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Exhibit R-2, RDT&E Budget Item Justification: PB 2017 Navy **Date:** February 2016

Appropriation/Budget Activity 1319: <i>Research, Development, Test & Evaluation, Navy / BA 5: System Development & Demonstration (SDD)</i>	R-1 Program Element (Number/Name) PE 0604503N / <i>SSN-688 & Trident Modernization</i>
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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
Total Program Element	1,324.793	70.053	109.893	117.476	-	117.476	123.012	106.901	95.950	97.906	Continuing	Continuing
0219: <i>Sub Sonar Improvement (ENG)</i>	854.026	40.731	68.891	67.179	-	67.179	87.382	72.201	61.305	62.559	Continuing	Continuing
0742: <i>Sub Integrated Ant System</i>	269.732	12.610	25.445	27.080	-	27.080	15.638	14.737	13.943	14.199	Continuing	Continuing
0775: <i>Submarine Supt Equip Prog</i>	1.179	8.064	6.204	13.215	-	13.215	9.077	9.268	9.950	10.171	Continuing	Continuing
1411: <i>Sub Tact Comm System</i>	199.856	8.648	9.353	10.002	-	10.002	10.915	10.695	10.752	10.977	Continuing	Continuing

A. Mission Description and Budget Item Justification

The Submarine Support Equipment Program develops and improves submarine Electronic Warfare Support (EWS) technology, components, equipment, and systems that will increase submarine operational effectiveness, safety of ship, and survivability in an increasingly dense and sophisticated electromagnetic environment caused by the proliferation of complex radar, communications, and navigation equipment of potential adversaries. Enhancements are necessary for submarine EWS to be operationally effective in the following mission areas: Joint Littoral Warfare, Joint Surveillance, Space and Electronic Warfare and Intelligence Collection, Maritime protection, and Joint Strike.

The Submarine Sonar Improvement Program delivers block updates to Sonar Systems and improved Sensors installed on SSN 688, 688I, SSN 21, VIRGINIA, SSBN, and SSGN Class Submarines to maintain clear acoustical, tactical and operational superiority over submarine and surface combatants in all scenarios through detection, classification, localization, and contact following. Current developments are focused on supporting Littoral Warfare, Regional Sea Denial, Battle Group Support, Diesel Submarine Detection, Surveillance, and Peacetime Engagement.

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B. Program Change Summary (\$ in Millions)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Previous President's Budget	71.551	109.908	97.958	-	97.958
Current President's Budget	70.053	109.893	117.476	-	117.476
Total Adjustments	-1.498	-0.015	19.518	-	19.518
• Congressional General Reductions	-	-0.015			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-0.056	0.000			
• SBIR/STTR Transfer	-1.442	0.000			
• Program Adjustments	0.000	0.000	20.809	-	20.809
• Rate/Misc Adjustments	0.000	0.000	-1.291	-	-1.291

Change Summary Explanation

Decrease in SSN-688 & Trident Modernization RDTEN by \$3.322M 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 \$0.532 million to account for the availability of prior years execution balance.

Increased funding in FY 2017 support procurement of a Submarine Launched Decoy Buoy, AN/BLQ-10 EW Next Generation Architecture (NGA) development, development of improved SSBN communications equipment, and procurement of SSBN ship safety sonar.

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Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy										Date: February 2016		
Appropriation/Budget Activity 1319 / 5					R-1 Program Element (Number/Name) PE 0604503N / SSN-688 & Trident Modernization				Project (Number/Name) 0219 / Sub Sonar Improvement (ENG)			
COST (\$ in Millions)	Prior Years	FY 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
0219: <i>Sub Sonar Improvement (ENG)</i>	854.026	40.731	68.891	67.179	-	67.179	87.382	72.201	61.305	62.559	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This program delivers block updates to Sonar Systems installed on SSN 688, 688I, SSN 21, VIRGINIA, SSBN, and SSGN Class Submarines to maintain clear acoustical, tactical and operational superiority over submarines and surface combatants in all scenarios through detection, classification, localization, and contact following.

Acoustics Rapid COTS Insertion (A-RCI) was a multi-phased evolutionary development geared toward addressing acoustic superiority issues through the rapid introduction of interim development products applicable to all classes of submarines. A-RCI Phase I and II introduced Towed Array processing improvements, Phase III introduced Spherical

Array processing improvements, and Phase IV provided High Frequency (HF) Array processing improvements for SSN 688I, SSGN, VIRGINIA, and SSN 21 Class Submarines. As part of CNO N972's plan to maintain acoustic superiority for in-service submarines, a joint cooperative effort with PEO IWS-5 was established to deliver annual Advanced Processing

Builds (APBs) to prevent obsolescence and deliver ongoing capability improvements. The capabilities in the APBs will be integrated as part of A-RCI certified system. The development of the Large Vertical Array (LVA) will improve detection and enhanced tactical situational awareness capability for tracking targets of interest, and supports acoustic superiority objectives for the Virginia and OHIO class submarines.

Sensor efforts provide increased operational capabilities for littoral operations, situational awareness, and reliability improvements.

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Title: APB Productionization	11.737	12.000	11.904	0.000	11.904
Articles:	-	-	-	-	-
Description: APB productionization provides for the transition of APB capability improvements to the Fleet for the integration, testing and formal certification.					
FY 2015 Accomplishments: Continued Advanced Processing Build (APB) Sea Testing, Integration, and Certification. This effort is primarily the transition of APB software from development to A-RCI for integration, testing, and formal certification.					
FY 2016 Plans:					

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Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604503N / SSN-688 & Trident Modernization	Project (Number/Name) 0219 / Sub Sonar Improvement (ENG)

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
<p>Continue Advanced Processing Build (APB) Sea Testing, Integration, and Certification. This effort is primarily the transition of APB software from development to A-RCI for integration, testing, and formal certification.</p> <p>FY 2017 Base Plans: Continue Advanced Processing Build (APB) Sea Testing, Integration, and Certification. This effort is primarily the transition of APB software from development to A-RCI for integration, testing, and formal certification.</p> <p>FY 2017 OCO Plans: N/A</p>					
<p>Title: Integration and Testing</p> <p align="right">Articles:</p> <p>Description: Integration and Testing provides support to integrated and test APB's into all submarine classes with numerous sensor systems.</p> <p>FY 2015 Accomplishments: Supported Advanced Processing Builds installed on SSN 688I, SSN 688, SSN 21, SSGN 726, SSBN, and VA Class Submarines. FY15 funding level incorporates a \$14.3M higher Departmental priority cut, cancelling the TI12/APB13 software upgrade, breaking the TI/APB model which provides for a newer TI hardware baseline to receive two versions of software baselines. By cancelling TI12/APB 13 , eight SSN 688/688I, two SEAWOLF and three VIRGINIA Class submarines will not receive the latest software improvements as part of the APB 13 baseline.</p> <p>FY 2016 Plans: Support Advanced Processing Builds installed on SSN 688I, SSN 688, SSN 21, SSGN 726, SSBN, and VA Class Submarines. FY15 funding level incorporates a \$14.3M higher Departmental priority cut, cancelling the TI12/APB13 software upgrade, breaking the TI/APB model which provides for a newer TI hardware baseline to receive two versions of software baselines. By cancelling TI12/APB 13 , eight SSN 688/688I, two SEAWOLF and three VIRGINIA Class submarines will not receive the latest software improvements as part of the APB 13 baseline. FY16 funding restores the funding to near (but below) FY14 level to enable planned upgrades to be incorporated into the TI14 baseline.</p> <p>FY 2017 Base Plans:</p>	25.144	35.410	33.972	0.000	33.972
	-	-	-	-	-

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Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy			Date: February 2016			
Appropriation/Budget Activity	R-1 Program Element (Number/Name)	Project (Number/Name)				
1319 / 5	PE 0604503N / SSN-688 & Trident Modernization	0219 / Sub Sonar Improvement (ENG)				
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)						
		FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Support Advanced Processing Builds installed on SSN 688I, SSN 688, SSN 21, SSGN 726, SSBN, and VA Class Submarines. FY17 funding provides integration and testing support to T116 and prior TI baselines.						
FY 2017 OCO Plans: N/A						
Title: SSBN Combat System Modernization		3.850	4.827	2.050	0.000	2.050
		Articles:	-	-	-	-
FY 2015 Accomplishments: This effort incorporated SSBN combat systems into the APB/TI model.						
FY 2016 Plans: This effort continues to incorporate SSBN combat systems into the APB/TI model.						
FY 2017 Base Plans: This effort continues to incorporate SSBN combat systems into the APB/TI model.						
FY 2017 OCO Plans: N/A						
Title: Large Vertical Array (LVA)		0.000	0.000	13.265	0.000	13.265
		Articles:	-	-	-	-
Description: Provides funding for the development of Large Vertical Array capability in the areas of detection and tracking for Virginia Class and Ohio Class Submarines.						
FY 2015 Accomplishments: N/A						
FY 2016 Plans: N/A						
FY 2017 Base Plans: This effort incorporates the Large Vertical Array (LVA) capability into the APB/TI model.						
FY 2017 OCO Plans: N/A						
Title: TB-29X Development		0.000	13.200	2.475	0.000	2.475

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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 delivers emerging capability improvements for current and future threats by supporting development, integration, and testing of emerging capability improvements in passive long range detection/wide area search for current and future threats in support of CNO ltr Ser N00/S0100 dtd 7 Jan 13, Subj: SSN/SSBN Acoustic Superiority Campaign Plan.					
<i>FY 2017 Base Plans:</i> This effort delivers emerging capability improvements for current and future threats by supporting development, integration, and testing of emerging capability improvements in passive long range detection/wide area search for current and future threats in support of CNO ltr Ser N00/S0100 dtd 7 Jan 13, Subj: SSN/SSBN Acoustic Superiority Campaign Plan.					
<i>FY 2017 OCO Plans:</i> N/A					
Accomplishments/Planned Programs Subtotals	40.731	68.891	67.179	0.000	67.179

C. Other Program Funding Summary (\$ in Millions)

<u>Line Item</u>	<u>FY 2015</u>	<u>FY 2016</u>	<u>FY 2017 Base</u>	<u>FY 2017 OCO</u>	<u>FY 2017 Total</u>	<u>FY 2018</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>Cost To Complete</u>	<u>Total Cost</u>
• OPN/BLI 2147: SSN Acoustics	160.932	232.835	0.000	-	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
• OPN/BLI 2150: SSN Acoustics	0.000	0.000	248.765	-	248.765	292.675	331.440	446.113	514.179	Continuing	Continuing

Remarks

D. Acquisition Strategy

Acoustic Systems:

A-RCI utilizes an open architecture and Commercial Off-the-Shelf products in support of new and upgraded sonar systems. A follow-on development and production sole source cost plus incentive fee contract was awarded to General Dynamics, Advanced Information Systems in April 2015 and a sole source contract was awarded to Lockheed Martin Maritime Systems & Sensors in February 2015. Program Reviews with the Milestone Decision Authority are conducted granting approval for the production options.

