition interoperability and application/ enforcement of enterprise requirements/architectures/standards toward greater Net-Centric Operations/Warfare and ID capability. -Continue to establish, develop, and validate interoperability requirements: Continue to perform Systems Engineering Technical Reviews (SETRs) on Acquisition Category (ACAT) I,II, and III programs utilizing validated assessment tools, system engineering methodologies and SETR checklists tracing system design to standards and requirements (e.g., Information Assurance (IA), data strategy, architecture, modeling, Open Architecture, Configuration Management (CM), Service Oriented Architecture (SOA) development, Anti-tamper, etc.) ensuring interoperability compliance to statutory and regulatory directives and guidance.					

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
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B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
-Ensure continuous improvement on SETR Checklists for ACAT I,II, and III programs by incorporating the latest policy, guidance, standards, and specifications, including specific criteria for effective implementation of and compliance with Information Technology (IT) and IA Technical Authority (TA) architectures, specifications, standards and profiles. -Continue to perform System of Systems (SoS) and platform technical evaluations to assess alignment with Office of the Chief of Naval Operations (OPNAV) N2/N6 ID vision, and identify technical performance, interoperability, and operational risks associated with the integration of capabilities across multiple systems to provide a robust, mission-based capability. -Continue to provide document reviews (of Acquisition Strategies, Systems Engineering Plans, Information Support Plans, IA Strategies, Initial Capabilities Documents, Capabilities Development Documents, Capabilities Production Documents, Enterprise Architectures, etc.) for OPNAV, Assistant Secretary of the Navy for Research, Development, and Acquisition (ASN(RDA)), Program Executive Offices (PEOs), and other Services to ensure the application of sound systems engineering analysis and design principles to system planning requirements, design, testing, and supportability. -Perform more complex engineering evaluations for afloat platforms to determine performance and operational impacts of proposed deviations from specification and provide buy/no-buy recommendations. -Continue to provide engineering evaluations and validation of Business Information Technology (IT) applications and IT infrastructure in order to combine, consolidate, and eliminate unnecessary or underutilized business systems for the Naval Enterprise Network. -Continue to provide engineering evaluations and validation of programs and ensure adherence to technical standards in the following technical domains: communications, networks, Information Storage and Retrieval/ Information Surveillance Reconnaissance/Information Operations, afloat platforms (both large and small decks), submarines, shore and Maritime Operations Center capability, command and control, and space systems. -Continue to provide Command, Control, Communications, Computers, Intelligence, Surveillance, and Reconnaissance (C4ISR) Certifications through design and testing analysis ensuring C4ISR delivery to the platform (shore, surface ship, submarine) is validated to meet the operational need and is interoperable with platform, force level, joint/allied/coalition forces. -Continue to provide technical support to the Department of the Navy Chief Information Office (DoN CIO) assessment of compliance with Department of Navy Enterprise Architecture (DoN EA) as part of Title 40/Clinger-Cohen Act certification process.					
FY 2017 OCO Plans:					

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
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B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
N/A					
Title: Coalition Warrior Interoperability eXploration, eXperimentation, eXamination, eXercise (CWIX)	1.463	0.837	0.983	0.000	0.983
Articles:	-	-	-	-	-
FY 2015 Accomplishments: -Developed interoperability and information sharing through coalition engagement, technology, demonstrations, and assessments that led to improvements of C4ISR systems within the Navy and in conjunction with Joint Services and Coalition efforts. -Leveraged Coalition Interoperability Assurance and Validation (CIAV) Mission Partner Environment (MPE) efforts in order to develop operationally relevant experiments and assessments focused on Navy mission enhancement in a Coalition environment. -Continued development of a Navy experimentation environment that can be leveraged to provide Navy focused Assurance and Validation support to the CIAV community. -Developed experiments integrated with North Atlantic Treaty Organization (NATO) and Third Country National (TCN) partners in conjunction with Coalition Warrior Interoperability eXploration, eXperimentation, eXamination, eXercise (CWIX) infrastructure. -Enhanced integration and engagement with Pacific Rim (PACOM AO) Coalition partners by leveraging existing experimentation and exercise venues (such as Rim of the Pacific (RIMPAC), Cooperation Afloat Readiness and Training (CARAT), Foal Eagle, and Cobra Gold) in order to develop operationally relevant experiments focused on enhancing Navy missions. -Demonstrated and evaluated cutting-edge technologies and transitioned them to the end-user, including Coalition Partners, and the Joint Services. -Continued to provide interoperability between existing and cutting-edge Command, Control, Communications, Computers, Intelligence, Surveillance, and Reconnaissance (C4ISR) systems. Integrated directly with Navy Acquisition Programs (i.e. Program Executive Office Command, Control, Communications, Computers, Intelligence (PEO C4I) and the Component/ Combatant Commanders at the Technical Director and Science Advisor levels). -Validated technology selection, experimental objective design, and execution to influence and direct design efforts and to satisfy warfighter capability gaps in a Coalition setting.					

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B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
-Continued to develop operationally relevant classified laboratory environments for Joint/Coalition war fighter technology experiments. Year-round connectivity will be continued with end-users in order to provide a distributed Coalition experimentation environment focused enhancement of Navy missions. ***FY 2016 Plans:*** -Develop interoperability and information sharing through coalition engagement, technology, demonstrations, and assessments leading to improvements of C4ISR systems within the Navy and in conjunction with Joint Services and Coalition efforts. -Further enhance integration and engagement with Pacific Rim (PACOM AO) Coalition partners as well as Coalition partners in the Southern Command Area of Operation (SOUTHCOM AO) by fostering a connected, distributed experimentation environment suitable for expanded experimentation in those areas. -Seek enhanced interoperability with North Atlantic Treaty Organization (NATO) Coalition partners through the Coalition Warrior Interoperability eXploration, eXperimentation, eXamination, eXercise (CWIX) infrastructure. -Utilize existing events such as Coalition Interoperability Assurance and Validation (CIAV) and CWIX to expose interoperability issues between United States (U.S.) and Coalition Partner systems and report issues and possible workarounds to relevant entities. -Leverage CIAV infrastructure to enhance U.S. maritime interoperability within the Joint Information Environment (JIE) Mission Partner Environment (MPE). -Coordinate experimentation with applicable acquisition and operational entities (i.e. PEO C4I, Component/ Combatant Commanders at the Technical Director and Science Advisor levels) in order to assess interoperability between existing and cutting-edge C4ISR systems. -Continue development of suitable environments for Joint/Coalition war fighter technology experiments. Periodic connectivity will be continued with end-users in order to provide a distributed Coalition experimentation environment focused enhancement of Navy missions. ***FY 2017 Base Plans:*** -Continue to develop interoperability and information sharing through coalition engagement, technology, demonstrations, and assessments leading to improvements of Command, Control, Communications, Computers, Intelligence, Surveillance, and Reconnaissance (C4ISR) systems within the Navy and in conjunction with Joint Services and Coalition efforts. -Pursue greater Pacific Rim (PACOM) Partner Nation and Southern Command (SOUTHCOM) Partner Nation engagement by fostering a connected, distributed experimentation environment suitable for expanded experimentation in those areas.					

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B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
-Foster enhanced interoperability amongst North Atlantic Treaty Organization (NATO) and affiliated Coalition Partners by participating in the planning and execution of Coalition Warrior Interoperability eXploration, eXperimentation, eXamination, eXercise (CWIX). -Assess Coalition Interoperability Assurance, Validation, and Verification as related to the engineering and execution of the Mission Partner Environment (MPE) via the Coalition Interoperability Assurance and Validation (CIAV) infrastructure. - Coordinate experimentation activities with appropriate acquisition and operational entities (i.e. Program Executive Office Command, Control, Communications, Computers, Intelligence (PEO C4I), Component/ Combatant Commanders at the Technical Director and Science Advisor levels) in order to create synergy and provide the most value. ***FY 2017 OCO Plans:*** N/A					
Title: Systems Engineering and Integration Revitalization	1.342	0.856	0.969	0.000	0.969
Articles:	-	-	-	-	-
FY 2015 Accomplishments: -Continued to refine the Integration & Interoperability (I&I) Systems Engineering Technical Review (SETR) checklist in support of the Assistant Secretary of the Navy for Research, Development, and Acquisition (ASN(RDA)). -Continued to conduct I&I SETR events to validate and refine I&I checklist items. -Continued to review all Navy Information Technology Procurement Requests (ITPR) for developing systems to ensure adherence to Navy Information Technology (IT) standards and capture and report metric information to support moving to bulk IT procurement to take advantage of economies of scale across the Department of the Navy (DoN). -Provided Command, Control, Communications, Computers, Intelligence (C4I) and Information Assurance (IA) Certifications (Naval Warfare Systems Certification Policy (NWSCP)) and Department of Defense Information Assurance Certification and Accreditation Process (DIACAP)). -Began engineering development for the Deputy Assistant Secretary of the Navy (DASN) Research, Development, Testing and Evaluation (RDT&E) Rapid Prototyping for Modulated Retro Reflector (MRR) CubeSat Project; Provided engineering development and support towards the development of the CubeSat bus and Radio Frequency (RF) ground station; Began development of the optical ground station for Modulated Retro Reflector effort; Began development of a processor board for the flight terminal that combined modem, storage					

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B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
and command handling, and a modem board for the ground station; Began trade study comparing different photo detector architectures for the ground station.					
FY 2016 Plans: -Continue to develop and refine the Integration & Interoperability (I&I) Integrated Capability Framework's (ICF) Mission Technical Baselines aligned to Required Operational Capability (ROC)/Platform Operational Environment (POE) mission areas to capture and decompose operational requirements and define System of System (SoS) interoperability requirements. Use these SoS baselines to develop Integrated Capability Technical Baselines to support analysis of capability gaps and engineering trades to inform investment decisions. -Continue to evolve Assured Command and Control (C2), Battlespace Awareness and Integrated Fires Integrated Capability Technical Baselines to ensure Information Dominance (ID) capabilities align to mission-specific kill chains to reduce interoperability seams across the supporting SoS. -Establish robust, foundational mission engineering tools (e.g., executable architecture models) to support I&I technical performance gap analysis and trade recommendations. -Review impact on Acquisition Category (ACAT) I, II, and III programs of I&I Systems Engineering Technical Reviews (SETR) checklist items on SETR outcomes and acquisition system improvements to deliver fully integrated and interoperable warfighting capability. -Provide Command, Control, Communications, Computers, Intelligence (C4I) and Information Assurance (IA) Certifications (Naval Warfare Systems Certification Policy (NWSCP)).					
FY 2017 Base Plans: -Continue to develop and refine the I&I ICF Mission Technical Baselines aligned to ROC/POE mission areas to capture and decompose operational requirements and define SoS interoperability requirements. Use these SoS baselines to develop Integrated Capability Technical Baselines to support analysis of capability gaps and engineering trades to inform investment decisions. -Continue to evolve Assured C2, Battlespace Awareness and Integrated Fires Integrated Capability Technical Baselines to ensure ID capabilities align to mission-specific kill chains to reduce interoperability seams across the supporting SoS. -Establish robust, foundational mission engineering tools (e.g., executable architecture models) to support I&I technical performance gap analysis and trade recommendations. -Review impact on Acquisition Category (ACAT) I, II, and III programs of Integration & Interoperability (I&I) Systems Engineering Technical Review (SETR) checklist items on SETR outcomes and acquisition system improvements to deliver fully integrated and interoperable warfighting capability.					

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B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
-Provide Command, Control, Communications, Computers, Intelligence (C4I) and Information Assurance (IA) Certifications (Naval Warfare Systems Certification Policy (NWSCP)). ***FY 2017 OCO Plans:*** N/A					
Title: Systems Engineering Standards and Processes	5.512	2.980	8.250	0.000	8.250
Articles:	-	-	-	-	-
FY 2015 Accomplishments: -Continued to develop/refine processes to integrate System of System (SoS) engineering technical assessments to identify cross system dependencies and potential interoperability and integration issues. -Continued to incorporate lessons learned from prior year system engineering efforts to ensure multi-systems processes were intuitive and met the mission of the Navy. -Continued efforts to develop Joint cloud-enabled, secure domain environment using virtual desktop technology that allowed secure and cost effective operations at the point of need, creating improved efficiencies, enhanced cyber operations and improved capabilities across a range of military operations. -Developed Information Technology (IT) and Command, Control, Communications, Computers, Intelligence, Surveillance, and Reconnaissance (C4ISR) requirements and interface specifications and standards. -Developed Information Assurance(IA)requirements and interface specifications and standards. -Developed/refined processes for IT and C4ISR Technical Authority (TA) implementation. -Developed/refined processes for IA TA implementation. -Established an online repository of SoS IT and IA Engineering Policies, Requirements, Standards, and Best Practices to facilitate consistent SoS Engineering across all Navy activities. -Updated the future Navy cloud architecture to inform Navy acquisition programs on cloud technologies.					
FY 2016 Plans: -Reduce cyber variance through the standardization of afloat, ashore and aloft infrastructure. Continue IT and IA TA efforts to define, place under configuration control, and manage physical and logical interface requirements and IA controls for systems that connect to the Navy Enterprise Network. -Sustain actions to develop platform as-programmed and target architectures to support continued progress toward reducing the number of unique interfaces and variance across platform configurations. -Continue to develop and promulgate specifications, standards and profiles under IT TA. -Develop and promulgate cybersecurity standards under IA TA to ensure consistent implementation of IA controls across Navy systems.					

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B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
-Develop Navy Cybersecurity Situational Awareness (NCSA) requirements and interface specifications and standards to reduce variance across the Navy cyber environment and enable integration and interoperation across multiple tools and technologies. -Ensure compliance with NCSA requirements and standards across Navy networks and systems, to include Command, Control, Communications, Computers, Intelligence, Surveillance, and Reconnaissance (C4ISR) systems as well as tactical control systems such as combat, Hull Mechanical & Electrical (HM&E), and navigation systems. -Perform risk assessments to improve NCSA decision-making regarding the protection, detection, and response to cyber events on Navy networks and systems. -Develop and sustain enterprise-level cybersecurity target architectures to support Navy transition to a holistic cybersecurity strategy that enables the establishment of a common, layered, Defense-in-Depth approach that improves the Navy's cyber security posture. Develop and support the establishment of the Defense-in-Depth Functional Implementation Architecture (DFIA) to define Information Assurance (IA) boundaries, IA and logical attributes, controlling parameters, and inheritable security controls. -Carry forward efforts to verify existing processes on Acquisition Category (ACAT) I, II, and III programs (e.g., Systems Engineering Technical Reviews (SETR), Gate Reviews, etc.) to ensure compliance with Information Technology (IT) and IA Technical Authority (TA) specifications, standards and profiles early in the acquisition lifecycle. Mature IT and IA Configuration Management and Waiver processes to ensure implementation and compliance determinations are based on enterprise-level risk management assessments. -Sustain the Information Dominance Enterprise Architecture (IDEA) to serve as the Navy Enterprise Network target end state that supports alignment with the Joint Information Environment (JIE), Intelligence Community Information Technology Environment (IC ITE), and enables integration of Navy Tactical Cloud capabilities. -Establish the IDEA-Repository (IDEA-R) to serve as the authoritative source of IT and IA TA architectures, specifications, standards and profiles. Sustain efforts to include Integration and Interoperability (I&I) outputs (e.g., Mission Technical Baselines, Integrated Capability Technical Baselines) and vignette descriptions within the IDEA-R to support mission-/capability-driven and System of Systems assessments that support Program Objective Memorandum (POM) inputs and ensure IDEA-R related products support objectives for Assured Command & Control (C2), Battlespace Awareness and Integrated Fires. -Use IDEA to validate the future Navy cloud architecture to inform Navy acquisition program investments on cloud technologies.					

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B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
-Certify applications and systems connected to the Naval Enterprise Network for compliance to Information Technology (IT) and Information Assurance (IA) standards and best practices and assure cyber resilience.					
FY 2017 Base Plans: -Reduce cyber variance through the standardization of afloat, ashore and aloft infrastructure. Continue IT and IA Technical Authority (TA) efforts to define, place under configuration control, and manage physical and logical interface requirements and IA controls for systems that connect to the Navy Enterprise Network. -Sustain actions to develop platform as-programmed and target architectures to support continued progress toward reducing the number of unique interfaces and variance across platform configurations. -Continue to develop and promulgate specifications, standards and profiles under IT TA. -Continue to develop and promulgate cybersecurity standards under IA TA to ensure consistent implementation of IA controls across Navy systems. -Continue to develop Navy Cybersecurity Situational Awareness (NCSA) requirements and interface specifications and standards to reduce variance across the Navy cyber environment and enable integration and interoperation across multiple tools and technologies. -Ensure compliance with NCSA requirements and standards across Navy networks and systems, to include Command, Control, Communications, Computers, Intelligence, Surveillance, and Reconnaissance (C4ISR) systems as well as tactical control systems such as combat, Hull Mechanical & Electrical (HM&E), and navigation systems. -Increase risk assessment analysis to improve NCSA decision-making regarding the protection, detection, and response to cyber events on Navy networks and systems. -Continue to develop and sustain enterprise-level cybersecurity target architectures to support Navy transition to a holistic cybersecurity strategy that enables the establishment of a common, layered, Defense-in-Depth approach that improves the Navy's cyber security posture. Develop and support the establishment of the Defense-in-Depth Functional Implementation Architecture (DFIA) to define IA boundaries, IA and logical attributes, controlling parameters, and inheritable security controls. -Verify existing processes on Acquisition Category (ACAT) I, II, and III programs (e.g., Systems Engineering Technical Reviews (SETR), Gate Reviews, etc.) to ensure compliance with IT and IA TA specifications, standards and profiles early in the acquisition lifecycle. Mature IT and IA Configuration Management and Waiver processes to ensure implementation and compliance determinations are based on enterprise-level risk management assessments.					

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B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
-Sustain the Information Dominance Enterprise Architecture (IDEA) to serve as the Navy Enterprise Network target end state that supports alignment with the Joint Information Environment (JIE), Intelligence Community Information Technology Environment (IC ITE), and enables integration of Navy Tactical Cloud capabilities. -Validate the IDEA-Repository (IDEA-R), which will serve as the authoritative source of IT and IA TA architectures, specifications, standards and profiles. Sustain efforts to include Integration and Interoperability (I&I) outputs (e.g., Mission Technical Baselines, Integrated Capability Technical Baselines) and vignette descriptions within the Information Dominance Enterprise Architecture-Repository (IDEA-R) to support mission/capability-driven and System of Systems assessments that support Program Objective Memorandum (POM) inputs and ensure IDEA-R related products support objectives for Assured Command & Control (C2), Battlespace Awareness and Integrated Fires. -Use IDEA to validate the future Navy cloud architecture to inform Navy acquisition program investments on cloud technologies. -Certify applications and systems connected to the Naval Enterprise Network for compliance to Information Technology (IT)/Information Assurance (IA) standards and best practices and assure cyber resilience. -Develop IT and IA Technical Authority (TA) standards to influence Programs of Record (PoRs) early in the acquisition cycle to ensure interoperability and cybersecurity are included in upfront design considerations for systems and applications that connect to the Navy IT Enterprise. - Establish cybersecurity engineering requirements for all Navy programs that connect to the Navy IT Enterprise to improve Fleet cyber readiness. - Provide risk assessments and authorization for Deviation from Specification (DFS) for systems that connect to the Navy IT Enterprise, as part of the IT/IA TA waiver process. The wavier process and associated risk assessments provide a mechanism for instilling disciplined systems engineering and enforcing standards intended to improve Navy interoperability and cybersecurity. - Establish Navy cybersecurity governance to develop processes in order to provide reasonable information assurance of critical platform components necessary for mission success such as Navy networks and control systems. - Develop the future progression for Navy cybersecurity by enhancing strategic engagements and ensuring cyber compliance during gate and milestone reviews of PoRs. - Validate compliance with CYBERSAFE Program within information systems, Platform Information Technology (PIT)-control systems, threat analysis, and policy, transforming mission needs into achievable CYBERSAFE requirements.					

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0604707N / *SEW Architecture/Eng Support*	**Project (Number/Name)** 2144 / *Space & Elec Warfare Engineering*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
- Evaluate current risk posture by reviewing assessments, inspections, audits, test/evaluation, and real-world events to ensure compliance with policy, establish strategic vision, and synchronize with the Navy's cyber approach. ***FY 2017 OCO Plans:*** N/A					
Accomplishments/Planned Programs Subtotals	11.045	7.300	13.175	0.000	13.175

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

Space and Electronic Warfare (SEW) Engineering is a non-acquisition program that develops, tests, implements technical authority, and validates naval Command, Control, Communications, Computers, Intelligence, Surveillance, and Reconnaissance (C4ISR); provides integrated architecture products and supports C4ISR systems engineering processes and standards. Activities include acquiring intellectual capital in emerging technical areas through contracts providing technical engineering expertise and surge capacity for emerging tasks.

E. Performance Metrics

The SEW engineering program will employ rigorous and consistent system engineering practices in an evolving value model to support development and deployment of shipboard, undersea, and land based capabilities based on mission and performance requirements, integrated enterprise architectures, model-validated solutions, and sustainment and supportability needs for the Command and Control, Intelligence, Networks, Communications, Space, and Business Information Technology domains.

Coalition Warrior Interoperability eXploration, eXperimentation, eXamination, eXercise (CWIX) Performance Metrics: Three key metrics: (1) Interoperability and compliance with Naval, joint, coalition and other non-governmental organization 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) war fighter utility assessment across the joint and coalition spectrum. Specific metrics validate performance of individual technologies participating in CWIX.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0604707N / *SEW Architecture/Eng Support*	Project (Number/Name) 2144 / *Space & Elec Warfare Engineering*	

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Development Support	Various	Various : Various	4.554	0.000		0.000		0.000		-		0.000	0.000	4.554	-
SEW/C4I Technology Integration	Various	Various : Various	12.985	0.000		0.000		0.000		-		0.000	0.000	12.985	-
MDA Prototype SE Support	Various	Various : Various	17.376	0.000		0.000		0.000		-		0.000	0.000	17.376	-
Systems Engineering & Integration Revitalization	Various	Various : Various	2.174	0.209	Feb 2015	0.000		0.000		-		0.000	0.000	2.383	-
Systems Engineering & Integration Revitalization	C/CPFF	ComGlobal : San Diego, CA	0.565	0.000		0.000		0.000		-		0.000	0.000	0.565	-
Systems Engineering & Integration Revitalization	C/CPFF	AUSGAR : San Diego, CA	0.966	0.401	Mar 2015	0.385	Mar 2016	0.436	Mar 2017	-		0.436	Continuing	Continuing	Continuing
Systems Engineering & Integration Revitalization	C/CPFF	METRON : Reston, VA	0.316	0.000		0.000		0.000		-		0.000	0.000	0.316	-
Systems Engineering & Integration Revitalization	C/CPFF	SAIC : McLean, VA	0.316	0.000		0.000		0.000		-		0.000	0.000	0.316	-
Systems Engineering & Integration Revitalization	WR	SSC LANT : Charleston, NC	0.637	0.232	Feb 2015	0.129	Feb 2016	0.145	Feb 2017	-		0.145	Continuing	Continuing	Continuing
Systems Engineering & Integration Revitalization	WR	SSC PAC : San Diego, CA	1.644	0.450	Feb 2015	0.342	Feb 2016	0.388	Feb 2017	-		0.388	Continuing	Continuing	Continuing
Systems Engineering & Integration Revitalization	WR	NRL : Washington, D.C.	0.000	0.050	Feb 2015	0.000		0.000		-		0.000	0.000	0.050	-
Systems Engineering Standards & Processes	Various	Various : Various	5.588	0.000		0.000		0.000		-		0.000	0.000	5.588	-
Systems Engineering Standards & Processes	C/CPFF	ComGlobal : San Diego, CA	1.454	0.000		0.000		0.000		-		0.000	0.000	1.454	-
Systems Engineering Standards & Processes	C/CPFF	AUSGAR : San Diego, CA	2.488	1.041	Mar 2015	0.990	Mar 2016	1.135	Mar 2017	-		1.135	Continuing	Continuing	Continuing
Systems Engineering Standards & Processes	C/CPFF	METRON : Reston, VA	0.813	0.000		0.000		0.000		-		0.000	0.000	0.813	-
Systems Engineering Standards & Processes	C/CPFF	SAIC : McLean, VA	0.812	0.000		0.000		0.000		-		0.000	0.000	0.812	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0604707N / *SEW Architecture/Eng Support*	Project (Number/Name) 2144 / *Space & Elec Warfare Engineering*	

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Systems Engineering Standards & Processes	WR	SSC LANT : Charleston, NC	1.644	0.347	Feb 2015	0.330	Feb 2016	1.238	Feb 2017	-		1.238	Continuing	Continuing	Continuing
Systems Engineering Standards & Processes	WR	SSC PAC : San Diego, CA	4.298	0.924	Feb 2015	0.880	Feb 2016	3.013	Feb 2017	-		3.013	Continuing	Continuing	Continuing
Systems Engineering Standards & Processes	C/CPFF	BAH : McLean, VA	0.000	3.200	Aug 2015	0.780	Aug 2016	2.864	Aug 2017	-		2.864	Continuing	Continuing	Continuing
Systems A&E and Validation	Various	Various : Various	13.188	0.000		0.000		0.000		-		0.000	0.000	13.188	-
Distributed C2 Interoperability Requirement analysis	Various	Various : Various	16.583	0.000		0.000		0.000		-		0.000	0.000	16.583	-
C4ISR Architecture and Standards	Various	Various : Various	14.268	0.000		0.000		0.000		-		0.000	0.000	14.268	-
End-to-End System Engineering and Integrated Design	Various	Various : Various	10.994	0.000		0.000		0.000		-		0.000	0.000	10.994	-
Info. Repository/Naval Architecture	Various	Various : Various	4.000	0.000		0.000		0.000		-		0.000	0.000	4.000	-
C4ISR Systems Engineering	Various	Various : Various	5.157	0.000		0.000		0.000		-		0.000	0.000	5.157	-
C4ISR Systems Engineering	WR	NSWC Dahlgren : Dahlgren, MD	0.879	0.000		0.000		0.000		-		0.000	0.000	0.879	-
C4ISR Systems Engineering	MIPR	DISA : Pensacola, FL	0.266	0.000		0.000		0.000		-		0.000	0.000	0.266	-
C4ISR Systems Engineering	C/CPFF	ComGlobal : San Diego, CA	7.636	0.000		0.000		0.000		-		0.000	0.000	7.636	-
C4ISR Systems Engineering	C/CPFF	AUSGAR : San Diego, CA	0.000	1.610	Mar 2015	1.550	Mar 2016	1.755	Mar 2017	-		1.755	Continuing	Continuing	Continuing
C4ISR Systems Engineering	WR	SSC LANT : Charleston, NC	0.440	0.000		0.000		0.000		-		0.000	0.000	0.440	-
C4ISR Systems Engineering	WR	SSC PAC : San Diego, CA	3.955	0.792	Feb 2015	0.763	Feb 2016	0.863	Feb 2017	-		0.863	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0604707N / *SEW Architecture/Eng Support*	Project (Number/Name) 2144 / *Space & Elec Warfare Engineering*	

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
C4ISR Systems Engineering	C/CPFF	SAIC : McLean, VA	0.000	0.326	Jan 2015	0.314	Jan 2016	0.355	Jan 2017	-		0.355	Continuing	Continuing	Continuing
C4ISR Systems Engineering	WR	NAVAIR : Patuxent River, MD	0.088	0.000		0.000		0.000		-		0.000	0.000	0.088	-
C4ISR Systems Engineering	MIPR	CECOM : Fort Monmouth, NJ	0.264	0.000		0.000		0.000		-		0.000	0.000	0.264	-
C4ISR Systems Engineering	MIPR	AF : Hill AFB, UT	0.220	0.000		0.000		0.000		-		0.000	0.000	0.220	-
		Subtotal	136.568	9.582		6.463		12.192		-		12.192	-	-	-

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
SEW Eng/CWIX	Various	Various : Various	30.171	0.000		0.000		0.000		-		0.000	0.000	30.171	-
SEW Eng/CWIX	MIPR	Defense Information Systems Agency : Arlington, VA	0.343	0.163	Apr 2015	0.093	Apr 2016	0.110	Apr 2017	-		0.110	Continuing	Continuing	Continuing
SEW Eng/CWIX	WR	Joint Interoperability Test Command : Fort Huachuca, AZ	2.204	0.000		0.000		0.000		-		0.000	0.000	2.204	-
SEW Eng/CWIX	WR	SSC Pacific : San Diego, CA	2.694	0.816	Dec 2014	0.467	Dec 2015	0.549	Dec 2016	-		0.549	Continuing	Continuing	Continuing
SEW Eng/CWIX	MIPR	US Northern Command : Peterson AFB, CO	0.332	0.000		0.000		0.000		-		0.000	0.000	0.332	-
SEW Eng/JRAE	Various	Various : Various	15.978	0.000		0.000		0.000		-		0.000	0.000	15.978	-
SEW Eng/CWIX	C/CPFF	SAIC : McLean, VA	0.000	0.317	Aug 2015	0.181	Aug 2016	0.213	Aug 2017	-		0.213	Continuing	Continuing	Continuing
SEW Eng/CWIX	C/CPFF	AUSGAR : San Diego, CA	0.000	0.167	Mar 2015	0.096	Mar 2016	0.111	Mar 2017	-		0.111	Continuing	Continuing	Continuing
		Subtotal	51.722	1.463		0.837		0.983		-		0.983	-	-	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0604707N / *SEW Architecture/Eng Support*	**Project (Number/Name)** 2144 / *Space & Elec Warfare Engineering*

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
ACQ Workforce Fund	Various	Various : Various	0.071	0.000		0.000		0.000		-		0.000	0.000	0.071	-
		Subtotal	0.071	0.000		0.000		0.000		-		0.000	0.000	0.071	-

	Prior Years	FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	188.361	11.045		7.300		13.175		-		13.175	-	-	-

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0604707N / *SEW Architecture/Eng Support*	**Project (Number/Name)** 2144 / *Space & Elec Warfare Engineering*

	FY 2015				FY 2016				FY 2017				FY 2018				FY 2019				FY 2020				FY 2021			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Proj 2144																												
Coalition Warrior Interoperability Demonstration/Coalition Warrior Interoperability Experiment (CWID/CWIX): Schedule as directed by the Joint Management Office (JMO) during execution year.																												

