

CLASSIFICATION: UNCLASSIFIED

EXHIBIT R-2, RDT&E BUDGET ITEM JUSTIFICATION **DATE**
May 2009

APPROPRIATION/BUDGET ACTIVITY RD TEN/BA 5			R-1 ITEM NOMENCLATURE 0604503N/SSN-688 AND TRIDENT MODERNIZATION				
COST (In Millions)	FY 2008	FY 2009	FY 2010				
Total PE Cost	114.354	142.836	122.733				
0219 / Sub Sonar Improvement (ENG)	59.548	67.651	59.321				
0742 / SUB INTEGRATED ANT SYS	31.818	57.851	40.667				
0775 / Submarine Supt Equip Prog	1.379	1.412	1.451				
1411 / SUBM TACT COMM SYS	15.439	15.922	21.294				
9999 / CONGRESSIONAL ADDS	6.170	0.000	0.000				

A. MISSION DESCRIPTION:

A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: The Submarine Support Equipment Program develops and improves submarine Electronic Warfare Support (EWS) techniques, components, equipment, and systems that will increase submarine operational effectiveness, safety of ship, and survivability in the increasingly dense and sophisticated electromagnetic environment caused by the proliferation of complex radar, communications, and navigation equipment of potential adversaries. Improvements 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 installed on SSN 688, 688I, 21, TRIDENT and SSGN Class Submarines to maintain clear acoustic, 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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May 2009

APPROPRIATION/BUDGET ACTIVITY

R-1 ITEM NOMENCLATURE

RD TEN/BA 5**0604503N/SSN-688 AND TRIDENT MODERNIZATION****B. PROGRAM CHANGE SUMMARY:**

Funding:	FY 2008	FY 2009	FY 2010
FY09 President's Budget	118.713	143.453	148.028
FY10 President's Budget	114.354	142.836	122.733
Total Adjustments	-4.359	-0.617	-25.295
(U) Summary of Adjustments			
Congressional Rescissions	0.000	0.000	0.000
Congressional Adjustments	0.000	-0.388	0.000
SBIR/STTR/FTT Assessment	-1.086	0.000	0.000
Program Adjustments	-2.887	-0.050	-24.252
Rate/Misc Adjustments	-0.386	-0.179	-1.043
Total	-4.359	-0.617	-25.295

FY09 through FY10 funding decrease due to the majority of the development CSD Inc 1 and SubHDR UNDEX being completed.

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EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION					DATE May 2009		
APPROPRIATION/BUDGET ACTIVITY RD TEN/BA 5		PROGRAM ELEMENT NUMBER AND NAME 0604503N/SSN-688 AND TRIDENT MODERNIZATION			PROJECT NUMBER AND NAME 0219/Sub Sonar Improvement (ENG)		
COST (In Millions)	FY 2008	FY 2009	FY 2010				
Project Cost	59.548	67.651	59.321				
RDT&E Articles Qty	0	0	0				
A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:							
<p>This program delivers block updates to Sonar Systems installed on SSN 688, 688I Flight, SSN 21, SSGN, Virginia, and SSBN 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 Array processing improvements for SSN 688I, SSGN, Virginia and SSN 21 Class Submarines. As part of CNO N872's plan to maintain acoustic superiority for In-Service Submarines a joint cooperative effort with PEO IWS-5 to deliver annual Advanced Processing Builds (APBs) to prevent obsolescence and deliver capability improvements is ongoing. The capabilities in the APBs will be integrated as part of A-RCI certified systems.</p> <p>Current developments to maintain Acoustic Superiority with new capability and prevent obsolescence are accomplished through annual Advanced Processing Builds (APBs). The capabilities in the APBs are integrated as part of the A-RCI certified systems.</p> <p>Sensor efforts provide increased operational capabilities for Littoral operations, situational awareness and reliability improvements.</p> <p>Towed system's development efforts provide increased operational capabilities and reliability improvements to maintain a clear acoustical, tactical, and operational superiority over submarine and surface combatants. These efforts include development of a Fiber Optic Thinline Towed Array, (TB-33) for increased reliability, the Next Generation Fatline Towed Array (TB-34) which provide improved Littoral Operational capability and the Low Cost Conformal Array, an HF array that provides enhanced situational awareness.</p>							

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EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION			DATE May 2009
APPROPRIATION/BUDGET ACTIVITY RD TEN/BA 5	PROGRAM ELEMENT NUMBER AND NAME 0604503N/SSN-688 AND TRIDENT MODERNIZATION	PROJECT NUMBER AND NAME 0219/Sub Sonar Improvement (ENG)	
B. ACCOMPLISHMENTS/PLANNED PROGRAM:			
	FY 2008	FY 2009	FY 2010
Accomplishments/Effort/Subtotal Cost	14.106	14.562	15.476
RDT&E Articles Quantity	0	0	0
APB Productionization			
FY08 through FY10 - 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 and test, and formal certification.			
	FY 2008	FY 2009	FY 2010
Accomplishments/Effort/Subtotal Cost	28.224	32.298	40.489
RDT&E Articles Quantity	0	0	0
Integration and Testing.			
Awarded new contracts to Lockheed Martin and General Dynamics in FY04 for continued A-RCI and MPP development, integration and test.			
FY08 through FY10 - Continued Integration and testing to support the introduction of Advanced Processing Builds to be installed on SSN 688I, SSN 688, SSBN 730, SSN 21, SSGN 726, VA Class, and new sensors TB-34 Towed Arrays, TB-33 Towed Arrays and Low Cost Conformal Array (LCCA).			
	FY 2008	FY 2009	FY 2010
Accomplishments/Effort/Subtotal Cost	2.000	2.200	0.000
RDT&E Articles Quantity	0	0	0
HF Precision Imaging Active Sonar			
Begin development efforts for HF Precision Imaging Active Sonar in FY07. The HF Precision Imaging Active Sonar provides improvements for under-ice capability and mine detection. This will assist the submarine in maneuvering near the bottom in medium and littoral waters, as well as the marginal ice zone and ice pack regions.			
	FY 2008	FY 2009	FY 2010
Accomplishments/Effort/Subtotal Cost	9.818	3.000	1.700
RDT&E Articles Quantity	0	0	0
Low Cost Conformal Array (LCCA) is a low cost HF array that provides enhanced situational awareness, providing the capability to extend passive detection range in littoral environments against quiet threats and multi-path ranging beyond first bottom bounce capability. The program is being developed by PEO-IWS-5 (PE 0603561N) and is currently scheduled to transition in FY08. EDM procurements, fabrication and assembly will begin in FY08. EDM Deliveries will be accepted in FY10. ARCI Integration, TECHEVAL and OPEVAL testing is planned for FY10.			
	FY 2008	FY 2009	FY 2010
Accomplishments/Effort/Subtotal Cost	5.400	2.066	0.000

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EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION (CONTINUATION)			DATE May 2009
APPROPRIATION/BUDGET ACTIVITY RDTEN/BA 5	PROGRAM ELEMENT NUMBER AND NAME 0604503N/SSN-688 AND TRIDENT MODERNIZATION	PROJECT NUMBER AND NAME 0219/Sub Sonar Improvement (ENG)	
RDT&E Articles Quantity		0	0
Affordable Towed Array Technology (TB-33) development provides more affordable and reliable thinline arrays using fiber optic technology and eliminating "wet end" electronics. Program began development in FY04, completed Critical Design Review in FY06 and has transitioned to Production Representative Unit (PRU) Fabrication.			
FY08 - Continue development of ATAT and begin operational testing in support of MS C decision.			
FY09 - Complete development and transition to MS C low rate initial production (LRIP).			
	FY 2008	FY 2009	FY 2010
Accomplishments/Effort/Subtotal Cost	0.000	13.525	1.656
RDT&E Articles Quantity	0	0	0
Future Sensor Capability - Providing array capability improves long range passive detection and wide area search capability.			
C. OTHER PROGRAM FUNDING SUMMARY:			
Line Item No. and Name	FY 2008	FY 2009	FY 2010
OPN BLI 214700 SSN Acoustics	235.979	203.311	243.052
OPN BLI 214705 SSN Acoustics Installation	74.609	71.903	56.910
Total	310.588	275.214	299.962
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 will be awarded to Lockheed Martin Maritime Systems & Sensors and General Dynamics, Advanced Information Systems in December 2008. Program Review with Milestone Decision Authority will be conducted in November 2008 granting approval for the FY09 production option.			
Thinline Arrays:			
Towed Systems is the development of a highly reliable and more affordable Fiber Optic Thinline variant towed array which uses fiber optic sensor technology for data collection and moves all outboard electronics from the array to inboard the submarine where they can be easily maintained. Cost savings in array production will be gained by using automated production techniques and significantly reducing or eliminating the "hand touch" labor common to today 's towed array production methods because of the number of different electronics that must be wired together to achieve the acoustics capabilities necessary to meet today's and tomorrow threats. This development is being accomplished under a Phase III SBIR. CDR was completed in FY06 and the program has transitioned to fabrication of Production Representative Units. Contract award for follow-on development awarded in 1st quarter FY07.			

