

# UNCLASSIFIED

## CLASSIFICATION:

EXHIBIT R-2, RDT&E Budget Item Justification							DATE:	
							February 2005	
APPROPRIATION/BUDGET ACTIVITY RESEARCH DEVELOPMENT TEST & EVALUATION , NAVY/ BA-5					R-1 ITEM NOMENCLATURE 0604503N/Submarine Systems Equipment Development			
COST (\$ in Millions)	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
Total PE Cost	82.173	95.082	95.499	111.507	125.021	129.015	106.998	116.632
0775/Submarine Support Equipment	1.432	1.357	1.405	1.690	1.370	1.401	1.435	1.470
0219/Submarine Sonar Improvements	60.348	40.281	54.333	73.343	73.766	70.320	66.751	79.148
0742/Submarine Integrated Antenna Systems	7.186	25.274	24.972	18.492	31.913	41.599	27.689	25.289
1411/Submarine Tactical Communications Systems	11.857	7.573	14.789	17.982	17.972	15.695	11.123	10.725
9384 Littoral Tactical Array System (LTAS)	1.350	6.733						
9562 Advance Processor Builds - MPP/A-RCI		9.906						
9562 Advance Processor Builds - MPP/A-RCI		3.958						
<b>A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:</b> 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.								
The Submarine Integrated Antenna Systems project develops the antennas needed to communicate in networks such as Ultra High Frequency Satellite Communications, Extremely Low Frequency (ELF), Extremely High Frequency (EHF), Super High Frequency and Global Positioning System. Hardware developments include: (a) mast-mounted systems; (b) buoyant cable systems; (c) expendable buoy systems and (d) submarine antenna distribution systems.								
The Submarine Tactical Communications Systems project provides attack submarines with an exterior communications system which: (a) minimizes the time required at communications depth; (b) enhances operability, reducing errors and manpower requirements; and (c) provides flexibility for low impact growth and change throughout the life of the submarine. Design efforts will provide increased antenna signal distribution and interconnection subsystems to accommodate ELF, EHF, and Mini-Demand Assigned Multiple Access and a message storage and processing subsystem.								

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EXHIBIT R-2a, RDT&E Project Justification							DATE:	
							February 2005	
APPROPRIATION/BUDGET ACTIVITY RDT&E, N / BA-5	PROGRAM ELEMENT NUMBER AND NAME 0604503N/Submarine System Equipment Development				PROJECT NUMBER AND NAME 0775/Submarine Support Equipment			
COST (\$ in Millions)	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
Project Cost	1.432	1.357	1.405	1.690	1.370	1.401	1.435	1.470
RDT&E Articles Qty								
<p><b>A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:</b> 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 Measures (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; and Joint Strike. Specific 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 integration tests, ie. PSR, LPI, Fleet Feedback Reports, etc. and (3) Integration, test, and installation of COTS technology for system enhancements.</p> <p>The program supports three submarine mission support categories; Threat Warning/Self Protection; Situational Awareness; and Intelligence, Surveillance and Reconnaissance (ISR). Threat Warning/Self Protection projects evaluate the vulnerability of submarine masts, periscopes and sensors to visual, radar, and infrared detection. It also evaluates state of the art technology to implement periscope/mast and engineering improvements into the tactical ES system, ie AN/BLQ-10 to reduce counter detection threats. Both Situational Awareness and ISR projects develop submarine unique improvements based on emerging technologies that are available from DOD Exploratory Development programs, industry independent Research and Development, and other sources.</p> <p>Threat Warning/Self Protection sub-projects include: Low Probability of Intercept (LPI) Receiver and AN/BLQ-10 software enhancements.</p> <p>Situational Awareness sub-projects include: integration of Automatic Identification System (AIS), Multifunction Modular Mast (MMM) Antenna, and Situational Awareness Bouy.</p> <p>ISR sub-projects include: Passive Surveillance Radar (PSR) , Advanced EW Tuners, MMM Antenna., and Situational Awareness Bouy.</p> <p>This RDTE Funding line supports the entire AN/BLQ-10 ES procurement program.</p>								

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Exhibit R-2, RDTE Budget Item Justification  
(Exhibit R-2, page 2 of 52)