E. Performance Metrics

The A-RCI program will modernize approximately 8-12 SSNs per year through executing bi-annual software Advanced Processor Builds (APBs) and bi-annual Technical Insertions (TIs). Beginning with FY17 installations, the A-RCI program will modernize approximately 2-3 SSBNs per year through bi-annual APB/TI.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy												Date: February 2016			
Appropriation/Budget Activity 1319 / 5				R-1 Program Element (Number/Name) PE 0604503N / SSN-688 & Trident Modernization				Project (Number/Name) 0219 / Sub Sonar Improvement (ENG)							
Product Development (\$ in Millions)				FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Primary Hardware Development	SS/CPIF	LMC : Manassas, VA	319.645	11.000	Feb 2015	18.743	Dec 2015	15.202	Dec 2016	-		15.202	Continuing	Continuing	Continuing
Ancillary Hardware Development	SS/CPFF	ARL University of Texas : Austin, TX	30.895	2.913	Mar 2015	3.595	Mar 2016	3.232	Mar 2017	-		3.232	Continuing	Continuing	Continuing
Systems Engineering	SS/CPFF	Johns Hopkins APL : Baltimore, MD	33.105	2.835	Jan 2015	3.585	Dec 2015	3.251	Dec 2016	-		3.251	Continuing	Continuing	Continuing
Systems Engineering	C/CPFF	LMC : VA - Keyport	30.256	2.877	Jan 2015	3.127	Jan 2016	3.439	Jan 2017	-		3.439	Continuing	Continuing	Continuing
Primary Hardware Development	C/CPIF	Progeny Systems : Manassas, VA	51.771	5.268	Jan 2015	6.965	Jan 2016	6.635	Jan 2017	-		6.635	Continuing	Continuing	Continuing
Systems Engineering	WR	NUWC : Newport, RI	161.154	5.331	Jan 2015	5.951	Dec 2015	6.115	Dec 2016	-		6.115	Continuing	Continuing	Continuing
Systems Engineering	WR	NSWC : Carderock, MD	23.245	2.393	Jan 2015	2.674	Dec 2015	2.910	Dec 2016	-		2.910	Continuing	Continuing	Continuing
TB-29X Development	C/CPIF	TBD : TBD	0.000	0.000		13.200	Mar 2016	2.475	Mar 2017	-		2.475	Continuing	Continuing	Continuing
LVA Development	C/CPIF	TBD : TBD	0.000	0.000		0.000		13.265	Nov 2016	-		13.265	0.000	13.265	-
Subtotal			650.071	32.617		57.840		56.524		-		56.524	-	-	-
Support (\$ in Millions)				FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Primary Software Development	C/CPIF	General Dynamics, AIS : Fairfax, VA	151.507	2.869	Apr 2015	5.569	Dec 2015	5.344	Dec 2016	-		5.344	Continuing	Continuing	Continuing
Primary Software Development	C/CPFF	Sedna Digital, : Manassas, VA	28.648	3.810	Jan 2015	4.141	Dec 2015	4.041	Dec 2016	-		4.041	Continuing	Continuing	Continuing
Subtotal			180.155	6.679		9.710		9.385		-		9.385	-	-	-

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy												Date: February 2016				
Appropriation/Budget Activity				R-1 Program Element (Number/Name)				Project (Number/Name)								
1319 / 5				PE 0604503N / SSN-688 & Trident Modernization				0219 / Sub Sonar Improvement (ENG)								
Test and Evaluation (\$ in Millions)				FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 Total				
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract	
Operational Test and Evaluation	WR	OPTEVFOR : Norfolk, VA	9.185	0.571	Dec 2014	0.525	Dec 2015	0.500	Dec 2016	-		0.500	Continuing	Continuing	Continuing	
Subtotal			9.185	0.571		0.525		0.500		-		0.500	-	-	-	
Management Services (\$ in Millions)				FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 Total				
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract	
Management Support Services	C/FFP	Alion, BAH, AECOM : Washington, DC	12.477	0.762	Jan 2015	0.716	Dec 2015	0.673	Dec 2016	-		0.673	Continuing	Continuing	Continuing	
Travel	WR	NAVSEA : Washington, DC	2.138	0.102	Dec 2014	0.100	Dec 2015	0.097	Dec 2016	-		0.097	Continuing	Continuing	Continuing	
Subtotal			14.615	0.864		0.816		0.770		-		0.770	-	-	-	
Project Cost Totals			854.026	40.731		68.891		67.179		-		67.179	-	-	-	
Remarks																

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

Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604503N / SSN-688 & Trident Modernization	Project (Number/Name) 0219 / Sub Sonar Improvement (ENG)
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ARCI Planning Schedule	FY15				FY16				FY17				FY18				FY19				FY20				FY21						
	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			
KEY EVENTS			▲				△				△				△				△				△				△				
MDA REVIEWS			▲				△				△				△				△				△				△				
Annual Program Reviews																															
CONTRACT AWARDS			▲				▲																								
A-RCI TI 16 Development and Production (CPIF)			▲																												
MPP TI 16 Development and Production (CPIF)			▲																												
A-RCI TI 18/20 Development and Production (CPIF)								△																							
A-RCI TI 22/24 Development and Production (CPIF)																								△							
CAC TI 18/20 Development and Production (CPIF)								△																							
CAC TI 22/24 Development and Production (CPIF)																								△							
LWWAA TI 18/20 Development and Services (CPIF)								△																							
LWWAA TI 22/24 Development and Services (CPIF)																								△							
LWLCCA TI 18/20 Development and Services (CPIF)								△																							
LWLCCA TI 22/24 Development and Services (CPIF)																								△							
OMS TI 18/20 Development and Production (CPIF)								△																							
OMS TI 22/24 Development and Production (CPIF)																								△							
PROCUREMENTS			▲				△				△				△				△				△				△				
DT/OT/FOT&E			▲				△				△				△				△				△				△				
APBs			▲				△				△				△				△				△				△				
TECH INSERTIONS			▲				△				△				△				△				△				△				
INSTALLATION PERIODS			▲				△				△				△				△				△				△				
688i Ph III/IV Upgrade and 688 Ph III																															
SEAWOLF Ph IV														SSGN Combat Systems																	
VIRGINIA Ph IV														SSBN Combat Systems																	

- ▲ Completed Milestone
- △ Upcoming Milestone
- ▲ Time Now

SSN Installation Period
SSGN/SSBN Installation Period

APB: Advanced Processing Builds
A-RCI: Acoustic – Rapid Commercial Off the Shelf (COTS) Insertion
CAC: Common Acoustic Cabinet
OMS: Ownship Monitoring System
LWWAA: Light Weight Wide Aperture Array - Wide Aperture Array

MPP: Multi-Purpose Processor
LWLCCA: Light Weight Low Cost Conformal Array

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

Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604503N / SSN-688 & Trident Modernization	Project (Number/Name) 0219 / Sub Sonar Improvement (ENG)
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Towed Systems Planning Schedule	FY15				FY16				FY17				FY18				FY19				FY20				FY21			
	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
KEY EVENTS	Annual Program Reviews																											
CONTRACT AWARDS																												
TB-29X Towed Array Development and Production (CPIF)																												
Production Option 1																												
Production Option 2																												
Production Option 3																												
Production Option 4																												
TB-34X Towed Array Production (CPIF)																												
Production Option 1																												
Production Option 2																												
Production Option 3																												
Production Option 4																												
FIRST ARTICLE MATERIAL, FABRICATION AND ASSEMBLY, AND TESTING FOR CONTRACT																												
TB-29X Towed Array Development and Production (CPIF)																												
TB-34X Towed Array Production (CPIF)																												
	FY15				FY16				FY17				FY18				FY19				FY20				FY21			

- Completed Milestone
- Upcoming Milestone
- Production Option
- Time Now

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Exhibit R-4A, RDT&E Schedule Details: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604503N / SSN-688 & Trident Modernization	Project (Number/Name) 0219 / Sub Sonar Improvement (ENG)

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Proj 0219				
ACOUSTICS	1	2015	4	2021
---Acquisition Milestones	3	2015	3	2021
---Annual Program Review	1	2015	4	2021
---Contract Awards - Acoustics	2	2015	4	2020
---Procurements	2	2015	2	2021
---DT/OT/FOT&E Tests	3	2016	2	2021
---APB Deliveries	1	2015	3	2020
---Tech Insertions	1	2015	1	2021
---Installation Periods	1	2015	4	2021
TOWED SYSTEMS DEVELOPMENT	2	2016	2	2021
---Contract Awards - Towed Systems	2	2016	1	2021
---Production Options	2	2016	2	2021
---First Article Procurement & Assembly	2	2016	4	2016

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Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy										Date: February 2016		
Appropriation/Budget Activity 1319 / 5					R-1 Program Element (Number/Name) PE 0604503N / SSN-688 & Trident Modernization				Project (Number/Name) 0742 / Sub Integrated Ant System			
COST (\$ in Millions)	Prior Years	FY 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
0742: <i>Sub Integrated Ant System</i>	269.732	12.610	25.445	27.080	-	27.080	15.638	14.737	13.943	14.199	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Submarine Integrated Antenna System project (0742) provides for the development and testing of submarine antennas designed to meet emerging submarine requirements of: (a) Increased frequency coverage and data rate capabilities of submarine antennas and their interface to the External Communications System, (b) Increased submarine antenna performance and data rate while the submarine is operating at speed and depth, (c) Antenna compatibility with new waveforms and transceiver equipment, (d) Increased stealth capability of existing and future antennas and (e) Improved antenna design to reduce Total Ownership Cost. This project funds research and development for submarine antennas including (1) Pre-Planned Product Improvement (P3I) efforts to existing antennas including Outboard Electronics (OE)-538/BRC Multi-Function Antenna, (2) OE-562 Submarine, High Data Rate (SubHDR) system development of components for reliability improvements, (3) Development of new systems including Advanced High Data Rate (AdvHDR) Low Probability of Intercept/Low Probability of Detection (LPI/LPD), (4) Continue support of Submarine Communications Buoy (SCB) Project Arrangement with United Kingdom (UK), (5) Antenna Improvements, previously funded under Transition Engineering (XENG), Reliability, Maintainability and Availability (RMA) development for legacy antennas, (6) Optical Communications Project Arrangement with United Kingdom and (7) Towed Buoy Antenna (AN/BRR- 6/6B) system development of three reliability improvements; (i) improving the buoy shape, (ii) engineering a combined Radio Frequency (RF) and Depth Can [continue in FY17]; and (iii) internal buoy Inertial Measurement Unit (IMU) planned to commence in FY 17. The efforts listed above will provide Ship Submersible Nuclear (SSN), Ship Submersible Ballistic Nuclear (SSBN) and Ship Submersible Guided Missile Nuclear (SSGN) platforms with improved communications capabilities to support future Joint, Allied, and Naval operations.