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APPROPRIATION/BUDGET ACTIVITY RD TEN/BA 5	PROGRAM ELEMENT NUMBER AND NAME 0604503N/SSN-688 AND TRIDENT MODERNIZATION	PROJECT NUMBER AND NAME 0219/Sub Sonar Improvement (ENG)	
<p>Fatline Arrays: In FY04 Towed Systems awarded multiple competitive contracts for the development of a Fatline Towed Array which will provide better littoral operations and ranging. Development is complete and this program has now transitioned to initial production. Results of operational testing are expected in FY09.</p> <p>Hull Mounted Arrays: The Low Cost Conformal Array (LCCA) will transition from PEO IWS in FY08 with a competitive contract being awarded for the PRU development. PRU procurements, fabrication and assembly will begin in FY10. PRU Deliveries will be accepted in FY10. ARCI Integration, TECHEVAL and OPEVAL testing is planned for FY10.</p> <p>E. MAJOR PERFORMERS: Lockheed Martin Corporation, Naval Electronics and Surveillance Systems-Undersea Systems; Manassas, Virginia - Provides primary hardware development, software integration and systems engineering support for Advanced Processor Builds for SSN 688, 688 I, 21 and Virginia Class submarine sonar systems. Contract awards projected for October each fiscal year.</p> <p>General Dynamics, Advanced Information Systems; Fairfax, Virginia - Provides primary software development for SSN688, 688I, 21 and Virginia Class submarine sonar systems. Contract awards projected for October each fiscal year.</p> <p>Naval Undersea Warfare Center, Newport, Rhode Island - Provides systems engineering support for SSN688, 688I, 21 and Virginia Class submarine sonar systems. Work Requests to be issued October each fiscal year.</p> <p>Chesapeake Science Corporation, Millersville, Maryland: Provides primary hardware development, software integration and systems engineering support for the Affordable Towed Array Technology Initiatives.</p>			

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EXHIBIT R-3, RDT&E PROJECT COST ANALYSIS									DATE May 2009			
APPROPRIATION/BUDGET ACTIVITY RD TEN/BA 5		PROGRAM ELEMENT NUMBER AND NAME 0604503N/SSN-688 AND TRIDENT MODERNIZATION					PROJECT NUMBER AND NAME 0219/Sub Sonar Improvement (ENG)					
Cost Categories	Contract Method & Type	Performing Activity & Location	Total PY Cost (\$000)			FY 2009 Cost (\$000)	FY 2009 Award Date	FY 2010 Cost (\$000)	FY 2010 Award Date			
Primary Hardware Development	SS/CPIF	LMC, Manassas, VA	189.925			16.500	FEB-09	25.447	DEC-09			
Primary Hardware Development	Various	Chesapeake Sciences, MD	31.626			1.724	DEC-08	0.000				
Ancillary Hardware Development	SS/CP	ARL University of Texas, TX	14.058			4.000	FEB-09	2.534	FEB-10			
Systems Engineering	SS/CP	John Hopkins APL, MD	16.742			3.800	DEC-08	1.642	DEC-09			
Systems Engineering	SS/CPAF	Lockheed Eagan, MN	12.032			2.500	JAN-09	1.085	JAN-10			
Primary Hardware Development	SS/CPAF	Progeny Systems, VA	20.481			2.200	JAN-09	6.221	JAN-10			
Primary Hardware Development	SS/CPIF	LM Syracuse, NY	10.318			3.000	DEC-08	0.500				
Systems Engineering	WR	NUWC, Newport, RI	120.922			7.400	DEC-08	7.615	DEC-09			
Systems Engineering	WR	NSWC, Carderock, MD	8.990			1.500	DEC-08	1.557	DEC-09			
Systems Engineering	WR	NSWC, Crane IN	0.503			0.000		0.000				
Systems Engineering	WR	Naval Research Lab, DC	1.342			0.300	DEC-08	0.000				
Primary hardware Development	SS/CPIF	LM (IWS 5)	0.000			11.768	JAN-09	4.752	JAN-10			
Hardware/Software Development	Various	SBIR (Various)	1.728			0.013	JUN-09	0.128	JUN-10			
Subtotal Product Development			428.667			54.705		51.481				
Remarks: Program Review 09 program increase of \$14.2M in FY09 to support transition of Twin Line thin Line Towed Array development from PEO-IWS-5 to PMS401.												
Primary Software Development	SS/CPAF	General Dynamics, AIS	132.726			4.957	MAY-09	2.449	DEC-09			
Primary Software Development	SS/CPFF	Sedna Digital, VA	6.880			5.629	DEC-08	3.604	DEC-09			
Subtotal Support Costs			139.606			10.586		6.053				
Remarks:												
Operational Test and Evaluation	WR	OPTEVFOR	4.987			1.400	DEC-08	0.684	DEC-09			
Subtotal Test and Evaluation			4.987			1.400		0.684				
Remarks:												
Management Support Services	C/CP	EG&G Technical Services	8.522			0.810	FEB-09	0.853	FEB-10			
Travel	WR	NAVSEA	1.050			0.150	NOV-08	0.250	NOV-09			
Subtotal Management Services			9.572			0.960		1.103				
Remarks:												
Total Cost			582.832			67.651		59.321				

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EXHIBIT R-4, SCHEDULE PROFILE										DATE May 2009			
APPROPRIATION/BUDGET ACTIVITY RDTEN/BA 5			PROGRAM ELEMENT NUMBER AND NAME 0604503N/SSN-688 AND TRIDENT MODERNIZATION					PROJECT NUMBER AND NAME 0219B/R-4 LCCA					
Fiscal Year	2008				2009				2010				
	1	2	3	4	1	2	3	4	1	2	3	4	
LCCA Development				[Bar]									
Acquisition Milestones Milestone B Milestone C		MS B ◆				MS C ◇							
Development, Production Representative Units Submarine Test - TECHEVAL Submarine Test - OPEVAL		[Bar]									◇	◇	
Low Rate Initial Production (LRIP)								[Bar]					
Full Rate Production													
Production Deliveries													

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EXHIBIT R-4, SCHEDULE PROFILE

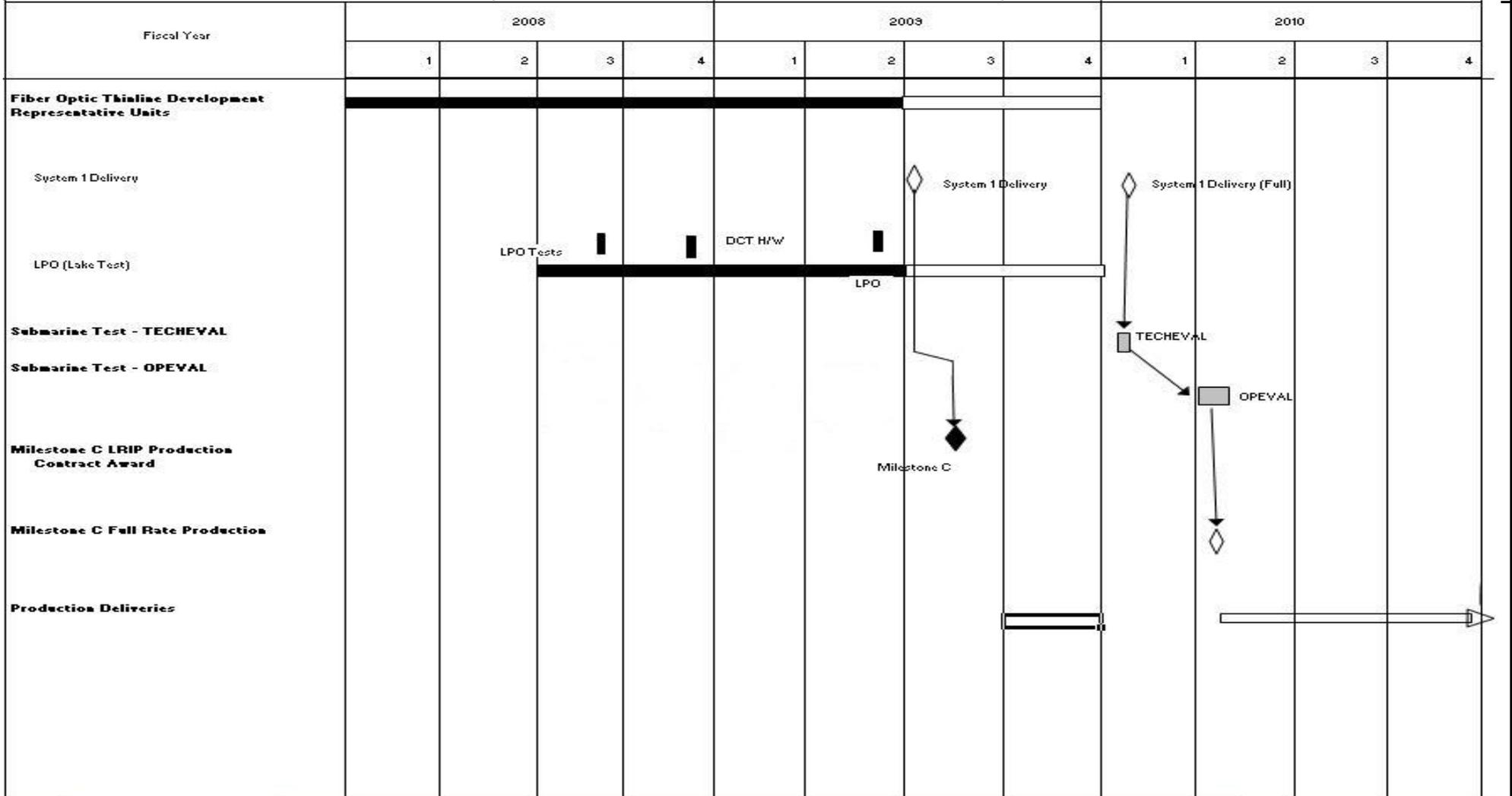
DATE

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APPROPRIATION/BUDGET ACTIVITY
RDTEN/BA 5