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EXHIBIT R-2a, RDT&E Project Justification			DATE: <b>February 2005</b>	
APPROPRIATION/BUDGET ACTIVITY <b>RDT&amp;E, N /BA-5</b>	PROGRAM ELEMENT NUMBER AND NAME 0604503N/Submarine System Equipment Development	PROJECT NUMBER AND NAME 0775/Submarine Support Equipment		
<b>B. Accomplishments/Planned Program</b>				
	FY 04	FY 05	FY 06	FY 07
Accomplishments/Effort/Subtotal Cost	1.432			
RDT&E Articles Quantity				
Commence integration of LPI Receiver into AN/BLQ-10. Plan At Sea Test of Specific Emitter Identification and Automatic Contact Correlation. Non-nuclear Propulsion Electronics System (NPES) software baseline changes. Research and resolve AN/BLQ-10 SPRs. ESM software enhancements. Passive Surveillance Radar (PSR) Mobile Host Modification. Support development of MMM Antenna and new classified capabilities				
	FY 04	FY 05	FY 06	FY 07
Accomplishments/Effort/Subtotal Cost		1.357		
RDT&E Articles Quantity				
Conduct At Sea Test of Specific Emitter Identification, Automatic Contact Correlation, and LPI Receiver NPES software baseline changes. Research and resolve AN/BLQ-10 SPRs. ESM software enhancements. Integrate Galelite into AN/BLQ-10. Integrate AIS into AN/BLQ-10 Support development of MMM Antenna and new classified capabilities				
	FY 04	FY 05	FY 06	FY 07
Accomplishments/Effort/Subtotal Cost			1.405	
RDT&E Articles Quantity				
NPES software baseline changes. Research and resolve AN/BLQ-10 SPRs. ESM software enhancements. LPI Spiral 1 Development (Ultra Wide Chirp). At-Sea Test of Galelite and AIS with AN/BLQ-10. Support development of MMM Antenna. LPI Receiver Spiral 1 Development.				
	FY 04	FY 05	FY 06	FY 07
Accomplishments/Effort/Subtotal Cost				1.690
RDT&E Articles Quantity				
NPES software baseline changes. Research and resolve AN/BLQ-10 SPRs. ESM software enhancements. Support development of MMM Antenna. Commence integration of Situational Awareness Buoy with AN/BLQ-10. LPI Receiver Spiral 2 Development.				