JUSTIFICATION FOR BUDGET ACTIVITY:

This project is funded under ENGINEERING AND MANUFACTURING DEVELOPMENT because it encompasses engineering and manufacturing development of new end-items prior to production approval decision.

Notes/Comments:

FY17 XENG: Development of future undersea communication capabilities in support of the 4th Generation Undersea Communication Architecture. High Altitude Electromagnetic Pulse (HEMP) testing.

FY17 OE-538: Complete Developmental Test (DT)/Operational Test (OT) in support of Full Rate Production (FRP). Complete applicable Integrated Logistics Support (ILS) documentation to support FRP decision. Complete development/update of required FRP acquisition documents. HEMP testing.

FY17 SubHDR: Continue development of Reliability, Maintainability and Availability (RMA), components identified by research and analysis to maintain Ao throughout the life of the system.

FY17 AdvHDR: Continue Optical Communications Project Arrangement with United Kingdom.

FY17 Towed Buoy Antenna (AN/BRR-6/6B): Component development, system integration, and testing for reliability improvements.

FY17 Antenna Improvements: RMA development for legacy antennas (previously funded under Transition Engineering).

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Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604503N / SSN-688 & Trident Modernization	Project (Number/Name) 0742 / Sub Integrated Ant System

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
<p>Title: Antenna Transition Engineering</p> <p align="right">Articles:</p> <p>FY 2015 Accomplishments:</p> <ul style="list-style-type: none"> - Continued to provide emerging requirements and Satellite Communications (SATCOM) database/link analysis for other development programs in support of current & future undersea communication architectures. - Continued Pre-Planned Product Improvement (P3I) investigation and development efforts towards legacy antenna systems. - Continued concept engineering, new technology evaluations, and assessments in support of current and future undersea antenna applications, to include Hull, Mechanical and Electrical (HM&E) interfaces. - Continued to investigate multiple usage antennas, including antennas that can be used for communications and other functions. - Continued development of undersea communication future capabilities in support of the 4th Generation Undersea Communication Architecture. <p>FY 2016 Plans:</p> <ul style="list-style-type: none"> - Continue to provide emerging requirements and SATCOM database/link analysis for other development programs in support of current & future undersea communication architectures. - Continue P3I investigation and development efforts towards legacy antenna systems. - Continue concept engineering, new technology evaluations, and assessments in support of current and future undersea antenna applications, to include HM&E interfaces. - Continue to investigate multiple usage antennas, including antennas that can be used for communications and other functions. - Continue development of future undersea communication capabilities in support of the 4th Generation Undersea Communication Architecture. - Commence High Altitude Electromagnetic Pulse (HEMP) testing. <p>FY 2017 Base Plans:</p> <ul style="list-style-type: none"> - Complete HEMP testing. - Continue to provide emerging requirements and SATCOM database/link analysis for other development programs in support of current & future undersea communication architectures. - Continue P3I investigation and development efforts towards legacy antenna. - Continue concept engineering, new technology evaluations, and assessments in support of current and future undersea antenna applications, to include HM&E interfaces. 	3.522	4.209	3.743	0.000	3.743
	-	-	-	-	-

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Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy			Date: February 2016			
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604503N / SSN-688 & Trident Modernization	Project (Number/Name) 0742 / Sub Integrated Ant System				
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)						
		FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
<ul style="list-style-type: none"> - Continue to investigate multiple usage antennas, including antennas that can be used for communications and other functions. - Continue development of future undersea communication capabilities in support of the 4th Generation Undersea Communication Architecture. <p>FY 2017 OCO Plans: N/A</p>						
<p>Title: Outboard Electronics (OE)-538</p> <p align="right">Articles:</p>		4.037	3.079	0.666	0.000	0.666
<p>FY 2015 Accomplishments:</p> <ul style="list-style-type: none"> - Completed Increment 2 system design, manufacture and testing of Engineering Development Model (EDM). - Completed applicable Integrated Logistics Support (ILS) documentation to support Low-Rate Initial Production (LRIP) decision. - Completed development/update of required Milestone C acquisition documents. MS-C achieved 3Q FY15 - Completed Developmental Test (DT) in support of LRIP. - Continued oversight for the development/integration of Global Positioning System (GPS) Anti-Jam (AJ) into OE-538 Increment 2. - Commenced preparation for DT/Operational Test (OT) in support of Full Rate Production (FRP). - Commenced and completed OE-538A Underwater Explosion (UNDEX) test. <p>FY 2016 Plans:</p> <ul style="list-style-type: none"> - Continue preparation for DT/OT in support of Full Rate Production (FRP). - Continue oversight for the development/integration of GPS AJ into OE-538 Increment 2. - Commence development/update of required FRP acquisition and ILS documents. - Commence and complete High Altitude Electromagnetic Pulse (HEMP) testing. - Commence and complete OE-538A First Article Test. <p>FY 2017 Base Plans:</p> <ul style="list-style-type: none"> - Complete DT/OT in support of FRP. - Complete FRP decision review and achieve Initial Operational Capability (IOC). - Complete development/update of required FRP acquisition documents. - Continue oversight for the development/integration of GPS AJ into OE-538 Increment 2. <p>FY 2017 OCO Plans:</p>		-	-	-	-	-

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Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy			Date: February 2016			
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604503N / SSN-688 & Trident Modernization	Project (Number/Name) 0742 / Sub Integrated Ant System				
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)						
		FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
N/A						
Title: Submarine High Data Rate (SubHDR) Pre-Planned Product Improvement (P3I)		2.734	10.487	9.922	0.000	9.922
Articles:		-	-	-	-	-
FY 2015 Accomplishments:						
<ul style="list-style-type: none"> - Continued Underwater Explosion (UNDEX) development and testing. - Continued development of Reliability Maintainability, and Availability (RMA) components identified by research and analysis to maintain Operational Availability (Ao) throughout the life of the system. 						
FY 2016 Plans:						
<ul style="list-style-type: none"> - Complete UNDEX development and testing, and receive delivery of two functioning UNDEX prototype kits. - Continue development of RMA components identified by research and analysis to maintain Ao throughout the life of the system. - Commence development of the Mast Motion Sensor (MMS) and Multivolt Power Supply (MVPS). - Commence and complete High Altitude Electromagnetic Pulse (HEMP) testing. - Commence development of the Traveling Wave Tube, Q Band Upconverter, High Volt Power Supply, and inverter. 						
FY 2017 Base Plans:						
<ul style="list-style-type: none"> - Continue development of RMA components identified by research and analysis to maintain Ao throughout the life of the system. - Continue development of the MMS and MVPS. - Continue development of the Traveling Wave Tube, Q Band Upconverter, High Volt Power Supply, and inverter. 						
FY 2017 OCO Plans:						
N/A						
Title: Advanced High Data Rate (AdvHDR)		0.000	3.524	3.534	0.000	3.534
Articles:		-	-	-	-	-
FY 2015 Accomplishments:						
- N/A						
FY 2016 Plans:						

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Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604503N / SSN-688 & Trident Modernization	Project (Number/Name) 0742 / Sub Integrated Ant System

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
<ul style="list-style-type: none"> - Commence Low Probability of Intercept/Low Probability of Detection (LPI/LPD) Analysis of Alternatives (AoA) development. - Commence Optical Communications Project Arrangement with United Kingdom. <p>FY 2017 Base Plans:</p> <ul style="list-style-type: none"> - Complete LPI/LPD AoA Development. - Continue Optical Communications Project Arrangement with United Kingdom. <p>FY 2017 OCO Plans:</p> <p>N/A</p>					
<p>Title: Submarine Communications Buoy (SCB)</p> <p align="right">Articles:</p> <p>Description: A project arrangement between the United States and the United Kingdom.</p> <p>FY 2015 Accomplishments:</p> <ul style="list-style-type: none"> - Completed support for SCB Project Arrangement with United Kingdom. - Completed component design specification development of candidate SCB components. - Completed development of demonstration plan for SCB components. - Completed performance evaluation of the candidate SCB components. - Commenced Final Report. <p>FY 2016 Plans:</p> <ul style="list-style-type: none"> - Complete Final Report. <p>FY 2017 Base Plans:</p> <ul style="list-style-type: none"> - N/A <p>FY 2017 OCO Plans:</p> <p>N/A</p>	1.756	0.240	0.000	0.000	0.000
	-	-	-	-	-
<p>Title: Towed Buoy Antenna (AN/BRR-6/6B)</p> <p align="right">Articles:</p> <p>FY 2015 Accomplishments:</p> <ul style="list-style-type: none"> - Completed component development, system integration, testing, design specification/modification for reliability improvements of tow cable strength/throughput and servo valve isolation. 	0.561	3.906	6.624	0.000	6.624
	-	-	-	-	-

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Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604503N / SSN-688 & Trident Modernization	Project (Number/Name) 0742 / Sub Integrated Ant System

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
N/A					
FY 2016 Plans: N/A					
FY 2017 Base Plans: - Continue Pre-Planned Product Improvement (P3I) investigation and Reliability, Maintainability and Availability (RMA) development efforts previously funded under Transition Engineering for Ohio Class Ballistic Missile (SSBN) BRA-24 legacy antenna.					
FY 2017 OCO Plans: N/A					
Accomplishments/Planned Programs Subtotals	12.610	25.445	27.080	0.000	27.080

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
• 313000: <i>Submarine Communications</i>	64.954	60.945	64.529	-	64.529	64.483	64.233	67.794	69.177	Continuing	Continuing

Remarks

D. Acquisition Strategy

Program Milestones (MS):
Outboard Electronics (OE)-538: 3rd Quarter (QTR) FY15 Milestone C (MS C); 3rd QTR FY17 Full Rate Production (FRP) Decision Review.

Test and Evaluation (T&E) Milestones:
OE-538: 1st QTR FY17 Developmental Test (DT) for FRP; 2nd QTR FY17 Operational Test (OT) for FRP.

E. Performance Metrics

FY17 OE-538: Complete DT and OT
FY17 SubHDR: Solid State X-Band Amplifier Prototype (Part of the Reliability, Maintainability and Availability (RMA) development).
FY17 AdvHDR: Low Probability of Intercept/Low Probability of Detection (LPI/LPD) Analysis of Alternatives (AoA).
FY17 BRR-6: Development of reliability improvements for antenna/amplifier.
FY17 Antenna Improvements: BRA-24 material solution investigation report.