PROGRAM ELEMENT NUMBER AND NAME
0604503N/SSN-688 AND TRIDENT MODERNIZATION

PROJECT NUMBER AND NAME
0219C/R-4 TB-33



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EXHIBIT R-4, SCHEDULE PROFILE											DATE May 2009		
APPROPRIATION/BUDGET ACTIVITY RDTEN/BA 5		PROGRAM ELEMENT NUMBER AND NAME 0604503N/SSN-688 AND TRIDENT MODERNIZATION				PROJECT NUMBER AND NAME 0219D/R-4 TB-34							
Fiscal Year	2008				2009				2010				
	1	2	3	4	1	2	3	4	1	2	3	4	
Milestone C Decision (LRIP)/ ARB	◆												
Additional LPO Prototype Performance and Reliability Testing		■											
Production Contract Award	◆												
Material Procurement, Fab and Assembly	■	■	■	■									
SEA Test (Including LPO)				■									
Submarine Test - TECHEVAL						■							
Submarine Test - OPEVAL								■					
Phase III Operational Test													
Milestone C Decision (FRP)/ ARB										◆			
Production Deliveries											■	■	■

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EXHIBIT R-4a, SCHEDULE DETAIL						DATE May 2009	
APPROPRIATION/BUDGET ACTIVITY RD TEN/BA 5		PROGRAM ELEMENT NUMBER AND NAME 0604503N/SSN-688 AND TRIDENT MODERNIZATION			PROJECT NUMBER AND NAME 0219A/R-4 Acoustics		
Schedule Profile		FY 2008	FY 2009	FY 2010			
Milestone II (MS II) FY95							
ARCI APB Integration		1Q-2Q	1Q	1Q			
Annual Program Review		1Q-4Q	1Q-4Q	1Q-4Q			
Milestone C (MS C) FY04							
Production Awards		2Q	2Q	2Q			
APB Test Readiness Review (TRR)		2Q-3Q	4Q				
APB Sea Tests		2Q	3Q	2Q			
APB Deliveries		1Q	3Q	3Q			
Tech Insertions		1Q	4Q				
Installation Periods		1Q-4Q	1Q-4Q	1Q-4Q			

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EXHIBIT R-4a, SCHEDULE DETAIL						DATE May 2009	
APPROPRIATION/BUDGET ACTIVITY RD TEN/BA 5		PROGRAM ELEMENT NUMBER AND NAME 0604503N/SSN-688 AND TRIDENT MODERNIZATION			PROJECT NUMBER AND NAME 0219B/R-4 LCCA		
Schedule Profile		FY 2008	FY 2009	FY 2010			
LCCA Development FY08-FY09		4Q	1Q				
Acquisition Milestone B (MS B) Start		2Q					
Acquisition Milestone C			3Q				
Acquisition Milestone B (MS B) Complete			4Q				
Production Representative Units Delivery		2Q-4Q	1Q-4Q				
Submarine Test - TECHEVAL				3Q			
Submarine Test - OPEVAL				4Q			
Low Rate Initial Production			3Q-4Q	1Q-4Q			

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APPROPRIATION/BUDGET ACTIVITY RD TEN/BA 5		PROGRAM ELEMENT NUMBER AND NAME 0604503N/SSN-688 AND TRIDENT MODERNIZATION			PROJECT NUMBER AND NAME 0219C/R-4 TB-33		
Schedule Profile		FY 2008	FY 2009	FY 2010			
Fiber Optic Thinline Development FY02-FY09		1Q-4Q	1Q-4Q				
Detailed Design CDR FY06							
System Deliveries			3Q	1Q			
LPO Test (Lake Test)		3Q-4Q	2Q				
Submarine Test - TECHEVAL				1Q			
Submarine Test - OPEVAL				2Q			
MS C LRIP Production Contract Award			3Q				
MS C Full Rate Production				3Q			
Production Deliveries				3Q-4Q			

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Schedule Profile		FY 2008	FY 2009	FY 2010			
Multiple Development Contracts Awarded FY05							
Additional LPO Prototype Performance and Reliability Testing		2Q-3Q					
Production Contract Award		1Q					
Protests Resolved		1Q					
Submarine Test - TECHEVAL			3Q				
Submarine Test - OPEVAL				1Q			
Milestone C Decision (FRP) / ARB				2Q			
Production Deliveries				2Q-4Q			

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APPROPRIATION/BUDGET ACTIVITY RD TEN/BA 5		PROGRAM ELEMENT NUMBER AND NAME 0604503N/SSN-688 AND TRIDENT MODERNIZATION			PROJECT NUMBER AND NAME 0742/SUB INTEGRATED ANT SYS		
COST (In Millions)	FY 2008	FY 2009	FY 2010				
Project Cost	31.818	57.851	40.667				
RDT&E Articles Qty	0	0	0				
A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:							
<p>The Submarine Integrated Antenna System (SIAS) project (0742) provides for the development and testing of submarine antennas designed to meet emerging submarine requirements of: (a) Improved frequency coverage and data rate capabilities of submarine antennas and their interface to the External Communications System (ECS), (b) Improved 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) Improved 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-538/BRC (OE-538/BRC) Multi-Function Antenna, (2) OE-562 Submarine, High Data Rate (SubHDR) system development of Underwater Explosion (UNDEX) modification kits, (3) Development of new systems including Advanced High Data Rate (AdvHDR) and (4) Communication at Speed and Depth (CSD) design efforts. These efforts will provide Ship Submersible Nuclear (SSN), Ship Submersible Ballistic Nuclear (SSBN) and Ship Submersible Guided Nuclear (SSGN) platforms with an improved communications capability while operating at speed and depth thus enhancing operational flexibility and maintaining stealth in littoral mission applications.</p>							
U) JUSTIFICATION FOR BUDGET ACTIVITY:							
<p>This program is funded under ENGINEERING AND MANUFACTURING DEVELOPMENT because it encompasses engineering and manufacturing development of new end-items prior to production approval decision.</p>							
Notes/Comments:							
<p>1) FY09 through FY10 funding decrease due to the majority of the development CSD Inc 1 and SubHDR UNDEX being completed.</p>							

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B. ACCOMPLISHMENTS/PLANNED PROGRAM:			
	FY 2008	FY 2009	FY 2010
Antenna Transition Engineering	3.601	4.531	4.536
RDT&E Articles Quantity			
<p>FY08: Provided emerging requirements and satellite communications database/line analysis for other development programs (i.e. Mobile Users Objective System (MUOS)), WGS, High Frequency Internet Protocol (HF IP), Automatic Identification System (AIS). Continued P3I investigation and development efforts for the legacy antenna systems Continued concept engineering, new technology evaluations and assessments in support of current and future submarine antenna applications. Investigated multiple usage antennas, i.e. antennas that can be used for communications and other purposes.</p> <p>FY09: Continue to provide emerging requirements and satellite communications database/link analysis for other development programs i.e. MUOS, Mobile Networking High-band (MNH), Intra-Battlegroup Wireless Network (IBGWN), Wideband Global SATCOM (WGS), Advanced EHF, Link 16, HF IP. Continue P3I investigation and development efforts for the legacy antenna systems. Continue concept engineering, new technology evaluations and assessments in support of current and future submarine antenna applications; specifically to assess the impact to the sail and hull penetrators on different classes of submarines. Continue to investigate multiple usage antennas including antennas that can be used for communication and future submarine sail development.</p> <p>FY10: Continue to provide emerging requirements and satellite communications database/link analysis for other development programs i.e. MUOS, Link 16, WGS, Advanced EHF, other new waveforms. Continue P3I investigation and development efforts for the legacy antenna systems. Continue to investigate multiple usage antennas including antennas that can be used for communication in future submarine sail development. Continue concept engineering, new technology evaluations and assessments in support of current and future submarine antenna applications; specifically to assess the impact to the sail and hull penetrators on different classes of submarines.</p>			
	FY 2008	FY 2009	FY 2010
OE-538	2.202	6.884	10.376
RDT&E Articles Quantity			
<p>FY08: Prepared required acquisition and contract documents in preparation for OE-538 Increment 2 Milestone B decision to support MUOS, Link 16, and Iridium incorporation into the OE-538 antenna.</p> <p>FY 09: Continue system design for Increment 2 EDM hardware/software. Commence preparation of integration and system testing of Increment 2 system. Continue system engineering including development of documentation in preparation for a Milestone B contract award and Integrated Logistics Support (ILS) products for Increment 2.</p> <p>FY10: Continue system design for Increment 2 EDM hardware/software. Continue integration and system testing of Increment 2 system. Continue system engineering including development of documentation and Integrated Logistics Support (ILS) products for Increment 2. Commence development/update of required Milestone C acquisition documents.</p>			