Exhibit R-4A, RDT&E Schedule Details: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0604707N / *SEW Architecture/Eng Support*	**Project (Number/Name)** 2144 / *Space & Elec Warfare Engineering*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 2144				
Coalition Warrior Interoperability Demonstration/Coalition Warrior Interoperability Experiment (CWID/CWIX): Schedule as directed by the Joint Management Office (JMO) during execution year.	1	2015	4	2021

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0604707N / *SEW Architecture/Eng Support*	Project (Number/Name) 2147 / *ISR Architecture*	

COST ($ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
2147: *ISR Architecture*	0.000	0.000	0.000	1.523	-	1.523	1.587	1.587	1.587	1.587	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

Note

Project 2147 Intelligence, Surveillance, and Reconnaissance (ISR) Architecture is a new start in FY17.

A. Mission Description and Budget Item Justification

Integrated architectures provide a technical framework for assessing capability gaps and performance of individual systems and systems of systems and their ability to effectively provide the desired effects to support warfighting missions. They also serve as a means to influence and drive Programs of Record (PORs) toward a common, more efficient state that promotes interoperability and security.

The Naval ISR Reference Architecture project is intended to guide system of systems capability development and promote interoperability across Navy ISR programs, as well as interoperability and alignment with Department of Defense (DoD)-wide enterprise initiatives including Joint Information Environment (JIE) and Intelligence Community (IC) Information Technology Environment (ITE). As tasked by the Navy's ISR Council, this effort to develop integrated ISR architectures will also help instill systems engineering discipline and standardization across the Navy ISR Enterprise and provide a means by which to assess ISR POR progress in conforming to a single Navy architecture. These efforts will help reduce Information Technology (IT)/ISR infrastructure complexity and variance, making it easier to manage, operate and defend our ISR capabilities, and help inform investment decisions across the Navy's ISR enterprise to support the Office of the Chief of Naval Operations (OPNAV) objectives for Assured Command and Control (C2), Battlespace Awareness and Integrated Fires.

This effort will encompass the documentation and analysis of current ISR enterprise architectures to inform and guide requirements for target architecture development and performance requirements to support full use and incorporation of ISR capabilities to advance Navy operations afloat. The associated studies will produce both technical and non-technical implementation guidance across the Doctrine, Organization, Training, Material, Leadership, Personnel and Facilities (DOTMLPF) spectrum.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Title: Intelligence, Surveillance, and Reconnaissance (ISR) Architecture	0.000	0.000	1.523	0.000	1.523
Articles:	-	-	-	-	-
FY 2015 Accomplishments: N/A					
FY 2016 Plans: N/A					
FY 2017 Base Plans:					

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0604707N / *SEW Architecture/Eng Support*	**Project (Number/Name)** 2147 / *ISR Architecture*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
-Analyze the current Intelligence, Surveillance, and Reconnaissance (ISR) capabilities of afloat, ashore, joint, and national systems within mission contexts to demonstrate gaps and overlaps in Information Dominance capabilities and document in engineering artifacts and architectures. Perform trade space analysis and develop and quantify solutions using technical and operational performance parameters. -Build on the documentation and analysis of the enterprise ISR capabilities to support system of systems engineering assessments to identify integration and interoperability gaps, trades, and solutions for sponsor-related equities. -Integrate the National ISR and Naval (Navy and Marine Corps) ISR architectures within mission contexts to identify functional capacities, materiel integration and interoperability gaps and overlaps, as well as any policy and doctrine impacts. -Perform Verification and Validation (V&V) to ensure ISR architecture and analytic products accurately capture system performance specifications. -Capture all architectural data in the Space & Naval Warfare Systems Command (SPAWAR) analysis tool suite to support rigorous engineering assessments and architecture excursions against solution alternatives. ***FY 2017 OCO Plans:*** N/A					
Accomplishments/Planned Programs Subtotals	0.000	0.000	1.523	0.000	1.523

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

The Naval ISR Architecture project is a non-acquisition program that provides integrated architecture products, engineering analysis of current and target/future capabilities to identify capability gaps and shortfalls and provide solution recommendations. These combined efforts support the ability to articulate risks and align and prioritize investment decision recommendations within the ISR domain for the Navy ISR Council, the Office of the Chief of Naval Operations (OPNAV) Resource Sponsors and ISR Program of Records (PORs).

E. Performance Metrics

The Naval ISR Reference Architecture effort will use consistent systems engineering practices to support development of integrated ISR enterprise architectures, model-validated solution recommendations against quantified technical and operational performance parameters.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0604707N / *SEW Architecture/Eng Support*	**Project (Number/Name)** 2147 / *ISR Architecture*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
ISR Architecture	C/CPFF	METRON : Reston, VA	0.000	0.000		0.000		0.761	Dec 2016	-		0.761	Continuing	Continuing	Continuing
ISR Architecture	C/CPFF	SAIC : McLean, VA	0.000	0.000		0.000		0.305	Dec 2016	-		0.305	Continuing	Continuing	Continuing
ISR Architecture	WR	SSC PAC : San Diego, CA	0.000	0.000		0.000		0.457	Dec 2016	-		0.457	Continuing	Continuing	Continuing
		Subtotal	0.000	0.000		0.000		1.523		-		1.523	-	-	-

	Prior Years	FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	0.000		0.000		1.523		-		1.523	-	-	-

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0604707N / *SEW Architecture/Eng Support*	**Project (Number/Name)** 2147 / *ISR Architecture*

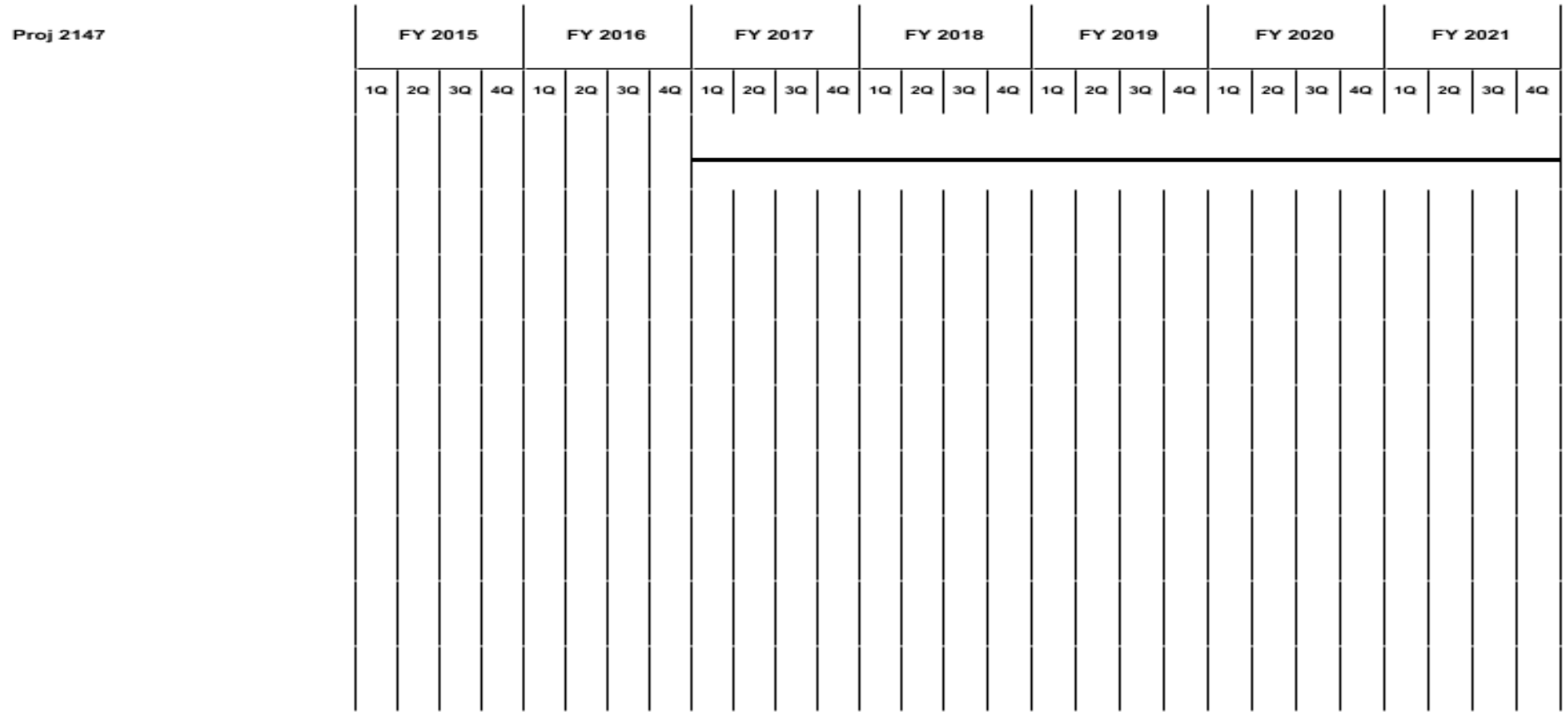

Exhibit R-4A, RDT&E Schedule Details: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0604707N / *SEW Architecture/Eng Support*	**Project (Number/Name)** 2147 / *ISR Architecture*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 2147				
ISR Architecture	1	2017	4	2021

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0604707N / *SEW Architecture/Eng Support*	Project (Number/Name) 2356 / *Maritime Concept Generation & Development*	

COST ($ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
2356: *Maritime Concept Generation & Development*	13.980	5.161	3.390	8.320	-	8.320	8.829	9.012	9.200	9.384	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

NWDC through project 2356 funding will provide naval warfare subject matter expertise, M&S support, and analysis expertise to enable execution of the planned 2017 experiment efforts (and the individual experiment initiatives contained within) in the areas of Electromagnetic Maneuver Warfare (EMW), Mine Warfare, Naval Integrated Fires, and Unmanned systems and conduct experiments (wargames, M&S, at-sea events) to develop emerging Naval concepts.
Typical deliverables for each experimental effort include:
- Experiment control plan
- Data Collection and Analysis Plan (DCAP)
- Experiment Analysis Summary Reference Document
- Experiment Engineering Plan
- Final Experiment Report (with DOTMLPF recommendations)
- New/refined doctrine/Tactics Techniques and Procedures (TTP).

The Maritime Concept Generation and Concept Development project funds four main efforts:
(1) Provides critical concept development and experimentation manpower and warfighting subject matter expertise aligned with the Concept Generation/Concept Development (CG/CD) program. The priorities for the CG/CD program are to develop concept/concept of operations and explore near/far-term technological and non-technological solutions to war fighting gaps across all naval warfare areas. The associated experimentation efforts include planning, systems engineering and integration, modeling and simulation support, event execution, data collection, analysis, and assessment for a wide-range of experimentation efforts including the examination of prototypes, tactical development and evaluation, support for S&T innovation, and program of record system development; venues such as workshops, seminars, war games, limited objective experiments, limited technical experiments, and live at-sea events are used to execute these experimentation efforts.
(2) Provides naval warfare subject matter expertise and analysis expertise to NWDC who plans, executes, and assesses fleet experimentation for the fleets and warfighting development centers (WDC) at the operational and tactical levels. This experimentation is focused on NWDC's WDC integration role, maritime command and control (C2), advanced cross-domain warfighting, and maritime operations centers (MOCS)/operational level of war (OLW) lines of operations; fleet experimentation seeks to solve fleet-identified warfighting gaps (referenced within the Integrated Priority Capability Lists (IPCL), Urgent Operational Needs Statements (UONS), CUSFF/CPF Commander's Guidance, etc). The experimentation and prototyping efforts of the CG/CD team support the "last tactical mile" of many Navy Science and Technology (S&T) programs by supporting those programs where the technology is mature enough, but requires evaluation on or by a "fleet asset" - ships, airplanes, submarines, sailors.
(3) Provides modeling and simulation (M&S) support to Fleet and NWDC experimentation efforts. M&S is used to stimulate decision making during seminar-style and system war gaming experiments and provides the simulated operational environment and capabilities with high-fidelity models such as the Joint Semi-Automated Force

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0604707N / *SEW Architecture/Eng Support*	**Project (Number/Name)** 2356 / *Maritime Concept Generation & Development*

(JSAF) program. Additionally, where applicable, the Navy Simulation System (NSS) "monte carlo" model is also used to give high confidence solutions and outcomes to complex warfighting problems.
(4) Provides for focused, solution-driven tactics development and evaluation through experimentation. This effort is focused on developing near-term doctrine solutions to address specific fleet-identified tactical issues.
Typical CG/CD products include:
- Concepts (signed by the CNO that influence future funding and technological development)
- Enabling concepts
- Concepts of operations (CONOPS)
- Final experimentation reports (including findings, insights, and recommendations and DOTMLPF change recommendations and plans for action)
- Experimentation Analysis Summary Reference Documents
- New/revised doctrinal and Tactics/Techniques/Procedures publications
- White papers (think pieces) intended to generate further discussion within Navy leadership

Specific products are listed in the Accomplishments/Plans section of this exhibit.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Title: Maritime Concept Generation and Development	5.161	3.390	8.320	0.000	8.320
Articles:	-	-	-	-	-

Description: Description: In FY 2015 this project funded:
- Portions of the CNO's Concept Generation/Concept Development program.
- NWDC management, planning, and execution and analysis support to the Fleet Experimentation (FLEX) program.
- Modeling and Simulation support to the FLEX program.
- Tactical Tactics Development and Evaluation.
- The former effort CNO's Rapid Innovation Cell

FY 2015 Accomplishments:
NWDC, through Project 2356 funding, provided collaborative support to CUSFF (Project 3319) in the form of naval warfare subject matter expertise and analysis expertise to enable execution of the CUSFFC/CPF FLEX program. Projects 3319 and 2356 each fund portions of the manpower teams that primarily focus on elements of experimentation design, planning, execution, analysis, and assessment. This same team also serves to integrate tactical/operational level experimentation campaign efforts with the Warfighting Development Centers (WDCs) in support of advanced cross domain warfighting and maritime command and control (C2) lines of operation. Project 3319 additionally focuses on experimentation expenses such as range time, air, surface and target services, asset support, accreditation and certification, and installation/de-installation.

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B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Concept generation/Concept Development * The Counter-Intelligence, Surveillance, and Reconnaissance (C-ISR) concept was completed, endorsed by Commander, U.S. Fleet Forces Command (CUSFFC) and Commander, Pacific Fleet (CPF), and forwarded to the Chief of Naval Operations (CNO) where it was approved and signed. * The Information Dominance Enabling Concept (IDEC) was completed, endorsed by CUSFFC and CPF, and forwarded to the CNO where it was approved and signed. * Analysis and information to update the Rail Gun Operating Concept (RGOC) was provided to Naval Sea Systems Command (NAVSEA 405). * The Electromagnetic Maneuver Warfare (EMW) concept was endorsed by CUSFFC and CPF, and forwarded to the CNO where it awaits approval and signature. * Operational Logistics Concept (OpLog). * Operational Logistics Concept (OpLog). NWDC drafted a white paper that describes a concept for conducting logistics in an A2/AD environment. CPF endorsed and forwarded the paper to CUSFF. CUSFF approved the white paper and concept development is underway. For Fleet Experimentation Planned, executed and assessed the following 2015 experimentation efforts: BOLD ALLIGATOR 2014 - Digital Call for Fire * During exercise BOLD ALLIGATOR 2014, conducted in FY15 from 29 Oct to 10 Nov 2014 in the Virginia Capes operating area, NWDC coordinated execution of a Digital Call for Fire experiment to explore the end-to-end, machine-to-machine transmission of a Naval Surface Fire Support (NSFS) digital call for fire from a Forward Observer/Fire Support Coordination Center through the Supporting Arms Coordination Center on USS KEARSARGE (LHD 3) to the Naval Fires Control System on USS WINSTON CHURCHILL (DDG 81) via high frequency (HF) communications path and SIPRNET. * The primary objective of this experiment was to determine the exact nature and extent of various challenges that arise when attempting to complete an end-to-end digital call for fire. * The results of this experiment will be used by the technical community (primarily Navy Surface Warfare Center, Port Hueneme) to refine system configuration and troubleshooting procedures that will in turn be used to update fleet operating procedures. Laser Weapon System (LaWS) Operational Demonstration					

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B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
* This very successful Operational Demonstration was completed 13-21 Nov 2014 on USS PONCE (AFSB 15) in Commander, FIFTH Fleet area of operations. The results achieved during a previous experiment, BLACK DART 2012, were so successful that they led the CNO to direct NAVSEA to forward deploy the system to the Middle East. In addition to providing data collection, analysis, and execution support in theater, NWDC produced the final experiment report and a Solid State Laser (SSL) Tactical Memorandum (TACMEMO) focused on operational employment, tactics, techniques and procedures, and command and control of weapon employment. Alternative Platforms with Payloads (APPS) Seminar War Game * As directed by USFF and in support of OPNAV staff, NWDC planned, executed, and assessed the APPS war game completed 12-13 Nov 2014. The purpose of this effort was to identify mission payloads with enablers that would allow selected USNS Military Sealift Command (MSC) vessels to support selected Combatant Commander steady state missions. Comprised of two events, a workshop in September 2014 and the seminar war game, the primary objectives were to: define Navy Component Commander (NCC) identified mission sets; define platform baseline; identify required payloads to support mission sets; identify disparity between platform's baseline and mission payload; and identify enablers to integrate platform and mission payload; and identify enablers to integrate platform and mission payload. The missions examined included: Counter Illicit Trafficking, Intelligence, Surveillance, and Reconnaissance, Humanitarian Assistance / Disaster Relief, Survey Operations, Support to Special Operations Forces, Theater Security Cooperation, and Crisis Response. The platforms considered included: Joint High Speed Vessel (JHSV), Mobile Landing Platform, Auxiliary Cargo and Ammunition Ship (T-AKE), and Large, Medium Speed Roll-on/Roll-Off (LMSR). The findings and recommendations of this effort will be used to inform the USFF/CPF 2017 POM input to OPNAV. Navy Integrated Fire Control-Counter Air (NIFC-CA) War Game #2 * The primary purpose of this classified war game was to identify DOTMLPF-P shortfalls to achieve full NIFC-CA Increment I capability at IOC circa 2017. It was part of the USFF-directed and led multi-year NIFC-CA campaign plan that began in 2013 to explore NIFC-CA capabilities, C2 decision-making, training, and CONOPS/TTP development and refinement. The results of this effort will inform a revised NIFC-CA Fleet Concept of Operations (CONOPS) and Fleet Readiness Training Plan (FRTP) development and certification standards. The results will also inform development of future Naval Integrated Fires (NIF) campaign events designed to support future capability delivery and provide capability gap analysis to Navy resource sponsors. Electromagnetic Maneuver Warfare (EMW) Experimentation Campaign					

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
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B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
* The FY 2015 portion of the EMW experimentation campaign consisted of multiple events designed to explore innovative concepts and technologies associated with EMW. Individual components of the overall EMW campaign include: * NEMESIS War Game. This war game was conducted by NWDC to obtain fleet stakeholder input into the requirements for and design of a classified ONR Innovative Naval Prototype. The results of this effort will be used to design prototypes that could eventually be fielded as a Navy program of record. * EMW At-Sea Experiment. Phase 1 of a multi-phase effort was completed with the results being used to develop new or refine existing tactics, techniques, and procedures (TTP). * NORTHERN EDGE 2015. During joint exercise NORTHERN EDGE 2015, held in the Joint Pacific Alaska Range Complex (JPARC), NWDC executed four specific classified initiatives focused on maritime operations in a complex electromagnetic spectrum (EMS) environment. The results of this effort will inform cyber development and develop new or refine existing tactics, techniques, and procedures (TTP). * EMW At Sea Experiment. This at-sea experiment was completed in the Virginia Capes operating areas and the results will be used to support continued development of this classified system. Undersea Domain Operating Concept (UDOC) Experimentation Campaign * The UDOC Experimentation Campaign, begun in 2014 and continuing for several years, examines Doctrine, Organization, Training, Material, Leadership and Education, Personnel, Facilities and Policy (DOTMLPF-P) solutions which exploit the undersea environment to achieve cross-domain synergies, enabling joint operational access. The FY15 efforts focused on the evaluation of several innovative capabilities and concepts: * Undersea Innovation War Game. This NWDC-conducted war game evaluated the military utility of selected innovative technologies and enabling capabilities to address Anti Access Area Denial (A2AD) through Joint Assured Access. The results of this war game will be used to make decisions regarding which innovative technologies to pursue further based on military utility. * Non-Traditional Theater ASW War Game. This classified, NWDC-conducted war game evaluated several courses of action for dealing with current operational challenges. The results will be used to inform updates to current doctrinal products and operational plans. * UDOC 2015. This NWDC-conducted at-sea event was completed in two phases in the Southern California and Hawaiian operating areas to examine selected innovative technologies and enabling capabilities in an operational environment. The experiment focused on four broad sets of capabilities: antisubmarine warfare (ASW) detection, high speed submarine communications, meteorological and oceanographic (METOC) support to ASW, and submarine-launched unmanned aircraft system (UAS). The results will be used to further development of the extended life sonobuoy program, inform final draft of a new TACMEMO (METOC					

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B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Geospatially Enabled ASW Decision Support), refine employment of low probability of intercept and high data rate communications capabilities, and further the development of a submarine-launched UAS capability. LPD 17 Employment Options. * Through a series of workshops and at-sea observation events, NWDC examined the feasibility of using the LPD-17 class to perform additional missions as a Regional/Sector Air Defense Coordinator and/or an alternate Command and Control Platform. The results of this effort will inform changes to LPD-17 Class ROC/POE, LPD-17 Class Tactical Manual, LPD-17 manning plan, and other related documents. Rail Gun Seminar War Game. * At the request of the NAVSEA Rail Gun program office and in support of USFF continuing efforts to evaluate new platforms and weapon systems prior to Fleet introduction, NWDC executed a seminar war game to inform an update of the Rail Gun Operating Concept, and preparations for the first at-sea Rail Gun demonstration planned for FY16 aboard JHSV. Joint High Speed Vessel (now Expeditionary Fast Transport (T-EPF)) At-Sea Experiment Campaign. * Conducted at the direction of USFF and in direct support of the OPNAV-led LCS/T-EPF Council, the campaign's objective is to evaluate the effectiveness of using various Adaptive Force Packages (AFPs) to expand T-EPF platform employment options, beyond that of intra-theater logistics and personnel transport, with an initial focus on mission options that involve little or no modification to the existing sea frame. * Phase One of the 2015 effort was executed during USNS SPEARHEAD's (T-EPF 1) C4F Southern Partnership Station deployment and explored the platform's capability to support Expeditionary Mine Counter Measures operations and Maritime Command and Control. * Phase Two examined the platform's capability to support Afloat Forward Staging Base operations, Counter Illicit Trafficking, Maritime Command and Control, and Intelligence, Surveillance and Reconnaissance operations using a telescoping mast to extend radar horizon, a small-boat docking facility, and small Unmanned Air Systems (UAS) operations (in conjunction with special forces). * The products of this effort include revisions to the T-EPF Platform Wholeness, T-EPF Warfighting, and AFP Fleet CONOPS. They also inform key investment decisions being made by the OPNAV staff regarding the employment of adaptable sensor, communication, and support payloads to enable T-EPF to conduct a range of missions beyond those it was originally built to perform. TRIDENT WARRIOR 2015 (TW 15)					

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B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
* TW15, co-led by Commander, Seventh Fleet (C7F) and NWDC, was completed in 3 phases C7F AOR to include participation in PACOM/PACFLT exercise TALISMAN SABRE 2015. The effort evaluated 16 technology and/or TTP initiatives to close warfighting gaps focused on: C2 of EMW assets in a contested environment, assured communications (Pandarra Net), long range SUW, and counter-ISR. The final experiment report includes multiple recommendations regarding the military utility and continued development of prototype technologies examined during TW15. Additionally, TW15 deliverables include two original documents and recommended input to three documents in development. Collaborative Unmanned Undersea Vehicles (UUV) Operations * NWDC completed a seminar war game to develop common tactics and procedures for employment of integrated UUVs operating in a 5 Eyes environment. Currently each member of the 5 Eyes community is developing, in isolation, TTPs for UUV operations which limit information exchange regarding use of similar UUV systems. This effort will produce a TACMEMO addressing UUV operations in a shared battle space that is 5 Eyes releasable. Netted Sensors At Sea Experiment * NWDC coordinated execution of this at-sea event in Virginia Capes operating areas to explore several initiatives focused on technologies and TTP that will improve Navy capability to passively find, fix, track, target, and ID surface and air contacts at extended ranges largely in support of long range SUW. The results inform NAVAIR (PMA 231, 265, and 290) efforts to shorten timelines to geo-locate short-duration emitters and enhance combat identification (CID) capability through networked sensors. Additionally, this effort informs ongoing development of a Net Centric Collaborative Targeting (NCCT) Employment Guide for use in Maritime Operations and recommends changes to the navy Airborne ISR Fleet CONOPS. Counter FAC/FIAC At Sea Experiment * NWDC completed this experiment in Virginia Capes operating areas to evaluate the effectiveness of employing an armed Switchblade UAS versus FIAC representative targets. To minimize experiment costs and complexity, unarmed Switchblade UAS were be used in this effort. The final experiment report provides several DOTMLPF-P recommendations to inform acquisition investment decisions and refine the development of this capability.					
FY 2016 Plans: Concept Generation/Concept Development Continue CG/CD development efforts that carry-over from FY 2015:					

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B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
* Operational Logistics Concept (OpLog). NWDC will continue development of the concept with anticipated completion in late FY 2016. * Electromagnetic Maneuver Warfare (EMW) concept. NWDC will incorporate any feedback from the CNO and re-submit for signature. * Rail Gun Operating Concept (RGOC). NAVSEA has asked for additional information and analysis on optional uses for the rail gun's high velocity projectile. That work will be completed in 2016. Begin development of new concepts resulting from idea harvesting/Four Star approval from previous years: * Littoral Operations in a Contested Environment concept. NWDC will continue partnership with Marine Corps Combat Development Command (MCCDC) to develop a concept for operating naval forces in the littorals. New FY2016 experiment efforts Through 2356, NWDC will continue to provide analytical and naval mission subject matter expertise support throughout the planning and execution process; identify fleet warfighting deficiencies through experimentation; identify and capture innovative solutions for fleet experiments that address prioritized fleet warfighting gaps; and identify suitable events to support the execution of the following Experimentation Campaigns: Electromagnetic Maneuver Warfare (EMW) Experimentation Campaign * In accordance with the EMW Charter, the CNO has assigned responsibility to Commander, U.S. Fleet Forces Command to create and execute the Navy-wide campaign to achieve Navy's articulated EMW end state by 2020. Additionally, the charter assigns NWDC as the EMW Action Lead and the lead for the Concepts, Doctrine, and Experimentation Level of Effort (LOE). * Throughout FY16, conduct a series of events designed to synchronize and align experiment initiatives with EMW tasks to provide solutions to EMW capability gaps and to ensure development of doctrine and TTP is synchronized with the introduction of new technology and provides the Fleet and Fleet trainers with required doctrine tools at the tactical and operational levels. Specific events planned for FY16 include: * Fleet Battle Experiment EMW (FBX EWM 16). FBX EMW 16 will consist of a series of events (nominally one per quarter) aligned with Carrier Strike Group (CSG) COMPTUEX training events, CSG transits to and from deployments, and exercise VALIANT SHIELD 2016. The primary focus of this effort will be to exercise and validate the contents of existing and newly developed EMW-related doctrine, TTP, and CONOPS. * EMW Technical War Game (Spectral Tsunami 16-1). Spectral Tsunami 16-1 is the first in a series of war games planned to evaluate the individual and cumulative effects of emerging capabilities in vignette-based scenarios and to enable operators to work side-by-side with technology developers to ID ways to close capability gaps.					