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Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604503N / <i>SSN-688 & Trident Modernization</i>	Project (Number/Name) 0742 / <i>Sub Integrated Ant System</i>
FY17 XENG: High Altitude Electromagnetic Pulse (HEMP) test report.		

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy												Date: February 2016			
Appropriation/Budget Activity 1319 / 5						R-1 Program Element (Number/Name) PE 0604503N / SSN-688 & Trident Modernization				Project (Number/Name) 0742 / Sub Integrated Ant System					
Product Development (\$ in Millions)				FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Systems/Hardware Dev (Submarine Communications Buoy - SCB)	WR	NSWC : Philadelphia	5.795	1.549	Nov 2014	0.150	Nov 2015	0.000		-		0.000	Continuing	Continuing	Continuing
Hardware Dev (Outboard Electronics (OE)-538)	C/CPAF	Lockeed Martin Sippican/Granite State MFG : MA and NH	20.272	0.293	Mar 2015	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Systems Engineering (OE-538)	WR	NUWC : Newport, RI	8.159	1.365	Nov 2014	0.609	Nov 2015	0.000		-		0.000	Continuing	Continuing	Continuing
Systems Engineering (SubHDR)	WR	NUWC : Newport, RI	16.561	1.859	Nov 2014	0.481	Nov 2015	0.481	Nov 2016	-		0.481	Continuing	Continuing	Continuing
Systems Engineering (Advanced High Data Rate - AdvHDR)	WR	SSC Pacific : San Diego, CA	8.062	0.000		0.000		0.000		-		0.000	0.000	8.062	8.062
Systems Engineering (Antenna Trans Eng)	WR	NUWC : Newport, RI	36.222	1.621	Nov 2014	1.670	Nov 2015	0.890	Nov 2016	-		0.890	Continuing	Continuing	Continuing
Systems Engineering (SCB)	C/CPFF	FSI : San Diego, CA	1.009	0.207	Nov 2014	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
UNDEX Kit Development (SubHDR)	C/CPFF	Raytheon : Marlboro, MA	5.475	0.257	Feb 2015	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Research and Analysis Reliability Dev (SubHDR)	WR	NUWC : Newport, RI	4.927	0.114	Nov 2014	1.300	Nov 2015	1.300	Nov 2016	-		1.300	Continuing	Continuing	Continuing
Systems Engineering (AdvHDR)	WR	NUWC : Newport, RI	4.346	0.000		3.146	Nov 2015	3.144	Nov 2016	-		3.144	Continuing	Continuing	Continuing
Systems Engineering (BRR-6)	C/CPFF	FSI : San Diego, CA	0.172	0.100	Nov 2014	0.175	Nov 2015	0.350	Nov 2016	-		0.350	Continuing	Continuing	Continuing
Systems Engineering/ Hardware Dev (BRR-6)	WR	NUWC : Newport, RI	1.417	0.093	Nov 2014	0.850	Nov 2015	1.086	Nov 2016	-		1.086	Continuing	Continuing	Continuing
Hardware Dev (OE-538)	WR	NUWC : Newport, RI	2.098	0.683	Nov 2014	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Systems Engineering/ Hardware Dev (BRR-6)	WR	NSWC : Philadelphia, PA	1.522	0.368	Nov 2014	2.656	Nov 2015	4.893	Nov 2016	-		4.893	Continuing	Continuing	Continuing

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy												Date: February 2016			
Appropriation/Budget Activity				R-1 Program Element (Number/Name)				Project (Number/Name)							
1319 / 5				PE 0604503N / SSN-688 & Trident Modernization				0742 / Sub Integrated Ant System							
Product Development (\$ in Millions)				FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Future Capabilities (Trans Eng)	WR	SSC Pacific : San Diego, CA	1.715	0.845	Nov 2014	1.383	Nov 2015	1.574	Nov 2016	-		1.574	Continuing	Continuing	Continuing
Systems Engineering (OE-538)	C/CPFF	FSI : San Diego, CA	1.403	0.410	Nov 2014	0.361	Nov 2015	0.000		-		0.000	Continuing	Continuing	Continuing
Research and Analysis Reliability Dev (SubHDR)	C/CPIF	TBD : TBD	0.000	0.000		6.938	Feb 2016	6.531	Feb 2017	-		6.531	Continuing	Continuing	Continuing
Software Dev (OE-538)	WR	NUWC : Newport, RI	0.226	0.252	Nov 2014	0.096	Nov 2015	0.000		-		0.000	Continuing	Continuing	Continuing
Systems Engineering (Antenna Trans Eng)	WR	MITRE : McLean, VA	0.398	0.400	Dec 2014	0.500	Dec 2015	0.545	Nov 2016	-		0.545	Continuing	Continuing	Continuing
Systems Engineering (Antenna Trans Eng)	WR	NPS : Monterey, CA	0.120	0.106	Apr 2015	0.060	Apr 2016	0.100	Feb 2017	-		0.100	Continuing	Continuing	Continuing
Systems Engineering (OE-538)	WR	NSWC : Philadelphia, PA	0.000	0.000		0.059	Nov 2015	0.042	Nov 2016	-		0.042	Continuing	Continuing	Continuing
Systems Engineering/ Hardware Dev (Antenna Improvements)	WR	NUWC : Newport, RI	0.000	0.000		0.000		0.934	Nov 2016	-		0.934	Continuing	Continuing	Continuing
Systems Engineering/ Hardware Dev (Antenna Improvements)	WR	NSWC : Philadelphia, PA	0.000	0.000		0.000		1.407	Nov 2016	-		1.407	Continuing	Continuing	Continuing
Systems Engineering/ Hardware Dev (Antenna Improvements)	C/CPFF	FSI : San Diego	0.000	0.000		0.000		0.125	Nov 2016	-		0.125	Continuing	Continuing	Continuing
Product Development Prior Years	Various	Various : Various	110.707	0.000		0.000		0.000		-		0.000	0.000	110.707	110.707
Subtotal			230.606	10.522		20.434		23.402		-		23.402	-	-	-
Support (\$ in Millions)				FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Cost Estimating (BRR-6)	C/CPFF	TASC : San Diego, CA	0.059	0.000		0.050	Nov 2015	0.050	Nov 2016	-		0.050	Continuing	Continuing	Continuing

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy												Date: February 2016			
Appropriation/Budget Activity				R-1 Program Element (Number/Name)						Project (Number/Name)					
1319 / 5				PE 0604503N / SSN-688 & Trident Modernization						0742 / Sub Integrated Ant System					
Support (\$ in Millions)				FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Integrated logistics Support (BRR-6)	WR	NUWC : Newport, RI	0.047	0.000		0.050	Nov 2015	0.075	Nov 2016	-		0.075	Continuing	Continuing	Continuing
Integrated logistics Support (BRR-6)	C/CPFF	CSA : San Diego, CA	0.050	0.000		0.050	Nov 2015	0.050	Nov 2016	-		0.050	Continuing	Continuing	Continuing
Integrated logistics Support (OE-538)	C/CPFF	CSA : San Diego, CA	0.092	0.105	Nov 2014	0.000		0.060	Nov 2016	-		0.060	Continuing	Continuing	Continuing
Integrated Logistics Support (AdvHDR)	C/CPFF	CSA : San Diego, CA	0.000	0.000		0.075	Feb 2016	0.075	Feb 2017	-		0.075	Continuing	Continuing	Continuing
Cost Estimating (AdvHDR)	C/CPFF	TASC : San Diego, CA	0.000	0.000		0.075	Feb 2016	0.075	Feb 2017	-		0.075	Continuing	Continuing	Continuing
Cost Estimating (OE-538)	C/CPFF	TASC : San Diego, CA	0.225	0.181	Nov 2014	0.098	Nov 2015	0.000		-		0.000	Continuing	Continuing	Continuing
Integrated Logistics Support (SubHDR)	C/CPFF	CSA : San Diego, CA	0.000	0.000		0.157	Feb 2016	0.157	Feb 2017	-		0.157	Continuing	Continuing	Continuing
Security Engineering (Antenna Trans Eng)	C/CPFF	Merdan : San Diego, CA	0.275	0.275	Nov 2014	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Integrated Logistics Support (OE-538)	WR	NUWC : Newport, RI	0.000	0.000		0.183	Nov 2015	0.000		-		0.000	Continuing	Continuing	Continuing
Integrated Logistics Support (OE-538)	WR	NSWC : Philadelphia, PA	0.000	0.000		0.036	Nov 2015	0.000		-		0.000	Continuing	Continuing	Continuing
Security Engineering (Antenna Trans Eng)	C/CPFF	TBD : TBD	0.000	0.000		0.300	Nov 2015	0.250	Nov 2016	-		0.250	Continuing	Continuing	Continuing
Integrated Logistics Support (Antenna Improvements)	C/CPFF	CSA : San Diego, CA	0.000	0.000		0.000		0.050	Nov 2016	-		0.050	Continuing	Continuing	Continuing
Support Prior Years	Various	Various : Various	6.630	0.000		0.000		0.000		-		0.000	0.000	6.630	6.630
Subtotal			7.378	0.561		1.074		0.842		-		0.842	-	-	-