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EXHIBIT R-2a, RDT&E Project Justification			DATE: <b>February 2005</b>																																				
APPROPRIATION/BUDGET ACTIVITY <b>RDT&amp;E, N / BA-5</b>	PROGRAM ELEMENT NUMBER AND NAME 0604503N/Submarine System Equipment Development	PROJECT NUMBER AND NAME 0775/Submarine Support Equipment																																					
<p><b>C. PROGRAM CHANGE SUMMARY:</b></p> <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left; width: 40%;">Funding:</th> <th style="text-align: right; width: 15%;">FY 2004</th> <th style="text-align: right; width: 15%;">FY 2005</th> <th style="text-align: right; width: 15%;">FY 2006</th> <th style="text-align: right; width: 15%;">FY 2007</th> </tr> </thead> <tbody> <tr> <td>FY05 President's Budget</td> <td style="text-align: right;">1.432</td> <td style="text-align: right;">1.387</td> <td style="text-align: right;">1.410</td> <td style="text-align: right;">1.691</td> </tr> <tr> <td>FY06 President's Budget</td> <td style="text-align: right;">1.432</td> <td style="text-align: right;">1.357</td> <td style="text-align: right;">1.405</td> <td style="text-align: right;">1.690</td> </tr> <tr> <td>Total Adjustments</td> <td style="text-align: right; border-top: 1px solid black;">0.000</td> <td style="text-align: right; border-top: 1px solid black;">-0.030</td> <td style="text-align: right; border-top: 1px solid black;">-0.005</td> <td style="text-align: right; border-top: 1px solid black;">-0.001</td> </tr> <tr> <td colspan="5" style="padding-top: 10px;">Summary of Adjustments</td> </tr> <tr> <td>Programmatic adjustments</td> <td></td> <td style="text-align: right;">-0.03</td> <td style="text-align: right;">-0.005</td> <td style="text-align: right;">-0.001</td> </tr> <tr> <td>Subtotal</td> <td style="text-align: right; border-top: 1px solid black;">0.000</td> <td style="text-align: right; border-top: 1px solid black;">-0.030</td> <td style="text-align: right; border-top: 1px solid black;">-0.005</td> <td style="text-align: right; border-top: 1px solid black;">-0.001</td> </tr> </tbody> </table> <p style="margin-top: 20px;">Schedule:</p> <p style="margin-left: 20px;">Not Applicable. Changes were negligible and absorbed within the Program of Record.</p> <p style="margin-top: 40px;">Technical:</p> <p style="margin-left: 20px;">Not Applicable. Changes were negligible and absorbed within the Program of Record.</p>					Funding:	FY 2004	FY 2005	FY 2006	FY 2007	FY05 President's Budget	1.432	1.387	1.410	1.691	FY06 President's Budget	1.432	1.357	1.405	1.690	Total Adjustments	0.000	-0.030	-0.005	-0.001	Summary of Adjustments					Programmatic adjustments		-0.03	-0.005	-0.001	Subtotal	0.000	-0.030	-0.005	-0.001
Funding:	FY 2004	FY 2005	FY 2006	FY 2007																																			
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EXHIBIT R-2a, RDT&E Project Justification								DATE:		February 2005	
APPROPRIATION/BUDGET ACTIVITY RDT&E, N / BA-5			PROGRAM ELEMENT NUMBER AND NAME 0604503N/Submarine System Equipment Development			PROJECT NUMBER AND NAME 0775/Submarine Support Equipment					
D. OTHER PROGRAM FUNDING SUMMARY:											
Line Item No. & Name	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	To Complete	Total Cost	
OPN Line 256000/256005											
ML007 ICADF	12.584	9.079	17.490	6.448	17.327	16.689	12.142	-	Complete	91.759	
ML008 ICADF Antenna	8.789	10.529	15.770	9.580	17.047	19.833	22.714	23.123	Continuing	Continuing	
ML009 APB-EW	0.668	1.452	0.150	0.282	1.648	1.178	1.087	1.246	Continuing	Continuing	
ML010 Tech Refresh Upgrades	3.456	2.093	0.160	0.306	1.718	1.226	1.131	1.296	Continuing	Continuing	
ML011 AN/WLR-8 R&M FCKs	0.509	0.881	0.489	0.399	0.308	0.312	0.316	0.321	Continuing	Continuing	
ML013 ESM IMA Support	0.176	0.041	0.182	0.186	0.190	0.193	0.197	0.201	Continuing	Continuing	
ML015 AN/BLQ-10(V) SSN ES Backfit System	17.998	35.360	45.682	44.878	45.261	52.630	46.962	13.494	Continuing	Continuing	
ML016 AN/BLQ-10(V) SSBN ES Systems	-	-	-	-	-	-	6.248	38.244	Continuing	Continuing	
ML017 AN/BLQ-10 Field Change Kits	3.621	7.013	4.361	8.747	6.030	4.336	4.999	17.589	Continuing	Continuing	
SCN LI 201300											
PE 0204287N	10.749	18.777	19.151	19.532	19.922	48.901	48.901	48.901	Continuing	234.834	
Partial (AN/BLQ-10 ES Only)											
Related RDT&E:											
(U) PE 0603562N/Submarine Tactical Warfare System/F0770 Advanced Submarine Support Equipment Program (ASSEP)											
E. ACQUISITION STRATEGY: *											
AN/BLQ-10 (V) ES System - Procurements are executed/managed in accordance with the Acquisition Strategy Report (Rev 3) for AN/BLQ-10(V) ES System dtd 10/11/00 and the Acquisition Plan (Rev 4) for AN/BLQ-10(V) ES System dtd 3/27/03; Rev 5 is in routing for approval.											
F. MAJOR PERFORMERS: **											
Lockheed-Martin, Syracuse, NY - AN/BLQ-10 system developer											
NUWC, Newport, RI - EW Library developer, AN/BLQ-10 systems engineering, TEMPALT development, integration test support., and TDA support.											
NAWC, China Lake - PSR controller software development, Patriot Systems Engineering											

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Exhibit R-3 Cost Analysis (page 1)										DATE: February 2005					
APPROPRIATION/BUDGET ACTIVITY			PROGRAM ELEMENT			PROJECT NUMBER AND NAME									
RDT&E, N / BA-5			0604503N/Submarine System Equipment Development			0775/Submarine Support Equipment									
Cost Categories	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 04 Cost	FY 04 Award Date	FY 05 Cost	FY 05 Award Date	FY 06 Cost	FY 06 Award Date	FY 07 Cost	FY 07 Award Date	Cost to Complete	Total Cost	Target Value of Contract	
AN/BLQ-10 ES Product Improvement	CPFF	Lockheed Syracuse, NY		0.418	04/04	0.430	12/04	0.471	12/05	0.671	12/06	CONT	CONT	NA	
Systems Engineering	WR	NUWC Newport, RI		0.357	12/03	0.417	11/04	0.476	11/05	0.546	11/06	CONT	CONT	N/A	
PSR Improvements and Test	WR	NAWC China Lake		0.136	03/04							CPLT	0.136		
Miscellaneous	VARIOUS	VARIOUS		0.073	04/04	0.024	NA	0.008	11/05	0.018	11/05	0.000	0.123	N/A	
Subtotal Product Development			0.000	0.984		0.871		0.955		1.235		CONT	CONT	N/A	
Remarks:															
Development Support													0.000		
Software Development													0.000	NA	
Training Development													0.000		
Integrated Logistics Support													0.000		
Configuration Management													0.000		
Technical Data													0.000		
Engineering Technical Services	CPFF	AT&T GSI, Vienna VA		0.200	07/04	0.250	11/04	0.208	11/05	0.213	11/06	CONT	CONT	NA	
GFE													0.000		
Subtotal Support			0.000	0.200		0.250		0.208		0.213		CONT	CONT		
Remarks:															