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B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
* KRYSTAL SPHINX. This at-sea effort will examine the warfighting utility of a classified prototype addressing a Fleet urgent operational need. * Navy Tactical Data Network At-Sea Experiment. This effort will provide a CG with access to previously unavailable information via a prototype data network. The prototype will be installed prior to the CG beginning intermediate training and will remain onboard throughout a deployment to enable a long term evaluation of the system's capabilities. * Logistics Force Assured C2 War Game. This war game will focus on the examination of logistics functions, processes, and capabilities and their possible vulnerabilities in order to answer overarching questions: Undersea Domain Operating Concept (UDOC) Experimentation Campaign. The FY16 UDOC experimentation campaign consists of several events/efforts supporting Commander, Submarine Force (COMSUBFOR) and the Navy Undersea Warfighting Development Center as they develop and implement an experiment plan in support of the UDOC. Specific events planned for FY16 include: * Undersea Innovation Seminar War Game. A seminar war game will be conducted in Q4 FY16 to explore how innovative technologies, such as those within the COMSUBFOR Undersea Rapid Capability Initiatives (URCI), might be employed by the Fleet to exploit use of the undersea, deny the adversary's use of the undersea, and provide war-winning cross domain effects. * Theater Undersea Warfare (TUSW) Command and Control (C2) Seminar War Game. A TUSW C2 seminar war game will be conducted in Q4 FY16 to examine options for C2 of naval operations in and through the undersea domain in two future timeframes (2018 and 2025) to inform development of an Undersea Warfare Command Concept of Operations. * UDOC At-Sea Experiment. This NWDC-conducted at-sea event is planned for a summer 2016 execution in the Southern California operating area to examine selected innovative technologies and enabling capabilities in an operational environment to include COMSUBFOR Undersea Rapid Capability Initiatives. Full Spectrum Mine Warfare Campaign. * Mine Warfare (MIW) Innovation War Game. A seminar war game will be conducted in April 2016 to explore how various innovative MIW technologies might be employed by the Fleet to address identified fleet warfighting capability gaps. Technologies with the most potential will be examined in a follow-on at-sea experiment. * MIW At-Sea Experiment. This at-sea event, planned for a summer 2016 execution in the Southern California operating area, will examine selected innovative technologies and TTPs enabling capabilities in an operational environment to support the transition of MIW capabilities from legacy manned platforms to future unmanned systems.					

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B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Unmanned System Series of Events. A series of unmanned systems-focused events will be conducted throughout FY16 to examine prototype systems, the concept of swarming unmanned systems, and counter-unmanned system capabilities. Planned events include: * A seminar war game will be conducted to examine the warfighting utility of ONR's low cost UAV swarming technology (LOCUST) to inform a follow-on at-sea experiment in FY17. * An at-sea experiment to examine warfighting utility and employment options of an Unmanned Surface Vehicle (USV) swarm. This is a follow-on to ONR's initial at-sea demonstration in August 2014. * An Autonomous Offboard Unmanned Systems (UxS) effort, sponsored by COMPACFLT, will examine the warfighting utility and multiple employment options offered by various types of unmanned systems in support of naval warfare missions with an emphasis on how unmanned systems can be a force multiplier. * A counter-UAS effort will examine the capabilities of systems ready to be fielded today to counter current threats to naval installations and platforms. Trident Warrior 2016 At-Sea Experiment. The TRIDENT WARRIOR 2016 (TW16) experiment, co-led by Commander, Third Fleet (C3F) and NWDC, will execute in conjunction with exercise Rim of the Pacific (RIMPAC) 2016 from Jun through Aug 2016 in C3F AOR. The effort will evaluate approximately 40 technology and/or TTP-related initiatives to close warfighting gaps identified across multiple POM-17 Integrated Prioritized Capability Lists (IPCLs). TW16 will support OPNAV, Space and Naval Warfare Systems Command (SPAWAR), program offices, Office of Naval Research (ONR), Naval Research Lab (NRL), and others in the spiral development of prototype capabilities at sea and in the hands of warfighters. T-EPF At-Sea Experiment. This effort is the latest event in a multi-year campaign conducted at the direction of CUSFF and in direct support of the OPNAV-led LCS/T-EPF Council. The objective of the campaign is to evaluate the effectiveness of using various Adaptive Force Packages (AFPs) to expand T-EPF platform employment options, beyond that of intra-theater logistics and personnel transport, with an initial focus on mission options involving little or no modification to the existing sea frame. The 2016 effort will execute in the Jun-Aug 2016 timeframe during JHSV C4F Southern Partnership Station deployment to evaluate multiple technologies enhancing T-EPF's capability to serve as an Afloat Forward Staging Base (AFSB) and improve T-EPF ISR capabilities. This effort will support development and validation of the T-EPF as an AFSB Fleet CONOPS. Strike Weapon Evaluations. This live-fire effort will evaluate weapon performance and developmental TTPs for employing air-delivered weapons and conducting Close Air Support in a complex electromagnetic spectrum (EMS) environment. Results of this effort will be incorporated into appropriate TTPs and also into air wing training curriculum.					

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B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Base FY 2017 Plans (Page 11) *Continue/finish all FY2016 CG/CD efforts: *Create new concepts resulting from idea harvesting/Four Star approval from previous year's Fleet experimentation. ***FY 2017 Base Plans:*** Through 2356, NWDC will continue to provide analytical and naval mission subject matter expertise support throughout the planning and execution process; identify fleet warfighting deficiencies through experimentation; identify and capture innovative solutions for fleet experiments that address prioritized fleet warfighting gaps; and identify suitable events to support the execution of the following Experimentation Campaigns: Unmanned Systems Experimentation * This effort will be conducted to examine the warfighting utility and multiple employment options offered by various types of unmanned systems in support of naval warfare missions with an emphasis on how unmanned systems can support PACFLT missions. Efforts will be closely aligned with OPNAV N99 and ONR prototype development. * A series of at-sea experiments in support of the development of several leap ahead unmanned system technologies and to support evaluation of several CNO speed to fleet projects. Tactical development efforts with Allies will also continue to ensure seamless combined naval operations. * LCS Manned/Unmanned Aviation Integrated Operations At-Sea Experiment. An experiment will be conducted with a Freedom Class LCS platform embarked with an SUW mission package to evaluate enhanced, coordinated LCS capabilities between the platform, MH-60S helicopter, and MQ-8B UAS. Trident Warrior 2017 At-Sea Experiment. The TRIDENT WARRIOR 2017 (TW17) experiment will execute in partnership with a numbered fleet commander yet to be determined. The effort will evaluate technology and/ or TTP-related initiatives to close warfighting gaps identified across multiple POM-18 Integrated Prioritized Capability Lists (IPCLs). TW17 will support OPNAV, SPAWAR, program offices, ONR, NRL, and others in the spiral development of prototype capabilities at sea and in the hands of warfighters. Undersea Warfare Vision 2025 Experimentation Campaign. The FY17 USW Vision 2025 experimentation campaign will consist of several events/efforts supporting COMSUBFOR and the Navy Undersea Warfighting Development Center as they develop and implement an experiment plan in support of Undersea Dominance. Specific events planned for FY17 include: * Undersea Innovation Seminar War Game. A seminar war game will be conducted to explore how innovative technologies, such as those within the COMSUBFOR Undersea Rapid Capability Initiatives (URCI), might be					

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B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
employed by the Fleet to exploit use of the undersea, deny the adversary's use of the undersea, and provide war-winning cross domain effects. * USW Vision 2025 At-Sea Experiment. This NWDC-coordinated at-sea event, planned for a summer 2017 execution in the Southern California operating area, will examine selected innovative technologies and enabling capabilities in an operational environment to include COMSUBFOR Undersea Rapid Capability Initiatives. * Non-Traditional Theater Anti-Submarine Warfare (ASW) At-Sea Experiment. This follow-on to the 2015 Non-Traditional Theater ASW War Game will examine selected innovative technologies and enabling capabilities, focused on a specific undersea mission, in an at-sea operational environment. EMW Experiment Campaign * In accordance with the EMW Charter, the Chief of Naval Operations (CNO) has assigned responsibility to Commander, U.S. Fleet Forces Command to create and execute the Navy-wide campaign to achieve Navy's articulated EMW end state by 2020. Additionally, the charter assigns Navy Warfare Development Command as the EMW Action Lead and the lead for the Concepts, Doctrine, and Experimentation Level of Effort (LOE). Throughout FY17, conduct a series of events designed to synchronize and align experiment initiatives with EMW tasks to provide solutions to EMW capability gaps and to ensure development of doctrine and TTP is synchronized with the introduction of new technology and provides the Fleet and Fleet trainers with required doctrine tools at the tactical and operational levels. Specific events currently planned for FY17 include: * Fleet Battle Experiment EMW (FBX EWM 17). FBX EMW 17 will consist of a series of events (nominally one per quarter) primarily aligned with Carrier Strike Group (CSG) COMPTUEX training events and CSG transits to and from deployments. The primary focus of this effort will be to exercise and validate the contents of existing and newly developed EMW-related doctrine, TTP, and CONOPS. * Navy Tactical Data Network At-Sea Experiment (Phase Two). This effort will provide a DDG with access to previously unavailable information via a prototype data network. The prototype will be installed prior to the DDG beginning intermediate training and will remain onboard throughout a deployment to enable a long term evaluation of the system's capabilities. * Real Time Spectrum Operations (RTSO) Speed to Fleet At-Sea Experiment. This CNO Speed to Fleet project will develop prototype RTSO systems that will be left behind on one or more surface combatants to support a long term evaluation of system performance and warfighting in FY17. Naval Integrated Fires (NIF) Campaign. The NIF Campaign is part of the USFF-directed and led multi-year NIFC-CA campaign plan that began in 2013 to explore NIFC-CA capabilities, C2 decision-making, training, and CONOPS/TTP development and refinement. A comprehensive campaign methodology is required to					

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B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
synchronize delivery of all NIFC-CA DOTMLPF actions and to provide Navy leadership with insight into challenges and limitations associated with NIFC-CA in operational scenarios in order to protect its "game changing" capabilities and key programs. Throughout FY17, a series of events including tabletop exercises, leadership conferences and modeling and simulation (M&S) will be conducted. The campaign will culminate in two Operator-in-the-Loop (OITL) M&S events, one kinetic, one non-kinetic. These events will examine how NIFC-CA increment 2 and beyond and Counter - Intelligence, Surveillance, Reconnaissance and Targeting (C-ISRT) capabilities, circa 2023, contribute to air and maritime warfare in an operationally representative environment. Full Spectrum mine Warfare. * Mine Warfare (MIW) Innovation War Game. A seminar war game will be conducted in Q1/Q2 FY17 to explore how various innovative MIW technologies might be employed by the Fleet to address identified fleet warfighting capability gaps. Technologies with the most potential will be examined in a follow-on at-sea experiment. * MIW At-Sea Experiment. This at-sea event, being planned for a summer 2017 execution in the Southern California operating areas, will examine selected innovative technologies and TTPs enabling capabilities in an operational environment to support the transition of MIW capabilities from legacy manned platforms to future unmanned systems. ***FY 2017 OCO Plans:*** N/A					
Accomplishments/Planned Programs Subtotals	5.161	3.390	8.320	0.000	8.320

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

The vast majority of this funding is used to acquire intellectual capital in emerging conceptual and technical areas through contracts providing expertise in conceptual and experiment design, execution and analysis to mitigate fleet-identified current and future war fighting gaps.

E. Performance Metrics

Maritime Concept Generation and Development/Related Experimentation:
- Refine concepts and identify key performance levels necessary for implementation.

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
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- 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 war fighting 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 war fighting capabilities in the fleet.
- Rapidly mature concepts, technologies, and doctrine.
- Focus on near, mid and long term war fighting challenges to realize increased war fighting effectiveness.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0604707N / *SEW Architecture/Eng Support*	**Project (Number/Name)** 2356 / *Maritime Concept Generation & Development*

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
System Test and Evaluation	C/CPFF	Defense Technical Information Center : Ft Belvoir VA	7.000	1.815	Feb 2015	1.500	Nov 2015	3.052	Nov 2016	-		3.052	Continuing	Continuing	Continuing
System Test and Evaluation	Various	SPAWARSYSCEN : Charleston, SC	1.850	0.562	Jan 2015	0.390	Jan 2016	0.375	Jan 2017	-		0.375	Continuing	Continuing	Continuing
System Test and Evaluation	Various	ONR : Washington, DC	1.120	0.250	Mar 2015	0.000	Dec 2015	0.000		-		0.000	Continuing	Continuing	Continuing
System Test and Evaluation	Various	NAVSEA : Washington, DC	0.800	0.534	Jan 2015	0.000	Dec 2015	0.600	Jan 2017	-		0.600	0.000	1.934	-
System Test and Evaluation	WR	Naval Underwater Warfare Center : Newport RI	0.500	0.000		0.000		0.400	Nov 2016	-		0.400	0.000	0.900	-
System Test and Evaluation	C/CPFF	NAVSUP : Norfolk VA	0.500	1.500	May 2015	1.500	Dec 2015	3.893	Jan 2017	-		3.893	0.000	7.393	-
		Subtotal	11.770	4.661		3.390		8.320		-		8.320	-	-	-

Remarks

The vast majority of the contract costs are for contract labor; primarily on two large Multi-Award contracts, one through DTIC (Defense Services MAC) and one through NAVSUP (Joint Staff J-7 MAC). Task orders on the DS MAC contract provide the majority of the Modeling & Simulation support for experimentation and some of the experiment planner support. Task orders on the JS J-7 MAC provide the majority of the experiment design, planner, and execution support provided by NWDC to the Fleet Experimentation program. Adjustments to schedule production required due to HASC Congressional mark of $5M in FY16.

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management	C/FFP	Navy Warfare Development Command : Norfolk, VA	2.210	0.500	Feb 2015	0.000		0.000		-		0.000	0.000	2.710	-
		Subtotal	2.210	0.500		0.000		0.000		-		0.000	0.000	2.710	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0604707N / *SEW Architecture/Eng Support*	Project (Number/Name) 2356 / *Maritime Concept Generation & Development*	

	Prior Years	FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	13.980	5.161		3.390		8.320		-		8.320	-	-	-

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0604707N / *SEW Architecture/Eng Support*	**Project (Number/Name)** 2356 / *Maritime Concept Generation & Development*

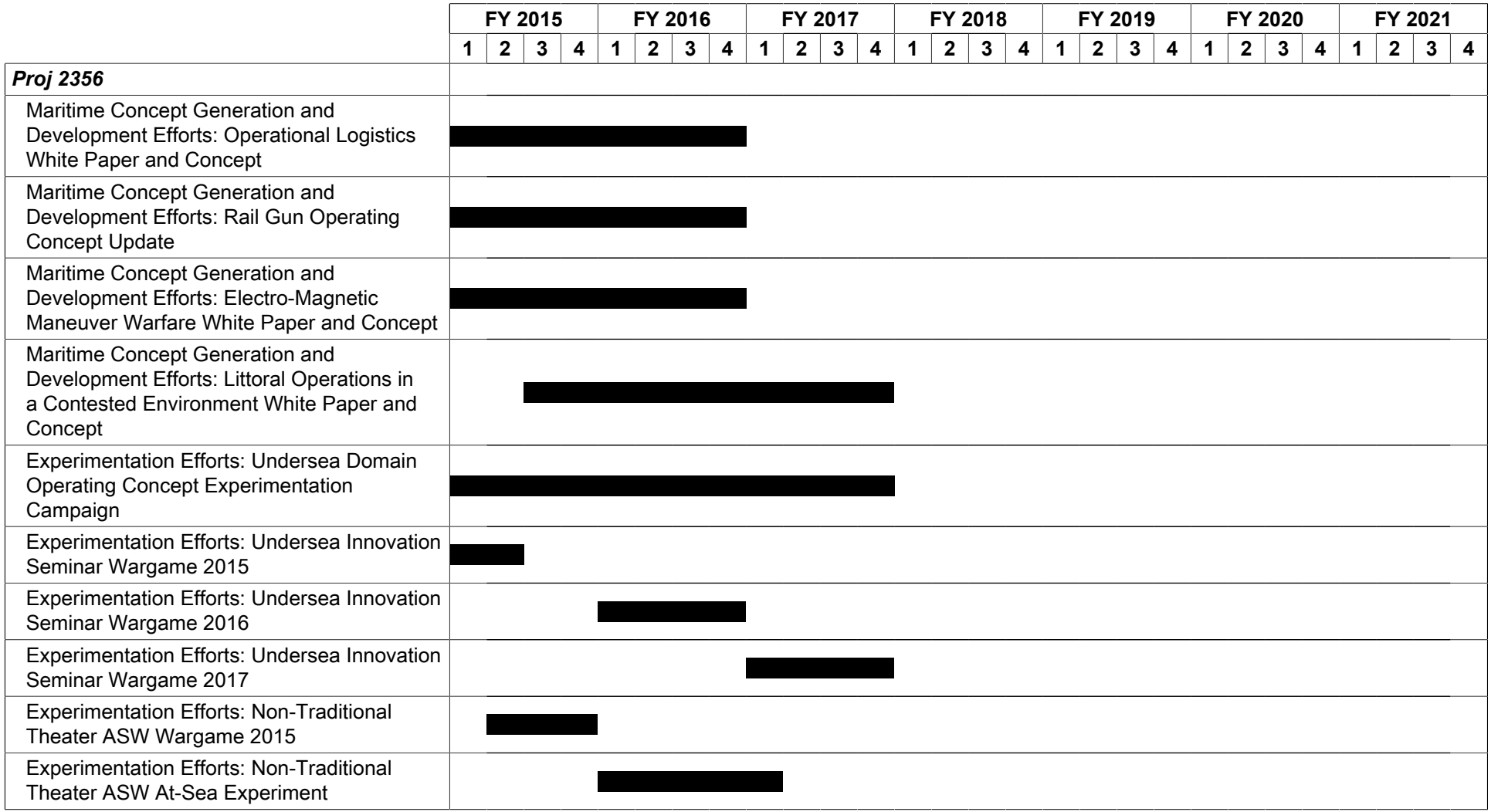

Exhibit R-4, RDT&E Schedule Profile: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0604707N / *SEW Architecture/Eng Support*	**Project (Number/Name)** 2356 / *Maritime Concept Generation & Development*

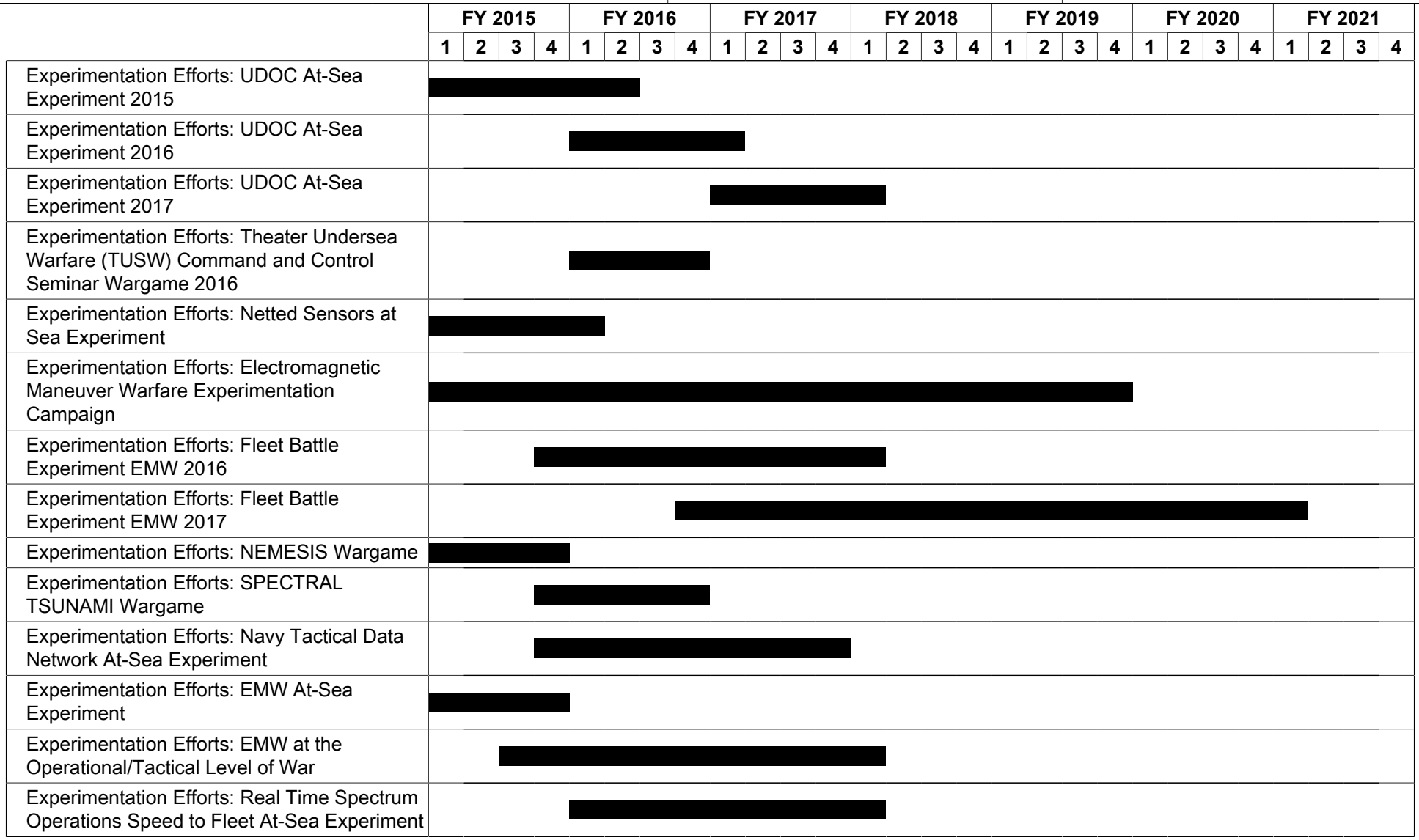

Exhibit R-4, RDT&E Schedule Profile: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0604707N / *SEW Architecture/Eng Support*	**Project (Number/Name)** 2356 / *Maritime Concept Generation & Development*

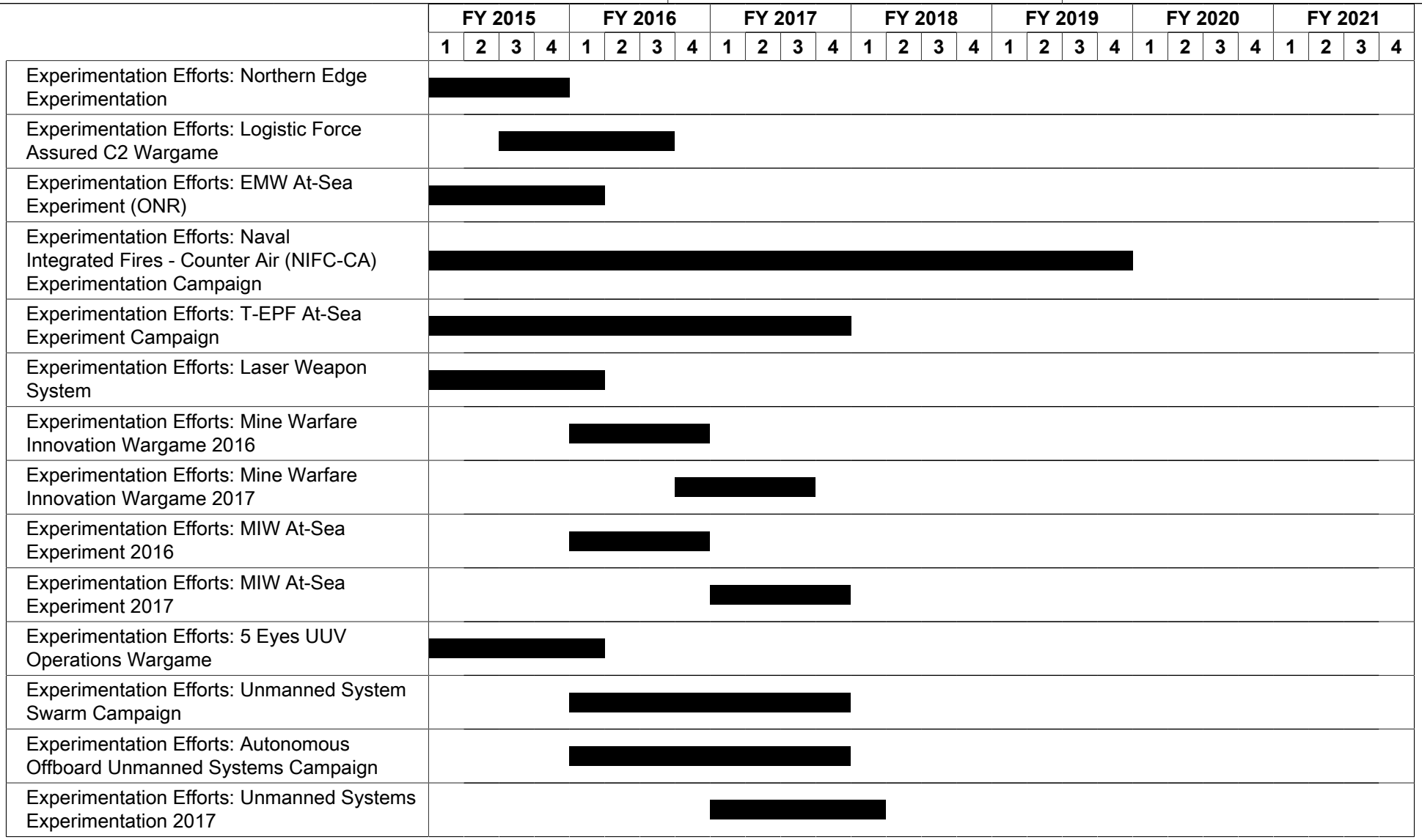

Exhibit R-4, RDT&E Schedule Profile: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0604707N / *SEW Architecture/Eng Support*	**Project (Number/Name)** 2356 / *Maritime Concept Generation & Development*