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy												Date: February 2016			
Appropriation/Budget Activity				R-1 Program Element (Number/Name)						Project (Number/Name)					
1319 / 5				PE 0604503N / SSN-688 & Trident Modernization						0742 / Sub Integrated Ant System					
Test and Evaluation (\$ in Millions)				FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Test & Evaluation (OE-538)	WR	COTF : Norfolk, VA	0.999	0.024	Nov 2014	0.286	Nov 2015	0.250	Nov 2016	-		0.250	Continuing	Continuing	Continuing
Test & Evaluation (SubHDR)	WR	NUWC : Newport, RI	1.143	0.152	Nov 2014	1.135	Nov 2015	1.013	Nov 2016	-		1.013	Continuing	Continuing	Continuing
Developmental/Operational T&E (OE-538)	WR	NUWC : Newport, RI	5.692	0.613	Nov 2014	1.351	Nov 2015	0.314	Nov 2016	-		0.314	Continuing	Continuing	Continuing
Test & Evaluation (SCB)	WR	NUWC : Newport, RI	0.950	0.000		0.090	Nov 2015	0.000		-		0.000	Continuing	Continuing	Continuing
Test and Evaluation Prior Years	Various	Various : Various	4.207	0.000		0.000		0.000		-		0.000	0.000	4.207	4.207
Subtotal			12.991	0.789		2.862		1.577		-		1.577	-	-	-
Management Services (\$ in Millions)				FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Support (SubHDR)	C/CPFF	CSA : San Diego, CA	2.994	0.352	Dec 2014	0.476	Feb 2016	0.440	Feb 2017	-		0.440	Continuing	Continuing	Continuing
Program Management Support (AdvHDR)	C/CPFF	CSA : San Diego, CA	7.563	0.000		0.228	Feb 2016	0.240	Feb 2017	-		0.240	Continuing	Continuing	Continuing
Program Management Support (Antenna Trans Eng)	C/CPFF	CSA : San Diego, CA	3.606	0.275	Nov 2014	0.296	Nov 2015	0.384	Nov 2016	-		0.384	Continuing	Continuing	Continuing
Program Management Support (SCB)	C/CPFF	CSA : San Diego, CA	0.373	0.000		0.000		0.000		-		0.000	0.000	0.373	0.373
Program Management Support (OE-538)	C/CPFF	CSA : San Diego, CA	4.124	0.111	Nov 2014	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Program Management Support (BRR-6)	C/CPFF	CSA : San Diego, CA	0.097	0.000		0.075	Nov 2015	0.120	Nov 2016	-		0.120	Continuing	Continuing	Continuing
Program Management Support (Antenna Improvements)	C/CPFF	CSA : San Diego, CA	0.000	0.000		0.000		0.075	Nov 2016	-		0.075	Continuing	Continuing	Continuing
Subtotal			18.757	0.738		1.075		1.259		-		1.259	-	-	-

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy							Date: February 2016				
Appropriation/Budget Activity 1319 / 5			R-1 Program Element (Number/Name) PE 0604503N / SSN-688 & Trident Modernization				Project (Number/Name) 0742 / Sub Integrated Ant System				
	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	269.732	12.610	25.445	27.080	-	27.080	-	-	-		

Remarks

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

Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604503N / SSN-688 & Trident Modernization	Project (Number/Name) 0742 / Sub Integrated Ant System
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Fiscal Year	2015				2016				2017				2018				2019				2020				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
Acquisition (OE-538 Inc 2) Milestones			▲ MS C								△ FRP DR	△ IOC OE-538A																
Requirements																												
System Development	■																											
Engineering Development Model	■																											
EDM Deliveries		▲ 1	▲ 1																									
Testing		▲ DT			■ FAT				△ DT	△ OT																		
Contract/Deliveries																												
LRIP Contract Options				▲ 7		△ 6																						
LRIP Deliveries								△ 7		△ 6	△ 18																	
FRP Contract Options													△ 27															
FRP Deliveries													△ 18				△ 24								△ 24			

Note: Production of OE-538 Increment 2 starting in FY20 and out will include Global Positioning System (GPS) Anti-Jam (AJ) capability funded by PMW/A 170 Sea NAVWAR Program.

Acronyms
 CPD: Capabilities Production IOC: Initial Operational Capability
 DR: Decision Review LRIP: Low Rate Initial Pr
 DT: Developmental Test MS C: Milestone C
 FAT: First Article Test OT: Operational Test
 FRP: Full Rate Production

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

Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604503N / SSN-688 & Trident Modernization	Project (Number/Name) 0742 / Sub Integrated Ant System
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Fiscal Year	2015				2016				2017				2018				2019				2020				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				
Acquisition (SubHDR) Milestones																																
System Development									UnderwaterExplosion (UNDEX)																							
Performance Reliability Component Development									Reliability, Maintainability and Avalaibility, (RMA) Development																							
Production Representative EDM Deliveries							2																									
							(UNDEX)																									
Radome Procurement Contract Award			8 (Option)				17 (Option)				10 (Option)				6 (Option)				Note 1 3 (Option)				4 (Option)									
Radome Procurement Deliveries			23				8				17 (Option)				10 (Option)				6 (Option)				3 (Option)								4 (Option)	
RMA Kit Porcurement Contrac Award																															12	

Note 1: The final 13 radomes will require a new contract.
 Note 2: UNDEX testing failure cause a one year slip in development and prototype kit delivery.

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

Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604503N / SSN-688 & Trident Modernization	Project (Number/Name) 0742 / Sub Integrated Ant System
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Fiscal Year	2015				2016				2017				2018				2019				2020				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
Acquisition (AdvHDR) Milestones																												
Requirements					▲	LPI/LPD AoA				△																		
Technology Demonstration																												
System Development Optical Communications, (OCOMMS) Project Agreement with United Kingdom						■ Develop an OCOMMS prototype to demonstrate capability																						
Engineering Dev. Model																												
Development Test																												
Contract/Deliveries (Down select)																												
Vendor 1																												
Vendor 2																												

Acronyms:
 AoA Analysis Of Alternatives
 LPI/LPD Low Probability of Intercept/Low Probability of Detection

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

Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604503N / SSN-688 & Trident Modernization	Project (Number/Name) 0742 / Sub Integrated Ant System
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Fiscal Year	2015				2016				2017				2018				2019				2020				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				
Acquisition (SCB) Milestones																																
Project Arrangement with United Kingdom					Evaluate Requirements, System Component Design and Component Prototypes																											

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

Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604503N / SSN-688 & Trident Modernization	Project (Number/Name) 0742 / Sub Integrated Ant System
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Fiscal Year	2015				2016				2017				2018				2019				2020				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					
Towed Buoy Antenna (BRR-6/6B) Components Development for Reliability Improvements	Tow Cable																																
																					Reliability, Maintainability & Availability (RMA) Development												
					Antenna and Amplifier Improvements																												
					Servo Valve Isolation																												
					Failure Analysis on Key Items																												
					Failure Analysis on Tow Cable																												
						Buoy Shape Improvements																											
						Combine RF and Depth Cans																											
									IMU Implementation (Integrated)																								

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

Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604503N / SSN-688 & Trident Modernization	Project (Number/Name) 0742 / Sub Integrated Ant System
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Fiscal Year	2015				2016				2017				2018				2019				2020				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				
Antenna Improvements																																
	Reliability, Maintainability & Availability (RMA) Development																															

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Exhibit R-4A, RDT&E Schedule Details: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604503N / SSN-688 & Trident Modernization	Project (Number/Name) 0742 / Sub Integrated Ant System

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Proj 0742				
Outboard Electronics (OE)-538 Milestone C (MS C) Decision	3	2015	3	2015
OE-538 Full Rate Production Decision Review (FRP DR)	3	2017	3	2017
OE-538 Initial Operational Capability (IOC) without Global Position System (GPS) Anti-Jam (AJ)	4	2017	4	2017
OE-538 System Development	1	2015	3	2015
OE-538 Engineering Development Model (EDM) Development	1	2015	2	2015
OE-538 1st EDM Delivery	2	2015	2	2015
OE-538 2nd EDM Delivery	3	2015	3	2015
OE-538 Developmental Test (DT) for Milestone C (MS C)	2	2015	3	2015
OE-538 First Article Test	1	2016	4	2016
OE-538 DT for Full Rate Production (FRP)	1	2017	1	2017
OE-538 Operational Test (OT)	2	2017	2	2017
OE-538 Low-Rate Initial Production (LRIP) Contract Option Year 1	4	2015	4	2015
OE-538 LRIP Deliveries Year 1	4	2016	1	2017
OE-538 LRIP Contract Option Year 2	2	2016	2	2016
OE-538 LRIP Deliveries Year 2	2	2017	3	2017
OE-538 Full Rate Production (FRP) Contract Options Year 1	3	2017	3	2017
OE-538 FRP Deliveries Year 1	3	2018	2	2019
OE-538 FRP Contract Option Year 2	2	2018	2	2018
OE-538 FRP Deliveries Year 2	2	2019	2	2020
OE-538 FRP Contract Option Year 3	2	2019	2	2019

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

Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604503N / SSN-688 & Trident Modernization	Project (Number/Name) 0742 / Sub Integrated Ant System
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Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
OE-538 FRP Deliveries Year 3	2	2020	2	2021
OE-538 FRP Contract Option Year 4	2	2020	2	2020
OE-538 FRP Deliveries Year 4	2	2021	4	2021
OE-538 FRP Contract Option Year 5	2	2021	2	2021
Submarine High Data Rate (SubHDR) Under Water Explosion (UNDEX) Development	1	2015	3	2016
SubHDR Performance Reliability Component Development/Test	1	2015	3	2019
SubHDR Production Representative UNDEX Engineering Development Model (EDM) Deliveries	3	2016	3	2016
SubHDR Radome Procurement Contract/Option Awards	3	2015	3	2020
SubHDR Radome Production Deliveries	3	2015	3	2021
SubHDR RMA Kit Procurement Contract Award	3	2021	3	2021
AdvHDR Technology Phase	1	2018	2	2021
AdvHDR Analysis of Alternative (AoA) for LPI/LPD	1	2016	3	2017
AdvHDR Optical Communications Project Agreement with United Kingdom	1	2016	4	2019
SCB Project arrangement with United Kingdom (UK)	1	2015	4	2016
Towed Buoy Antenna (BRR-6/6B) Tow Cable Improvements	1	2015	4	2015
BRR-6/6B Antenna and Amplifier Improvements	1	2015	4	2017
BRR-6/6B Servo Valve Isolation	1	2015	4	2015
BRR-6/6B Failure Analysis on Key Items	1	2015	3	2016
BRR-6/6B Failure Analysis on Tow Cable	1	2015	4	2016
BRR-6/6B Buoy shape Improvements	1	2016	4	2018
BRR-6/6B Combine RF and Depth Cans	1	2016	4	2018
BRR-6/6B IMU Implementation (Integrated)	1	2017	4	2019
BRR-6/6B Reliability, Maintainability & Availability (RMA) Development	1	2020	4	2021
Antenna Improvements Reliability, Maintainability & Availability (RMA) Development	1	2017	4	2021

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Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy										Date: February 2016		
Appropriation/Budget Activity 1319 / 5					R-1 Program Element (Number/Name) PE 0604503N / SSN-688 & Trident Modernization				Project (Number/Name) 0775 / Submarine Supt Equip Prog			
COST (\$ in Millions)	Prior Years	FY 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
0775: Submarine Supt Equip Prog	1.179	8.064	6.204	13.215	-	13.215	9.077	9.268	9.950	10.171	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Significant increase from FY16 to FY17 attributable to continued development of TI-20/INC 2 capabilities for High Speed Network, SIRFSUP capabilities, Multifunctional Modular Mast (MMM) payload Next Generation EW System, and Communications Digital Aperture Correlation and Emitter improvements. Develop or transition from Future Naval Capability (FNC) efforts to TI-20/INC 2 capabilities for Electronic Attack, EW sensor for future Task-Oriented Technology Insertion Mast (TOTIM) planned for TI-20 platforms, improved digitizers, and EW data processing. Develop Advanced technology demonstrations for feasibility of systems capable of meeting later increments of AN/BLQ-10(B) for performance and digital data delivery.