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		FY 2008	FY 2009	FY 2010
SubHDR P3I		2.093	8.329	1.722
RDT&E Articles Quantity				
FY08: Commenced concept development and System Engineering for SubHDR antenna enhancement efforts required for compatibility with grade-A shock requirements. Commenced program planning, ECP/Integrated Logistic System (ILS) documentation and test support development of Grade-A shock requirements.				
FY09: Continue system engineering for the development efforts to meet grade-A shock requirement. Commence development of grade-A shock (UNDEX) improvement kits. Continue program planning, ECP/ILS documentation development, system integration and Design Verification Test (DVT) procedures.				
FY10: Continue UNDEX development and testing. Commence research and analysis on SubHDR components to increase performance reliability.				
		FY 2008	FY 2009	FY 2010
Advanced HDR		4.284	14.007	7.830
RDT&E Articles Quantity				
FY08: Commenced system definition/risk reduction and system development efforts. Initiated technology demonstration to prove maturity of system concept. Developed system development test documents and procedures. Commenced Milestone B documentation preparation.				
FY09: Continue design and acquisition documentation development in support of Milestone B. Continue system definition/risk reduction and system development efforts. Continue technology maturation and demonstration efforts. Continue system development engineering efforts.				
FY10: Continue design and acquisition documentation development in support of Milestone B. Continue system definition/risk reduction and system development efforts. Continue technology maturation and demonstration efforts. Continue system development engineering efforts.				
		FY 2008	FY 2009	FY 2010
Communications (Comms) at Speed and Depth		19.638	24.100	16.203
RDT&E Articles Quantity				
FY08: Continued cost share technology development with ONR for SeaDeep project. Continued to develop acquisition documentation, program management, contract management and systems engineering oversight in support of a Milestone B decision. Awarded a design/development contract for Increment 1 Engineering Development Models (EDMs). Installed the RTOF system aboard an OHIO Class submarine and provided technical oversight for the at-sea test. Removed RTOF and restored the boat to its original configuration. Continued testing and participating in the Sea Eagle Advanced Capability Technology Demonstration (ACTD) Military Utility Assessment (MUA) for Deep Siren Tactical Paging Buoy.				
FY09: Continue to develop Increment 1 EDMs and test assets for certification. Plan for developmental testing and an operational assessment (DT/OA) of the EDMs to				

CLASSIFICATION:	UNCLASSIFIED
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EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION (CONTINUATION)	DATE May 2009
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APPROPRIATION/BUDGET ACTIVITY RDTEN/BA 5	PROGRAM ELEMENT NUMBER AND NAME 0604503N/SSN-688 AND TRIDENT MODERNIZATION	PROJECT NUMBER AND NAME 0742/SUB INTEGRATED ANT SYS
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include updating the Test and Evaluation Master Plan (TEMP). Prepare Ship Alterations (SHIPALTs) in support of the EDM installations. Development of Increment 1 Capabilities Production Document (CPD), update acquisition documentation program management, contract management and systems engineering documentation in support of Milestone C - Low Rate Initial Production (LRIP).

FY10: Continue the design and development of the Increment 1 EDMs and test assets including integrating the CSD capability into the shore Broadcast Control Authority (BCA). Conduct developmental testing and an operational assessment (DT/OA) of the EDMs. Provide ongoing acquisition, program management, contracting and systems engineering oversight in support of CSD to include updating all acquisition documentation in preparation for a Milestone C decision.

C. OTHER PROGRAM FUNDING SUMMARY:

Related RDT&E:

PE 0602232N Space and Electronic Warfare (SEW) Technology

PE 0303109N Satellite Communications - Provides for the EHF transmitter and receiver that utilized the antenna developed under this program.

Line Item No. and Name	FY 2008	FY 2009	FY 2010						
3130 Submarine Communications	82.773	79.526	48.729						

D. ACQUISITION STRATEGY:

Program Milestones: FY08 3rd QTR CSD Milestone B (MS-B) for Increment 1; FY09 2nd QTR OE-538 INC 2 MS B.

The acquisition strategy of the CSD program is an Evolutionary Acquisition effort that will produce various capabilities to be fielded in Increments. The Program of Record will enter the Joint Capability Integration and Development System (JCIDS) process, in accordance with DoD 5000.2. The CSD Program focuses on providing Internet Protocol (IP), medium data rate, two-way communication with a submerged submarine throughout the full range of tactically relevant speeds and depths. A family of solutions is required to meet the multitude of communications and operational requirements on general Information Technology (IT) capabilities used by ship and shore operators.

T&E Milestones:

Contract Milestones:

OE-538: 4th QTR FY09 Development Contract Award

SubHDR: 2nd QTR FY08 FOT/SHF Procurement Contract

SubHDR: 4th QTR FY08 GBS/SHF Procurement Contract

CSD: 2nd QTR FY09 Development Contract Award

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EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION (CONTINUATION)			DATE May 2009
APPROPRIATION/BUDGET ACTIVITY RD TEN/BA 5	PROGRAM ELEMENT NUMBER AND NAME 0604503N/SSN-688 AND TRIDENT MODERNIZATION	PROJECT NUMBER AND NAME 0742/SUB INTEGRATED ANT SYS	
E. MAJOR PERFORMERS:			
Raytheon, Marlboro, MA - SHF/FOT Development, SubHDR Development			
Naval Undersea Warfare Center, Division Newport, RI - System Engineering, Technical Design Agent			

CLASSIFICATION:		UNCLASSIFIED										
EXHIBIT R-3, RDT&E PROJECT COST ANALYSIS									DATE			
									May 2009			
APPROPRIATION/BUDGET ACTIVITY		PROGRAM ELEMENT NUMBER AND NAME					PROJECT NUMBER AND NAME					
RD TEN/BA 5		0604503N/SSN-688 AND TRIDENT MODERNIZATION					0742/SUB INTEGRATED ANT SYS					
Cost Categories	Contract Method & Type	Performing Activity & Location	Total PY Cost (\$000)			FY 2009 Cost (\$000)	FY 2009 Award Date	FY 2010 Cost (\$000)	FY 2010 Award Date			
Digital Interface Dev (SubHDR)	CPAF	Raytheon, Marlboro, MA	3.545			0.000		0.000				
Digital Dev (SubHDR)	CPAF	Raytheon, Marlboro, MA	8.182			0.000		0.000				
Hardware Dev (SubHDR)	WX	NUWC, Newport, RI	2.723			0.477	DEC-08	0.250	DEC-09			
Hardware Dev (HDR SHF/FOT)	CPAF	Raytheon, Marlboro, MA	14.632			0.000		0.000				
Hardware Dev (AdvHDR)	WX	NUWC, Newport, RI	0.000			0.000		0.000				
Hardware Dev (Trans Eng)	CPAF	Sippican Marion, MA	1.910			0.000		0.000				
Hardware Dev (CSD)	CPAF	Apogen, CA	2.800			0.000		0.000				
Systems/Hardware Dev (CSD)	CPAF	Various	14.453			16.381	NOV-08	6.902	NOV-09			
Hardware Dev (OE-538)	CPAF	TBD	0.000			3.213	MAY-09	7.049	JAN-10			
Systems Engineering (OE-538)	CPAF	TBD	1.105			1.497	MAY-09	1.000	JAN-10			
Systems Engineering (OE-538)	WX	NUWC, Newport, RI	1.177			1.600	DEC-08	1.000	DEC-09			
Systems Engineering (SubHDR)	CPFF	Raytheon, Marlboro, MA	6.717			3.350	FEB-09	0.000				
System Engineering (SubHDR)	WX	NUWC, Newport, RI	12.571			1.850	DEC-08	0.000				
Systems Engineering (AdvHDR)	WX	NUWC, Newport, RI	7.316			7.662	DEC-08	2.450	DEC-09			
System Engineering (Trans Eng)	WX	NUWC, Newport, RI	16.360			3.583	DEC-08	3.450	DEC-09			
System Engineering (Trans Eng)	Various	Various	5.415			0.950	DEC-08	0.965	DEC-09			
System Engineering (CSD)	Various	Various	5.126			2.000	DEC-08	2.541	DEC-09			
System Engineering (CSD)	WX	SSC-SD, San Diego, CA	2.157			1.035	DEC-08	1.680	DEC-09			
Systems Engineering (CSD)	WX	NUWC, Newport, RI	9.333			1.850	DEC-08	1.809	DEC-09			
UNDEX Kit Development (SubHDR)	CPAF	Raytheon, Marlboro, MA	0.000			1.782	FEB-09	1.222	FEB-10			
Technology Maturation/Demonstrations Dev(AdvHDR)	CPAF	Various	0.000			6.345	JAN-09	6.176	JAN-10			
Research and Analysis Reliability Dev (SubHDR)	CPAF	TBD	0.000			0.000		0.000				
Subtotal Product Development			115.522			53.575		36.494				
Remarks:												
Software Development	WX	NUWC, Newport, RI	0.739			0.000		0.000				
Integrated Logistics Support	Various	Various	3.670			1.185	DEC-08	1.293	DEC-09			
Subtotal Support Costs			4.409			1.185		1.293				
Remarks:												