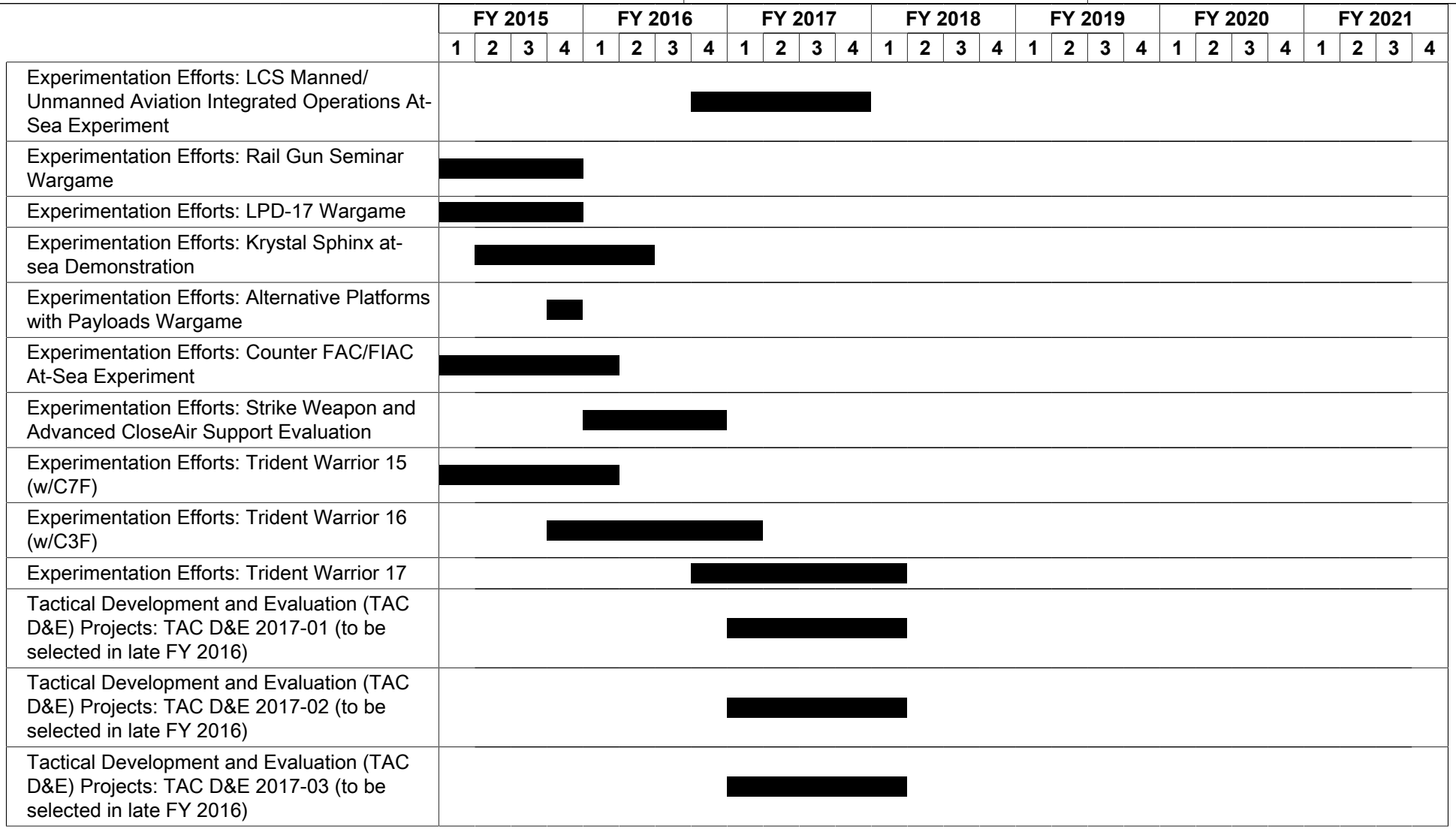

Exhibit R-4, RDT&E Schedule Profile: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0604707N / *SEW Architecture/Eng Support*	**Project (Number/Name)** 2356 / *Maritime Concept Generation & Development*

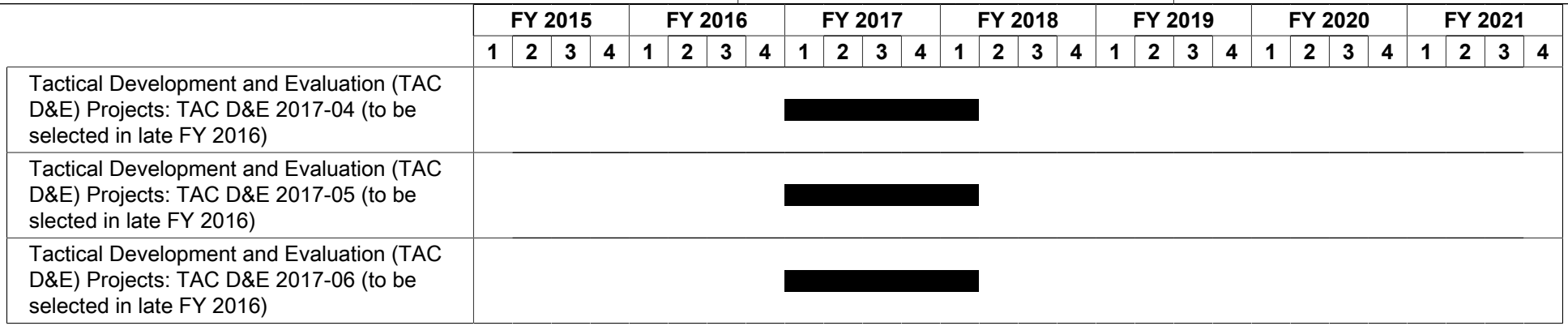

Exhibit R-4A, RDT&E Schedule Details: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0604707N / *SEW Architecture/Eng Support*	**Project (Number/Name)** 2356 / *Maritime Concept Generation & Development*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 2356				
Maritime Concept Generation and Development Efforts: Operational Logistics White Paper and Concept	1	2015	4	2016
Maritime Concept Generation and Development Efforts: Rail Gun Operating Concept Update	1	2015	4	2016
Maritime Concept Generation and Development Efforts: Electro-Magnetic Maneuver Warfare White Paper and Concept	1	2015	4	2016
Maritime Concept Generation and Development Efforts: Littoral Operations in a Contested Environment White Paper and Concept	3	2015	4	2017
Experimentation Efforts: Undersea Domain Operating Concept Experimentation Campaign	1	2015	4	2017
Experimentation Efforts: Undersea Innovation Seminar Wargame 2015	1	2015	2	2015
Experimentation Efforts: Undersea Innovation Seminar Wargame 2016	1	2016	4	2016
Experimentation Efforts: Undersea Innovation Seminar Wargame 2017	1	2017	4	2017
Experimentation Efforts: Non-Traditional Theater ASW Wargame 2015	2	2015	4	2015
Experimentation Efforts: Non-Traditional Theater ASW At-Sea Experiment	1	2016	1	2017
Experimentation Efforts: UDOC At-Sea Experiment 2015	1	2015	2	2016
Experimentation Efforts: UDOC At-Sea Experiment 2016	1	2016	1	2017
Experimentation Efforts: UDOC At-Sea Experiment 2017	1	2017	1	2018
Experimentation Efforts: Theater Undersea Warfare (TUSW) Command and Control Seminar Wargame 2016	1	2016	4	2016
Experimentation Efforts: Netted Sensors at Sea Experiment	1	2015	1	2016
Experimentation Efforts: Electromagnetic Maneuver Warfare Experimentation Campaign	1	2015	4	2019

Exhibit R-4A, RDT&E Schedule Details: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0604707N / *SEW Architecture/Eng Support*	**Project (Number/Name)** 2356 / *Maritime Concept Generation & Development*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Experimentation Efforts: Fleet Battle Experiment EMW 2016	4	2015	1	2018
Experimentation Efforts: Fleet Battle Experiment EMW 2017	4	2016	1	2021
Experimentation Efforts: NEMESIS Wargame	1	2015	4	2015
Experimentation Efforts: SPECTRAL TSUNAMI Wargame	4	2015	4	2016
Experimentation Efforts: Navy Tactical Data Network At-Sea Experiment	4	2015	4	2017
Experimentation Efforts: EMW At-Sea Experiment	1	2015	4	2015
Experimentation Efforts: EMW at the Operational/Tactical Level of War	3	2015	1	2018
Experimentation Efforts: Real Time Spectrum Operations Speed to Fleet At-Sea Experiment	1	2016	1	2018
Experimentation Efforts: Northern Edge Experimentation	1	2015	4	2015
Experimentation Efforts: Logistic Force Assured C2 Wargame	3	2015	3	2016
Experimentation Efforts: EMW At-Sea Experiment (ONR)	1	2015	1	2016
Experimentation Efforts: Naval Integrated Fires - Counter Air (NIFC-CA) Experimentation Campaign	1	2015	4	2019
Experimentation Efforts: T-EPF At-Sea Experiment Campaign	1	2015	4	2017
Experimentation Efforts: Laser Weapon System	1	2015	1	2016
Experimentation Efforts: Mine Warfare Innovation Wargame 2016	1	2016	4	2016
Experimentation Efforts: Mine Warfare Innovation Wargame 2017	4	2016	3	2017
Experimentation Efforts: MIW At-Sea Experiment 2016	1	2016	4	2016
Experimentation Efforts: MIW At-Sea Experiment 2017	1	2017	4	2017
Experimentation Efforts: 5 Eyes UUV Operations Wargame	1	2015	1	2016
Experimentation Efforts: Unmanned System Swarm Campaign	1	2016	4	2017
Experimentation Efforts: Autonomous Offboard Unmanned Systems Campaign	1	2016	4	2017
Experimentation Efforts: Unmanned Systems Experimentation 2017	1	2017	1	2018
Experimentation Efforts: LCS Manned/Unmanned Aviation Integrated Operations At-Sea Experiment	4	2016	4	2017

Exhibit R-4A, RDT&E Schedule Details: PB 2017 Navy		Date: February 2016
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	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Experimentation Efforts: Rail Gun Seminar Wargame	1	2015	4	2015
Experimentation Efforts: LPD-17 Wargame	1	2015	4	2015
Experimentation Efforts: Krystal Sphinx at-sea Demonstration	2	2015	2	2016
Experimentation Efforts: Alternative Platforms with Payloads Wargame	4	2015	4	2015
Experimentation Efforts: Counter FAC/FIAC At-Sea Experiment	1	2015	1	2016
Experimentation Efforts: Strike Weapon and Advanced CloseAir Support Evaluation	1	2016	4	2016
Experimentation Efforts: Trident Warrior 15 (w/C7F)	1	2015	1	2016
Experimentation Efforts: Trident Warrior 16 (w/C3F)	4	2015	1	2017
Experimentation Efforts: Trident Warrior 17	4	2016	1	2018
Tactical Development and Evaluation (TAC D&E) Projects: TAC D&E 2017-01 (to be selected in late FY 2016)	1	2017	1	2018
Tactical Development and Evaluation (TAC D&E) Projects: TAC D&E 2017-02 (to be selected in late FY 2016)	1	2017	1	2018
Tactical Development and Evaluation (TAC D&E) Projects: TAC D&E 2017-03 (to be selected in late FY 2016)	1	2017	1	2018
Tactical Development and Evaluation (TAC D&E) Projects: TAC D&E 2017-04 (to be selected in late FY 2016)	1	2017	1	2018
Tactical Development and Evaluation (TAC D&E) Projects: TAC D&E 2017-05 (to be slected in late FY 2016)	1	2017	1	2018
Tactical Development and Evaluation (TAC D&E) Projects: TAC D&E 2017-06 (to be selected in late FY 2016)	1	2017	1	2018

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy			Date: February 2016
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COST ($ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
3319: *Fleet Experimentation*	45.815	4.979	8.864	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	59.658
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

Note

In FY17, project 3319 will move to PE 0606355N.

A. Mission Description and Budget Item Justification

The Fleet Experimentation (FLEX) program examines the doctrine, organization, training, materiel, leadership and education, personnel, facilities, and policy (DOTMLPF-P) solutions to identified warfighter capability gaps within the FYDP. The FLEX program considers warfighting gaps identified in: Integrated Prioritized Capability Lists (IPCL) generated by Warfighting Development Centers (WDC) through the warfare improvement program; USFF/CPF's Integrated Priorities Letter (IPL) delivered annually to the CNO; USFF/CPF's Commanders' FLEX Guidance; and Navy and Joint Urgent Operational Needs Statements. In addition, FLEX addresses innovative concepts, and tactics, techniques, and procedures (TTP), and Fleet Concepts of Operation (CONOPS) that collectively mitigate Fleet-identified warfighting capability gaps as defined by Commander, U.S. Fleet Forces' (CUSFF)/Commander, Pacific Fleet's (CPF) annual FLEX guidance. Through experimentation activities such as workshops, system or seminar war games, live at-sea events, and experimentation campaigns, the FLEX program examines potential materiel and non-materiel tangible solutions that will enhance the Fleet's ability to execute assigned missions. FLEX events and campaigns are comprised of all facets of experimentation including design, planning, systems engineering and integration, execution, data collection, analysis, assessment, and the delivery of tangible products to the fleet. While Navy-centric, FLEX efforts include joint, coalition, Science and Technology (S&T), academia, and industry partners.

Experimentation is vital to continuously improving naval warfighting capabilities. As such, the FLEX program directly supports four of the five elements outlined in the Secretary of the Navy's Innovation Vision: Build the Naval Innovation Network, Improve the Use of DON Information, Accelerate Emerging Operational Capabilities to the Fleet, and Develop Game-Changing Warfighting Concepts. In accordance with the joint CUSFF and CPF FLEX instruction, the FLEX program is the conduit to conduct experimentation using operational fleet assets. As such, the FLEX program, and associated efforts of the FLEX team, provides critical support to achieve the "last tactical mile" of Navy and S&T programs. This "last tactical mile" support is delivered through "at sea" or "salt-water" testing and experimentation at the point when the technology is sufficiently mature and requires evaluation using a fleet asset - ships, airplanes, submarines, networks, and/or sailors.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Title: Fleet Experimentation	4.979	8.864	0.000	0.000	0.000
Articles:	-	-	-	-	-
Description: FLEX is a USFF/CPF collaborative effort to address fleet prioritized capability gaps, led by USFF N8/N9, supported by Navy Warfare Development Command (NWDC), and coordinated with Naval Component Commands (NCC)/Numbered Fleets, Type Commanders (TYCOM), Systems Commands (SYSCOM), OPNAV,					

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
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B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Services, Coalition, and Science & Technology (S&T) community. The Fleet Experimentation program objective is to produce recommended changes in doctrine, organization, training, materiel, leadership development, personnel, facilities, and policy (DOTMLPF-P) actions. Deliverables are focused on operational and tactical warfighting capability in the near term (within the Fiscal Year Defense Plan), and prioritized by the Commander, U.S. Fleet Forces (USFF)/Commander, Pacific Fleet (CPF) Fleet Experimentation annual guidance. NWDC plans and executes USFF/CPF approved multi-year Fleet experimentation campaigns and final reports. USFF/ CPF staff manage the follow-on DOTMLPF-P actions with OPNAV, SYSCOMs, TYCOMs and Warfighter Development Command (WDC) staffs to establish or enhance warfighting capability in Integrated Air and Missile Defense (IAMD), Amphibious Warfare (AMW), Surface Warfare (SUW), Strike Warfare (STW), Anti-Submarine Warfare(ASW),Expeditionary Warfare (EXW), Information Dominance (ID), Mine Warfare (MIW) and Anti-Terrorism/Force Protection (AT/FP). - The Operational venue to experiment, demonstrate, assess warfighting CONOPS development, concepts, doctrine/training development, techniques and procedures (TTPs), and technologies - Multi-year experiment campaigns focuses on warfighting capability per CPF/CUSFFC guidance to evaluate and transition to DOTMLPF-Policy change recommendations: - Trident Warrior is the component of FLEX that specifically targets C4I systems ***FY 2015 Accomplishments:*** The FY15 Execution Plan (ExPlan) is based on five USFF/CPF directed focus areas to include, in very broad terms, Electromagnetic Maneuver Warfare, Joint Assured Access, Integration and Interoperability, Unmanned Systems, and New Platform Introduction. The status of the FY15 ExPlan is as follows: 1. Navy Integrated Fire Control-Counter Air (NIFC-CA) War Game #2 The NIFC-CA War Game was completed 08-12 Dec 2014 at the Boeing Virtual Warfare Center. The primary purpose of this classified USFF-led war game was to identify DOTMLPF-P shortfalls to achieve full NIFC-CA Increment I capability at Initial Operational Capability (IOC) circa 2017. NIFC-CA Wargame #2 was part of the USFF-directed and led multi-year NIFC-CA campaign plan that began in 2013 to explore NIFC-CA capabilities, C2 decision-making, training, and CONOPS/TTP development and refinement. A comprehensive campaign methodology is required to synchronize delivery of all NIFC-CA DOTMLPF-P actions and to provide Navy leadership with insight into challenges and limitations associated with NIFC-CA in operational scenarios in order to protect its "game changing" capabilities and key programs.					

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
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B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Primary results of this effort will inform a revised NIFC-CA Fleet Concept of Operations (CONOPS) and will inform Fleet Readiness Training Plan (FRTP) development and certification standards. Results will also inform development of future Naval Integrated Fires (NIF) campaign events designed to support future capability delivery and provide capability gap analysis to Navy resource sponsors. The final experiment report dated 28 Feb 2015 is available in FIMS. Execute experimentation as laid out in the FLEX Execution Plan for 2015 including: 1. Naval Integrated Fire Control-Counter Air (NIFC-CA) Campaign Wargame 2. Focus: Execute NIFC-CA Wargame 2 in Dec 2014. Navy leadership requires awareness and understanding of NIFC-CA capabilities to protect its "game changing" potential and associated pillar programs. A comprehensive methodology is required to synchronize delivery of all NIFC-CA doctrine, organization, training, materiel, leadership, personnel, facilities, and policy (DOTMLPF-P) actions, and Navy leadership requires insight into challenges and limitations associated with NIFC-CA in operational scenarios. Throughout FY15, a series of events including modeling and simulation (M&S) development were conducted. The wargame culminated in an Operator-in-the-Loop (OITL) M&S event. This event examined how NIFC-CA increment 1 capabilities, circa 2017, contribute to air warfare in an operationally representative environment. Objectives: - Inform decisions on: - Concepts of Operation (CONOPS), tactics, techniques, and procedures (TTP), and Operational Task (OPTASK) modifications, - Training requirements and future experimentation, - NIFC-CA pillar program investments. - Investigate: - C2 flow/decision making - Battlespace management and deconfliction in a joint engagement zone (JEZ), - Combat ID (CID) with National Technical Means (NTM) and 5th-4th Generation fighter integration,					

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B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
- Operations in an electronic attack (EA) environment, - Counter-intelligence, surveillance, reconnaissance (C-ISR)/counter-targeting (CTTG) impact on red force response (postwargame). Functions: USFFC proposes continued Fleet - OPNAV NIFC-CA partnership including: - Support a United States Fleet Forces Command (USFFC)-led multi-year NIFC-CA campaign plan to explore NIFC-CA capabilities, C2 decision-making, training, CONOPS, and TTP. - Inform development/refinement of NIFC-CA Fleet CONOPS, Integrated Air and Missile Defense (IAMD) TTPs, and OPTASKs. - Inform the Fleet training continuum from schoolhouse to Fleet Synthetic Training (FST) to Composite Training Unit Exercise (COMPTUEX). Costing Data: - NIFC-CA workshops, fleet participant travel, and Senior Leadership Seminar - Workshop included: CID, TTP, Air Defense Commander (ADC)/Composite Warfare Commander (CWC)/Rules of Engagement (ROE), CTTG/Electromagnetic Warfare (EMW), SLS - Wargame execution IT weeks, TTP execution check, and final execution weeks - Wargame data analysis support - Core wargame cost including: - Increased to three BL-9 - Modeling and simulation, technical support, and venue - F-22/F-15 Integration - Manned F-22s and constructive F-15s - Leverages combination of NTM, Info Gateway for 5th-4th Gen FTRs/L16 - Blue EA (EA-18G) - Explicit effect modeling of jammers - Improved capability to support Growler employment/contribution to integrated fire control (IFC) - Dynamic Red Team - Manned threat fighters, enemy Operator in the Loop (OITL) reaction to Blue actions Participants: - Subject Matter Experts (SME) from fleet, training, doctrine, acquisition, and test communities					

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
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B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
- Future generations of NIFC-CA stakeholders Deliverables: - Wargame Glideslope - Preliminary workshops (CID, Blue Force Laydown, TTP Development, Air Defense Syndicate) - Wargame planning, scenario and Data Collection and Analysis Plan (DCAP) development, IT testing and M&S engineering - Dry runs/TTP week/wargame execution - Post-wargame workshop (C-ISR/T) - Wargame 2 - Counter ISR/C-Targeting workshop - Understand how EMW and C-ISR/T techniques can be applied to achieve desired results to counter Red force ability to target Blue force location, and/or disrupt Red force ability to conduct coordinated attacks (ex. simultaneous Time on Target (TOT), threat axis, etc.) based on results of AC-14C. - NIFC-CA wargame 2 Senior Leader Seminar (SLS) Accomplishments - Evaluate potential kill chains for desirability, relevancy, - Create ideal and realistic wargame 2 mission plan, - Provide guidance for updating NIFC-CA CONOPS, - Identify operationally relevant capability gaps, - Inform resource sponsors of NIFC-CA utility and improvements necessary to achieve capability potential. 2. Electromagnetic Maneuver Warfare (EMW) Experimentation Campaign The EMW experimentation campaign consists of multiple events throughout 2015 designed to explore innovative concepts and technologies associated with EMW. EMW is the Navy's warfighting approach to gain decisive military advantage in the electromagnetic spectrum (EMS) to enable freedom of action across all Navy mission areas. Individual components of the overall EMW campaign include: o NEMESIS War Game This Office of Naval Research (ONR) sponsored war game was conducted by NWDC and completed 23-26 Feb 2015. The primary purpose of the war game was to obtain fleet stakeholder input into the requirements for and					

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
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B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
design of a classified ONR Innovative Naval Prototype. The results of this effort will be used to design prototypes that could eventually be fielded as a Navy program of record. o EMW At-Sea Experiment Phase 1 of this multi-phase effort was completed in March 2015. The classified details of this effort are available in FIMS. Results of this effort will be used to develop new or refine existing tactics, techniques, and procedures (TTP). o Northern Edge 2015 During joint exercise Northern Edge 2015, held 15-26 Jun 15 in the Joint Pacific Alaska Range Complex (JPARC), NWDC executed four specific classified initiatives focused on maritime operations in a complex EMS environment. Results of this effort will inform cyber development and will be used to develop new or refine existing TTP. EMW At Sea Experiment This ONR-sponsored at-sea experiment will execute in the Virginia Capes operating areas from 10-16 Aug 2015. Once completed, classified details of this effort will be available in FIMS. 3. Alternative Platforms with Payloads (APPS) Seminar War Game As directed and led by USFF and in support of OPNAV staff, NWDC planned, executed, and assessed the APPS war game completed 12-13 Nov 2014. Combatant Commander (CCDR) steady-state requirements are straining surface combatant (CRUDES and Amphibious) capacities to source and sustain Phase 0/1 missions. The purpose of this FLEX effort was to identify mission payloads with enablers that would allow selected USNS Military Sealift Command (MSC) vessels to support selected CCDR steady state missions. Comprised of two events, a workshop in September 2014 and the seminar war game, the primary objectives were to: define Navy Component Commander (NCC) identified mission sets; define platform baseline; identify required payloads to support mission sets; identify disparities between platform's baseline and mission payload; and identify enablers to integrate platform and mission payload. Missions examined included: Counter Illicit Trafficking, Intelligence, Surveillance, and Reconnaissance, Humanitarian Assistance/Disaster Relief, Survey Operations, Support to Special Operations Forces, Theater Security Cooperation, and Crisis Response.					