The Submarine Support Equipment Program (SSEP) is responsible for the development and improvement of Submarine Electronic Warfare (EW) systems in support of effective operations in the following mission areas: Joint Littoral Warfare; Joint Intelligence Surveillance Reconnaissance (ISR), Indications and Warnings; Electronic Warfare; Information Operations including Cyber; and Special Operations Force (SOF) support. The rapid proliferation of complex radar, communications and navigation equipment available to potential adversaries creates an increasingly dense and sophisticated electromagnetic environment. Sustained and significant improvements to submarine EW systems are required to maintain tactical ship safety and operation effectiveness. As such EW was raised to a submarine primary mission area in FY2012 by Commander Submarine Forces, and EW is listed as the number one modernization requirement by the Submarine Tactical Requirements Group (STRG). OPNAV letter dated 17 June 12, SER N97/12U144401 further codified this need by directing development of a digital Next Generation EW system as an evolution of the AN/BLQ-10 EW program. SSEP efforts in support of these needs include: integration of technology developed and transitioned from the Advanced Submarine Support Equipment Program (ASSEP) into tactical EW systems, interface and capability integration with Submarine Warfare Federated Tactical System Modernization efforts and development of the Next Generation EW AN/BLQ-10 system.

RDTE Funding line supports the entire AN/BLQ-10 EW procurement program. Increases in RDTE budget starting in FY15 supports development of EW Next Generation Architecture (NGA). The increase in FY17 funds over PB16 plans supports two new requirements: \$0.230M was funded to satisfy the U.S. Navy Submarine Force (SUBFOR) requirement Ltr: Serial N00/5012: 17 JUN 13 to provide a Submarine Launched Decoy Buoy. \$4.1M is also provided as a zero-sum transfer from EW Next Generation Architecture (NGA) OPN funds (ML020) to support development of critical enabling technologies for TI-20 that will provide maximized AN/BLQ-10 NGA development. The increase supports critical enabling technologies that will provide maximized electronic spectrum digitization and processing as well as Electronic Attack capability. Specific NGA technology development focus areas include simultaneous transmit and receive apertures, improved antenna sensors, high bandwidth digitizers, high speed networking, large capacity data storage and retrieval, and advanced algorithms for improved system performance and new 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: Submarine Support Equipment Program	8.064	6.204	13.215	0.000	13.215

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Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604503N / SSN-688 & Trident Modernization	Project (Number/Name) 0775 / Submarine Supt Equip Prog

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Articles:	-	-	-	-	-
<p><i>FY 2015 Accomplishments:</i> Update AN/BLQ-10 software baseline changes for SWFTS and NPES, SPR Resolution and Software Enhancement. Development of TI-16 Processor Upgrades, remote display and vulnerability rules of thumb. Commence development of Next Generation Architecture (NGA) Increment 1 and Electronic Warfare Tactical Improvement Set (ETIS). Develop EW server, displays and control of digital Electronic Intelligence (ELINT) and digital Communications Intelligence (COMINT) subsystems. Advanced technology demonstrations for feasibility of systems capable of meeting later increments of AN/BLQ-10(B) for performance and digital data delivery.</p> <p><i>FY 2016 Plans:</i> TI-14 DT. Update AN/BLQ-10 software baseline changes for SWFTS and NPES, SPR Resolution and Software Enhancement. Complete testing of TI-16 Processor Upgrades and incorporate ETIS set into TI16 baseline. Commence development of TI-20/INC 2 for High Speed Network, SIRFSUP capabilities, Multifunctional Modular Mast (MMM) payload Next Generation EW System. Develop Communications Digital Aperture Correlation and Emitter improvements. Advanced technology demonstrations for feasibility of systems capable of meeting later increments of AN/BLQ-10(B) for performance and digital data delivery.</p> <p><i>FY 2017 Base Plans:</i> Perform TI-14 Operational Test (OT). Update AN/BLQ-10 software baseline changes for SWFTS and NPES, SPR Resolution and Software Enhancement. Integration of Submarine Launched Decoy buoys with ship interfaces and AN/BLQ-10 submarine electronic warfare system software. Develop TI-18 Processor Upgrades. Complete TI-18 NRE updates of Human Machine Interface (HMI) package to incorporate Digital Onboard Trainer and usage of I&Q data; Digital Apertures, Embedded Built in Test (BIT). Continued development of TI-20/INC 2 capabilities for High Speed Network, SIRFSUP capabilities, Multifunctional Modular Mast (MMM) payload Next Generation EW System, and Communications Digital Aperture Correlation and Emitter improvements. Develop or transition from Future Naval Capability (FNC) efforts to TI-20/INC 2 capabilities for Electronic Attack, EW sensor for future Task-Oriented Technology Insertion Mast (TOTIM) planned for TI-20 platforms, improved digitizers, and EW data processing. Develop Advanced technology demonstrations for feasibility of systems capable of meeting later increments of AN/BLQ-10(B) for performance and digital data delivery.</p> <p><i>FY 2017 OCO Plans:</i> N/A</p>					
Accomplishments/Planned Programs Subtotals	8.064	6.204	13.215	0.000	13.215

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Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy **Date:** February 2016

Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604503N / SSN-688 & Trident Modernization	Project (Number/Name) 0775 / Submarine Supt Equip Prog
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C. Other Program Funding Summary (\$ in Millions)

Line Item	FY 2015	FY 2016	FY 2017	FY 2017	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	Cost To	
			Base	OCO	Total					Complete	Total Cost
• OPN/256000: <i>Submarine Supt Equip Prog</i>	36.938	78.816	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	296.710
• SCN/201300: <i>VIRGINIA Class Submarine</i>	56.512	57.650	58.821	-	58.821	60.015	61.215	62.562	67.567	Continuing	Continuing
• RDT&E/0604558N: <i>VIRGINIA Class Design Development</i>	1.500	1.500	1.500	-	1.500	1.500	1.526	1.557	1.557	Continuing	Continuing
• RDT&E/0603562N: <i>Advanced Submarine Support Equipment (ASSEP)</i>	3.320	4.103	4.429	-	4.429	4.143	4.403	4.725	4.828	Continuing	Continuing
• OPN/084000: <i>Sub Periscopes, Imaging Equip. and Supt Equip Program</i>	0.000	0.000	136.421	-	136.421	142.104	215.983	249.189	206.465	Continuing	Continuing

Remarks

D. Acquisition Strategy

AN/BLQ-10 (V) EW System - Procurements are executed/managed in accordance with Acquisition Plan (Rev 9) for AN/BLQ-10(V) EW System dtd 06/06/13 and the Single Acquisition Management Plan dtd 06/12/14.

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.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy **Date:** February 2016

Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604503N / SSN-688 & Trident Modernization	Project (Number/Name) 0775 / Submarine Supt Equip Prog
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Product Development (\$ in Millions)				FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Hardware and Software Development	Various	Various : Various	0.000	0.000		0.000		2.500	Oct 2016	-		2.500	0.000	2.500	-
Hardware and Software Development	WR	NUWC : Newport, RI	0.000	6.993	Oct 2014	4.068	Nov 2015	6.269	Oct 2016	-		6.269	Continuing	Continuing	Continuing
Subtotal			0.000	6.993		4.068		8.769		-		8.769	-	-	-

Remarks
 Increase in FY15 Hardware Development supports efforts for AN/BLQ-10(B) EW Next Generation Architecture (NGA). The increase in FY17 over PB16 plans includes \$4.1M of EW NGA OPN (ML020) funds converted to RDT&E in a zero sum transfer to better reflect the developmental need in support of TI-20 critical enabling technologies. The increase in FY17 also includes \$0.230M to satisfy the U.S. Navy Submarine Force (SUBFOR) requirement to provide a Submarine Launched Decoy Buoy.

Significant increase from FY16 to FY17 attributable to continued development of TI-20/INC 2 capabilities for High Speed Network, SIRFSUP capabilities, Multifunctional Modular Mast (MMM) payload Next Generation EW System, and Communications Digital Aperture Correlation and Emitter improvements. Develop or transition from Future Naval Capability (FNC) efforts to TI-20/INC 2 capabilities for Electronic Attack, EW sensor for future Task-Oriented Technology Insertion Mast (TOTIM) planned for TI-20 platforms, improved digitizers, and EW data processing. Develop Advanced technology demonstrations for feasibility of systems capable of meeting later increments of AN/BLQ-10(B) for performance and digital data delivery.

Test and Evaluation (\$ in Millions)				FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Test Support	WR	COTF : Norfolk, VA	0.000	0.254	Oct 2014	0.260	Mar 2016	0.275	Oct 2016	-		0.275	0.000	0.789	-
Systems Engineering & Test Support	WR	NUWC : Newport, RI	1.179	0.817	Oct 2014	1.876	Nov 2015	4.171	Oct 2016	-		4.171	0.000	8.043	-
Subtotal			1.179	1.071		2.136		4.446		-		4.446	0.000	8.832	-

	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		1.179	8.064	6.204	13.215	-	-	-	-

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy							Date: February 2016			
Appropriation/Budget Activity 1319 / 5			R-1 Program Element (Number/Name) PE 0604503N / SSN-688 & Trident Modernization			Project (Number/Name) 0775 / Submarine Supt Equip Prog				
	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	Cost To Complete	Total Cost	Target Value of Contract	

Remarks
 Development Integration and Test (DI&T) for NGA Increment I/ETIS extends into FY17 to complete testing for Increment I hardware tied to VIRGINIA new construction schedule.