CLASSIFICATION:		UNCLASSIFIED										
EXHIBIT R-3, RDT&E PROJECT COST ANALYSIS									DATE May 2009			
APPROPRIATION/BUDGET ACTIVITY RDTEN/BA 5		PROGRAM ELEMENT NUMBER AND NAME 0604503N/SSN-688 AND TRIDENT MODERNIZATION					PROJECT NUMBER AND NAME 0742/SUB INTEGRATED ANT SYS					
Cost Categories	Contract Method & Type	Performing Activity & Location	Total PY Cost (\$000)			FY 2009 Cost (\$000)	FY 2009 Award Date	FY 2010 Cost (\$000)	FY 2010 Award Date			
Test & Evaluation (CSD)	WX	COTF	0.230			0.120	DEC-08	0.265	DEC-09			
Test & Evaluation (OE-538)	WX	COTF	0.070			0.070	NOV-08	0.082	NOV-09			
Test & Evaluation (SubHDR)	WX	NUWC, Newport, RI	0.272			0.750	DEC-08	0.550	DEC-09			
Developmental/Operational T&E	Various	Various	1.267			0.000		0.000				
Test & Evaluation (CSD)	WX	SSC-SD, CA	0.268			0.850	DEC-08	0.560	DEC-09			
Subtotal Test and Evaluation			2.107			1.790		1.457				
Remarks:												
Program Management Support	Various	Various	6.602			1.301	NOV-08	1.423	NOV-09			
Subtotal Management Services			6.602			1.301		1.423				
Remarks:												
Total Cost			128.640			57.851		40.667				

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UNCLASSIFIED

EXHIBIT R-4, SCHEDULE PROFILE

DATE

May 2009

APPROPRIATION/BUDGET ACTIVITY

PROGRAM ELEMENT NUMBER AND NAME

PROJECT NUMBER AND NAME

RDTEN/BA 5

0604503N/SSN-688 AND TRIDENT MODERNIZATION

0742/SUB INTEGRATED ANT SYS

Fiscal Year	2008				2009				2010																		
	1	2	3	4	1	2	3	4	1	2	3	4															
Acquisition (SubHDR) Milestones	★ FOT/SHF IOC																										
System Development					Underwater Explosion (UNDEX)																						
Performance Reliability Development & Testing									Research & Analysis for Performance Reliability																		
Production Representative EDM Demos	▲	▲▲																									
Hardware Delivery Initial Build Final Build																											
Test & Evaluation Milestones																											
Development Testing Technical Evaluation Operational Evaluation	▲ OT																										
FOT/SHF Procurement Contract Award	36 (Option 1) ▲				31 (Option 1) ▲				26 ▲				31 ▲														
FOT/SHF Production Deliveries					19 (Option 1) ▲				29 ▲				26 ▲				31 ▲										
GBM/SHF Procurement Contract Award	19 ▲				29 ▲				19 ▲				29 ▲														
GBM/SHF Production Deliveries					19 ▲				29 ▲																		

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UNCLASSIFIED

EXHIBIT R-4, SCHEDULE PROFILE

DATE

May 2009

APPROPRIATION/BUDGET ACTIVITY

PROGRAM ELEMENT NUMBER AND NAME

PROJECT NUMBER AND NAME

RDTEN/BA 5

0604503N/SSN-688 AND TRIDENT MODERNIZATION

0742B/Adv HDR

Fiscal Year	2008				2009				2010																							
	1	2	3	4	1	2	3	4	1	2	3	4																				
	Acquisition (AdvHDR)	██████████				Technology Development																										
Milestones																																
Requirements						▲			CDD																							
Technology Demonstration	██████████				DEMO																											
					██████████				Technology Maturation																							
System Development																																
Engineering Dev Model																																
Development Test																																
Contract/Deliveries (Down select)																																
Vendor 1																																
Vendor 2																																

CLASSIFICATION:

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EXHIBIT R-4, SCHEDULE PROFILE

DATE

May 2009

APPROPRIATION/BUDGET ACTIVITY

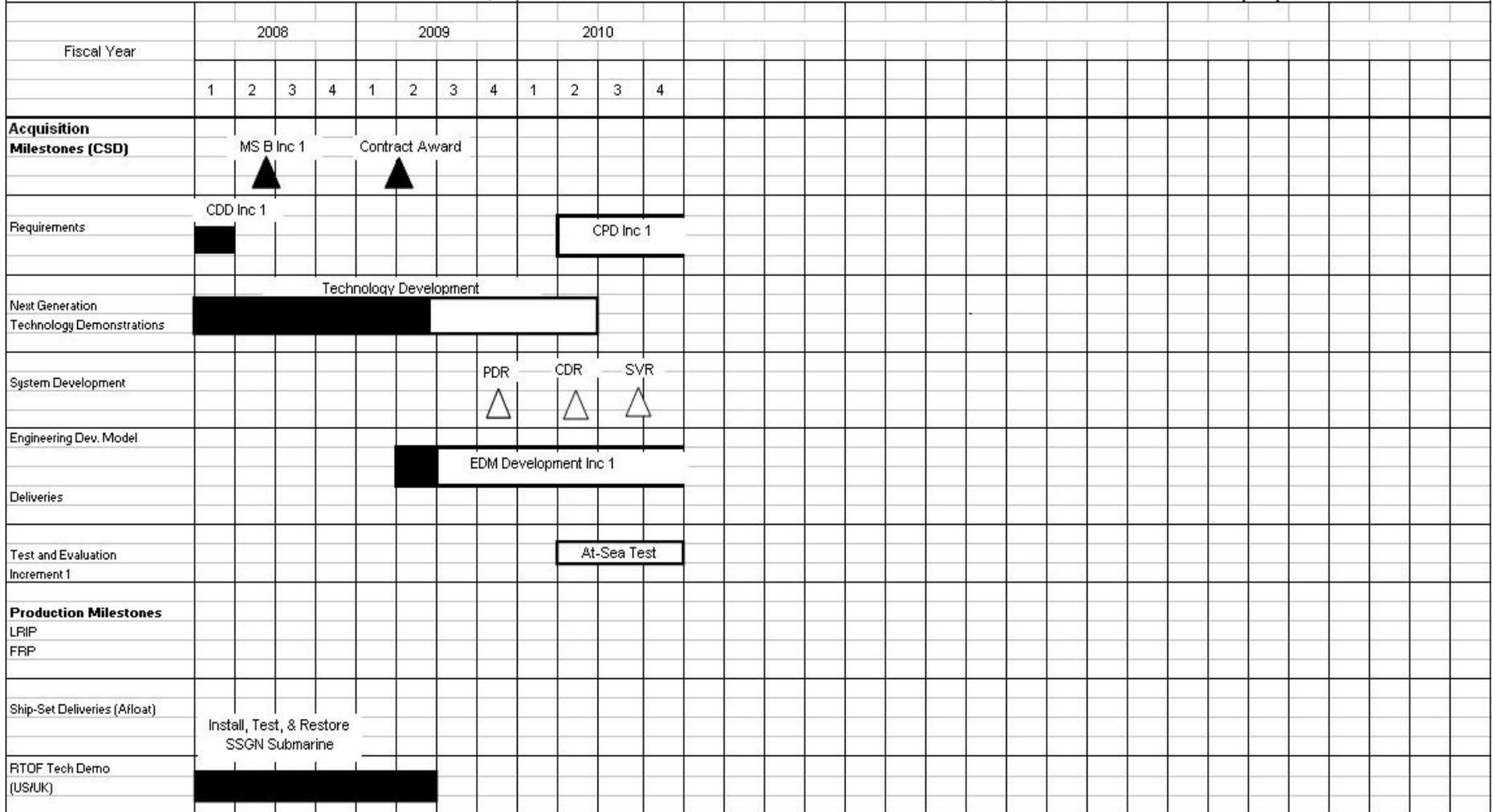
PROGRAM ELEMENT NUMBER AND NAME

PROJECT NUMBER AND NAME

RD TEN/BA 5

0604503N/SSN-688 AND TRIDENT MODERNIZATION

0742C/CSD



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EXHIBIT R-4, SCHEDULE PROFILE

DATE

May 2009

APPROPRIATION/BUDGET ACTIVITY

PROGRAM ELEMENT NUMBER AND NAME

PROJECT NUMBER AND NAME

RD TEN/BA 5

0604503N/SSN-688 AND TRIDENT MODERNIZATION

0742D/OE-538

Fiscal Year	2008				2009				2010																							
	1	2	3	4	1	2	3	4	1	2	3	4																				
Acquisition OE-538 Inc 2 Milestones						MS B																										
Requirements	CDD									CPD																						
System Development										PDR			System Development																			
Engineering Dev. Model													EDM Development																			
Development Contract Award						Contract Award																										
Testing																																
Contract Deliveries																																
LRIP Contract Options																																
LRIP Deliveries																																
FRP Contract Options																																
FRP Deliveries																																