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B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
The platforms considered were Joint High Speed Vessel (JHSV), Mobile Landing Platform (MLP), Auxiliary Cargo and Ammunition Ship (T-AKE), and Large, Medium Speed Roll-on/Roll-Off (LMSR). NWDC promulgated the APPS final experiment report on 25 Mar 2015, and the report is available on the Fleet Experimentation Information Management System (FIMS) SIPRNET portal. Findings and recommendations of this effort will be used to inform the USFF/CPF 2017 POM input to OPNAV. 4. Undersea Domain Operating Concept (UDOC) Experimentation Campaign The UDOC experimentation campaign, begun in 2014 and continues into 2015, examines DOTMLPF-P solutions that exploit the undersea environment to achieve cross-domain synergies and enable joint operational access. FY15 efforts will focus on the evaluation of several innovative capabilities and concepts. Individual components of the FY15 UDOC campaign include: o Undersea Innovation War Game This Commander, Submarine Forces-sponsored and NWDC-conducted war game was completed 07-10 Apr 2015 at NWDC's headquarters. During the war game, participants evaluated the military utility of selected innovative technologies and enabling capabilities to address Anti Access Area Denial (A2AD) through Joint Assured Access scenarios for operational planning phases 0 through 2. Results of this war game will be used to make decisions regarding which innovative technologies to pursue further based on military utility. Non-Traditional Theater ASW War Game This Commander, Submarine Forces-sponsored and NWDC-conducted war game is being planned for a July 2015 execution at NWDC's headquarters. During the war game, participants will evaluate courses of action for dealing with current operational challenges. Classified details of this war game are available in FIMS. UDOC 2015 This Commander, Submarine Forces-sponsored and NWDC-conducted at-sea event, is planned for an August 2015 execution in the Southern California operating area and will examine selected innovative technologies and enabling capabilities in an operational environment. 5. Joint High Speed Vessel At Sea Experiment Campaign Conducted at the direction of CUSFF and in direct support of the OPNAV-led Littoral Combat Ship (LCS)/JHSV Council, the objective of the JHSV campaign is to evaluate the effectiveness of using various Adaptive Force					

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B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Packages (AFPs) to expand JHSV platform employment options, beyond that of intra-theater logistics and personnel transport. Initial focus is on mission options involving little or no modification to the existing sea frame. Phase One of the 2015 effort was executed 13-26 Jun 2015 during USNS SPEARHEAD's (JHSV 1) Commander, Fourth Fleet (C4F) Southern Partnership Station (SPS) deployment. Phase One explored the platform's capability to support Expeditionary Mine Counter Measures (EMCM) operations and Maritime Command and Control. Phase Two, executing 15-22 Jul 2015, will examine the platform's capability to support Afloat Forward Staging Base (AFSB) operations, Counter Illicit Trafficking, Maritime Command and Control, and Intelligence, Surveillance and Reconnaissance operations using a telescoping mast to extend radar horizon, a small-boat docking facility, and small Unmanned Air Systems (UAS) operations (in conjunction with special forces). In addition to a final experiment report, the products of this effort will include revisions to the JHSV Platform Wholeness, JHSV Warfighting, and Adaptive Force Packages (AFP) Fleet CONOPS. More importantly, results will inform key investment decisions under consideration by OPNAV regarding the employment of adaptable sensor, communication, and support payloads enabling JHSV to conduct a range of missions beyond those it was originally built to perform. 6. Trident Warrior 2015 (TW15) The Trident Warrior 2015 (TW15) advanced at-sea warfighting experiment, co-led by Commander, Seventh Fleet (C7F) and NWDC, will execute in 3 phases from Jun through Sep 2015 in C7F AOR to include participation in PACOM/PACFLT exercise Talisman Sabre 2015. The TW15 effort will evaluate 17 technology and/or TTP initiatives designed to close warfighting gaps focused on: C2 of EMW assets in a contested environment, assured communications, long range Surface Warfare (SUW), and counter-ISR. To date, all planning meetings have been conducted, and a significant planning effort focused on ensuring technologies planned for shipboard/ashore installation will meet installation and Information Assurance certification and accreditation requirements has been completed. In addition to a final experiment report, expected products of TW15 include change recommendations to existing doctrine publications and development/refinement of draft doctrine (Tactical Memorandums). 7. Laser Weapon System (LaWS) Operational Demonstration The highly successful (and highly publicized) Solid State Laser Weapon System (LaWS) Quick Reaction Capability (SSL QRC) operational demonstration was completed 13-21 Nov 2014 on USS PONCE (AFSB 15) in Commander, Fifth Fleet (C5F) area of operations. The FLEX program has played a crucial role in the overall development of LaWS. In August 2012, during Black Dart 2012 (a FY12 FLEX event), the Navy Air and Missile					

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B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Defense Command (NAMDC), supported by NWDC, led the execution of a fleet experiment that resulted in the first successful engagement of an unmanned aerial vehicle - with a laser weapon system - from a U.S. Navy destroyer - USS DEWEY (DDG 105). The results achieved during Black Dart 2012 were so successful that they led the CNO to direct Naval Sea Systems Command (NAVSEA) to forward deploy the system to the Middle East on USS PONCE (AFSB-15). Without the FLEX program, LaWS, the Navy's most revolutionary weapon of the 21st century, would not have made it onto a surface combatant and eventually onto PONCE. ? In addition to providing data collection, analysis, and execution support in theater, NWDC has delivered the final experiment report and has developed a SSL Tactical Memorandum (TACMEMO) focused on operational employment, tactics, techniques and procedures, and command and control of weapon employment. 8. LPD 17 Employment Options Through a series of workshops and at-sea observation events, NWDC is conducting an experiment examining the feasibility of using the LPD-17 class to perform additional missions as a Regional/Sector Air Defense Coordinator and/or an alternate Command and Control Platform. During the KEARSARGE ARG/26 Marine Expeditionary Unit (MEU) Post Deployment Brief (PDB), CUSFF directed the identification of potential employment areas that differ from traditional LPD employment. Results of this effort will inform changes to LPD-17 Class Required Operational Capabilities/Projected Operating Environment (ROC/POE), LPD-17 Class Tactical Manual, LPD-17 manning plan, and other related documents. 9. Rail Gun Seminar War Game At the request of the NAVSEA Rail Gun program office and in support of CUSFF continuing efforts to evaluate new platforms and weapon systems prior to Fleet introduction, NWDC executed a Rail Gun seminar war game from 15-18 June 2015. Results of this effort will contribute to a revised Rail Gun Operating Concept encompassing new missions and target sets envisioned for the rail gun and its associated hyper-velocity projectile. Results will also inform preparations for the first at-sea Rail Gun demonstration planned for FY16 aboard JHSV. 10. Collaborative Unmanned Undersea Vehicles (UUV) Operations From 14-18 Sep 2015, NWDC will conduct a seminar war game to develop common tactics and procedures for employment of integrated UUVs operating in a FVEY (Five Eyes - an intelligence alliance comprising Australia, Canada, New Zealand, the United Kingdom, and the United States) environment. Currently each member of the FVEY community is developing, in isolation, TTPs for UUV operations limiting collaboration and information exchange regarding use of similar UUV systems and associated data.					

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B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
This effort will produce a TACMEMO addressing UUV operations in a shared battle space that is FVEY releasable. 11. Netted Sensors At Sea Experiment This Naval Air Systems Command (NAVAIR) sponsored and NWDC coordinated effort, planned for 14-18 Sep 2015 execution in Virginia Capes operating area, will explore several initiatives focused on technologies and TTP that will improve Navy capability to passively find, fix, track, target, and ID surface and air contacts at extended ranges, largely in support of long range SUW. In addition to a final experiment report, this effort will inform NAVAIR (PMA 231 and 265) efforts to shorten timelines to geo-locate short-duration emitters and enhance combat identification (CID) capability through networked sensors. 12. Counter FAC/FIAC At Sea Experiment This effort, planned for Sep or Oct 2015 execution in Virginia Capes operating area, will evaluate the effectiveness of employing an unarmed Switchblade Unmanned Air System (UAS) versus Fast Attack Craft (FAC) and Fast Incoming Attack Craft (FIAC) representative targets. In addition to a final experiment report, this effort will provide DOTMLPF-P recommendations to inform acquisition investment decisions and will recommend revisions to current counter FAC and FIAC doctrine. 13. Bold Alligator 2014 - Digital Call for Fire During exercise Bold Alligator 2014, conducted in FY15 from 29 Oct to 10 Nov 2014 in the Virginia Capes operating area, NWDC coordinated execution of an experiment exploring the end-to-end, machine-to-machine transmission of a Naval Surface Fire Support (NSFS) digital call for fire from a Forward Observer/Fire Support Coordination Center through the Supporting Arms Coordination Center on USS KEARSARGE (LHD 3) to the Naval Fires Control System on USS WINSTON CHURCHILL (DDG 81). The experiment was conducted via high frequency (HF) communications path and SIPRNET. The primary objective of this experiment was to determine the exact nature and extent of various challenges that arise when attempting to complete an end-to-end digital call for fire. Results of this experiment will be used by the technical community (primarily Navy Surface Warfare Center, Port Hueneme) to refine system configuration and troubleshooting procedures that will, in turn, be used to update fleet operating procedures.					
FY 2016 Plans:					

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B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
The FY16 ExPlan is based on four USFF/CPF directed focus areas to include, in very broad terms, Multi-mission Electromagnetic Maneuver Warfare, Naval Integrated Fires, Full Spectrum Mine Warfare, and Unmanned Systems. In addition to the four named, FLEX will also be leveraged to support new platform introduction capabilities. Experimentation will be executed as laid out in the draft FLEX ExPlan for FY 2016 as follows: 1. Electromagnetic Maneuver Warfare Experiment Campaign In accordance with the EMW Charter, CNO has assigned responsibility to CUSFF to create and execute the Navy-wide campaign to achieve Navy's articulated EMW end state by 2020. Additionally, the charter assigns NWDC as the EMW action lead and the lead for the Concepts, Doctrine, and Experimentation. Throughout FY16, a series of events designed to synchronize and align experiment initiatives with EMW tasks to provide solutions to EMW capability gaps and to ensure development of doctrine and TTP is synchronized with the introduction of new technology will be conducted. Additionally, these events will be conducted to develop and provide the Fleet and Fleet trainers with required doctrine tools at the tactical and operational levels. Specific events planned for FY16 include: 2. Fleet Battle Experiment (FBX EWM 16) FBX EMW 16 will consist of a series of events (nominally one per quarter) primarily aligned with Carrier Strike Group (CSG) Composite Training Unit Exercise (COMPTUEX) events and CSG transits to and from deployments. The primary focus of this effort will be to exercise and validate the contents of existing and newly developed EMW-related doctrine, TTP, and CONOPS. 3. EMW at the Operational/Tactical Level of War This effort will focus on examining EMW functionality at the Operational and Tactical Levels of War and to assess how well the Fleet is operationalizing EMW into routine daily Fleet operations. 4.Navy Lighterage At-Sea Demonstration This effort will examine the warfighting utility of a prototype addressing a Fleet urgent operational need. 5.Electro-Optical/Infrared (EO/IR) Engagement Capability Workshop This effort will examine the potential of various electro-optical and infrared technology solutions for use on unmanned systems to provide long range (beyond organic radar horizon) fire control quality data.					

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B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
6.Passive Radar Demonstration This effort will examine the warfighting utility of a passive radar system and its ability to conduct live operations in support of Integrated Air and Missile Defense (IAMD). This land-based demonstration will inform plans for a FY17 follow-on shipboard installation and at-sea experiment. 7.Navy Tactical Data Network At-Sea Experiment This Commander, Tenth Fleet (C10F) sponsored effort will provide a DDG with access to previously unavailable information via a prototype data network. The prototype will be installed prior to the DDG beginning intermediate training and will remain onboard throughout deployment to enable a long term evaluation of the system's capabilities. 8.Naval Integrated Fires (NIF) Campaign 3 NIF Campaign 3 is part of the USFF-directed and led multi-year NIFC-CA campaign plan that began in 2013 to explore NIFC-CA capabilities, C2 decision-making, training, and CONOPS/TTP development and refinement. A comprehensive campaign methodology is required to synchronize delivery of all NIFC-CA DOTMLPF-P actions and to provide Navy leadership with insight into challenges and limitations associated with NIFC-CA in operational scenarios in order to protect its "game changing" capabilities and key programs. Throughout the remainder of FY15 USFF will conduct a series of tabletop workshops, mission planning events, and modeling and simulation analysis that will culminate in a non-kinetic operator-in-the-loop (OITL) system war game in Nov 2015 and a kinetic OITL system war game in Mar 2016. Primary results of this effort will inform development of an Integrated Counter Intelligence, Surveillance, Reconnaissance, and Targeting (C-ISRT) Fleet Concept of Operations (CONOPS), a revision to NIFC-CA Fleet Concept of Operations (CONOPS), and will inform Fleet Readiness Training Plan (FRTP) training and certification standards. The results will also inform development of future Naval Integrated Fires (NIF) campaign events designed to support future capability delivery and provide capability gap analysis to Navy resource sponsors. 9. Undersea Domain Operating Concept (UDOC) Experimentation Campaign The FY16 UDOC experimentation campaign consists of several events/efforts supporting Commander, Submarine Forces (COMSUBFOR) and the Navy Undersea Warfighting Development Center. Specific events planned for FY16 include:					

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B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Undersea Innovation Seminar War Game A seminar war game will be conducted in Q1/Q2 FY16 to explore how innovative technologies, such as those within the COMSUBFOR Undersea Rapid Capability Initiatives (URCI), might be employed by the Fleet to exploit use of the undersea, deny the adversary's use of the undersea, and provide war-winning cross domain effects. Theater Undersea Warfare (TUSW) Command and Control (C2) Seminar War Game A TUSW C2 seminar war game will be conducted in Q1/Q2 FY16 to examine options for C2 of naval operations in and through the undersea domain in two future timeframes (2018 and 2025) to inform development of an Undersea Warfare Command Concept of Operations. UDOC At-Sea Experiment This COMSUBFOR-sponsored and NWDC-conducted at-sea event, planned for a summer 2016 execution in the Southern California operating area, will examine selected innovative technologies and enabling capabilities in an operational environment to include COMSUBFOR Undersea Rapid Capability Initiatives. Non-Traditional Theater Anti-Submarine Warfare (ASW) At-Sea Experiment This follow-on to the 2015 Non-Traditional Theater ASW War Game will examine selected innovative technologies and enabling capabilities, focused on a specific undersea mission, in an at-sea operational environment. 11. Trident Warrior 2016 At-Sea Experiment The Trident Warrior 2016 (TW16) experiment, co-led by Commander, Third Fleet (C3F) and NWDC, will execute in conjunction with exercise Rim of the Pacific (RIMPAC) from Jun through Aug 2016 in C3F AOR. This effort will evaluate approximately 30 technology and/or TTP-related initiatives to close warfighting gaps identified across multiple POM-17 Integrated Prioritized Capability Lists (IPCLs). TW16 will support OPNAV, Space and Naval Warfare Systems Command (SPAWAR), program offices, Office of Naval Research (ONR), Naval Research Lab (NRL), and others in the spiral development of prototype capabilities at sea and in the hands of warfighters. 12. C4F JHSV At-Sea Experiment Campaign This campaign will be conducted at the direction of CUSFF and in direct support of the OPNAV-led LCS/ JHSV Council. The objective of the campaign is to evaluate the effectiveness of using various Adaptive Force					

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B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Packages (AFPs) to expand JHSV platform employment options, beyond that of intra-theater logistics and personnel transport, with an initial focus on mission options involving little or no modification to the existing sea frame. The 2016 effort will execute in the Jun-Aug 2016 timeframe during JHSV C4F Southern Partnership Station deployment to evaluate multiple technologies enhancing JHSV's capability to serve as an Afloat Forward Staging Base (AFSB) and improve JHSV ISR capabilities. This effort will support development and validation of a JHSV as an AFSB Fleet CONOPS. 13. Strike Weapon and Advanced Close Air Support Evaluations This Naval Air Warfighting Development Center (NAWDC) sponsored live-fire effort will evaluate weapon performance and developmental TTPs for employing air-delivered weapons and conducting Close Air Support in a complex electromagnetic spectrum (EMS) environment. Results of this effort will be incorporated into appropriate TTPs and also into air wing training curriculum. 14. Mine Warfare (MIW) Innovation War Game A seminar war game will be conducted in Q1/Q2 FY16 to explore how various innovative MIW technologies might be employed by the Fleet to address identified fleet warfighting capability gaps. Technologies with the most potential will be examined in a follow-on at-sea experiment. MIW At-Sea Experiment This at-sea event, planned for a summer 2016 execution in the Southern California operating area, will examine selected innovative technologies and TTPs enabling capabilities in an operational environment to support the transition of MIW capabilities from legacy manned platforms to future unmanned systems. Unmanned System Swarm Series of Events A seminar war game will be conducted to examine the warfighting utility of ONR's low cost Unmanned Air Vehicle (UAV) swarming technology (LOCUST) to inform a follow-on at-sea experiment in FY17. An ONR-sponsored at-sea experiment will be conducted examining warfighting utility and employment options of an Unmanned Surface Vehicle (USV) swarm. This is a follow-on to ONR's initial at-sea demonstration conducted in August 2014. Autonomous Offboard Unmanned Systems (UxS) Campaign					

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B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
This COMPACFLT-sponsored effort will examine the warfighting utility and multiple employment options offered by various types of unmanned systems in support of naval warfare missions with an emphasis on how unmanned systems can be a force multiplier. ***FY 2017 Base Plans:*** N/A ***FY 2017 OCO Plans:*** N/A					
Accomplishments/Planned Programs Subtotals	4.979	8.864	0.000	0.000	0.000

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

This funding supports 15 to 25 significant warfighting experiment campaigns/events encompassing over one hundred individual experiment initiatives annually. These campaigns/events focus on addressing fleet identified significant capability gaps. The majority of this funding is applied toward acquiring intellectual capital in emerging technical areas through contracts providing engineering expertise, experiment design, execution and analysis support, range support, certification and accreditation of technical capabilities, targets, and supporting air assets, and it is also used to purchase engineering and integration costs associated with conducting campaign-based experiments.

E. Performance Metrics

Fleet Experimentation:
- 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 war fighting 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 war fighting capabilities in the fleet.
- Rapidly mature concepts, technologies, and doctrine.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy			Date: February 2016
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Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Systems Test and Evaluation	MIPR	Defense Technical Information Center : Ft Belvoir VA	4.136	0.225	Sep 2015	1.400	Jun 2016	0.000		-		0.000	0.000	5.761	-
Systems Test and Evaluation	C/FFP	NAVSEA : Washington DC	3.514	0.065	Mar 2015	0.200	Mar 2016	0.000		-		0.000	0.000	3.779	-
Systems Test and Evaluation	C/FFP	SPAWAR : San Diego CA	4.991	0.200	Aug 2015	1.600	Mar 2016	0.000		-		0.000	0.000	6.791	-
Systems Test and Evaluation	C/FFP	SPAWARSYSCEN Atlantic : Charleston SC	3.323	0.000		0.000		0.000		-		0.000	0.000	3.323	-
Systems Test and Evaluation	Various	SPAWARSYSCEN Pacific : San Diego CA	2.977	0.115	Mar 2015	0.400	Mar 2016	0.000		-		0.000	0.000	3.492	-
Systems Test and Evaluation	Various	Naval Undersea Warfare Center : Newport RI	1.399	0.400	Mar 2015	0.400	Jun 2016	0.000		-		0.000	0.000	2.199	-
Systems Test and Evaluation	Various	Naval Surface Warfare Center : CA, IN, MD, VA	2.970	0.848	Aug 2015	0.600	Jul 2016	0.000		-		0.000	0.000	4.418	-
Systems Test and Evaluation	C/FFP	Naval Postgraduate School : Monterey CA	1.595	0.052	Feb 2015	0.000		0.000		-		0.000	0.000	1.647	-
Systems Test and Evaluation	C/FFP	Navy Warfare Development Command : Norfolk VA	1.213	0.000		0.000		0.000		-		0.000	0.000	1.213	-
Systems Test and Evaluation	C/FFP	Naval Research Laboratory : Washington DC	0.250	0.139	Apr 2015	0.500	Jun 2016	0.000		-		0.000	0.000	0.889	-
System Test and Evaluation	C/FFP	Naval Air Warfare Center : Point Mugu CA	0.691	0.200	Jul 2015	0.600	Jun 2016	0.000		-		0.000	0.000	1.491	-
Systems Test and Evaluation	C/FFP	Fleet Industrial Supply : Norfolk VA	0.729	0.000		0.000		0.000		-		0.000	0.000	0.729	-

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Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Systems Test and Evaluation	C/FFP	Naval Air Warfare Center Aircraft Division : CA, MD, NJ	7.309	0.434	Jul 2015	0.800	Aug 2016	0.000		-		0.000	0.000	8.543	-
System Test and Evaluation	MIPR	Air Force Research Lab : Wright Patterson AFB OH	1.250	0.488	Apr 2015	0.400	Mar 2016	0.000		-		0.000	0.000	2.138	-
System Test and Evaluation	C/FFP	Navy System Management Activity : Washington DC	1.116	0.030	Apr 2015	0.800	Jun 2016	0.000		-		0.000	0.000	1.946	-
System Test and Evaluation	C/FFP	Naval Surface Warfare Center : Corona CA	0.246	0.000		0.000		0.000		-		0.000	0.000	0.246	-
System Test and Evaluation	C/FFP	CECOM : Aberdeen Proving Grounds MD	0.150	0.000		0.000		0.000		-		0.000	0.000	0.150	-
System Test and Evaluation	C/FFP	DMEA : Sacramento CA	0.535	0.000		0.000		0.000		-		0.000	0.000	0.535	-
System Test and Evaluation	Various	Naval Surface Warfare Command : Dahlgren VA	0.201	0.193	May 2015	0.200	Jun 2016	0.000		-		0.000	0.000	0.594	-
System Test and Evaluation	Various	APG-Army : Natick	0.467	0.000		0.000		0.000		-		0.000	0.000	0.467	-
System Test and Evaluation	Various	Naval air Warfare Center : CA, NJ	0.514	0.000		0.000		0.000		-		0.000	0.000	0.514	-
System Test and Evaluation	Various	BTR per DCNO N2N6 : To Project 3311	0.460	0.000		0.000		0.000		-		0.000	0.000	0.460	-
System Test and Evaluation	Various	Air Force Research Lab/RI : Rome NY	0.000	0.223	Apr 2015	0.400	Mar 2016	0.000		-		0.000	0.000	0.623	-
System Test and Evaluation	Various	Office of Naval Research : Arlington VA	0.000	0.317	May 2015	0.200	Jul 2016	0.000		-		0.000	0.000	0.517	-

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Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
System Test and Evaluation	Various	USFF : Norfolk, VA	0.000	0.610	Sep 2015	0.364	May 2016	0.000		-		0.000	0.000	0.974	-
System Test and Evaluation	Various	Pacific Missile Range Facility : Pekekha HI	0.000	0.198	Aug 2015	0.000		0.000		-		0.000	0.000	0.198	-
System Test and Evaluation	Various	SUPSHIP CNR : Bath ME	0.000	0.042	Aug 2015	0.000		0.000		-		0.000	0.000	0.042	-
System Test and Evaluation	Various	Defense Logistics Agency : Philadelphia MD	0.000	0.200	Aug 2015	0.000		0.000		-		0.000	0.000	0.200	-
		Subtotal	40.036	4.979		8.864		0.000		-		0.000	0.000	53.879	-

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management	C/FFP	SPAWAR : San Diego CA	3.190	0.000		0.000		0.000		-		0.000	0.000	3.190	-
Program Management	C/FFP	Naval Postgraduate School : Montery CA	0.700	0.000		0.000		0.000		-		0.000	0.000	0.700	-
Program Management	C/FFP	Naval Air Warfare Center Aircraft Division : Patuxent River MD	0.250	0.000		0.000		0.000		-		0.000	0.000	0.250	-
Program Management	C/FFP	Naval Surface Warfare Command : DahlgrenVA	0.000	0.000		0.000		0.000		-		0.000	0.000	0.000	-
Program Management	Various	Naval Surface Warfare Center : Corona CA	0.000	0.000		0.000		0.000		-		0.000	0.000	0.000	-
Program Management	MIPR	Defense Technical Information Center: VA : Ft Belvoir VA	1.639	0.000		0.000		0.000		-		0.000	0.000	1.639	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0604707N / *SEW Architecture/Eng Support*	**Project (Number/Name)** 3319 / *Fleet Experimentation*

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
		Subtotal	5.779	0.000		0.000		0.000		-		0.000	0.000	5.779	-

	Prior Years	FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	45.815	4.979		8.864		0.000		-		0.000	0.000	59.658	-

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0604707N / *SEW Architecture/Eng Support*	**Project (Number/Name)** 3319 / *Fleet Experimentation*

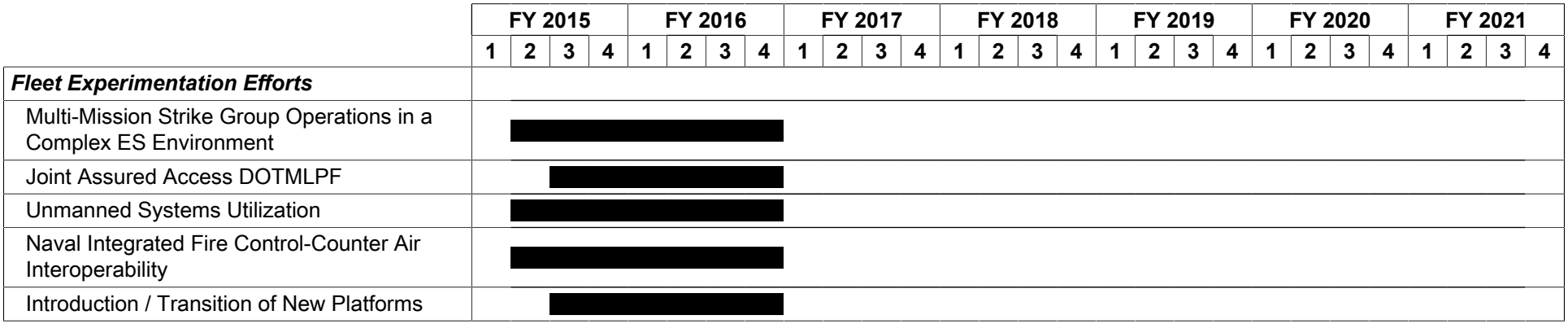


Exhibit R-4A, RDT&E Schedule Details: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0604707N / *SEW Architecture/Eng Support*	**Project (Number/Name)** 3319 / *Fleet Experimentation*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Fleet Experimentation Efforts				
Multi-Mission Strike Group Operations in a Complex ES Environment	2	2015	4	2016
Joint Assured Access DOTMLPF	3	2015	4	2016
Unmanned Systems Utilization	2	2015	4	2016
Naval Integrated Fire Control-Counter Air Interoperability	2	2015	4	2016
Introduction / Transition of New Platforms	3	2015	4	2016

Exhibit R-2, RDT&E Budget Item Justification: PB 2017 Navy	Date: February 2016
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 0604786N *I (U)Offensive Anti-Surface Warfare Weapon Dev*

COST ($ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
Total Program Element	164.292	181.719	285.849	252.409	-	252.409	146.044	119.147	84.208	86.002	Continuing	Continuing
3337: *Offensive Anti-Surface Warfare (OASuW) Weapon*	164.292	181.719	285.849	250.371	-	250.371	128.972	46.023	0.000	0.000	0.000	1,057.226
3343: *Offensive Anti-Surface Warfare (OASuW) Weapon Increment II*	0.000	0.000	0.000	2.038	-	2.038	17.072	73.124	84.208	86.002	Continuing	Continuing

Program MDAP/MAIS Code:
Project MDAP/MAIS Code(s): 449

A. Mission Description and Budget Item Justification

Offensive Anti-Surface Warfare (OASuW) will be an offensive weapon system that can be air, surface, and subsurface launched in the maritime battle space environment. OASuW will be a vital component of the Joint Force Anti-Surface Warfare capability and incorporate new and emergent technologies to support an increased offensive strike capability. Due to emerging threats, the fleet issued an Urgent Operational Needs Statement (UONS) that identified a capability gap for a long-range anti-ship missile to be filled by 2018. Directly supporting this UONS and significantly reducing Joint Force warfighting risks, the U.S. Navy initiated OASuW Increment 1, which leverages the Defense Advanced Research Projects Agency(DARPA)/Office of Naval Research Long Range Anti-Ship Missile (LRASM) demonstration program to deliver an Early Operational Capability (EOC) in the required timeframe. LRASM fills the most urgent air-launched capability gap to compliment, existing ASuW weapon systems and positions the Department of Defense to address evolving surface warfare threats. Longer term OASuW requirements will be addressed in the future by OASuW Increment II.

The OASuW program is part of the Navy's Integrated Fire Control (IFC) approach to address advanced threat capabilities in the Anti-Access/Area-Denial (A2AD) environment. IFC solutions enable individual system capabilities to be leveraged across an effects chain, placing the full spectrum of tactical capability in the hands of the warfighter. IFC solutions that push engagement distances beyond the launch platform's radar horizon and allows the U.S. Navy to operate in, and control, contested battle space in littoral waters and A2/AD environments are increasingly critical as more and more scenarios require compressed and coordinated fire control timelines.