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Exhibit R-3 Cost Analysis (page 2)										DATE: <b>February 2005</b>				
APPROPRIATION/BUDGET ACTIVITY <b>RDT&amp;E, N / BA-5</b>			PROGRAM ELEMENT 0604503N/Submarine System Equipment Development			PROJECT NUMBER AND NAME 0775/Submarine Support Equipment								
Cost Categories	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 04 Cost	FY 04 Award Date	FY 05 Cost	FY 05 Award Date	FY 06 Cost	FY 06 Award Date	FY 07 Cost	FY 07 Award Date	Cost to Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation													0.000	
Operational Test & Evaluation													0.000	
Live Fire Test & Evaluation													0.000	
Test Assets													0.000	
Tooling													0.000	
GFE													0.000	
Award Fees													0.000	
Subtotal T&E			0.000	0.000		0.000		0.000		0.000		0.000	0.000	
Remarks:														
Contractor Engineering Support													0.000	
Government Engineering Support													0.000	
Management Support Services													0.000	
Travel				0.150	11/03	0.150	11/04	0.150	11/05	0.150	11/06	CONT	CONT	
Labor (Research Personnel)													0.000	
SBIR Assessment				0.098		0.086		0.092		0.092		CONT	CONT	
Subtotal Management				0.248		0.236		0.242		0.242		CONT	CONT	
Remarks:														
Total Cost			0.000	1.432		1.357		1.405		1.690		CONT	CONT	
Remarks:														

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EXHIBIT R-2a, RDT&E Project Justification						DATE: February 2005			
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NAME AND NUMBER			PROJECT NAME AND NUMBER					
RDT&E, N/BA-5	0604503N/Submarine Sys Equip Development			0775/Submarine Support Equipment					
SSEP F0775 SCHEDULE	FY03	FY04	FY05	FY06	FY07	FY08	FY09	FY10	FY11
Specific Emitter ID/Auto Contact Correlation		At Sea Test							
AN/BLQ-10 Baseline Changes, SPR Resolution, and Software Enhancements		S/W Update	S/W Update	S/W Update	S/W Update	S/W Update	S/W Update	S/W Update	S/W Update
Low Probability of Intercept (LPI) Receiver	Design	Integration	At Sea Test	Spiral 1	Spiral 2				
Automatic Identification System (AIS)			Integration	At Sea Test					
Advanced EW Tuners							Research	Integration	
Situational Awareness Bouy					Research	Integration		At Sea Test	
GALE Lite		Integration		At Sea Test					
CADF/Multifunctional Antenna		Specification		Integration		Spiral 1		Spiral 2	
Passive Surveillance Radar (PSR)	At Sea Test	Mobile Host	At Sea Test						

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Exhibit R-4, RDT&amp;E Project Justification

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Exhibit R-2, RDTEN Budget Item Justification  
(Exhibit R-2, page 8 of 52)



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Exhibit R-4a, Schedule Detail						DATE: <b>February 2005</b>			
APPROPRIATION/BUDGET ACTIVITY <b>RDT&amp;E, N /BA-5</b>		PROGRAM ELEMENT 0604503N/Submarine Sys Equip Development			PROJECT NUMBER AND NAME 0775/Submarine Support Equipment				
Schedule Profile		FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
<b>AN/BLQ-10 Baseline Changes, SPR Resolution, and Software Enhancements</b>		2Q	2Q	2Q	2Q	2Q	2Q	2Q	2Q
<b>Specific Emitter ID/ACC</b>									
	At -Sea Test		2Q						
<b>GALE Lite</b>									
	Integration	4Q							
	At -Sea Test			2Q					
<b>CADF/IW Multifunction Antenna</b>									
	S/W Specification	3Q							
	Integration			3Q					
	Spiral 1					2Q			
	Spiral 2							2Q	
<b>Passive Surveillance Radar (PSR)</b>									
	At -Sea Test	CMPLT							
	Spiral 2 (Mobile Host)	2Q							
	At -Sea Test	4Q							
<b>Advanced EW Tuners</b>									
	Research						2Q		
	Integration							2Q	
<b>LPI</b>									
	Integration	2Q							
	At -Sea Test		1Q						
	Spiral 1			2Q					
	Spiral 2				2Q				
<b>AIS</b>									
	Integration		3Q						
	At -Sea Test			3Q					
<b>Situational Awareness Bouy</b>									
	Research				2Q				
	Integration					2Q			
	At -Sea Test							2Q	