CLASSIFICATION:		UNCLASSIFIED					
EXHIBIT R-4a, SCHEDULE DETAIL						DATE May 2009	
APPROPRIATION/BUDGET ACTIVITY RD TEN/BA 5		PROGRAM ELEMENT NUMBER AND NAME 0604503N/SSN-688 AND TRIDENT MODERNIZATION			PROJECT NUMBER AND NAME 0742/SUB INTEGRATED ANT SYS		
Schedule Profile		FY 2008	FY 2009	FY 2010			
FOT/SHF Production Representative EDM		1-2Q					
FOT/SHF Operational Evaluation (OPEVAL)		1Q					
Research & Analysis for Performance Reliability				1-4Q			
Performance Reliability Development/Test							
FOT/SHF IOC		1Q					
FOT/SHF Contract Award		2Q					
FOT/SHF Full Rate Production (FRP) First Delivery			3Q				
GBS/SHF Contract Award		4Q					
GBS/SHF Full Rate Production (FRP) First Delivery				1Q			
UNDEX Development			1-4Q	1Q			
UNDEX Contract Option				2Q			
UNDEX Full Rate Production (FRP) First Delivery							

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EXHIBIT R-4a, SCHEDULE DETAIL						DATE May 2009	
APPROPRIATION/BUDGET ACTIVITY RD TEN/BA 5		PROGRAM ELEMENT NUMBER AND NAME 0604503N/SSN-688 AND TRIDENT MODERNIZATION			PROJECT NUMBER AND NAME 0742B/Adv HDR		
Schedule Profile		FY 2008	FY 2009	FY 2010			
Milestone B Decision (MS B)							
Milestone C Decision (MS C)							
EDM Award							
EDM Delivery							
Capabilities Development Document (CDD)			3Q-4Q	1Q-2Q			
Capabilities Production Document (CPD)							
Preliminary Design Review (PDR)							
Critical Design Review (CDR)							
Operational Assessment (OA)							
LRIP Award							

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EXHIBIT R-4a, SCHEDULE DETAIL						DATE May 2009	
APPROPRIATION/BUDGET ACTIVITY RD TEN/BA 5		PROGRAM ELEMENT NUMBER AND NAME 0604503N/SSN-688 AND TRIDENT MODERNIZATION			PROJECT NUMBER AND NAME 0742C/CSD		
Schedule Profile		FY 2008	FY 2009	FY 2010			
Technology Demonstrations		1Q-4Q	1Q-4Q	1Q-4Q			
RTOF Install, Test, and Restore		1Q-4Q	1Q-2Q				
Capabilities Development Document Increment 1		1Q					
Milestone B Decision Increment 1		2Q					
Contract Award Increment 1		4Q					
EDM Development Increment 1		4Q	1Q-4Q	1Q-4Q			
Preliminary Design Review (PDR) Increment 1			3Q				
Critical Design Review (CDR) Increment 1			4Q				
EDM Deliveries Increment 1				1Q			
Capabilities Production Document (CPD) Increment 1			1Q-4Q				
Test and Evaluation Increment 1				1Q-4Q			
Milestone C Decision Increment 1							
Initial Operational Capability (IOC) Increment 1							
Follow-on Test & Evaluation Increment 1							
Capabilities Development Document (CDD) Increment 2							
Milestone B Decision Increment 2							
EDM Development Increment 2							
Development Acquisition Documentation Increment 2							

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EXHIBIT R-4a, SCHEDULE DETAIL						DATE May 2009	
APPROPRIATION/BUDGET ACTIVITY RD TEN/BA 5		PROGRAM ELEMENT NUMBER AND NAME 0604503N/SSN-688 AND TRIDENT MODERNIZATION			PROJECT NUMBER AND NAME 0742D/OE-538		
Schedule Profile		FY 2008	FY 2009	FY 2010			
Capability Development Document (CDD)		1Q-4Q					
Milestone B Decision (MS B)			2Q				
Development Contract Award			3Q				
System Development			3Q-4Q	1Q-4Q			
Engineering Development Model Development			3Q-4Q	1Q-4Q			
Preliminary Design Review (PDR)			4Q				
Critical Design Review (CDR)							
Eng Dev Model (EDM) - Delivery							
Developmental Test (DT)							
Operational Assessment							
Operational Test (OT)							
Capability Production Document (CPD)				1Q-4Q			
Milestone C (MS C) Decision							
LRIP							
LRIP First Delivery							
Full Rate Production Decision							
IOC							
Full Rate Production Contract Award							
Full Rate Production First Delivery							

CLASSIFICATION:		UNCLASSIFIED					
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION					DATE May 2009		
APPROPRIATION/BUDGET ACTIVITY RD TEN/BA 5		PROGRAM ELEMENT NUMBER AND NAME 0604503N/SSN-688 AND TRIDENT MODERNIZATION			PROJECT NUMBER AND NAME 0775/Submarine Supt Equip Prog		
COST (In Millions)	FY 2008	FY 2009	FY 2010				
Project Cost	1.379	1.412	1.451				
RDT&E Articles Qty	0	0	0				
A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:							
<p>This program develops and improves techniques, components, equipment, and systems that will increase submarine operational effectiveness, safety of ship, and survivability in the increasingly dense and sophisticated electromagnetic environment caused by the proliferation of complex radar, communications, and navigation equipment of potential adversaries. Improvements are necessary for Submarine Electronic Warfare Support (ES) systems to be operationally effective in the following mission areas: Joint Littoral Warfare; Joint Surveillance, Space and Electronic Warfare and Intelligence Collection; Maritime Protection; Information Operations, Special Operations Force (SOF) Support; and Joint Strike. Efforts include: (1) Integration of the technology developed and transitioned from the Advanced Submarine Support Equipment Program (ASSEP), project F0770 into the tactical ES system; (2) Resolution of software trouble reports during technology updates, from fleet feedback reports, and Submarine Warfare Federated Tactical System (SWFTS)/Non Propulsion Electronic System (NPES) Tactical Local Area Network (TACLAN) migrations; (3) Integration, test, and installation of COTS technology for system enhancements.</p> <p>The Advanced Electronic Warfare Support (ES) Development Projects include the development of: PATRIOT Phase B - Low Probability of Intercept (LPI) Radar, LPI Direction Finding (DF), Distant ES Support and Remote Log-In, Specific Emitter Identification (SEI) Improvements, ES Vulnerability Tool, Integrated ES and ECS Radio Frequency Distribution Unit (RFDU), Multi-function Modular Mast (MMM) payloads, Mast Signature Reduction, PATRIOT Non-Scanning LPI Radar, Capability and Technical Initiatives, and next generation processes and radar wideband miniaturization.</p> <p>RDTE Funding line supports the entire AN/BLQ-10 ES procurement program. Average FY OPN and SCN hardware procurement yearly funds are \$100M.</p>							

CLASSIFICATION:		UNCLASSIFIED					
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION							DATE May 2009
APPROPRIATION/BUDGET ACTIVITY RDTEN/BA 5		PROGRAM ELEMENT NUMBER AND NAME 0604503N/SSN-688 AND TRIDENT MODERNIZATION			PROJECT NUMBER AND NAME 0775/Submarine Supt Equip Prog		
B. ACCOMPLISHMENTS/PLANNED PROGRAM:							
		FY 2008		FY 2009		FY 2010	
Accomplishments/Effort/Subtotal Cost		1.379		1.412		1.451	
RDT&E Articles Quantity		0		0		0	
FY 08 Conduct Test of Specific Emitter Identification enhancements, Automatic Contact Correlation, LPI Receiver DF, EVS Test, Auto Calibration & testing, IO payload development, algorithm development. NPES and SWFTS software baseline changes.							
FY 09 Conduct Test of Specific Emitter Identification, Automatic Contact Correlation, and LPI Receiver. Passive Ranging Development and Processor improvements. Research and resolve AN/BLQ-10 SPRs							
FY 10 Complete Test of LPI Receiver. Develop remote maintenance, processor improvements, Advanced EW tuners, and IO payloads. Research and resolve AN/BLQ-10 SPRs. NPES and SWFTS software baseline changes.							
C. OTHER PROGRAM FUNDING SUMMARY:							
Line Item No. and Name	FY 2008	FY 2009	FY 2010				
OPN LI 2560/Submarine Supt Equip Prog	118.896	103.291	98.645				
SCN LI 201300/Virginia Class Submarine	25.824	28.045	28.206				
Related RDT&E:							
(U) PE 0603562N/Submarine Tactical Warfare System							
D. ACQUISITION STRATEGY: AN/BLQ-10 (V) ES System - Procurements are executed/managed in accordance with the Acquisition Strategy Report (Rev 4) for AN/BLQ-10(V) ES System dtd 3/7/06 and the Acquisition Plan (Rev 6) for AN/BLQ-10(V) ES System dtd 3/7/06.							
E. MAJOR PERFORMERS: Lockheed-Martin, Syracuse, NY - AN/BLQ-10 system developer and End-to-End Integrator NUWC, Newport, RI - EW Library developer, AN/BLQ-10 systems engineering, TEMPALT development, integration support, DT/OT support, ISEA, and TDA.							