Budget Item Justification: OASuW (Increment I)
Funding supports the delivery of an EOC of OASuW Increment I's LRASM weapon system, including the transition of the LRASM demonstration design into a fielded air-launched weapon system, using an accelerated acquisition approach, with streamlined governance. The program is leveraging DoDI 5000.02i Model 4 to structure the acquisition strategy, which includes a highly integrated and concurrent transition design, integration, and developmental / operational test program to meet the EOC schedule required by the UONS. To manage the accelerated timeline and resulting concurrency, the program uses a structured Knowledge Point review process that support decisions regarding significant program events such as transition from design to integration phase and contract awards. These reviews also provide senior DoD leadership the opportunity to provide focused support and active management of technical and acquisition risk and are chaired by the Service Acquisition

Executive, ASN(RDA), and the Deputy Director of DARPA. The knowledge points are similar to acquisition milestone reviews, but occur more frequently and are tailored to program-specific milestone events. Of note, the OASuW Increment I knowledge points are defined differently than GAO defines the same term and are tailored to program-specific milestone events. The program intends to meet the statutory requirements associated with Milestone B at Knowledge Point 3. In addition to the Knowledge Point reviews, Executive Steering Board reviews, chaired by the MDA, are held at least monthly. Supporting these reviews, the associated engineering approach is designed to mitigate resulting risk by implementing a rolling-wave engineering progression based on the NAVAIR Systems Engineering Technical Review (SETR) process to enable detailed planning and decisions as the system matures. This process includes capstone SETR events that are tailored reviews using standard design review criteria. SETR 2.0 in FY15 provided a Production Design Review level review of the system and supported the Knowledge Point 2 decision to continue toward the Integration and Test phase. The Technology Maturation effort in FY15 and FY16 culminates in a system Critical Design Review (CDR) level review at SETR 4.0. SETR 3.0 in 4QFY15 provides a CDR-level review and supports the Knowledge Point 3 decision to initiate the Integration and Test phase for the all-up-round components.

In FY17, system qualification testing will complete, environmental and ship suitability testing will be conducted, flight test articles will deliver, and flight testing will commence, including the first free-flight weapon firing.

This program is funded under ADVANCED COMPONENT DEVELOPMENT AND PROTOTYPES because it includes all efforts necessary to evaluate integrated technologies, representative models or prototype systems in a high fidelity and realistic operating environment

B. Program Change Summary ($ in Millions)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Previous President's Budget	181.939	285.849	232.751	-	232.751
Current President's Budget	181.719	285.849	252.409	-	252.409
Total Adjustments	-0.220	0.000	19.658	-	19.658
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	5.000	0.000			
• SBIR/STTR Transfer	-5.220	0.000			
• Program Adjustments	0.000	0.000	17.180	-	17.180
• Rate/Misc Adjustments	0.000	0.000	2.478	-	2.478

Change Summary Explanation

Decrease in Offensive Anti-Surface Warfare Weapon Dev by $9.892M as required for the Department of the Navy to comply with the Bipartisan Budget Act of 2015.

PU 3337:

Exhibit R-2, RDT&E Budget Item Justification: PB 2017 Navy	Date: February 2016
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 0604786N *I (U)Offensive Anti-Surface Warfare Weapon Dev*

Schedule: Procurement schedule adjusted to account for lead times and to remove FY20 procurement. Delivery schedule updated to align with procurement schedule.

Acquisition Strategy: Acquisition Strategy further defined adding Knowledge Point (KP) and System Engineering Technical Review (SETR) events. Original KP5 is now KP6 and KP 5, 7 and 8 were defined and added. SETR 5 is the PRR event, SETR 6-8 have been further defined to include dates and added.

PU 3343:

End date shifted from 4Q17 to 4Q18 due to reduction of Cruise Missile Study funding in FY17.

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0604786N / *(U)Offensive Anti-Surface Warfare Weapon Dev*	Project (Number/Name) 3337 / *Offensive Anti-Surface Warfare (OASuW) Weapon*	

COST ($ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
3337: *Offensive Anti-Surface Warfare (OASuW) Weapon*	164.292	181.719	285.849	250.371	-	250.371	128.972	46.023	0.000	0.000	0.000	1,057.226
Quantity of RDT&E Articles		26	24	-	-	-	-	-	-	-		

Project MDAP/MAIS Code: 449

A. Mission Description and Budget Item Justification

Offensive Anti-Surface Warfare (OASuW) will be an offensive weapon system that can be air, surface, and subsurface launched in the maritime battle space environment. OASuW will be a vital component of the Joint Force Anti-Surface Warfare capability and incorporate new and emergent technologies to support an increased offensive strike capability. Due to emerging threats, the fleet issued an Urgent Operational Needs Statement (UONS) that identified a capability gap for a long-range anti-ship missile to be filled by 2018. Directly supporting this UONS and significantly reducing Joint Force warfighting risks, the U.S. Navy initiated OASuW Increment 1, which leverages the Defense Advanced Research Projects Agency(DARPA)/Office of Naval Research Long Range Anti-Ship Missile (LRASM) demonstration program to deliver an Early Operational Capability (EOC) in the required timeframe. LRASM fills the most urgent air-launched capability gap to compliment, existing ASuW weapon systems and positions the Department of Defense to address evolving surface warfare threats. Longer term OASuW requirements will be addressed in the future by OASuW Increment II.

Budget Item Justification: OASuW (Increment I)
Funding supports the delivery of an EOC of OASuW Increment I's LRASM weapon system, including the transition of the LRASM demonstration design into a fielded air-launched weapon system, using an accelerated acquisition approach, with streamlined governance. The program is leveraging DoDI 5000.02i Model 4 to structure the acquisition strategy, which includes a highly integrated and concurrent transition design, integration, and developmental / operational test program to meet the EOC schedule required by the UONS. To manage the accelerated timeline and resulting concurrency, the program uses a structured Knowledge Point review process that support decisions regarding significant program events such as transition from design to integration phase and contract awards. These reviews also provide senior DoD leadership the opportunity to provide focused support and active management of technical and acquisition risk and are chaired by the Service Acquisition Executive, ASN(RDA), and the Deputy Director of DARPA. The knowledge points are similar to acquisition milestone reviews, but occur more frequently and are tailored to program-specific milestone events. Of note, the OASuW Increment I knowledge points are defined differently than GAO defines the same term and are tailored to program-specific milestone events. The program intends to meet the statutory requirements associated with Milestone B at Knowledge Point 3. In addition to the Knowledge Point reviews, Executive Steering Board reviews, chaired by the MDA, are held at least monthly. Supporting these reviews, the associated engineering approach is designed to mitigate resulting risk by implementing a rolling-wave engineering progression based on the NAVAIR Systems Engineering Technical Review (SETR) process to enable detailed planning and decisions as the system matures. This process includes capstone SETR events that are tailored reviews using standard design review criteria. SETR 2.0 in FY15 provided a Production Design Review level review of the system and supported the Knowledge Point 2 decision to continue toward the Integration and Test phase. The Technology Maturation effort in FY15 and FY16 culminates in a system Critical Design Review (CDR) level review at SETR 4.0. SETR 3.0 in late 2015 provided a CDR-level review for the all-up-round components and supports the Knowledge Point 3 decision to initiate the Integration and Test phase.

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0604786N / *(U)Offensive Anti-Surface Warfare Weapon Dev*	**Project (Number/Name)** 3337 / *Offensive Anti-Surface Warfare (OASuW) Weapon*

In FY17, system qualification testing will complete, environmental and ship suitability testing will be conducted, flight test articles will deliver, and flight testing will commence, including the first free-flight weapon firing. Platform integration work continues.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Title: OASuW Development Program	181.719	285.849	250.371	0.000	250.371
Articles:	26	24	-	-	-

FY 2015 Accomplishments:
Primary efforts included continued weapon system design and hardware development to support subsystem design reviews. Additional activities included identification and design of weapon system test sets required in support of subsystem and system level testing, and initial integration design/development on the USAF and USN launch platforms, which include mission planning development and environmental qualification. Test assets procured in FY15 will be utilized to test the separation qualities of the weapon off of the launch platforms, develop the interface between the weapon and the launch platforms, and qualify the weapon in the operational electro-magnetic environment. The quantities listed represent the initiation of test article production for assets that are incrementally funded in FY15-FY17.

FY 2016 Plans:
The Integration and Test phase of the program will be initiated in FY16, concurrently with the completion of the Technology Maturation phase. This program concurrency is required to meet the Early Operational Capability (EOC) fielding timeline identified by the fleet. Primary efforts include weapon system design maturation to support completion of full system critical design review and system qualification in preparation for a Production Readiness Review in FY17. These efforts will be supported by subsystem testing utilizing a Flying Test Bed, laboratory assets and associated models. Additional activities include integration design/development on the launch platforms as well as procurement of free flight test items. The program will complete SETR 3.0, SETR 4.0, SETR 5.0, and Knowledge Point 3. Test Assets procured in FY16 will be utilized for environmental and ship suitability qualification, as well as free-flight weapon firings beginning in FY17. Some test assets initiated in FY15 will be continued in FY16. Test article production assets will deliver in FY16-FY18.

FY 2017 Base Plans:
The Integration and Test phase of the program will continue in FY17. System qualification testing will complete, environmental and ship suitability testing will be conducted, flight test articles will deliver, and flight testing will commence, including the first free-flight weapon firing.

FY 2017 OCO Plans:

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0604786N / *(U)Offensive Anti-Surface Warfare Weapon Dev*	**Project (Number/Name)** 3337 / *Offensive Anti-Surface Warfare (OASuW) Weapon*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
N/A					
Accomplishments/Planned Programs Subtotals	181.719	285.849	250.371	0.000	250.371

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
• WPN/2291: *LRASM*	0.000	0.000	29.643	-	29.643	74.664	74.641	0.000	0.000	0.000	178.948
• MPAF/8010: *LRASM*	0.000	0.000	60.000	-	60.000	45.000	45.000	85.000	86.530	0.000	321.530

Remarks

U.S. Navy WPN funding supports the following quantities:

FY17 - 10
FY18 - 25
FY19 - 25

U.S. Air Force MPAF funding supports the following quantities:

FY17 - 20
FY18 - 15
FY19 - 15
FY20 - 28
FY21 - 28

D. Acquisition Strategy

OASuW Increment I is using an accelerated acquisition approach, with streamlined governance to transition the DARPA/ONR-demonstrated Long Range Anti-Ship Missile (LRASM) for use as an air-launched weapon from USAF and USN platforms. The program is leveraging DoDI 5000.02i Model 4 to structure the acquisition strategy, which includes a highly integrated and concurrent transition design, integration, and developmental / operational test program to meet the 2018 Early Operation Capability (EOC) fielding schedule required by an Urgent Operational Need Statement (UONS) issued by the fleet. The program is structured in three phases: Technology Maturation, Integration and Test, and Procurement. To manage the accelerated timeline and resulting concurrency, the program uses a structured Knowledge Point review process that support decisions regarding significant program events such as transition from design to integration phase and contract awards. These reviews also provide senior DoD leadership the opportunity to provide focused support and active management of technical and acquisition risk and are chaired by the Service Acquisition Executive, ASN(RDA) (delegated MDA), and the Deputy Director of DARPA. The knowledge points are similar to acquisition milestone

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0604786N / *(U)Offensive Anti-Surface Warfare Weapon Dev*	**Project (Number/Name)** 3337 / *Offensive Anti-Surface Warfare (OASuW) Weapon*

reviews, but occur more frequently. Of note, the OASuW Increment I knowledge points are defined differently than GAO defines the same term. Knowledge Point 1 supported program initiation and approval of the acquisition strategy ; Knowledge Point 2 supported evaluation of the preliminary design of the weapon system as well as release of the Request for Proposal for the Integration and Test phase; Knowledge Point 3 supports evaluation of the final (critical design review level) weapon system design and initiation of/contract award for the Integration and Test phase; Knowledge Point 4 supports the procurement decision for EOC units for the B-1; and Knowledge Point 5 supports the procurement decision for EOC units for the F/A-18E/F. The program intends to meet the statutory requirements associated with Milestone B at Knowledge Point 3. In addition to the Knowledge Point reviews, Executive Steering Board reviews (also chaired by the MDA) are held at least monthly. Supporting these reviews, the associated engineering approach is designed to mitigate resulting risk by implementing a rolling-wave engineering progression based on the NAVAIR Systems Engineering Technical Review (SETR) process to enable detailed planning and decisions as the system matures. This process includes capstone SETR events that are tailored reviews using standard design review criteria. SETR 1.0 in FY14 provided a Systems Requirements Review. SETR 2.0 in FY15 provided a Preliminary Design Review level review of the system and supported Knowledge Point 2. SETR 3.0 in late 2015 provided a Critical Design Review (CDR) level review of the All-up Round in support of Knowledge Point 3, while SETR 4.0 in FY16 will provide a CDR level review of the entire weapon system in support of Knowledge Point 4 in early FY17, along with flight test information.

E. Performance Metrics

The Knowledge Points are defined reviews with the Executive Steering Board comprised of Service Acquisition Executive, ASN(RDA) (delegated MDA) and the Deputy Director of DARPA to make program decisions at key points in the program life cycle in place of milestone reviews, but tailored to support the accelerated process. The acquisition program baseline will be established at Knowledge Point 3.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0604786N / *(U)Offensive Anti-Surface Warfare Weapon Dev*	**Project (Number/Name)** 3337 / *Offensive Anti-Surface Warfare (OASuW) Weapon*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Product Development	C/CPIF	Lockheed Martin Missile and Fire Control : Orlando, FL	106.225	132.413	Oct 2014	193.853	Oct 2015	172.848	Oct 2016	-		172.848	113.625	718.964	718.964
Product Development	C/CPFF	Boeing : St. Louis, MO	4.984	13.488	Nov 2014	28.723	Oct 2015	9.077	Oct 2016	-		9.077	6.516	62.788	62.788
		Subtotal	111.209	145.901		222.576		181.925		-		181.925	120.141	781.752	781.752

Remarks

FY17 LMCO costs includes all integration and test efforts by LMCO and associated sub-contractors to complete Knowledge Point 4 and the tailored qualification/flight test program.

FY17 Boeing costs includes software integration onto the B-1 and the F/A-18 E/F to maintain synchronization with weapon development/test and EOC timelines.

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Government Support	WR	NAWC AD : Patuxent River,MD	0.311	3.085	Dec 2014	2.493	Oct 2015	2.117	Oct 2016	-		2.117	1.467	9.473	-
Government Support	WR	NAWC WD : China Lake, CA	13.310	6.353	Jan 2015	10.245	Oct 2015	11.670	Oct 2016	-		11.670	8.090	49.668	-
Government Support	WR	NSWC : Various	2.912	0.010	Jan 2015	0.080	Nov 2015	0.068	Nov 2016	-		0.068	0.048	3.118	-
Development Support	C/FFP	NSMA : Washington, DC	5.247	3.046	Nov 2014	6.935	Dec 2015	5.942	Dec 2016	-		5.942	3.037	24.207	24.207
Development Support	MIPR	USAF : Various	0.185	0.200	Nov 2014	0.434	Oct 2015	0.372	Oct 2016	-		0.372	0.267	1.458	-
Integrated Logistics Support	WR	NAWC AD : Patuxent River, MD	0.165	0.119	Nov 2014	0.212	Oct 2015	0.180	Oct 2016	-		0.180	0.124	0.800	-
Contractor Support	C/CPFF	JHU/APL : Laurel, MD	8.541	2.299	Dec 2014	0.000	Oct 2015	0.000	Oct 2016	-		0.000	1.229	12.069	12.069
Contractor Support	C/FFP	Schaffer Corporation : Arlington, VA	4.050	4.466	Dec 2014	5.053	Oct 2015	4.330	Oct 2016	-		4.330	3.108	21.007	21.007

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0604786N / *(U)Offensive Anti-Surface Warfare Weapon Dev*	Project (Number/Name) 3337 / *Offensive Anti-Surface Warfare (OASuW) Weapon*	

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Mission Planning Support	C/CPFF	Northrup Grummann : Bethpage, NY	0.246	1.686	Jan 2015	4.732	Oct 2015	4.055	Oct 2016	-		4.055	2.911	13.630	13.630
Contractor Support	Various	Various : Various	5.542	0.382	Nov 2014	0.382	Oct 2015	0.327	Oct 2016	-		0.327	0.235	6.868	6.868
Development Support	Various	NRL : Various	0.000	0.000		0.990	Nov 2015	0.000		-		0.000	0.000	0.990	0.990
Prior Yr Supp no longer funded in the FYDP	Various	Various : Various	2.800	0.000		0.000		0.000		-		0.000	0.000	2.800	-
		Subtotal	43.309	21.646		31.556		29.061		-		29.061	20.516	146.088	-

Remarks

FY17 Support costs consist of support from Government offices and Contractor Support experts associated with threat analysis, CONOPs, and Training and Tactical assessments in support of Program Readiness Review (PRR), Knowledge Point 4, the developmental test program, the Quick Reaction Assessment (QRA), and tactics development supporting EOC.

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Development Support	WR	NAWC WD : China Lake, CA	2.997	5.020	Jan 2015	19.322	Oct 2015	24.997	Oct 2016	-		24.997	17.330	69.666	-
Development Support	WR	NAWC AD : Patuxent River, MD	0.354	2.729	Dec 2014	8.301	Oct 2015	8.340	Oct 2016	-		8.340	5.784	25.508	-
Development Support	WR	NSWC : Various	0.000	0.064	Nov 2014	0.064	Nov 2015	0.054	Nov 2016	-		0.054	0.037	0.219	-
Development Support	WR	COTF : Norfolk, VA	0.055	0.050	Nov 2014	0.172	Oct 2015	0.147	Oct 2016	-		0.147	0.106	0.530	-
Development Support	MIPR	USAF : Various	0.191	0.099	Nov 2014	1.104	Oct 2015	3.511	Oct 2016	-		3.511	2.520	7.425	-
Wind Tunnel Testing	MIPR	AEDC : Arnolds AFB, TN	0.250	3.903	Oct 2014	0.000		0.000		-		0.000	0.000	4.153	-
		Subtotal	3.847	11.865		28.963		37.049		-		37.049	25.777	107.501	-

Remarks

FY17 Test and Evaluation costs support flight testing, system qualifications, range time, and target costs needed for the B-1 and F/A-18 E/F to support PRR, Knowledge Point 4, the developmental test program, and the Quick Reaction Assessment (QRA).

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0604786N / *(U)Offensive Anti-Surface Warfare Weapon Dev*	Project (Number/Name) 3337 / *Offensive Anti-Surface Warfare (OASuW) Weapon*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Government Support	WR	NAWC AD : Patuxent River, MD	2.947	1.429	Dec 2014	1.716	Oct 2015	1.457	Oct 2016	-		1.457	1.010	8.559	-
Government Support	WR	NAWC WD : China Lake, CA	1.234	0.534	Jan 2015	0.798	Oct 2015	0.678	Oct 2016	-		0.678	0.470	3.714	-
Project Management Support	C/CPFF	NAWC AD : Patuxent River, MD	1.541	0.059	Dec 2014	0.000		0.000		-		0.000	0.000	1.600	1.600
Travel	Various	NAWC AD : Patuxent River, MD	0.205	0.285	Oct 2014	0.240	Oct 2015	0.201	Oct 2016	-		0.201	0.144	1.075	-
		Subtotal	5.927	2.307		2.754		2.336		-		2.336	1.624	14.948	-

Remarks

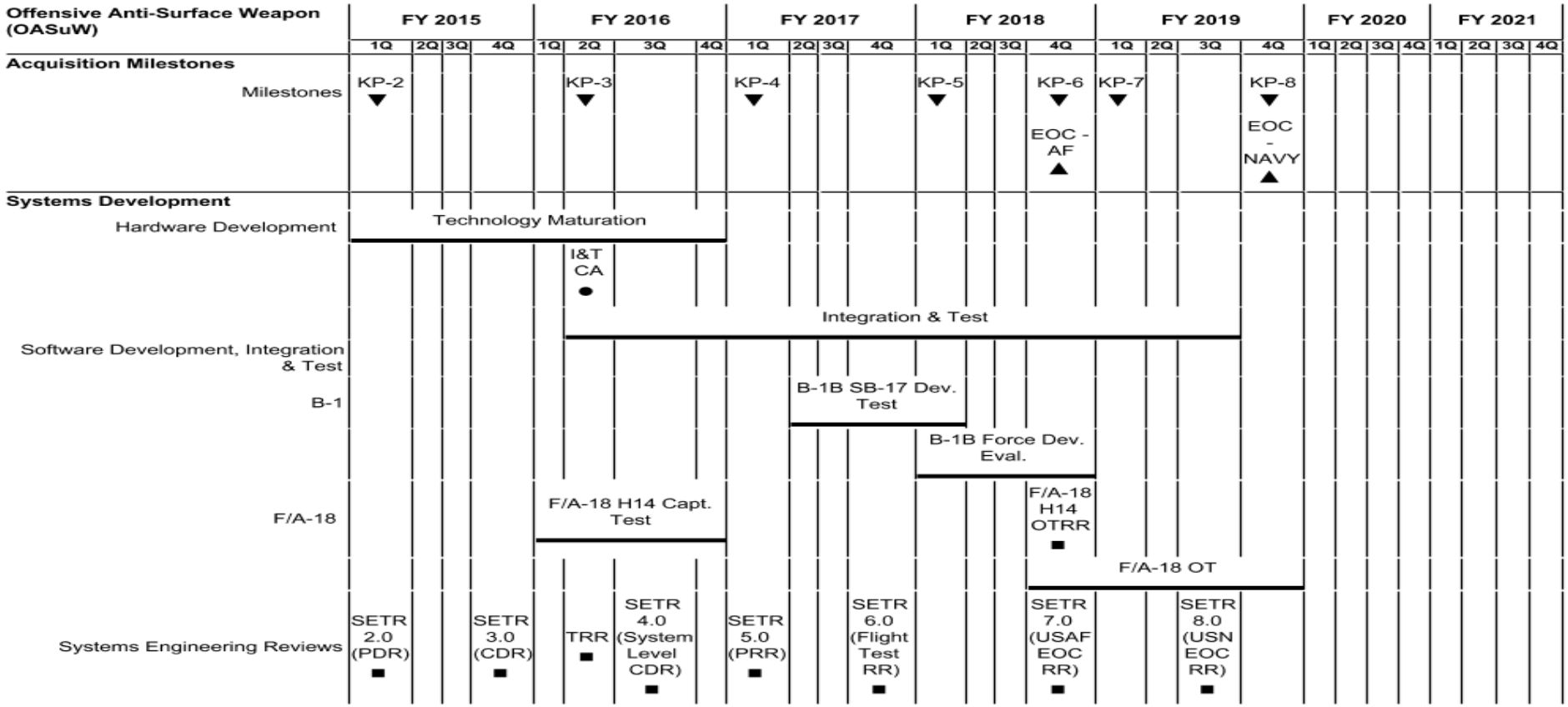
FY17 Management Services costs consist of Non-Headquarters Program Office Management team (Government labor and Contractor support services) required for the management of the program.

	Prior Years	FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	164.292	181.719		285.849		250.371		-		250.371	168.058	1,050.289	-

Remarks

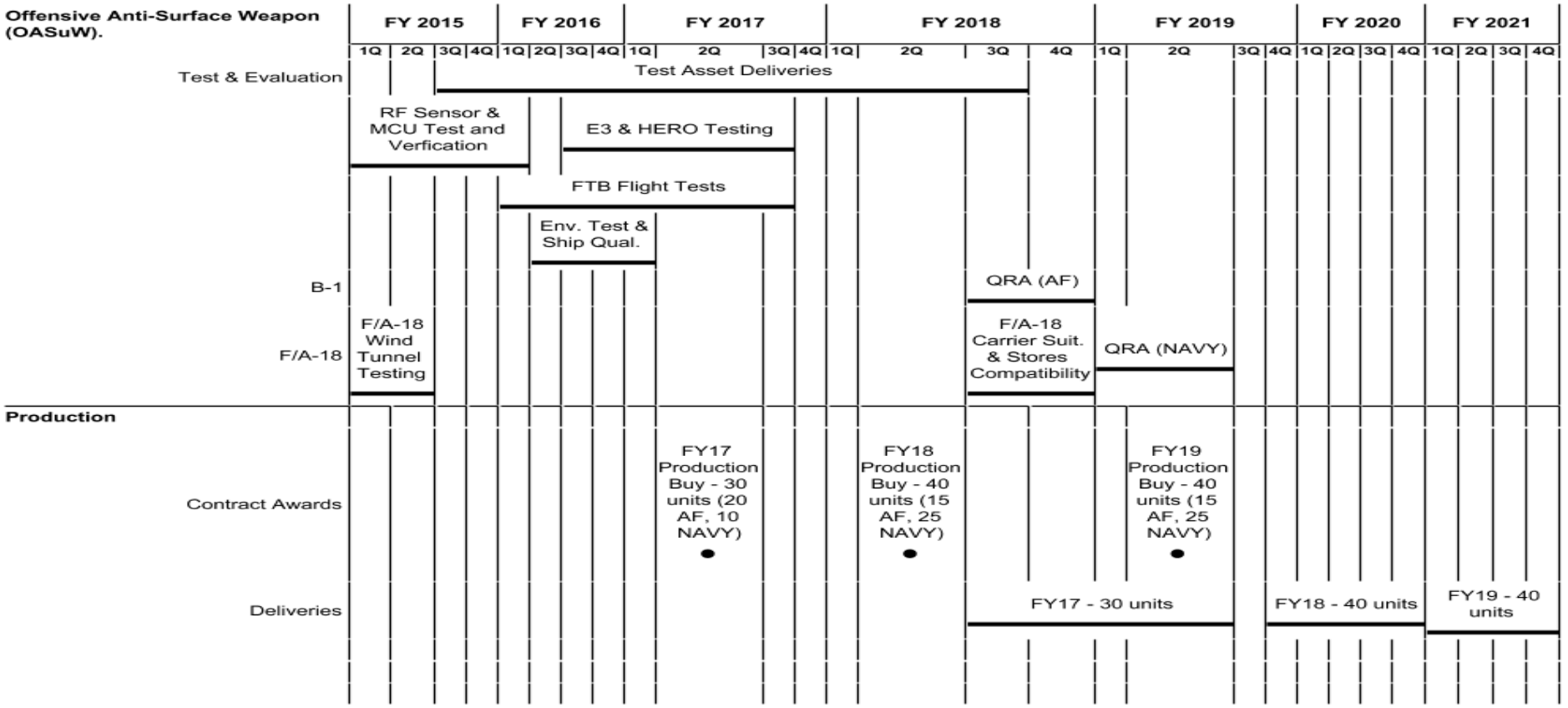
Prior year and FY15 updated for actuals.

Exhibit R-4, RDT&E Schedule Profile: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0604786N / *(U)Offensive Anti-Surface Warfare Weapon Dev*	**Project (Number/Name)** 3337 / *Offensive Anti-Surface Warfare (OASuW) Weapon*



2017PB - 0604786N - 3337

Exhibit R-4, RDT&E Schedule Profile: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0604786N / *(U)Offensive Anti-Surface Warfare Weapon Dev*	**Project (Number/Name)** 3337 / *Offensive Anti-Surface Warfare (OASuW) Weapon*



2017PB - 0604786N - 3337 Schedule changes reflect proposed Acquisition Strategy risk reduction initiative updates to be presented at KP3.
Delivery of FY17 quantities begins in 3QFY18 with USAF EOC weapons; USN FY17 EOC quantities will begin delivering in 4QFY18.
Delivery of FY19 quantities concludes in 1QFY22; due to system limitations, graphical representation of the delivery schedule does not accurately capture the entire delivery period for these units.