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

Date: February 2016

Appropriation/Budget Activity
1319 / 5

R-1 Program Element (Number/Name)
PE 0604503N / SSN-688 & Trident
Modernization

Project (Number/Name)
0775 / Submarine Supt Equip Prog

Fiscal Year	2015				2016				2017				2018				2019				2020				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				
AN/BLQ-10 Baseline Changes, SPR Resolution, and Software Enhancement: AN/BLQ-10 Baseline Changes, SPR Resolution, and Software Enhancement: Software Update	S/W Upgrade	▲			S/W Upgrade	▲			S/W Upgrade	▲			S/W Upgrade	▲			S/W Upgrade	▲			S/W Upgrade	▲			S/W Upgrade	▲			S/W Upgrade	▲		
Technical Insertion: Development, Integration & Test																																
TI-14: Process or Upgrades, Remote Log-In, Rapid Reprogramming of Threat Libraries and ES Server Correlator								▲				▲																				
TI-16: Processor Upgrades, Vulnerability Rules of Thumb, Control EW Display and Embedded Bit																▲				▲												
TI-18: Processor Upgrades, ES On-Board Trainer (OBT), Tactical Decision Aid																								▲				▲				
TI-20: High Speed Network, SIRFSUP capabilities ; MMM Payload Next Generation EW System																																
Next Generation EW System: Development, Integration & Test																																
Next Generation Architecture (Increment 1)/ETIS (DI&T)																																
Next Generation Architecture (Increment 2) (DI&T)																																
TI-APB: Integration & Test																																
APB-15																																
APB-17																																
APB-19																																
Submarine Launched Decoy Buoy																																

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Exhibit R-4A, RDT&E Schedule Details: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604503N / SSN-688 & Trident Modernization	Project (Number/Name) 0775 / Submarine Supt Equip Prog

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Proj 0775				
AN/BLQ-10 Baseline Changes, SPR Resolution, and Software Enhancement: AN/BLQ-10 Baseline Changes, SPR Resolution, and Software Enhancement: Software Update FY15	2	2015	2	2015
AN/BLQ-10 Baseline Changes, SPR Resolution, and Software Enhancement: AN/BLQ-10 Baseline Changes, SPR Resolution, and Software Enhancement: Software Update FY16	2	2016	2	2016
AN/BLQ-10 Baseline Changes, SPR Resolution, and Software Enhancement: AN/BLQ-10 Baseline Changes, SPR Resolution, and Software Enhancement: Software Update FY17	2	2017	2	2017
AN/BLQ-10 Baseline Changes, SPR Resolution, and Software Enhancement: AN/BLQ-10 Baseline Changes, SPR Resolution, and Software Enhancement: Software Update FY18	2	2018	2	2018
AN/BLQ-10 Baseline Changes, SPR Resolution, and Software Enhancement: AN/BLQ-10 Baseline Changes, SPR Resolution, and Software Enhancement: Software Update FY19	2	2019	2	2019
AN/BLQ-10 Baseline Changes, SPR Resolution, and Software Enhancement: AN/BLQ-10 Baseline Changes, SPR Resolution, and Software Enhancement: Software Update FY20	2	2020	2	2020
AN/BLQ-10 Baseline Changes, SPR Resolution, and Software Enhancement: AN/BLQ-10 Baseline Changes, SPR Resolution, and Software Enhancement: Software Update FY21	2	2021	2	2021
TI-14: Processor Upgrades, Remote Log-In, Rapid Reprogramming of Threat Libraries and ES Server DT	4	2016	4	2016
TI-14: Processor Upgrades, Remote Log-In, Rapid Reprogramming of Threat Libraries and ES Server OT	3	2017	3	2017

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

Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604503N / SSN-688 & Trident Modernization	Project (Number/Name) 0775 / Submarine Supt Equip Prog
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Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
TI-16: Processor Upgrades, Vulnerability Rules of Thumb, Control EW display and Embedded bit	1	2015	4	2016
TI-16: Processor Upgrades, Vulnerability Rules of Thumb, Control EW display and Embedded bit DT	2	2018	2	2018
TI-16: Processor Upgrades, Vulnerability Rules of Thumb, Control EW display and Embedded bit OT	2	2019	2	2019
TI-18: Processor Upgrades, ES On-Board Trainer (OBT), Tactical Decision Aid	1	2018	3	2019
TI-18: Processor Upgrades, ES On-Board Trainer (OBT), Tactical Decision Aid DT	1	2020	1	2020
TI-18: Processor Upgrades, ES On-Board Trainer (OBT), Tactical Decision Aid OT	1	2021	1	2021
TI-20: High Speed Network, SIRFSUP capabilities, MMM Payload Next Generation EW System	3	2016	4	2021
Next Generation EW System: Development, Integration & Test (DI&T): Next Generation Architecture (Increment 1)/ETIS (DI&T)	1	2015	4	2017
Next Generation EW System: Development, Integration & Test (DI&T): Next Generation Architecture (Increment 2) (DI&T)	3	2016	4	2021
TI-APB: Integration & Test: APB-15	1	2016	4	2016
TI-APB: Integration & Test: APB-17	1	2018	4	2018
TI-APB: Integration & Test: APB-19	1	2020	4	2020

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Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy										Date: February 2016		
Appropriation/Budget Activity 1319 / 5					R-1 Program Element (Number/Name) PE 0604503N / SSN-688 & Trident Modernization				Project (Number/Name) 1411 / Sub Tact Comm System			
COST (\$ in Millions)	Prior Years	FY 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
1411: <i>Sub Tact Comm System</i>	199.856	8.648	9.353	10.002	-	10.002	10.915	10.695	10.752	10.977	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Submarine Tactical Communications System project (1411) provides submarines with communications systems designed to: (a) enhance assured information transfer via automated and integrated network management; (b) support assured Command & Control, (c) provide submarine Internet Protocol (IP) connectivity; (d) be interoperable with Nuclear Command, Control, and Communications (NC3), joint United States, and allied/coalition military networks; (e) meet NC3 strategic messaging requirements; and (f) improve reliability, maintainability, and availability. This is accomplished by providing the submarine with a properly integrated mix of fully interoperable Navy standard and Commercial Off-the-Shelf (COTS) communication equipment covering a wide range of frequencies and modes. The Common Submarine Radio Room (CSRR) transforms LOS ANGELES, OHIO (SSBN and SSGN) and SEAWOLF Class radio rooms from suites of class-specific, closed system equipment to a common (not identical) design which incorporates Open System Architecture communications equipment. CSRR leverages and continues the development of VIRGINIA Class External Communications System (ECS) design and ECS Control and Management software, applies a system-of-systems approach to design and implementation of Joint Maritime Communication System, and integrates COTS and Government Off-the-Shelf components with emerging technologies into a single centrally managed radio room architecture for all classes of submarines. The project utilizes land-based integration test facilities to integrate Command, Control, Communications, Computers, and Intelligence (C4I) programs of record components into the open architecture prior to fleet implementation on all submarine platforms. This project funds the development of a replacement simulation/stimulation suite to support training requirements. The project includes system engineering efforts associated with demonstration of new technology allowing submarines to connect to the global information grid, participate in strike group and joint operations, and support NC3 commitments. CSRR supports the Navy Strategy for achieving Information Dominance by providing the submarine resilient, robust communications capabilities for NC3, joint United States and allied/coalition military operations. The new technology will ensure the submarine's continued ability to participate in network-centric warfare and exploit its inherent stealth capabilities in support of the Navy, Joint, and allied/coalition fight to achieve total battlespace information dominance.

JUSTIFICATION FOR BUDGET ACTIVITY:

This program is funded under ENGINEERING and MANUFACTURING DEVELOPMENT because it encompasses development and demonstration of new end-items prior to fielding approval decision. The amount of RDT&E funding is dependent on the number of baselines being integrated and tested in any given year.

Funding in FY17 is to continue CSRR Increment 1 Version 4 systems engineering development for OHIO Class ballistic missile (SSBN) submarines, VIRGINIA, LOS ANGELES and SEAWOLF Class attack (SSN) submarines, OHIO Class guided missile (SSGN) submarines, and ensure Supply Chain Risk Management (SCRM) compliance. Continue development of platform specific builds for Control & Management software incorporating Increment 1 Version 4 capabilities. Continue development of the Multi-purpose Reconfigurable Training System (MRTS) software for Increment 1 Version 4 capabilities. Update acquisition documentation to reflect changes in Increment 1 Version 4 through Version 6. Complete Increment 1 Version 3 Joint Interoperability Test Command (JITC) Re-Certification. Commence CSRR Increment 1 Version 5 system engineering development and modernization.

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Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy	Date: February 2016
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Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604503N / SSN-688 & Trident Modernization	Project (Number/Name) 1411 / Sub Tact Comm System
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Acquisition Decision Memorandum signed by Assistant Secretary of Navy for Research, Development & Acquisition dated 15 July 2008 approved consolidating Increments 1 and 2 to a single Increment 1 with multiple block upgrades (Versions).

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Title: Common Submarine Radio Room (CSRR)	8.648	9.353	10.002	0.000	10.002
Articles:	-	-	-	-	-
FY 2015 Accomplishments:					
<ul style="list-style-type: none"> - Completed Increment 1 Version 3 Operational Test (OT) test deferrals and Special Operations Forces (SOF) testing. - Completed development of platform specific builds of Control & Management (C&M) software Increment 1 Version 3 capabilities for VIRGINIA, LOS ANGELES, SEAWOLF, SSGN and SSBN Class submarines incorporating End of Life (EOL) issues due to equipment obsolescence. - Completed Multi-purpose Reconfigurable Training System (MRTS) software upgrade for Increment 1 Version 3 CSRR baseline for SSBN Class operator trainer. - Continued Supply Chain Risk Management (SCRM) assessment as part of Program Protection Plan (PPP) revision. - Continued CSRR Increment 1 Version 4 system engineering development and modernization for the LOS ANGELES, SSBN and VIRGINIA Class submarines. - Continued development of platform specific builds of Increment 1 Version 4 Control and Management software for LOS ANGELES, SSBN and VIRGINIA Class capabilities. - Continued implementation of Increment 1 Version 4 security upgrades to meet Cyber Security and multiple certification requirements for General Service (GENSER) and Sensitive Compartmented Information (SCI) for all CSRR platforms. - Continued Multi-purpose Reconfigurable Training System (MRTS) software upgrade for Increment 1 Version 4 CSRR baseline for LOS ANGELES, SSBN, and SSGN Class operator trainer and VIRGINIA Class maintenance trainer. - Continued Federal Information System Management Act (FISMA) statutory requirement for Cyber Security compliance and correction of Increment 1 Version 1 - Version 3 Cyber Security deficiencies. - Commenced Federal Information System Management Act (FISMA) statutory requirement for Cyber Security compliance and correction of Increment 1 Version 4 cyber security deficiencies. - Commenced CSRR Increment 1 Version 4 system engineering development and modernization for the SSGN and SEAWOLF Class submarines. - Commenced development of platform specific builds of Increment 1 Version 4 C&M software for SSGN and SEAWOLF Class capabilities. 					