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COST (\$ in Millions)	FY2004	FY2005	FY2006	FY2007	FY2008	FY2009	FY2010	FY2011
Project Cost	60.348	40.281	54.333	73.343	73.766	70.320	66.751	79.148
RDT&E Articles Qty								

**A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:** This program delivers block updates to Sonar Systems installed on SSN 688, 688I, 21, SSGN and TRIDENT 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, detailed below, are focused on supporting Littoral Warfare, Regional Sea Denial, Battle Group Support, Diesel Submarine Detection, Surveillance, and Peacetime Engagement. Acoustics Rapid COTS Insertion (A-RCI ) is a multi-phased, evolutionary development effort geared toward addressing Acoustic Superiority issues through the rapid introduction of interim development products applicable to SSN 688, 688I Flight, SSN21, SSGN and SSBN 726 Class Submarines. A-RCI Phases I and II introduce towed array processing improvements; A-RCI Phase III introduces spherical array processing improvements. The AN/BSY-1 High Frequency Upgrade is a stand-alone program which will be introduced as A-RCI Phase IV for SSN 688I and Seawolf Class only. As part of CNO N772's plan to maintain acoustic superiority for In-Service Submarines a joint cooperative effort with NAVSEA (SEA 93, ASTO) to deliver annual Advanced Processing Builds (APBs). The capabilities in the APBs will be integrated as part of A-RCI certified systems. This effort, known as the N772 Business Plan funds the APB integration efforts with the Multi-Purpose Processor as well as the AN/BQQ-10 Sonar system beginning in FY02. This project also funds development of the Total Ship Monitoring System, Active Intercept and Ranging as well as Acoustic Intelligence (ACINT 21) capabilities to be introduced into the Fleet. Precision Bottom Mapping transition, integration and testing began in FY01.

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, and the Next Generation Fatline Towed Array and Hull Mounted array which provide improved Littoral Operational capability. Low Cost Conformal Array (LCCA) development provides enhanced situational awareness collision avoidance for backfit on 688, 688I, SEAWOLF, SSGN, and forward fit to VIRGINIA. The LCCA will provide enhanced capability against quiet targets. The Mission Tailored Towed Array (MTTA) is a variant of the TB-29A/FOTL array which will improve acoustic sensor performance in littoral and open ocean environments. The mission tailored TB-29A/FOTL array will be re-configurable in aperture and length based on the mission to be performed and will expand frequency coverage via a high frequency aperture(s).

AN/BSY-2 efforts are focused on ARCI-(V)5 development which implements ARCI Phases II-IV in the Seawolf Class submarines.

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<b>B. Accomplishments/Planned Program</b>																			
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 30%;"></td> <td style="width: 15%;">FY04</td> <td style="width: 15%;">FY 05</td> <td style="width: 15%;">FY 06</td> <td style="width: 15%;">FY07</td> </tr> <tr> <td>Accomplishments/Effort/Subtotal Cost</td> <td>16.092</td> <td>12.975</td> <td>13.87</td> <td>13.849</td> </tr> <tr> <td>RDT&amp;E Articles Quantity</td> <td></td> <td></td> <td></td> <td></td> </tr> </table>						FY04	FY 05	FY 06	FY07	Accomplishments/Effort/Subtotal Cost	16.092	12.975	13.87	13.849	RDT&E Articles Quantity				
	FY04	FY 05	FY 06	FY07															
Accomplishments/Effort/Subtotal Cost	16.092	12.975	13.87	13.849															
RDT&E Articles Quantity																			
<div style="border: 1px solid black; padding: 5px;"> APB Productionization  Completed A-RCI OpEval in FY03. Received A-RCI MSIII decision authority in FY04.  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.  APB sea tests sceduled for FY05. </div>																			
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 30%;"></td> <td style="width: 15%;">FY04</td> <td style="width: 15%;">FY 05</td> <td style="width: 15%;">FY 06</td> <td style="width: 15%;">FY07</td> </tr> <tr> <td>Accomplishments/Effort/Subtotal Cost</td> <td>29.447</td> <td>18.900</td> <td>28.81</td> <td>36.583</td> </tr> <tr> <td>RDT&amp;E Articles Quantity</td> <td></td> <td></td> <td></td> <td></td> </tr> </table>						FY04	FY 05	FY 06	FY07	Accomplishments/Effort/Subtotal Cost	29.447	18.900	28.81	36.583	RDT&E Articles Quantity				
	FY04	FY 05	FY 06	FY07															
Accomplishments/Effort/Subtotal Cost	29.447	18.900	28.81	36.583															
RDT&E Articles Quantity																			
<div style="border: 1px solid black; padding: 5px;"> Integration and Testing.  Awarded new contracts to Lockheed Martin and General Dynamics in FY04 for continued A-RCI and MPP development, integration and test.  Continued Integration and testing to support the introduction of Advanced Processing Builds to be installed on SSN 688I, SSN 688, SSBN 730, SSN 21, and SSGN 726 and VA Class. </div>																			
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Accomplishments/Effort/Subtotal Cost		2.896	0.900																
RDT&E Articles Quantity																			
<div style="border: 1px solid black; padding: 5px;"> BQS-15A EC20  Merges the BQS-15 EC-18 array with A-RCI processing displays.  FY05 - fund the development, integration and testing associated with upgrading the existing outboard receiver, internal array components and Unit 6 Display Console.  FY06 - Complete development, integration and testing of the BQS-15A EC-20. </div>																			