Exhibit R-4A, RDT&E Schedule Details: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0604786N / *(U)Offensive Anti-Surface Warfare Weapon Dev*	**Project (Number/Name)** 3337 / *Offensive Anti-Surface Warfare (OASuW) Weapon*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Offensive Anti-Surface Weapon (OASuW)				
Acquisition Milestones: Milestones: Knowledge Point 2	1	2015	1	2015
Acquisition Milestones: Milestones: Knowledge Point 3	2	2016	2	2016
Acquisition Milestones: Milestones: Knowledge Point 4	1	2017	1	2017
Acquisition Milestones: Milestones: Knowledge Point 5	1	2018	1	2018
Acquisition Milestones: Milestones: Knowledge Point 6	4	2018	4	2018
Acquisition Milestones: Milestones: Knowledge Point 7	1	2019	1	2019
Acquisition Milestones: Milestones: Knowledge Point 8	4	2019	4	2019
Acquisition Milestones: Milestones: Early Operational Capability (EOC) Air Force	4	2018	4	2018
Acquisition Milestones: Milestones: Early Operational Capability (EOC) Navy	4	2019	4	2019
Systems Development: Hardware Development: Technology Maturation	1	2015	4	2016
Systems Development: Hardware Development: Integration & Test Contract Award	2	2016	2	2016
Systems Development: Hardware Development: Integration & Test	2	2016	3	2019
Systems Development: B-1: B-1 SB-17 Software Development Test	2	2017	1	2018
Systems Development: B-1: B-1 Force Development Evaluation	1	2018	4	2018
Systems Development: F/A-18: F/A-18 H14 Captive Carriage Test	1	2016	4	2016
Systems Development: F/A-18: F/A-18 H14 Operational Test Readiness Review	4	2018	4	2018
Systems Development: F/A-18: F/A-18 H14 Operational Test	4	2018	4	2019
Systems Development: Systems Engineering Reviews: System Engineering Technical Review 2.0 (Preliminary Design Review)	1	2015	1	2015
Systems Development: Systems Engineering Reviews: System Engineering Technical Review 3.0 (All-up Round Critical Design Reivew)	4	2015	4	2015

Exhibit R-4A, RDT&E Schedule Details: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0604786N / *(U)Offensive Anti-Surface Warfare Weapon Dev*	**Project (Number/Name)** 3337 / *Offensive Anti-Surface Warfare (OASuW) Weapon*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Systems Development: Systems Engineering Reviews: System Engineering Technical Review 4.0 (System Level Critical Design Review)	3	2016	3	2016
Systems Development: Systems Engineering Reviews: System Engineering Technical Review 5.0 (Production Readiness Review)	1	2017	1	2017
Systems Development: Systems Engineering Reviews: System Engineering Technical Review 6.0 (Flight Test Readiness Review)	4	2017	4	2017
Systems Development: Systems Engineering Reviews: System Engineering Technical Review 7.0 (USAF EOC Readiness Review)	4	2018	4	2018
Systems Development: Systems Engineering Reviews: System Engineering Technical Review 8.0 (USN EOC Readiness Review)	3	2019	3	2019
Systems Development: Systems Engineering Reviews: Technical Readiness Review	2	2016	2	2016
Offensive Anti-Surface Weapon (OASuW).				
Test & Evaluation: Test Asset Deliveries	3	2015	3	2018
Test & Evaluation: E3 & HERO Testing	3	2016	3	2017
Test & Evaluation: RF Sensor and MCU Testing and Verification	1	2015	1	2016
Test & Evaluation: Flying Test Bed Flight Tests	1	2016	3	2017
Test & Evaluation: Environmental Test & Ship Qualification	2	2016	1	2017
B-1: Quick Reaction Assessment Testing (AF)	3	2018	4	2018
F/A-18: F/A-18 Wind Tunnel Testing	1	2015	2	2015
F/A-18: Quick Reaction Assessment Testing (Navy)	1	2019	2	2019
F/A-18: F/A-18 Carrier Suitability & Stores Compatibility	3	2018	4	2018
Production: Contract Awards: FY17 Production Buy - 30 units (20 AF, 10 NAVY)	2	2017	2	2017
Production: Contract Awards: FY18 Production Buy - 40 units (15 AF, 25 NAVY)	2	2018	2	2018
Production: Contract Awards: FY19 Production Buy - 40 units (15 AF, 25 NAVY)	2	2019	2	2019
Production: Deliveries: FY17 Deliveries - 30 units	3	2018	2	2019
Production: Deliveries: FY18 Deliveries - 40 units	4	2019	4	2020
Production: Deliveries: FY19 Deliveries - 40 units	1	2021	4	2021

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0604786N / *(U)Offensive Anti-Surface Warfare Weapon Dev*	Project (Number/Name) 3343 / *Offensive Anti-Surface Warfare (OASuW) Weapon Increment II*	

COST ($ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
3343: *Offensive Anti-Surface Warfare (OASuW) Weapon Increment II*	0.000	0.000	0.000	2.038	-	2.038	17.072	73.124	84.208	86.002	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Update of Analysis of Alternatives (AoA) for OASuW Inc. II capabilities.

The Next Generation Strike Capability (NGSC) strategy will address future threats in time to replace or update legacy weapons while bringing next generation technology to Department of the Navy (DoN) standoff conventional strike (Land Attack & ASuW). Within NGSC, OASuW Inc. II will be an offensive weapon system that can be air launched to address 2024 and beyond threat. To the maximum extent possible, the Navy will utilize common components and component technologies (e.g. navigation; communications; seeker; guidance and control) to reduce cost, shorten development timelines, and promote interoperability. The program is part of the Navy's Integrated Fire Control (IFC) approach to address advanced threat capabilities in the Anti-Access/Area-Denial (A2AD) environment. IFC solutions enable individual system capabilities to be leveraged across an effects chain, placing the full spectrum of tactical capability in the hands of the warfighter. IFC solutions that push engagement distances beyond the launch platform's radar horizon and allows the U.S. Navy to operate in, and control, contested battle space in littoral waters and A2/AD environments are increasingly critical as more and more scenarios require compressed and coordinated fire control timelines.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Title: Analysis of Alternatives	0.000	0.000	2.038	0.000	2.038
Articles:	-	-	-	-	-
FY 2015 Accomplishments: N/A					
FY 2016 Plans: N/A					
FY 2017 Base Plans: Funding supports analysis required for system specification development and Acquisition Strategy development.					
FY 2017 OCO Plans: N/A					
Accomplishments/Planned Programs Subtotals	0.000	0.000	2.038	0.000	2.038

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0604786N / *(U)Offensive Anti-Surface Warfare Weapon Dev*	**Project (Number/Name)** 3343 / *Offensive Anti-Surface Warfare (OASuW) Weapon Increment II*

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

E. Performance Metrics

Ongoing updates of AoA.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0604786N / *(U)Offensive Anti-Surface Warfare Weapon Dev*	Project (Number/Name) 3343 / *Offensive Anti-Surface Warfare (OASuW) Weapon Increment II*	

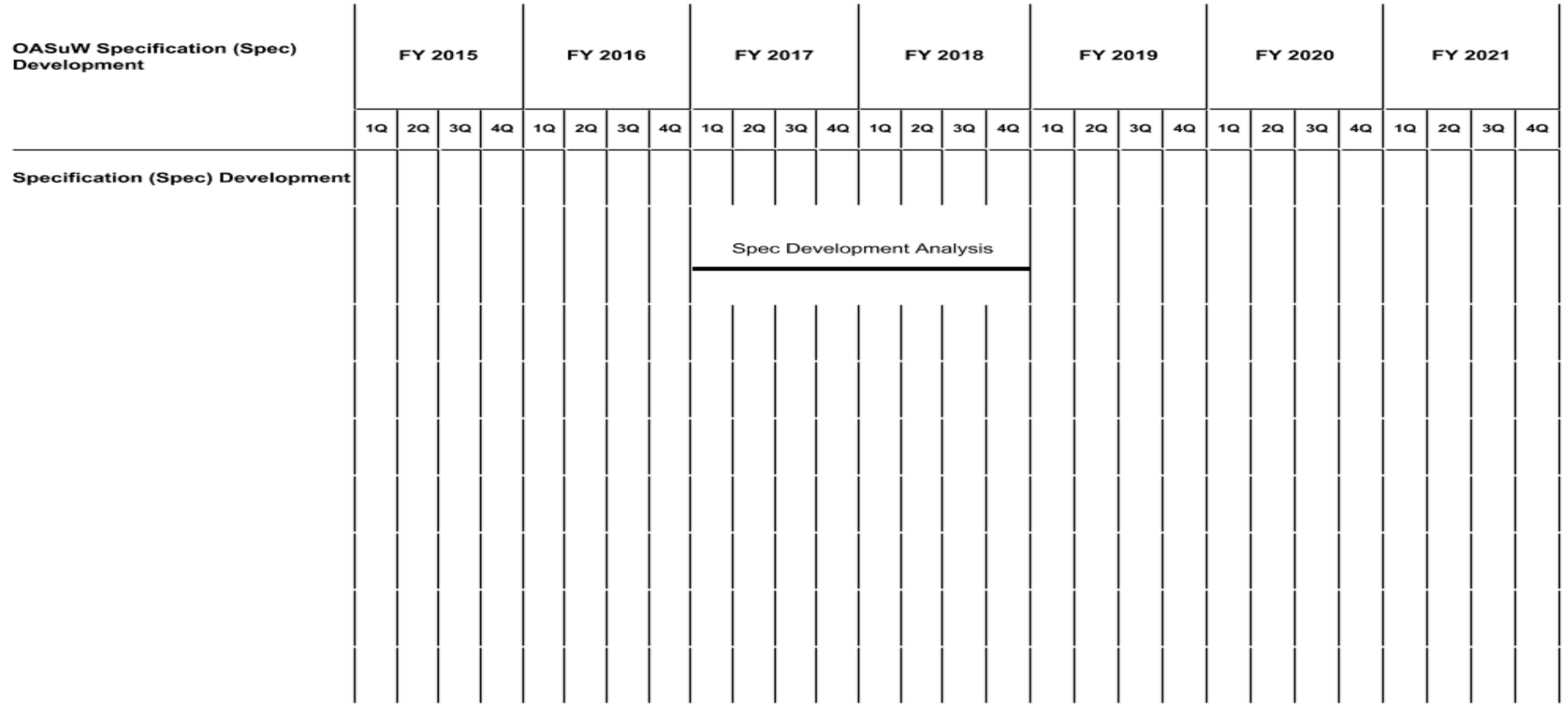
Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Government Support	WR	NAWCWD : China Lake, CA	0.000	0.000		0.000		1.215	Nov 2016	-		1.215	Continuing	Continuing	Continuing
Government Support	WR	NAWCAD : Patuxent River, MD	0.000	0.000		0.000		0.290	Nov 2016	-		0.290	Continuing	Continuing	Continuing
Contractor Support	C/CPFF	JHU/APL : Laurel, MD	0.000	0.000		0.000		0.533	Nov 2016	-		0.533	0.000	0.533	2.100
		Subtotal	0.000	0.000		0.000		2.038		-		2.038	-	-	-

	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	0.000		0.000		2.038		-		2.038	-	-	-

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0604786N / *(U)Offensive Anti-Surface Warfare Weapon Dev*	**Project (Number/Name)** 3343 / *Offensive Anti-Surface Warfare (OASuW) Weapon Increment II*



2017PB - 0604786N - 3343

Exhibit R-4A, RDT&E Schedule Details: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0604786N / *(U)Offensive Anti-Surface Warfare Weapon Dev*	**Project (Number/Name)** 3343 / *Offensive Anti-Surface Warfare (OASuW) Weapon Increment II*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
OASuW Specification (Spec) Development				
Specification (Spec) Development: Analysis	1	2017	4	2018

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Exhibit R-2, RDT&E Budget Item Justification: PB 2017 Navy	Date: February 2016
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 0605812M *I (U)Joint Light Tactical Vehicle(JLTV) EMD*

COST ($ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
Total Program Element	85.930	8.970	32.149	23.197	-	23.197	7.873	2.854	2.135	0.000	0.000	163.108
3209: *Joint Light Tactical Vehicle*	85.930	8.970	32.149	23.197	-	23.197	7.873	2.854	2.135	0.000	0.000	163.108

Program MDAP/MAIS Code: 279

Note

The FY 2011 NDAA directed the Services to separate the Joint Light Tactical Vehicle (JLTV) program into distinct PEs to provide Congress with increased transparency and allow for more effective oversight. Transition of funding from PE 0603635M to the new JLTV PE 0605812M was effective beginning in FY 2013.

A. Mission Description and Budget Item Justification

Funding supports the development and testing of the Joint Light Tactical Vehicle (JLTV) Family of Vehicles (FoV). JLTV is a joint program between the U.S. Army and the U.S. Marine Corps, of which the U.S. Army is the lead service. JLTV is a FoV capable of performing multiple mission roles designed to provide protected, sustained and networked mobility for personnel and payloads across the full Range of Military Operations (ROMO). JLTV objectives include increased performance, protection, and payload over the current legacy HMMWV fleet, minimizing ownership costs by maximizing commonality, fuel efficiency and reliability. The commonality of components, maintenance procedures, training, etc, among vehicles, is expected to be inherent in FoV solutions across mission variants to minimize total ownership cost. Unique service requirements have been minimized.

Major FY 2017 budget activities include the continued monitoring of contractor performance, logistics demonstration, completion of provisioning and continued logistics publications for test, continued fabrication of Live Fire Test Assets, and the continuation of the Low-Rate Initial Production (LRIP) test program such as: Full Up System Level test, Automatic Fire Extinguishing System (AFES) test, C4I test and ballistics.

B. Program Change Summary ($ in Millions)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Previous President's Budget	9.445	36.656	23.614	-	23.614
Current President's Budget	8.970	32.149	23.197	-	23.197
Total Adjustments	-0.475	-4.507	-0.417	-	-0.417
• Congressional General Reductions	-	-0.007			
• Congressional Directed Reductions	-	-4.500			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-0.154	0.000			
• SBIR/STTR Transfer	-0.321	0.000			
• Rate/Misc Adjustments	0.000	0.000	-0.417	-	-0.417

Exhibit R-2, RDT&E Budget Item Justification: PB 2017 Navy	Date: February 2016
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 0605812M *I (U)Joint Light Tactical Vehicle(JLTV) EMD*

Change Summary Explanation

The funding decrease from FY 2016 to FY 2017 ($8.952M) is due to the completion of procurement of live fire test assets and Government Furnished Equipment (GFE).

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0605812M / *(U)Joint Light Tactical Vehicle(JLTV) EMD*	Project (Number/Name) 3209 / *Joint Light Tactical Vehicle*	

COST ($ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
3209: *Joint Light Tactical Vehicle*	85.930	8.970	32.149	23.197	-	23.197	7.873	2.854	2.135	0.000	0.000	163.108
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

Note

The FY 2017 funding request was reduced by $4.247 million to account for the availability of prior year execution balances.

A. Mission Description and Budget Item Justification

Funding supports the development and testing of the JLTV Family of Vehicles (FoV). JLTV is a joint program between the U.S. Army and the U.S. Marine Corps, of which the U.S. Army is the lead service. JLTV is a FoV capable of performing multiple mission roles designed to provide protected, sustained and networked mobility for personnel and payloads across the full Range of Military Operations (ROMO). JLTV objectives include increased performance, protection, and payload over the current legacy HMMWV fleet, minimizing ownership costs by maximizing commonality, fuel efficiency and reliability. The commonality of components, maintenance procedures, training, etc, among vehicles, is expected to be inherent in FoV solutions across mission variants to minimize total ownership cost. Unique service requirements have been minimized.

Major FY17 budget activities include the continued monitoring of contractor performance, logistics demonstration, completion of provisioning and continued logistics publications for test, continued fabrication of Live Fire (LF) Test Assets, and the continuation of the Low-Rate Initial Production (LRIP) test program such as: Full Up System Level (FUSL) test, Automatic Fire Extinguishing System (AFES) test, C4I test, and ballistics.

The funding decrease from FY 2016 to FY 2017 ($8.952M) is due to the completion of procurement of live fire test assets and Government Furnished Equipment (GFE).

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Title: Live Fire Test Assets	4.280	5.456	4.074	0.000	4.074
Articles:	8	1	-	-	-
Description: Contract and support for development and fabrication of LF Test Assets					
FY 2015 Accomplishments: -Awarded LRIP, procured Live Fire (LF) test assets. Assets will be destroyed during testing.					
FY 2016 Plans: -Complete efforts in support of the fabrication of LF test assets that will be destroyed during testing and continue Field Service Representative support for LF testing.					

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0605812M / *(U)Joint Light Tactical Vehicle(JLTV) EMD*	**Project (Number/Name)** 3209 / *Joint Light Tactical Vehicle*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
-Continue vendor RDT&E activity on the LRIP contract. ***FY 2017 Base Plans:*** -Continue vendor efforts in support of LF testing. -Continue vendor RDT&E activity on the LRIP contract. -Continue logistics support of Government Furnished Equipment (GFE) that will be required for LF test events. -Funding decrease between FY16 and FY17 is a result of a reduction in vendor test support requirements in accordance with the JLTV test plan. ***FY 2017 OCO Plans:*** N/A					
Title: Product Development Systems Engineering ***Articles:*** ***FY 2015 Accomplishments:*** -Completed the systems engineering evaluation of human systems integration of the three EMD vendor designs. ***FY 2016 Plans:*** N/A ***FY 2017 Base Plans:*** N/A ***FY 2017 OCO Plans:*** N/A	0.185 -	0.000 -	0.000 -	0.000 -	0.000 -
Title: GFE, ILS, Facilities Documentation/Analysis and Support Engineering ***Articles:*** ***FY 2015 Accomplishments:*** -Initiated logistics support. -Initiated the development of logistics documentation and oversight of programmatic and contractual issues related to logistics, and procurement of GFE which will be destroyed during testing. ***FY 2016 Plans:***	1.058 -	5.100 -	0.000 -	0.000 -	0.000 -

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0605812M / *(U)Joint Light Tactical Vehicle(JLTV) EMD*	**Project (Number/Name)** 3209 / *Joint Light Tactical Vehicle*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
-Continue logistics support, the development of logistics documentation and oversight of programmatic and contractual issues related to logistics to include the requirement to purchase GFE which will be destroyed during testing. ***FY 2017 Base Plans:*** -The funding decrease from FY16 to FY 17 reflects the completion of GFE procurement required for LF testing. ***FY 2017 OCO Plans:*** N/A					
Title: Test and Evaluation Events and Analysis ***Articles:*** ***FY 2015 Accomplishments:*** -Completed EMD test reports in support of MS C, LRIP source selection, and procurement of ballistic hulls in preparation for LRIP test. -Completed Limited User Test. ***FY 2016 Plans:*** -Complete the development of the LRIP Test Plan. -Initiate the LRIP test program to include (but not limited to) AFES, ballistic, corrosion, performance, RAM, logistics demonstration, and operational testing. ***FY 2017 Base Plans:*** -Continue activity in accordance with the LRIP test program to include FUSL, AFES, corrosion, roof crush, and logistics demonstration. -Live Fire test. -The funding increase from FY16 to FY17 reflects the continuation of LRIP test activity in accordance with the JLTV Test Plan. ***FY 2017 OCO Plans:*** N/A	2.061 -	19.460 -	17.868 -	0.000 -	17.868 -
Title: Program Management Support ***Articles:*** ***FY 2015 Accomplishments:***	1.386 -	2.133 -	1.255 -	0.000 -	1.255 -

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0605812M / *(U)Joint Light Tactical Vehicle(JLTV) EMD*	**Project (Number/Name)** 3209 / *Joint Light Tactical Vehicle*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
-Completed EMD phase to include program management, level of effort reports, test and evaluation analysis, integrated logistics support for test events, GFE management, close out of the EMD contract, and preparation of analysis and documentation in support of MS C and LRIP source selection. ***FY 2016 Plans:*** -Initiate support for LRIP activity to include program management for test events, GFE management, monitoring and execution of the LRIP contract, and monitoring of vendor performance during LF testing. ***FY 2017 Base Plans:*** -Continue support for LRIP activity such as program management for test events, GFE management, monitoring and execution of the LRIP contract, and monitoring of vendor performance during LF testing. -The funding decrease from FY16 to FY17 reflects the reduced RDT&E funded support requirements as a result of decreased test scope in accordance with the JLTV Test Plan. Test activities include LF Test, Multi-Service Operational Test and Evaluation (MOT&E), and logistics demonstration. ***FY 2017 OCO Plans:*** N/A					
Accomplishments/Planned Programs Subtotals	8.970	32.149	23.197	0.000	23.197

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
• PMC/5095: *0206211M- JLTV*	7.425	59.954	113.230	-	113.230	421.660	668.830	681.183	98.994	155.456	2,206.732
• OPA/D15603: *JLTV (Army)*	164.615	249.911	594.688	-	594.688	837.043	1,092.066	1,113.019	1,149.424	Continuing	Continuing
• RDTEA/VU9: *0605812A-JLTV (Army)*	45.694	32.486	11.877	-	11.877	3.213	3.085	3.143	2.141	Continuing	Continuing

Remarks

Joint Program Live Fire Test Asset/LRIP contract awarded 25 Aug 2015.

D. Acquisition Strategy

Joint Light Tactical Vehicle (JLTV) is a Joint Service Program with the U.S. Army and U.S. Marine Corps as the two main components. The U.S. Army is the JLTV service lead.

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0605812M / *(U)Joint Light Tactical Vehicle(JLTV) EMD*	**Project (Number/Name)** 3209 / *Joint Light Tactical Vehicle*

The JLTV Program entered the Production and Deployment Phase with the Acquisition Decision Memorandum authorization on 25 August 2015. With Milestone C approval, the LRIP fixed price contract was awarded to Oshkosh Defense LLC on 25 August 2015. This contract consists of a three year LRIP period with options for five additional years of FRP deliveries. The JLTV JPO requested separately priced firm fixed price (FFP) option(s) for purchase of the Technical Data Package (TDP) with appropriate data rights to allow for possible future competition for production vehicles as well as spares. On 8 September 2015, a Stop Work Order was issued to Oshkosh after a protest was filed to the Government Accountability Office (GAO). On 15 December 2015, the GAO dismissed the protest due to the protester's decision to file a Notice of Post-Award Bid Protest with the US Court of Federal Claims. The Stop Work Order was officially canceled and Oshkosh has resumed work. JPO JLTV is currently evaluating potential protest impacts.

The program now begins the LRIP phase where it will strive to produce production vehicles for extensive Test and Evaluation activities to support a FRP Decision. A ramp up of JLTV quantities will continue thru FY19 to support fielding to U.S. Army and USMC units once the FRP decision is achieved and allow the program to smoothly transition into FRP.

The JLTV program will continually monitor emerging technologies and capabilities through its partnerships with U.S. Army and Marine Corps science and technology organizations as well as through industry market research and partnerships. At this time follow-on increments for technology insertion are undefined; the JLTV program will look for opportunities to implement increased capabilities throughout the system's Life Cycle.

E. Performance Metrics

Milestone Reviews

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0605812M / *(U)Joint Light Tactical Vehicle(JLTV) EMD*	Project (Number/Name) 3209 / *Joint Light Tactical Vehicle*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Systems Engineering - Human Systems Integration	WR	NSWC : Dahlgren, VA	1.350	0.185	Nov 2014	0.000		0.000		-		0.000	0.000	1.535	-
Prior Years Cumulative Funding	Various	Various : Various	36.818	0.000		0.000		0.000		-		0.000	0.000	36.818	-
Live Fire Test Assets	C/FFP	Oshkosh : Oshkosh, WI	0.000	4.280	Aug 2015	5.456	Feb 2016	4.074	Dec 2016	-		4.074	5.751	19.561	Continuing
		Subtotal	38.168	4.465		5.456		4.074		-		4.074	5.751	57.914	-

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Integrated Logistics Support	Various	Various : Various	0.643	0.000		0.000		0.000		-		0.000	0.000	0.643	-
SPAWAR GFE Management	MIPR	SPAWAR : Charleston, SC	0.341	0.000		0.000		0.000		-		0.000	0.000	0.341	-
Manpower, Personnel, Training	C/FFP	A. Harold & Assoc. : Quantico, VA	0.430	0.430	Sep 2015	0.000		0.000		-		0.000	0.000	0.860	-
Corrosion Impact Mitigation & Analysis	C/FFP	JHU : Baltimore, MD	1.434	0.000		0.000		0.000		-		0.000	0.000	1.434	-
GFE	Various	Various : Various	0.000	0.628	Sep 2015	5.100	Mar 2016	0.000		-		0.000	0.000	5.728	-
		Subtotal	2.848	1.058		5.100		0.000		-		0.000	0.000	9.006	-

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation (Performance, RAM, Ballistic, Report Generation)	MIPR	Govt Proving Grounds : Aberdeen, MD	6.576	0.000		1.722	Jan 2016	0.000		-		0.000	0.000	8.298	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0605812M / *(U)Joint Light Tactical Vehicle(JLTV) EMD*	Project (Number/Name) 3209 / *Joint Light Tactical Vehicle*	

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation (Performance, RAM, Ballistic, Report Generation)	MIPR	Govt Proving Grounds : Yuma, AZ	14.813	0.000		4.147	Apr 2016	0.000		-		0.000	0.000	18.960	-
Developmental Test & Evaluation (Performance, RAM, Ballistic, Report Generation)	MIPR	Govt Proving Grounds : Various	7.029	0.000		3.350	Apr 2016	1.513	Apr 2017	-		1.513	0.000	11.892	-
Operational Testing (Planning, Conduct, Evaluation and Report Generation)	MIPR	Govt Proving Grounds : Various	3.165	0.000		4.988	Apr 2016	14.018	Apr 2017	-		14.018	2.118	24.289	-
Developmental Test & Evaluation (Oversight)	WR	MCOTEA : Quantico, VA	0.776	0.000		0.200	Jan 2016	0.000		-		0.000	0.000	0.976	-
Live Fire Test & Evaluation	MIPR	Govt Proving Grounds : Aberdeen, MD	0.000	2.061	Feb 2015	5.053	Apr 2016	2.337	Apr 2017	-		2.337	0.000	9.451	-
		Subtotal	32.359	2.061		19.460		17.868		-		17.868	2.118	73.866	-

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Support	C/CPFF	BAH : McLean, VA	9.739	1.090	Jan 2015	0.000		0.000		-		0.000	0.000	10.829	-
Program Management Support	C/CPFF	Kalman, Inc : Virginia Beach, VA	0.000	0.000		2.033	Jan 2016	1.155	Dec 2016	-		1.155	0.782	3.970	-
Program Management Support	C/CPFF	Various : Various	1.340	0.000		0.000		0.000		-		0.000	0.000	1.340	-
Program Management Support	C/CPFF	CECOM/MITRE : Aberdeen Proving Ground, MD	1.053	0.000		0.000		0.000		-		0.000	0.000	1.053	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0605812M / *(U)Joint Light Tactical Vehicle(JLTV) EMD*	Project (Number/Name) 3209 / *Joint Light Tactical Vehicle*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Travel	Various	MCSC : Quantico, VA	0.423	0.296	Oct 2014	0.100	Oct 2015	0.100	Oct 2016	-		0.100	0.000	0.919	-
		Subtotal	12.555	1.386		2.133		1.255		-		1.255	0.782	18.111	-

	Prior Years	FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	85.930	8.970		32.149		23.197		-		23.197	8.651	158.897	-