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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
<p>- Commenced updating the CSRR Acquisition Plan, Acquisition Strategy, System Engineering Plan, and Program Protection Plan to reflect changes for Increment 1 Version 4 through Version 6.</p> <p>FY 2016 Plans:</p> <ul style="list-style-type: none"> - Continue Federal Information System Management Act (FISMA) statutory requirement for Cyber Security compliance and correction of Increment 1 Version 1 - Version 4 Cyber Security deficiencies. - Continue Supply Chain Risk Management (SCRM) assessment as part of PPP revision. - Continue CSRR Increment 1 Version 4 system engineering development and modernization for the LOS ANGELES, SSBN, VIRGINIA, SSGN, and SEAWOLF Class submarines. - Continue development of platform specific builds of Increment 1 Version 4 Control and Management software for LOS ANGELES, SSBN, VIRGINIA, SSGN and SEAWOLF Class capabilities. - Continue implementation of Increment 1 Version 4 security upgrades to meet Cyber Security and multiple certification requirements for General Service (GENSER) and Sensitive Compartmented Information (SCI) for all CSRR platforms. - Continue Multi-Purpose Reconfigurable Training System (MRTS) software upgrade for Increment 1 Version 4 CSRR baseline for LOS ANGELES, SSBN, and SSGN Class operator trainer and VIRGINIA Class maintenance trainer. - Continue updating the CSRR Acquisition Plan, Acquisition Strategy, System Engineering Plan, and Program Protection Plan to reflect changes for Increment 1 Version 4 through Version 6. - Commence planning for CSRR Increment 1 Version 3 Joint Interoperability Test Command (JITC) Re-Certification. - Commence development of the Test and Evaluation Master Plan (TEMP) and all preparations for Increment 1 Version 4 Developmental Test (DT) and Operational Test (OT) events. <p>FY 2017 Base Plans:</p> <ul style="list-style-type: none"> - Complete CSRR Increment 1 Version 3 Joint Interoperability Test Command (JITC) Re-Certification. - Complete updating the CSRR Acquisition Plan, Acquisition Strategy, System Engineering Plan, and Program Protection Plan to reflect changes for Increment 1 Version 4 through Version 6. - Continue CSRR Increment 1 Version 4 system engineering development and modernization for the LOS ANGELES, SSBN, VIRGINIA, SSGN, and SEAWOLF Class submarines. - Continue development of platform specific builds of Increment 1 Version 4 Control and Management software for LOS ANGELES, SSBN, VIRGINIA, SSGN, and SEAWOLF Class capabilities. 					

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Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604503N / SSN-688 & Trident Modernization	Project (Number/Name) 1411 / Sub Tact Comm System

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
<ul style="list-style-type: none"> - Continue implementation of Increment 1 Version 4 security upgrades to meet Cyber Security and multiple certification requirements for General Service (GENSER) and Sensitive Compartmented Information (SCI) for all CSRR platforms. - Continue Federal Information System Management Act (FISMA) statutory requirement for Cyber Security compliance and correction of Increment 1 Version 1 - Version 4 Cyber Security deficiencies. - Continue Multi-purpose Reconfigurable Training System (MRTS) software upgrade for Increment 1 Version 4 CSRR baseline for LOS ANGELES, SSBN, and SSGN Class operator trainer and VIRGINIA Class maintenance trainer. - Continue Supply Chain Risk Management (SCRM) assessment as part of Program Protection Plan revision. - Continue development of the Test and Evaluation Master Plan (TEMP) and all preparations for Increment 1 Version 4 Developmental Test (DT) and Operational Test (OT) events. - Commence CSRR Increment 1 Version 5 system engineering development and modernization for the LOS ANGELES, SSBN, VIRGINIA, SSGN, and SEAWOLF Class submarines. - Commence development of platform specific builds of Increment 1 Version 5 Control and Management software for LOS ANGELES, SSBN, VIRGINIA, SSGN, and SEAWOLF Class capabilities. - Commence contract planning for Control and Management Software contract re-compete. <p>FY 2017 OCO Plans: N/A</p>					
Accomplishments/Planned Programs Subtotals	8.648	9.353	10.002	0.000	10.002

C. Other Program Funding Summary (\$ in Millions)

<u>Line Item</u>	<u>FY 2015</u>	<u>FY 2016</u>	<u>FY 2017 Base</u>	<u>FY 2017 OCO</u>	<u>FY 2017 Total</u>	<u>FY 2018</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>Cost To Complete</u>	<u>Total Cost</u>
• 313000: <i>Submarine Communications</i>	64.954	60.945	64.529	-	64.529	64.483	64.233	67.794	69.177	Continuing	Continuing

Remarks

D. Acquisition Strategy

Program Milestones: Increment 1 Version 4 Preliminary Design Review (PDR) 1Q FY16, Critical Design Review (CDR) 4Q FY16, Developmental Test (DT) 3Q FY18, Operational Test (OT) 4Q FY18, and Fielding Decision 4Q FY18. Increment 1 Version 5 PDR 4Q FY18, CDR 3Q FY19, DT 2Q FY21, OT 3Q FY21, and Fielding Decision 4Q FY21.

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Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604503N / <i>SSN-688 & Trident Modernization</i>	Project (Number/Name) 1411 / <i>Sub Tact Comm System</i>

E. Performance Metrics

FY17 CSRR reduces the overall cost for implementation of Command, Control, Communications Computers, and Intelligence (C4I) Programs of Record components into the submarine external communications system by implementing block upgrades and reducing the integration/installation costs.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy												Date: February 2016			
Appropriation/Budget Activity				R-1 Program Element (Number/Name)				Project (Number/Name)							
1319 / 5				PE 0604503N / SSN-688 & Trident Modernization				1411 / Sub Tact Comm System							
Product Development (\$ in Millions)				FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Multi-Purpose Reconfigurable Training System (MRTS) Development	WR	SSC LANT : Charleston, SC	1.526	1.372	Dec 2015	0.777	Mar 2016	1.214	Dec 2016	-		1.214	Continuing	Continuing	Continuing
Systems Eng/Design Version 4	WR	NUWC : Newport, RI	6.015	3.678	Nov 2014	3.840	Jan 2016	3.782	Nov 2016	-		3.782	Continuing	Continuing	Continuing
Site Platform Integration/ Certification	WR	NUWC : Newport, RI	12.817	0.120	Nov 2014	0.130	Jan 2016	0.145	Nov 2016	-		0.145	Continuing	Continuing	Continuing
Software Development (CSRR)	C/CPIF	Lockheed Martin : San Diego, CA	4.460	2.095	Jan 2015	2.118	Feb 2016	2.338	Nov 2016	-		2.338	Continuing	Continuing	Continuing
Product Development Prior Years	Various	Various : Various	124.155	0.000		0.000		0.000		-		0.000	0.000	124.155	124.155
Subtotal			148.973	7.265		6.865		7.479		-		7.479	-	-	-
Support (\$ in Millions)				FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Integrated Logistics Support	WR	NUWC : Newport, RI	3.627	0.061	Nov 2014	0.192	Nov 2015	0.268	Nov 2016	-		0.268	Continuing	Continuing	Continuing
Software Engineering	WR	SSC PAC : San Diego, CA	3.481	0.170	Jan 2015	0.185	Nov 2015	0.207	Nov 2016	-		0.207	Continuing	Continuing	Continuing
Information Security/ Cyber Security (INFOSEC) Certification/Supply Chain Risk Management (SCRM) Assessment	Various	SSC PAC/SSC LANT/NUWC/ MITRE : San Diego, CA/Charleston, SC/ Newport, RI/San Diego	21.757	1.084	Nov 2014	1.536	Nov 2015	1.743	Nov 2016	-		1.743	Continuing	Continuing	Continuing
Subtotal			28.865	1.315		1.913		2.218		-		2.218	-	-	-

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy												Date: February 2016			
Appropriation/Budget Activity 1319 / 5				R-1 Program Element (Number/Name) PE 0604503N / SSN-688 & Trident Modernization				Project (Number/Name) 1411 / Sub Tact Comm System							
Test and Evaluation (\$ in Millions)				FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Developmental/ Operational Test and Evaluation (T&E)	WR	COTF, JITC : Various	11.285	0.000		0.500	Nov 2015	0.220	Nov 2016	-		0.220	Continuing	Continuing	Continuing
Subtotal			11.285	0.000		0.500		0.220		-		0.220	-	-	-
Management Services (\$ in Millions)				FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Support	C/CPFF	CSA/FSI : San Diego, CA	10.733	0.068	Jan 2015	0.075	Dec 2015	0.085	Nov 2016	-		0.085	Continuing	Continuing	Continuing
Subtotal			10.733	0.068		0.075		0.085		-		0.085	-	-	-
Project Cost Totals			199.856	8.648		9.353		10.002		-		10.002	-	-	-
Remarks															

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Exhibit R-4A, RDT&E Schedule Details: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604503N / SSN-688 & Trident Modernization	Project (Number/Name) 1411 / Sub Tact Comm System

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Proj 1411				
Fielding Decision (Increment 1 Version 4)	4	2018	4	2018
Fielding Decision (Increment 1 Version 5)	4	2021	4	2021
Technical Reviews (Increment 1 Version 4 Preliminary Design Review (PDR))	1	2016	1	2016
Technical Reviews (Increment 1 Version 4 Critical Design Review (CDR))	4	2016	4	2016
Technical Reviews (Increment 1 Version 5 Preliminary Design Review (PDR))	4	2018	4	2018
Technical Reviews (Increment 1 Version 5 Critical Design Review (CDR))	3	2019	3	2019
Technical Reviews (Increment 1 Version 6 Preliminary Design Review (PDR))	4	2021	4	2021
System Development (Increment 1 Version 4)	1	2015	4	2018
System Development (Increment 1 Version 5)	4	2017	4	2021
System Development (Increment 1 Version 6)	4	2020	4	2021
Contracts (Software---Lockheed Martin)	1	2015	4	2018
Contracts (Software-Follow-on to include planning)	1	2018	4	2021
Emergency Action Message (EAM) Certification (Increment 1 Version 4)	3	2018	4	2018
Emergency Action Message (EAM) Certification (Increment 1 Version 5)	2	2021	3	2021
Increment 1 Version 3 Operational Test (OT) deferrals & Special Operations Forces (SOF) testing	1	2015	2	2015
Increment 1 Version 3 Joint Interoperability Test Command (JITC) Re-Certification	2	2017	2	2017
Increment 1 Version 4 Joint Interoperability Test Command (JITC) Re-Certification	4	2018	4	2018
Increment 1 Version 5 Joint Interoperability Test Command (JITC) Re-Certification	4	2021	4	2021
Developmental Test (DT) (Increment 1 Version 4)	3	2018	3	2018
Operational Test (OT) (Increment 1 Version 4)	4	2018	4	2018

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

Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604503N / <i>SSN-688 & Trident Modernization</i>	Project (Number/Name) 1411 / <i>Sub Tact Comm System</i>
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Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Developmental Test (DT) (Increment 1 Version 5)	2	2021	2	2021
Operational Test (OT) (Increment 1 Version 5)	3	2021	3	2021
Procurement (Increment 1 Modernization Kits)	1	2015	4	2021
Installation (Increment 1 Modernization Kits)	1	2015	4	2021

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