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	FY 04	FY 05	FY 06	FY 07															
Accomplishments/Effort/Subtotal Cost				2.000															
RDT&E Articles Quantity																			
<div style="border: 1px solid black; min-height: 150px; margin-top: 10px;"> <p>HF Precision Imaging Active Sonar Will begin development efforts for HF Precision Imaging Active Sonar in FY07.</p> </div>																			
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th style="width: 30%;"></th> <th style="width: 15%;">FY 04</th> <th style="width: 15%;">FY 05</th> <th style="width: 15%;">FY 06</th> <th style="width: 15%;">FY 07</th> </tr> <tr> <td>Accomplishments/Effort/Subtotal Cost</td> <td>5.278</td> <td>0.146</td> <td>0.300</td> <td></td> </tr> <tr> <td>RDT&amp;E Articles Quantity</td> <td></td> <td></td> <td></td> <td></td> </tr> </table>						FY 04	FY 05	FY 06	FY 07	Accomplishments/Effort/Subtotal Cost	5.278	0.146	0.300		RDT&E Articles Quantity				
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Accomplishments/Effort/Subtotal Cost	5.278	0.146	0.300																
RDT&E Articles Quantity																			
<div style="border: 1px solid black; min-height: 100px; margin-top: 10px;"> <p>The development of the Next Generation Fatline Towed Array provides improvement in littoral water operations and increased frequency coverage. Began development efforts for the Next Generation Fatline Towed Array in FY04. Continue development efforts in FY05. Conduct design readiness review , complete EDM integration and assembly efforts. Complete development and conduct early operational assessment in FY06.</p> </div>																			
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	FY 04	FY 05	FY 06	FY 07															
Accomplishments/Effort/Subtotal Cost	6.431	5.364	4.453	5.726															
RDT&E Articles Quantity																			
<p>Affordable Towed Array Technology (ATAT) development provides more affordable and reliable thinline arrays using fiber optic technology.</p> <p>FY04 - Continue development of Affordable Towed Array Technology (ATAT, Fiber Optic Array, TB-33). Conduct PDR.</p> <p>FY05 - Continue ATAT development and conduct CDR.</p> <p>FY06 - Continue development of ATAT and begin EDM fabrication.</p> <p>FY07 - Continue development of ATAT, complete EDM fabrication and begin at sea operational assessment.</p>																			
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 30%;"></td> <td style="width: 15%; text-align: center;">FY 04</td> <td style="width: 15%; text-align: center;">FY 05</td> <td style="width: 15%; text-align: center;">FY 06</td> <td style="width: 15%; text-align: center;">FY 07</td> </tr> <tr> <td>Accomplishments/Effort/Subtotal Cost</td> <td></td> <td></td> <td style="text-align: center;">6.000</td> <td style="text-align: center;">4.000</td> </tr> <tr> <td>RDT&amp;E Articles Quantity</td> <td></td> <td></td> <td></td> <td></td> </tr> </table>						FY 04	FY 05	FY 06	FY 07	Accomplishments/Effort/Subtotal Cost			6.000	4.000	RDT&E Articles Quantity				
	FY 04	FY 05	FY 06	FY 07															
Accomplishments/Effort/Subtotal Cost			6.000	4.000															
RDT&E Articles Quantity																			
<p>Mission Tailorable Towed Array (MTTA) development provides mission dependent variant of thinline arrays to improve sensor performance in littoral environment while maintaining open ocean capability.</p> <p>Begin development of mission dependent variant of thinline arrays.</p> <p>FY07 - Continue development of mission dependent variant of thinline arrays.</p>																			
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Accomplishments/Effort/Subtotal Cost	3.100																		
RDT&E Articles Quantity																			
<p>Acoustic Intelligence (ACINT) development, integration, test and certification. This effort includes the development of an onboard acoustic analysis system. ACINT integration, test and certification will be completed, as well as system integration, test and certification with the A-RCI system.</p>																			