CLASSIFICATION:		UNCLASSIFIED										
EXHIBIT R-3, RDT&E PROJECT COST ANALYSIS										DATE		
										May 2009		
APPROPRIATION/BUDGET ACTIVITY		PROGRAM ELEMENT NUMBER AND NAME					PROJECT NUMBER AND NAME					
RD TEN/BA 5		0604503N/SSN-688 AND TRIDENT MODERNIZATION					0775/Submarine Supt Equip Prog					
Cost Categories	Contract Method & Type	Performing Activity & Location	Total PY Cost (\$000)			FY 2009 Cost (\$000)	FY 2009 Award Date	FY 2010 Cost (\$000)	FY 2010 Award Date			
AN/BLQ-10 ES Product Development	CPFF	Various Contractors	1.770			0.626	MAR-09	0.471	MAR-10			
Systems Engineering & Test Spt	WX	NUWC, Newport, RI	1.312			0.380	MAR-09	0.500	MAR-10			
Miscellaneous	Various	Various	0.235			0.041	MAR-09	0.100	MAR-10			
Subtotal Product Development			3.317			1.047		1.071				
Remarks:												
Engineering Technical Services	CPAF	AT&T GSI, VA	0.680			0.221	MAR-09	0.230	MAR-10			
Subtotal Support Costs			0.680			0.221		0.230				
Remarks:												
Travel	WX	NAVSEA	0.240			0.087	TBD	0.020	TBD			
SBIR Assessment			0.168			0.057	TBD	0.060	TBD			
Labor (Research Personnel)			0.052			0.000	TBD	0.070	TBD			
Subtotal Management Services			0.460			0.144		0.150				
Remarks:												
Total Cost			4.457			1.412		1.451				

CLASSIFICATION:

UNCLASSIFIED

EXHIBIT R-4, SCHEDULE PROFILE

DATE

May 2009

APPROPRIATION/BUDGET ACTIVITY
RDTE/BA 5

PROGRAM ELEMENT NUMBER AND NAME
0604503N/SSN-688 AND TRIDENT MODERNIZATION

PROJECT NUMBER AND NAME
0775/Submarine Supt Equip Prog

Fiscal Year	2008				2009				2010																							
	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				
SSEP F0775 SCHEDULE																																
AN/BLQ-10 Baseline SWFTS and NPES Changes, SPR Resolution and Software Enhancements	S/W Update	△			S/W Update	△			S/W Update	△																						
Specific Emitter ID/Auto Contact Correlation			Spiral 1	△																												
Low Probability of Intercept DF (LPI)		At Sea test	△			Spiral 1	△																									
Advanced EW Tuners		Test	△		Integrate	△					Research	△																				
Multifunction Modular Mast (MMM) Payload											Research	△																				
Processor Upgrade																																
Remote Maintenance		Integrate	△																													
EVS									Research	△																						
Capability Insertions					Research	△				Research	△																					

CLASSIFICATION:		UNCLASSIFIED					
EXHIBIT R-4a, SCHEDULE DETAIL						DATE May 2009	
APPROPRIATION/BUDGET ACTIVITY RD TEN/BA 5		PROGRAM ELEMENT NUMBER AND NAME 0604503N/SSN-688 AND TRIDENT MODERNIZATION			PROJECT NUMBER AND NAME 0775/Submarine Supt Equip Prog		
Schedule Profile		FY 2008	FY 2009	FY 2010			
AN/BLQ-10 BASELINE CHANGES, SPR RESOLUTION, AND SOFTWARE ENHANC		2Q	2Q	2Q			
SPECIFIC EMITTER ID/ACC & VIRGINIA DT/OT							
--Test							
--Spiral 1		3Q					
LOW PROBABILITY OF INTERCEPT DF (LPI)							
--Integrate							
--At-Sea Test		2Q					
--Spiral 1			3Q				
ADVANCED EW TUNERS							
--Research				4Q			
--Test		3Q					
--Integrate			1Q				
CAPABILITY INSERTIONS (NRE for Integration)							
--Research							
--PROCESSOR UPGRADE							
--Test							
--Integrate							
--Research				3Q			
REMOTE MAINTENANCE							
--Test							
--Integrate		2Q					
EVS							
--Research				1Q			
--Test							
--Integrate							
--Research							
PULSE DIGITIZER UPGRADE							
Capability Insertions							
--Research			2Q	3Q			

CLASSIFICATION:		UNCLASSIFIED					
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION					DATE May 2009		
APPROPRIATION/BUDGET ACTIVITY RD TEN/BA 5		PROGRAM ELEMENT NUMBER AND NAME 0604503N/SSN-688 AND TRIDENT MODERNIZATION			PROJECT NUMBER AND NAME 1411/SUBM TACT COMM SYS		
COST (In Millions)	FY 2008	FY 2009	FY 2010				
Project Cost	15.439	15.922	21.294				
RDT&E Articles Qty	0	0	0				
A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:							
<p>The Submarine Tactical Communications System project (1411) provides submarines with communications systems designed to: (a) enhance data throughput through automation and integrated network management; (b) convert to ForceNet and tactical data networks, (c) provide submarines Internet Protocol (IP) connectivity; (d) be interoperable with other joint United States (U.S.) and combined allied military networks; and (e) 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) integrates COTS and Government Off-The-Shelf (GOTS) components into a single radio room configuration for all classes of submarines. CSRR leverages the development of VIRGINIA Class Exterior Communications System (ECS) which includes Open Systems Architecture (OSA) design. The project utilizes land-based integration test facilities to integrate C4I Program of Record (POR) components into the open architecture prior to fleet implementation on all submarine platforms. This project funds the development of a replacement Simulation/Stimulation (SIM/STIM) suite to support testing and training requirements. The project includes system engineering efforts associated with demonstration of new technology which will allow submarines to connect to the Global Information Grid (GIG) and participate in strike group, as well as joint 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 joint and combined fight to achieve total battlespace dominance.</p>							
(U) JUSTIFICATION FOR BUDGET ACTIVITY:							
<p>This program is funded under SYSTEMS DEVELOPMENT and DEMONSTRATION because it encompasses development and demonstration of new end-items prior to production approval decision.</p>							
Notes/Comments:							
<p>1) FY09 through FY10 funding increase due to Increment 1 Ver 3 and the addition of LOS ANGELES platform development into CSRR.</p> <p>2) Per Acquisition Decision Memorandum signed by ASN RDA dated 15 July 2008 approval to consolidate Increments 1 and 2 to a single Increment 1 with multiple block upgrades (Versions).</p>							

CLASSIFICATION:		UNCLASSIFIED	
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION			DATE May 2009
APPROPRIATION/BUDGET ACTIVITY RD TEN/BA 5	PROGRAM ELEMENT NUMBER AND NAME 0604503N/SSN-688 AND TRIDENT MODERNIZATION	PROJECT NUMBER AND NAME 1411/SUBM TACT COMM SYS	
B. ACCOMPLISHMENTS/PLANNED PROGRAM:			
	FY 2008	FY 2009	FY 2010
BCA OPCON architecture	0.497	0.000	0.000
RDT&E Articles Quantity	0	0	0
FY08: Completed system engineering supporting BCA/OPCON architecture (\$0.497).			
	FY 2008	FY 2009	FY 2010
Common Sub Radio Room/Sub Comms Support System	14.942	15.922	21.294
RDT&E Articles Quantity	0	0	0
FY08: Completed software integration of the CSRR Information Assurance (IA) requirements for Digital Modular Radio (DMR) and other component programs into the Control & Management (C&M) software (\$1.335). Completed systems engineering for DMR 6.4 and Super High Frequency (SHF) integration into the CSRR architecture (\$1.643). Completed system engineering/design development for Submarine Communications Support Systems (SCSS) modernization (\$0.232). Commenced system engineering and development of Multi-Purpose Reconfigurable Training System (MRTS) for maintenance trainers (\$2.101). Continued implementation of security upgrades to meet IA, Information Security (INFOSEC) and multiple levels of certification requirements General Service (GENSER) and Sensitive Compartmented Information (SCI) for all CSRR platforms (\$3.879). Commenced software integration of new technologies for CSRR Increment 1 Ver 2 into the C&M control system (\$2.878). Commenced systems engineering design development testing supporting CSRR modernization Increment 1 Ver 2 (\$2.874).			
FY09: Continue system engineering and development of maintenance trainers Increment 1 Ver 1, and upgrade maintenance operator MRTS to CSRR Increment 1 Ver 2 baseline (\$3.274). Continue implementation of security upgrades to meet IA, INFOSEC and multiple levels of certification requirements for General Service (GENSER) and SCI for all CSRR platforms (\$3.606). Continue systems engineering/design development and to support testing for CSRR Increment 1 Ver 2 for VIRGINIA FLT 1&2, SEAWOLF and complete Ship Submersible Guided Nuclear (SSGN) platforms (\$5.088). Upgrade Control & Management (C&M) software integration of CSRR Increment 1 Ver 2 capabilities (\$3.081). Commence systems engineering development efforts supporting CSRR modernization Increment 1 Ver 3 for LOS ANGELES class submarines (\$0.950).			
FY10: Complete MRTS software upgrade for Increment 1 Ver 1 and Ver 2 CSRR baselines (\$1.105). Commence MRTS software upgrade for Increment 1 Ver 3 (\$1.900). Continue implementation of security upgrades to meet IA, INFOSEC and multiple levels of certification requirements for GENSER and SCI on all CSRR platforms. (\$4.566). Complete systems engineering/design development and testing for CSRR Increment 1 Ver 2 for VIRGINIA FLT 1&2 and SEAWOLF platforms (\$2.045). Continue systems engineering development efforts for CSRR modernization Increment 1 Ver 3 for LOS ANGELES (LA) class submarines (\$1.866). Commence systems engineering development efforts supporting CSRR modernization Increment 1 Ver 3 for SEAWOLF, VIRGINIA and OHIO (SSGN) class submarines (\$3.882). Commence upgrade of C&M software to include Increment 1 Ver 3 capabilities (\$5.521). Conduct Follow on Test and Evaluation (FOT&E), Developmental Testing (DT) and Operation Assessment (OA) efforts on the CSRR platforms (\$0.700).			