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0605812M / *(U)Joint Light Tactical Vehicle(JLTV) EMD*	**Project (Number/Name)** 3209 / *Joint Light Tactical Vehicle*

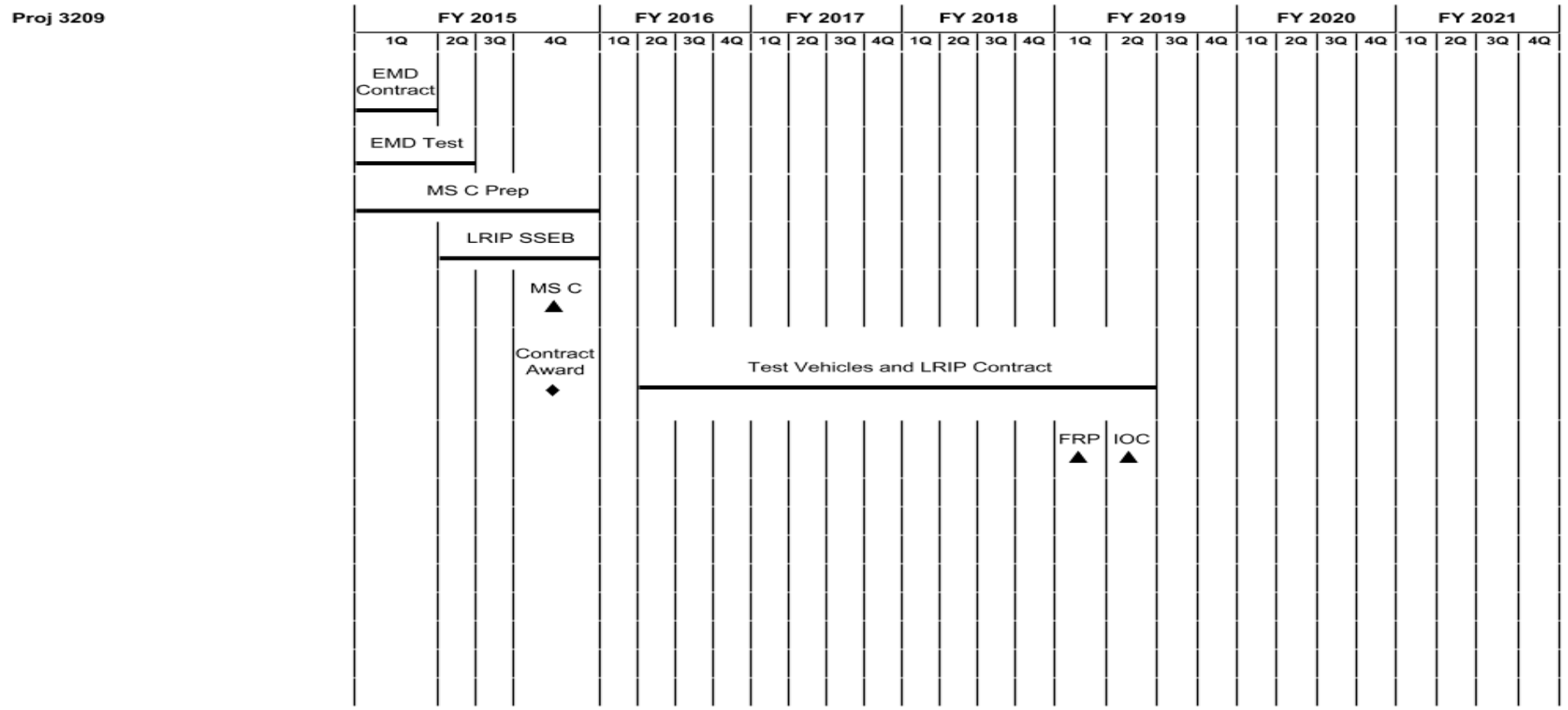

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Exhibit R-4A, RDT&E Schedule Details: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0605812M / *(U)Joint Light Tactical Vehicle(JLTV) EMD*	**Project (Number/Name)** 3209 / *Joint Light Tactical Vehicle*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 3209				
EMD Contract (Contract Awarded 4Q FY12)	1	2015	1	2015
EMD Government Test Program and Reporting	1	2015	2	2015
Milestone C Preparation	1	2015	4	2015
LRIP Source Selection Evaluation Board	2	2015	4	2015
Milestone C Decision	4	2015	4	2015
Live Fire Test Assets and LRIP Contract Award	4	2015	4	2015
Test Vehicles and LRIP Contract	2	2016	2	2019
Full Rate Production Decision	1	2019	1	2019
Marine Corps Initial Operational Capability	2	2019	2	2019

Exhibit R-2, RDT&E Budget Item Justification: PB 2017 Navy											Date: February 2016	
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 4: *Advanced Component Development & Prototypes (ACD&P)*					R-1 Program Element (Number/Name) PE 0303354N *I ASW Systems Development - MIP*							
COST ($ in Millions)	**Prior Years**	**FY 2015**	**FY 2016**	**FY 2017 Base**	**FY 2017 OCO**	**FY 2017 Total**	**FY 2018**	**FY 2019**	**FY 2020**	**FY 2021**	**Cost To Complete**	**Total Cost**
Total Program Element	20.213	6.495	9.835	9.110	-	9.110	8.336	9.027	9.141	9.328	Continuing	Continuing
0490: *Airborne Acoustic Intelligence (AAI)*	20.213	6.495	9.835	9.110	-	9.110	8.336	9.027	9.141	9.328	Continuing	Continuing

A. Mission Description and Budget Item Justification

Decrease in ASW SYSTEMS DEVELOPMENT - MIP by $0.386M as required for the Department of the Navy to comply with the Bipartisan Budget Act of 2015.

The mission of Airborne Acoustic Intelligence (AAI) (CNO Project K-0416) is to provide advanced antisubmarine warfare capabilities through rapid development of new technology and prototype mechanisms for the collection of antisubmarine warfare (ASW) related intelligence. This includes full spectrum intelligence collections and cataloging of current targets of interest. The program develops and swiftly deploys disruptive innovation to counter emerging threats in order to maintain the United States' current undersea warfare superiority. AAI employs the capability to quickly reconstruct and analyze passive and active measurements of submarine vulnerabilities providing actionable intelligence to fleet commanders. The AAI data collection program provides full spectrum intelligence data essential for the design and development of advanced sensors, weapon systems, environmental models, and tactical decision aids. AAI collection systems are installed and employed on uniquely configured aircraft, specially configured ground support facilities, ships, and other assets as required for the collection, processing, exfiltration, and dissemination of undersea intelligence. AAI includes recording systems, advanced detection and tracking systems, specially designed sensors, advanced processing systems and techniques, and specially derived tactics.

This is a Military Intelligence Program (MIP).

JUSTIFICATION FOR BUDGET ACTIVITY: This program is funded under ADVANCED COMPONENT DEVELOPMENT AND PROTOTYPES because it includes all efforts necessary to evaluate integrated technologies, representative models or prototype systems in a high fidelity and realistic operating environment.

Exhibit R-2, RDT&E Budget Item Justification: PB 2017 Navy					Date: February 2016
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 4: *Advanced Component Development & Prototypes (ACD&P)*		R-1 Program Element (Number/Name) PE 0303354N *I ASW Systems Development - MIP*			
B. Program Change Summary ($ in Millions)	**FY 2015**	**FY 2016**	**FY 2017 Base**	**FY 2017 OCO**	**FY 2017 Total**
Previous President's Budget	6.495	9.835	9.535	-	9.535
Current President's Budget	6.495	9.835	9.110	-	9.110
Total Adjustments	0.000	0.000	-0.425	-	-0.425
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Rate/Misc Adjustments	0.000	0.000	-0.425	-	-0.425

Change Summary Explanation

Technical: Not Applicable

Schedule: Added the MH-60R to the Systems Engineering portion of the schedule. Added Passive Extended Range Sonic Sensor (PERSS) to the schedule in 1Q/19 thru 4Q/21. Adjusted quantity of prototypes accordingly.

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0303354N / *ASW Systems Development - MIP*	Project (Number/Name) 0490 / *Airborne Acoustic Intelligence (AAI)*	

COST ($ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
0490: *Airborne Acoustic Intelligence (AAI)*	20.213	6.495	9.835	9.110	-	9.110	8.336	9.027	9.141	9.328	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The mission of Airborne Acoustic Intelligence (AAI) (CNO Project K-0416) is to provide advanced antisubmarine warfare capabilities through rapid development of new technology and prototype mechanisms for the collection of antisubmarine warfare (ASW) related intelligence. This includes full spectrum intelligence collections and cataloging of current targets of interest. The program develops and swiftly deploys disruptive innovation to counter emerging threats in order to maintain the United States' current undersea warfare superiority. AAI employs the capability to quickly reconstruct and analyze passive and active measurements of submarine vulnerabilities providing actionable intelligence to fleet commanders. The AAI data collection program provides full spectrum intelligence data essential for the design and development of advanced sensors, weapon systems, environmental models, and tactical decision aids. AAI collection systems are installed and employed on uniquely configured aircraft, specially configured ground support facilities, ships, and other assets as required for the collection, processing, exfiltration, and dissemination of undersea intelligence. AAI includes recording systems, advanced detection and tracking systems, specially designed sensors, advanced processing systems and techniques, and specially derived tactics.

This is a Military Intelligence Program (MIP).

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Title: Systems Engineering / Aircraft Mods Active Acoustic Program	1.767	1.767	1.670	0.000	1.670
Articles:	-	-	-	-	-
FY 2015 Accomplishments: Engineering to support full spectrum ASW intelligence collections. Post mission processor upgrades for Calibrated Acoustic Intelligence (ACINT). Field initial prototypes of Acoustic Intelligence Collection Suites (ACS) in support of P-8A deployments.					
FY 2016 Plans: Engineering support of ACINT Collection Suites for certified AAI collection platforms and management of full spectrum database. Continued upgrades for unique airborne avionics and post mission processing capabilities for ACINT/MASINT (Measurement and Signature Intelligence) requirements. Science and technology research in development of new systems. Field ACS kits in support of P-8A deployments.					
FY 2017 Base Plans:					

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0303354N / *ASW Systems Development - MIP*	**Project (Number/Name)** 0490 / *Airborne Acoustic Intelligence (AAI)*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Engineering support of Acoustic Intelligence (ACINT) Collection Suites for certified AAI collection platforms and management of full spectrum database. Engineering support for design upgrades to ACINT Collection Suites for certified AAI collection platforms. Evaluate additional P-8 aircraft sensor station for in-flight analysis of ACINT. Continue evaluation of Fleet software releases for ONI certification aboard ASW collection platforms. Continued upgrades and development for unique airborne avionics and sensors. Continue fielding ACS kits in support of P-8A deployments. ***FY 2017 OCO Plans:*** N/A					
Title: Data Collection and Analysis	1.645	1.064	0.663	0.000	0.663
Articles:	-	-	-	-	-
FY 2015 Accomplishments: Data collection support at Operational Wings. Ongoing collection of high interest acoustic and non-acoustic data in support of MASINT/ONI threat assessment requirements. Characterization, analysis and certification of the upgraded Fleet MASINT collection assets. Reduction, Analysis and Fleet Rapid Feedback. Conduct special operations support. Essential performance modeling and evaluation for advanced technology sensor systems design and Fleet tactics development. Develop post mission analysis hardware, software and processes in response to evolving enemy capabilities. ***FY 2016 Plans:*** Data collection support at Operational Wings. Ongoing collection of high interest acoustic and non-acoustic data in support of MASINT/ONI threat assessment requirements. Characterization, analysis and certification of the upgraded Fleet MASINT collection assets. Reduction, Analysis and Fleet Rapid Feedback. Conduct special operations support. Essential performance modeling and evaluation for advanced technology sensor systems design and Fleet tactics development. Develop post mission analysis hardware, software and processes in response to evolving enemy capabilities. ***FY 2017 Base Plans:*** Data collection support at Operational Wings. Ongoing collection of high interest acoustic and non-acoustic data in support of MASINT/ONI threat assessment requirements. Characterization, analysis and certification of the upgraded Fleet MASINT collection assets. Reduction, Analysis and Fleet Rapid Feedback. Conduct special operations support. Essential performance modeling and evaluation for advanced technology sensor systems					

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0303354N / *ASW Systems Development - MIP*	**Project (Number/Name)** 0490 / *Airborne Acoustic Intelligence (AAI)*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
design and Fleet tactics development. Develop post mission analysis hardware, software and processes in response to evolving enemy capabilities. ***FY 2017 OCO Plans:*** N/A					
Title: Active Measurement Validation ***Articles:*** ***FY 2015 Accomplishments:*** Active Measurement Validation of targets of interest. Provides the acoustic analysis of echo characterization (which includes: signal excess measurements, peak frequency, trend analysis and pulse duration measurements) and target strength. ***FY 2016 Plans:*** Active Measurement Validation of targets of interest. Provides the acoustic analysis of echo characterization (which includes: signal excess measurements, peak frequency, trend analysis and pulse duration measurements) and target strength. ***FY 2017 Base Plans:*** Active Measurement Validation of targets of interest. Provides the acoustic analysis of echo characterization (which includes: signal excess measurements, peak frequency, trend analysis and pulse duration measurements) and target strength. ***FY 2017 OCO Plans:*** N/A	0.150 -	0.150 -	0.150 -	0.000 -	0.150 -
Title: Navy Underwater Active Multiple Ping (NUAMP) Product Development ***Articles:*** ***FY 2015 Accomplishments:*** Continue sonic frequency design, development, integration, and test for additional sonic frequencies. Procure 30 prototype sonobuoys for certification of the initial NUAMP sonic frequencies. ***FY 2016 Plans:***	2.933 -	6.854 -	6.627 -	0.000 -	6.627 -

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0303354N / *ASW Systems Development - MIP*	**Project (Number/Name)** 0490 / *Airborne Acoustic Intelligence (AAI)*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Complete full qualification and certification efforts for the initial Navy Underwater Active Multiple Ping (NUAMP) sonic frequencies. Continue sonic frequency design, development, integration and test for additional sonic frequencies of the NUAMP sonobuoy family. ***FY 2017 Base Plans:*** Complete full qualification and certification efforts for the second Navy Underwater Active Multiple Ping (NUAMP) sonic frequency sonobuoy. Continue sonic frequency design, development, integration and test for additional sonic frequencies of the NUAMP sonobuoy family. ***FY 2017 OCO Plans:*** N/A					
Accomplishments/Planned Programs Subtotals	6.495	9.835	9.110	0.000	9.110

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

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

E. Performance Metrics

Provide engineering to support Sound Pressure Level (SPL) recording. Provide data collection support at Operation Wings. Perform Active Measurement Validation of targets of interest.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0303354N / *ASW Systems Development - MIP*	Project (Number/Name) 0490 / *Airborne Acoustic Intelligence (AAI)*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Active Measurement Validation	WR	NAWCAD : PATUXENT RIVER, MD	1.443	0.150	Dec 2014	0.150	Dec 2015	0.150	Dec 2016	-		0.150	Continuing	Continuing	Continuing
Ancillary Hdw Development	WR	NAWCAD : PATUXENT RIVER, MD	1.990	1.799	Dec 2014	1.350	Dec 2015	0.875	Dec 2016	-		0.875	Continuing	Continuing	Continuing
Ancillary Hdw Development Cont	Various	VARIOUS : VARIOUS	0.397	0.350	Dec 2014	0.200	Dec 2015	0.177	Dec 2016	-		0.177	Continuing	Continuing	Continuing
Systems Eng	WR	NAWCAD : PATUXENT RIVER, MD	2.879	1.012	Dec 2014	1.000	Dec 2015	0.927	Dec 2016	-		0.927	Continuing	Continuing	Continuing
Systems Eng	Various	VARIOUS : VARIOUS	0.000	0.755	Dec 2014	0.767	Dec 2015	0.743	Dec 2016	-		0.743	0.000	2.265	-
Primary Hdw Development	SS/CPIF	ERAPSCO : FT. WAYNE IN	10.870	1.861	Dec 2014	5.794	Dec 2015	5.690	Dec 2016	-		5.690	14.080	38.295	38.295
		Subtotal	17.579	5.927		9.261		8.562		-		8.562	-	-	-

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Mgt & Prof Spt Svcs (Non-FFRDC)	Various	VARIOUS : VARIOUS	2.502	0.323	Dec 2014	0.329	Dec 2015	0.319	Dec 2016	-		0.319	Continuing	Continuing	Continuing
Contractor Eng Spt	Various	VARIOUS : VARIOUS	0.037	0.185	Dec 2014	0.185	Dec 2015	0.181	Dec 2016	-		0.181	Continuing	Continuing	Continuing
Travel	Various	VARIOUS : VARIOUS	0.064	0.060	Dec 2014	0.060	Dec 2015	0.048	Dec 2016	-		0.048	Continuing	Continuing	Continuing
Prior year Mgmt Svcs no longer funded in the FYDP	Various	VARIOUS : VARIOUS	0.031	0.000		0.000		0.000		-		0.000	0.000	0.031	-
		Subtotal	2.634	0.568		0.574		0.548		-		0.548	-	-	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0303354N / *ASW Systems Development - MIP*	Project (Number/Name) 0490 / *Airborne Acoustic Intelligence (AAI)*	

	Prior Years	FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	20.213	6.495		9.835		9.110		-		9.110	-	-	-

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0303354N / *ASW Systems Development - MIP*	**Project (Number/Name)** 0490 / *Airborne Acoustic Intelligence (AAI)*

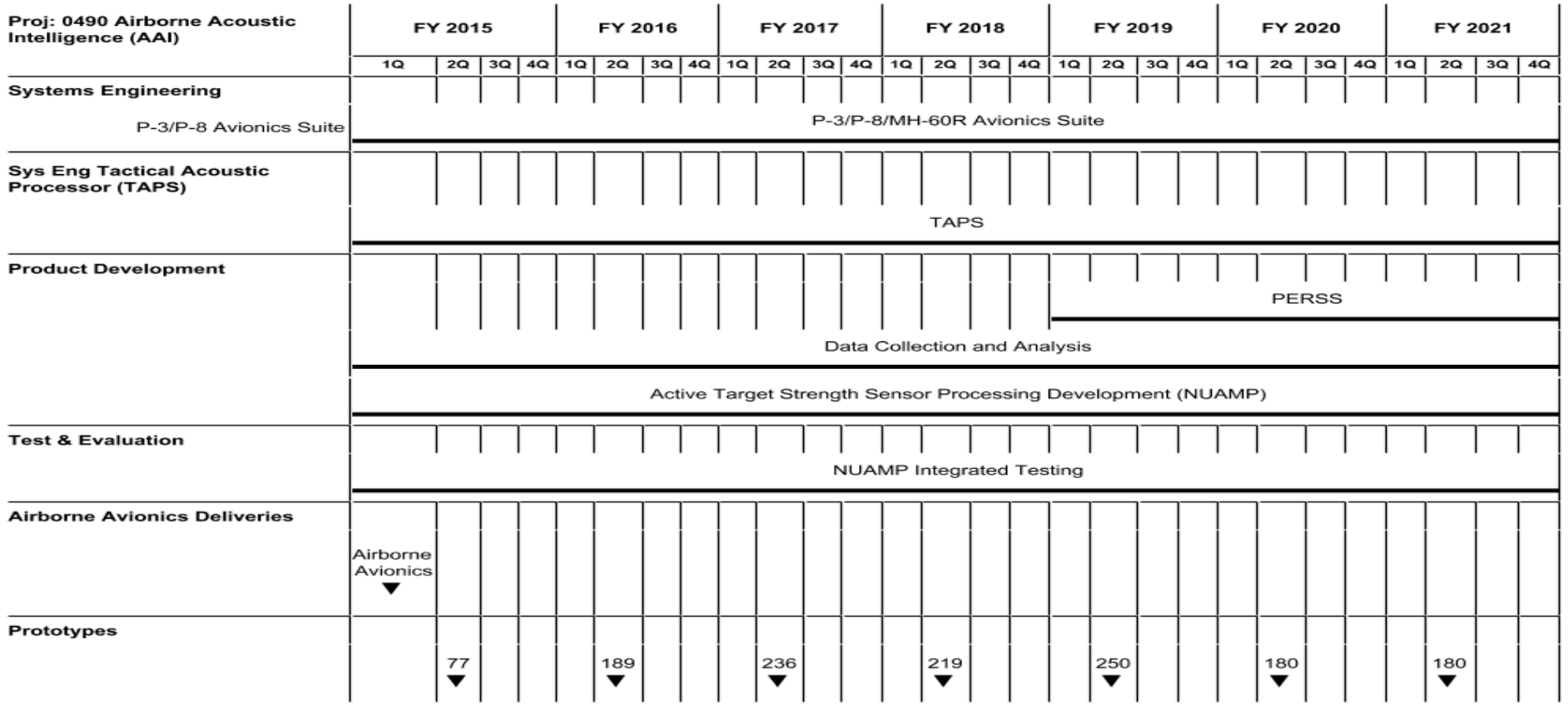

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Exhibit R-4A, RDT&E Schedule Details: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0303354N / *ASW Systems Development - MIP*	**Project (Number/Name)** 0490 / *Airborne Acoustic Intelligence (AAI)*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj: 0490 Airborne Acoustic Intelligence (AAI)				
Systems Engineering: P-3/P-8 Avionics Suite: P-3/P-8/MH-60R Avionics Suite	1	2015	4	2021
Sys Eng Tactical Acoustic Processor (TAPS): Sys Eng Tactical Acoustic Processor (TAPS)	1	2015	4	2021
Product Development: Passive Extended Range Sonic Sensor	1	2019	4	2021
Product Development: Data Collection and Analysis	1	2015	4	2021
Product Development: Active Target Strength sensor processing development	1	2015	4	2021
Test & Evaluation: Technical Evaluation	1	2015	4	2021
Airborne Avionics Deliveries: Airborne Avionics	1	2015	1	2015
Prototypes: Prototype 2	2	2015	2	2015
Prototypes: Prototype 3	2	2016	2	2016
Prototypes: Prototype 4	2	2017	2	2017
Prototypes: Prototype 5	2	2018	2	2018
Prototypes: Prototype 6	2	2019	2	2019
Prototypes: Prototype 7	2	2020	2	2020
Prototypes: Prototype 8	2	2021	2	2021

Exhibit R-2, RDT&E Budget Item Justification: PB 2017 Navy	Date: February 2016
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 0304270N *I Electronic Warfare Development - MIP*

COST ($ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
Total Program Element	3.619	0.332	0.580	0.437	-	0.437	0.481	0.494	0.503	0.514	Continuing	Continuing
2260: *Specific Emitter ID*	3.619	0.332	0.580	0.437	-	0.437	0.481	0.494	0.503	0.514	Continuing	Continuing

A. Mission Description and Budget Item Justification

Decrease in ELECTRONIC WARFARE DEVELOPMENT - MIP by $0.018M as required for the Department of the Navy to comply with the Bipartisan Budget Act of 2015.

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 PE is a Military Intelligence Program.

B. Program Change Summary ($ in Millions)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Previous President's Budget	0.332	0.580	0.465	-	0.465
Current President's Budget	0.332	0.580	0.437	-	0.437
Total Adjustments	0.000	0.000	-0.028	-	-0.028
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Rate/Misc Adjustments	0.000	0.000	-0.028	-	-0.028

Change Summary Explanation

Technical: Not applicable.

Schedule: Not applicable.

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0304270N / *Electronic Warfare Development - MIP*	Project (Number/Name) 2260 / *Specific Emitter ID*	

COST ($ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
2260: *Specific Emitter ID*	3.619	0.332	0.580	0.437	-	0.437	0.481	0.494	0.503	0.514	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

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 Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Title: SENSOR FUSION	0.100	0.187	0.135	0.000	0.135
Articles:	-	-	-	-	-
Description: 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 2015 Accomplishments:*** - 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. ***FY 2016 Plans:*** - Continue all efforts of FY 2015, unless noted as completed above. ***FY 2017 Base Plans:*** - Continue all efforts of FY 2016, unless noted as completed above. - Initiate task to expand and improve ELectronic INTelligence (ELINT) information that will aid SEI signal processing, analysis, and deinterleaving. ***FY 2017 OCO Plans:*** N/A					
Title: SYSTEM AUTOMATION	0.132	0.201	0.153	0.000	0.153

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0304270N / *Electronic Warfare Development - MIP*	**Project (Number/Name)** 2260 / *Specific Emitter ID*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Articles:	-	-	-	-	-
Description: This effort supports development of an autonomous surveillance system capable of providing emitter signal information to a central location. ***FY 2015 Accomplishments:*** - 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. ***FY 2016 Plans:*** - Continue all efforts of FY 2015, unless noted as completed above. ***FY 2017 Base Plans:*** - Continue all efforts of FY 2016, unless noted as completed above. - Complete task to automate fusion of other sensor information with SEI data collection. ***FY 2017 OCO Plans:*** N/A					
Title: TECHNOLOGY REFRESH & COMMUNICATION ENHANCEMENT	0.100	0.192	0.149	0.000	0.149
Articles:	-	-	-	-	-
Description: This effort improves SEI system performance, real-time communication and tactical use of SEI which will be expanded with next generation SEI technology. ***FY 2015 Accomplishments:*** - 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. ***FY 2016 Plans:*** - Continue all efforts of FY 2015, unless noted as completed above.					

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0304270N / *Electronic Warfare Development - MIP*	**Project (Number/Name)** 2260 / *Specific Emitter ID*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
- Complete task to incorporate further message reporting formats for dissemination of SEI data and improve SEI interoperability. - Initiate task to provide software enhancements to improve SEI system performance based on mission needs and requirements, user inputs, and platform environment. ***FY 2017 Base Plans:*** - Continue all efforts of FY 2016, unless noted as completed above. ***FY 2017 OCO Plans:*** N/A					
Accomplishments/Planned Programs Subtotals	0.332	0.580	0.437	0.000	0.437

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

Not applicable.

E. Performance Metrics

MIP Program.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0304270N / *Electronic Warfare Development - MIP*	**Project (Number/Name)** 2260 / *Specific Emitter ID*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
NRL	TBD	Not Specified : Not Specified	3.619	0.332	Jan 2015	0.580	Jan 2016	0.437	Jan 2017	-		0.437	Continuing	Continuing	Continuing
		Subtotal	3.619	0.332		0.580		0.437		-		0.437	-	-	-

	Prior Years	FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	3.619	0.332		0.580		0.437		-		0.437	-	-	-

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0304270N / *Electronic Warfare Development - MIP*	**Project (Number/Name)** 2260 / *Specific Emitter ID*

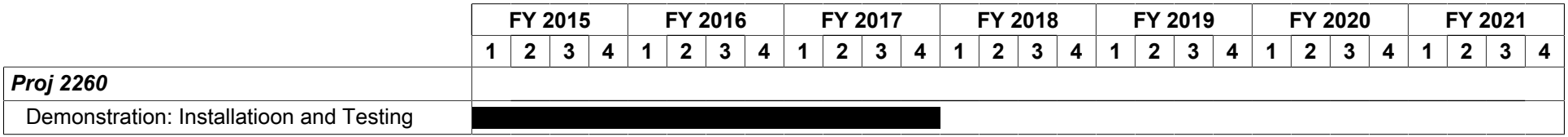

Exhibit R-4A, RDT&E Schedule Details: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0304270N / *Electronic Warfare Development - MIP*	**Project (Number/Name)** 2260 / *Specific Emitter ID*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 2260				
Demonstration: Installatioon and Testing	1	2015	4	2017

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