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APPROPRIATION/BUDGET ACTIVITY <b>RDT&amp;E, N / BA-5</b>	PROGRAM ELEMENT NUMBER AND NAME 0604503N/Submarine Systems Equipment Development	PROJECT NUMBER AND NAME 0219/Submarine Sonar Improvement		
<b>B. Accomplishments/Planned Program (Cont.)</b>				
	FY 04	FY 05	FY 06	FY 07
Accomplishments/Effort/Subtotal Cost				11.185
RDT&E Articles Quantity				
<div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;"> Low Cost Conformal Array (LCCA) development provides enhanced situational awareness collision avoidance.  Transition advanced development of LCCA from ASTO. Begin EDM assembly. </div>				

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<p><b>C. PROGRAM CHANGE SUMMARY:</b></p> <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left; width: 50%;"></th> <th style="text-align: right; width: 12.5%;">FY 2004</th> <th style="text-align: right; width: 12.5%;">FY 2005</th> <th style="text-align: right; width: 12.5%;">FY 2006</th> <th style="text-align: right; width: 12.5%;">FY 2007</th> </tr> </thead> <tbody> <tr> <td>Funding:</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>FY05 President's Budget</td> <td style="text-align: right;">61.762</td> <td style="text-align: right;">40.705</td> <td style="text-align: right;">31.807</td> <td style="text-align: right;">46.31</td> </tr> <tr> <td>FY06 President's Budget</td> <td style="text-align: right;">60.348</td> <td style="text-align: right;">40.281</td> <td style="text-align: right;">54.333</td> <td style="text-align: right;">73.343</td> </tr> <tr> <td>Total Adjustments</td> <td style="text-align: right; border-top: 1px solid black;">-1.414</td> <td style="text-align: right; border-top: 1px solid black;">-0.424</td> <td style="text-align: right; border-top: 1px solid black;">22.526</td> <td style="text-align: right; border-top: 1px solid black;">27.033</td> </tr> <tr> <td colspan="5" style="padding-top: 10px;">Summary of Adjustments</td> </tr> <tr> <td>Execution Realignment</td> <td style="text-align: right;">-0.017</td> <td></td> <td></td> <td></td> </tr> <tr> <td>Submarine Systems Equipment Development</td> <td style="text-align: right;">-0.136</td> <td></td> <td></td> <td></td> </tr> <tr> <td>Undistributed congressional reductions</td> <td style="text-align: right;">-1.261</td> <td style="text-align: right;">-0.360</td> <td></td> <td></td> </tr> <tr> <td>Programmatic adjustment</td> <td></td> <td style="text-align: right;">-0.064</td> <td style="text-align: right;">22.526</td> <td style="text-align: right;">27.033</td> </tr> <tr> <td style="text-align: right; padding-right: 20px;">Subtotal</td> <td style="text-align: right; border-top: 1px solid black;">-1.414</td> <td style="text-align: right; border-top: 1px solid black;">-0.424</td> <td style="text-align: right; border-top: 1px solid black;">22.526</td> <td style="text-align: right; border-top: 1px solid black;">27.033</td> </tr> </tbody> </table> <p style="margin-top: 20px;">Schedule:</p> <p>The A-RCI and TB-29 TECHEVAL/OPEVAL completed in FY03. Both programs obtained approval to proceed with the FY04 Production Buys in the MDA (Milestone Decision Authority) Review held in October 2003. Milestone III authority for A-RCI was received in February 2004. FY04 and FY05 production options have been awarded.</p> <p style="margin-top: 20px;">Technical:</p> <p>Not applicable</p>						FY 2004	FY 2005	FY 2006	FY 2007	Funding:					FY05 President's Budget	61.762	40.705	31.807	46.31	FY06 President's Budget	60.348	40.281	54.333	73.343	Total Adjustments	-1.414	-0.424	22.526	27.033	Summary of Adjustments					Execution Realignment	-0.017				Submarine Systems Equipment Development	-0.136				Undistributed congressional reductions	-1.261	-0.360			Programmatic adjustment		-0.064	22.526	27.033	Subtotal	-1.414	-0.424	22.526	27.033
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<b>RDT&amp;E, N / BA-5</b>			0604503N/Submarine Systems Equipment Development			0219/Submarine Sonar Improvements			