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EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION (CONTINUATION)								DATE May 2009	
APPROPRIATION/BUDGET ACTIVITY RDTEN/BA 5		PROGRAM ELEMENT NUMBER AND NAME 0604503N/SSN-688 AND TRIDENT MODERNIZATION				PROJECT NUMBER AND NAME 1411/SUBM TACT COMM SYS			
C. OTHER PROGRAM FUNDING SUMMARY: Related RDT&E PE 0602232N Space and Electronic Warfare (SEW) Technology PE 0204163N Fleet Communications									
Line Item No. and Name		FY 2008	FY 2009	FY 2010					
31300 Submarine Communications		82.773	79.526	48.729					
D. ACQUISITION STRATEGY: CSRR transforms LOS ANGELES, OHIO and SEAWOLF Class radio rooms from suites of class-specific, closed system equipment to a common design which incorporates Open System Architecture (OSA) communications equipment. CSRR will leverage VIRGINIA Class Exterior Communication System (ECS) design, utilize VIRGINIA Class ECS Control and Management (C&M) software, apply a systems approach to design and implementation of Joint Maritime Communication System (JMCOMS), and maximize use of COTS products and emerging technologies. Program Milestones: Increment 1 CSRR - FRP 4Q FY07, T&E Milestones: Completed CSRR SSBN TECHEVAL 2Q FY07, CSRR SSBN OPEVAL 2Q FY07, CSRR SSGN TECHEVAL 1Q FY07, CSRR SSGN OPEVAL 3Q FY07. All FY07 testing reported operationally suitable and operationally effective. Increment 1 Ver 2 FOT&E DT scheduled 2Q FY10, OT 3Q on SSGN platform.									
E. MAJOR PERFORMERS: Naval Undersea Warfare Center, Division Newport, RI - Technical Design Agent & System Integration Lockheed Martin/Maritime Sensors & Systems, Eagan, MN - Software Development									

CLASSIFICATION:		UNCLASSIFIED										
EXHIBIT R-3, RDT&E PROJECT COST ANALYSIS									DATE			
									May 2009			
APPROPRIATION/BUDGET ACTIVITY		PROGRAM ELEMENT NUMBER AND NAME				PROJECT NUMBER AND NAME						
RD TEN/BA 5		0604503N/SSN-688 AND TRIDENT MODERNIZATION				1411/SUBM TACT COMM SYS						
Cost Categories	Contract Method & Type	Performing Activity & Location	Total PY Cost (\$000)			FY 2009 Cost (\$000)	FY 2009 Award Date	FY 2010 Cost (\$000)	FY 2010 Award Date			
Hardware Development	CPFF	SSC-SD/NUWC Newport, RI	2.776			0.000		0.000				
Hardware Development*	CPFF	SSCs/NUWC Newport, RI	0.211			0.000		0.000				
MCS Development	Various	Motorola, misc labs	10.214			0.000		0.000				
H/W Development Facilities	Various	NUWC Newport, RI	0.000			0.000		0.000				
Software Development	CPFF/WX	SSC-SD San Diego, CA	2.068			0.000		0.000				
Software Development	WX	NUWC Newport, RI	5.498			0.000		0.000				
MRTS Development	CPFF	NAVAIR, Orlando	5.592			3.274	JAN-09	3.005	JAN-10			
Systems Engineering	Various	Misc Labs	21.262			4.087	JAN-09	4.669	DEC-09			
Systems Eng/Design 688 Class	Various	Misc Labs	3.606			0.950	JAN-09	1.866	DEC-09			
Site Platform Integration/Certification	Various	NUWC Newport, RI	10.762			0.323	JAN-09	0.598	DEC-09			
BCA/OPCON architecture	WX	NUWC Newport, RI	3.683			0.000		0.000				
Subtotal Product Development			65.672			8.634		10.138				
Remarks:												
* CSRR Development for OHIO Class submarines												
Software Development (CSRR)	CPAF	Lockheed Martin Tech Sys	19.120			2.493	JAN-09	4.964	JAN-10			
Integrated Logistics Support	WR	NUWC Newport, RI	1.828			0.253	DEC-08	0.488	DEC-09			
Software Engineering	WR	SSC-SD San Diego, CA	1.153			0.588	DEC-08	0.605	DEC-09			
INFOSEC/IA Certification	Various	Various	6.854			3.206	DEC-08	3.629	DEC-09			
Subtotal Support Costs			28.955			6.540		9.686				
Remarks:												
Developmental/Operational T&E	Various	Various	8.583			0.000	DEC-08	0.700	DEC-09			
Subtotal Test and Evaluation			8.583			0.000		0.700				
Remarks:												
Program Management Support	Various	Various	7.843			0.748	DEC-08	0.770	DEC-09			
Subtotal Management Services			7.843			0.748		0.770				
Total Cost			111.053			15.922		21.294				
Remarks:												

CLASSIFICATION:

UNCLASSIFIED

EXHIBIT R-4, SCHEDULE PROFILE

DATE
May 2009

APPROPRIATION/BUDGET ACTIVITY
RD TEN/BA 5

PROGRAM ELEMENT NUMBER AND NAME
0604503N/SSN-688 AND TRIDENT MODERNIZATION

PROJECT NUMBER AND NAME
1411/SUBM TACT COMM SYS

Fiscal Year	2008				2009				2010																		
	1	2	3	4	1	2	3	4	1	2	3	4															
Acquisition Milestones	Gate 6 Review ▲								Inc1V2 Fielding Decision * △																		
Technical Reviews	SSGN 11V2 CDR ● SW 11V2 PDR ●				SSBN 11V1 VCD ● 11V3 PDR ○ SW 11V2 CDR ○				11V3 CDR ○																		
Contracts Software/Lockheed Martin	Contract Award ▲																										
System Development Technology Demonstration Engineering Dev. Model	Inc 1 v1 Development Phase				Certification Testing				Inc 1 v2 Development Phase				Inc 1 v3 Development Phase														
Test & Evaluation Development Test Operational Test									CSRR Inc1V2 FOT&E Inc1V2 DT △ JTC Cert Inc1V2 OT △																		
Production (Increment 1) LRIP LRIP Deliveries FRP Award FRP Deliveries	4 ▲ FRP (1)				1 ▲ FRP (1)				2 ▲				1 ▲														
Procurement Inc 1 mod kits	15 ▲				11 ▲				9 △																		
Installation Inc 1 mod kits	14 ▲				21 ▲				9 △																		

CLASSIFICATION:		UNCLASSIFIED					
EXHIBIT R-4a, SCHEDULE DETAIL						DATE May 2009	
APPROPRIATION/BUDGET ACTIVITY RD TEN/BA 5		PROGRAM ELEMENT NUMBER AND NAME 0604503N/SSN-688 AND TRIDENT MODERNIZATION			PROJECT NUMBER AND NAME 1411/SUBM TACT COMM SYS		
Schedule Profile		FY 2008	FY 2009	FY 2010			
Gate 6 Review		3Q					
Fielding Decision (Increment 1 V2)				4Q			
Fielding Decision (Increment 1 V3)							
Fielding Decision (Increment 1 V4)							
Technology Demonstration (Increment 1 V1)		1-3Q					
Technology Demonstration (Increment 1 V2)		1-4Q	1-4Q				
Technology Demonstration (Increment 1 V3)			3-4Q	1-4Q			
Technology Demonstration (Increment 1 V4)							
DT (Increment 1 V2)				2Q			
OT (Increment 1 V2)				3Q			
DT (Increment 1 V3)							
OT (Increment 1 V2)							
DT (Increment 1 V4)							
OT (Increment 1 V2)							

CLASSIFICATION:		UNCLASSIFIED		
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION				DATE May 2009
APPROPRIATION/BUDGET ACTIVITY RD TEN/BA 5	PROGRAM ELEMENT NUMBER AND NAME 0604503N/SSN-688 AND TRIDENT MODERNIZATION	PROJECT NUMBER AND NAME 9999/CONGRESSIONAL ADDS		
B. ACCOMPLISHMENTS/PLANNED PROGRAM:				
	FY 2008	FY 2009	FY 2010	
9840A/ Improved Submarine Towed Array Handler and Reliability	3.085	0.000	0.000	
RDT&E Articles Quantity	0	0	0	
Improved Submarine Towed Array Reliability development provides procurement of Towed Array Handler reliability improvements such as the Capstan Wrap Reduction Modification and Control/Indicator unit upgrades which reduce stress on the towed array, improving reliability and availability of the array.				
	FY 2008	FY 2009	FY 2010	
9C14A/ Advanced Intercept and Ranging System (AIRS)	3.085	0.000	0.000	
RDT&E Articles Quantity	0	0	0	
The Active intercept and Ranging System will test a laboratory theory at sea for an active intercept and ranging system that uses GPS and cellular phone localization algorithms on a submarine. Should the test prove successful and should additional funds become available then the algorithms will be integrated into the sonar systems aboard US Navy submarines.				