  

**D. OTHER PROGRAM FUNDING SUMMARY:**

<u>Line Item No. &amp; Name</u>	<u>FY 2004</u>	<u>FY 2005</u>	<u>FY 2006</u>	<u>FY 2007</u>	<u>FY 2008</u>	<u>FY 2009</u>	<u>FY 2010</u>	<u>FY 2011</u>	<u>To Complete</u>	<u>Total Cost</u>
OPN BLI 214700 SSN Acoustics	205,953	185.013	184.843	238.481	273.785	238.09	244.821	256.311	Continuing	Continuing
OPN BLI 214705 SSN Acoustics Installation	58.567	44.01	42.071	33.168	51.026	54.802	45.637	49.17	Continuing	Continuing
Total	264.520	229.023	226.914	271.649	324.811	292.892	290.458	305.481		

**E. ACQUISITION STRATEGY:**

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 award fee contract was awarded to Lockheed Martin Federal Systems and Digital System Resources in December 2003. Program Review with Milestone Decision Authority was conducted in October 2003 granting approval for the FY04 production option. MS III authority for A-RCI was received in February 2004. FY04 and FY05 production options have been awarded.

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. In FY04 Towed Systems awarded two competitive contracts for the development of a Fatline Towed Array which will provide better littoral operations and ranging. Development efforts are currentlu on-going and will complete in FY06. The Low Cost Conformal Array (LCCA) will transition from ASTO in FY07 with a competitive contract being awarded for the EDM development.

**F. 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.

**Digital System Resources, Inc; Fairfax, Virginia** - Provides primary software development for SSN688, 688I, 21 and Virginia Class submarine sonar systems. Contract awards projected for October each fiscal year.

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<p><b>F. Major Performers (cont'd)</b></p> <p><b>Naval Undersea Warfare Center, Newport, Rhode Island</b> - 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><b>Chesapeake Science Corporation, Millersville, Maryland:</b> Provides primary hardware development, software integration and systems engineering support for the Affordable Towed Array Technology Initiatives. Contract awards projected for October each fiscal year.</p>		

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Exhibit R-3 Cost Analysis (page 1)							DATE: February 2005							
APPROPRIATION/BUDGET ACTIVITY			PROGRAM ELEMENT			PROJECT NUMBER AND NAME								
RDT&E, N / BA-5			0604503N/Submarine Systems Equipment Development			0219/Submarine Sonar Improvement								
Cost Categories	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY04 Cost	FY04 Award Date	FY05 Cost	FY05 Award Date	FY06 Cost	FY06 Award Date	FY07 Cost	FY07 Award Date	Cost to Complete	Total Cost	Target Value of Contract
Primary Hardware Development	Various	Lockheed Martin (Omnibus)	14.187										14.187	
Primary Hardware Development	Various	Chesapeake Sciences	15.074	7.850	10/03	2.553	10/04	3.284	10/05	4.399	10/6		33.160	
Primary Hardware Development	SS/CPAF	LMC, Manassas, VA	128.677	9.536	10/03	13.382	11/04	21.634	11/05	32.622	11/06		205.851	
Ancillary Hardware Development	SS/CP	ARL University of Texas	2.738	2.602	10/03	2.402	12/04	3.600	12/05	3.6	12/06		14.942	
		Newport News		0.060	2/04	0.044	1/05	0.037	1/06	.048	1/07		0.189	
Systems Engineering	WX	NUWC, Newport R.I.	95.270	4.931	10/03	4.876	10/04	5.201	10/05	6.253	10/06		116.531	
Systems Engineering	SS/CPAF	LMC, Syracuse N.Y.	5.763	2.433	9/04	1.173	10/04	2.800	10/05	3.000	10/06		15.169	
Systems Engineering	Various	Various	12.220	0.565	10/03	0.200	10/04	0.087	10/05	.100	10/06		13.172	
Software Development	SS/CP	Progeny Systems	4.981	2.118	10/03	2.900	11/04	2.200	11/05	2.800	11/06		14.999	
Systems Engineering	WX	NSWC, Carderock MD	3.146	1.445	10/03	1.100	10/04	1.445	10/05	2.166	10/06		9.302	
Systems Engineering	SS/CP	John Hopkins APL	3.051	3.780	10/03	3.700	2/05	3.600	12/05	3.78	12/06		17.911	
Hardware/Software Development	Various	SBIR's	1.303	0.150	10/03	0.100	2/05	0.075	12/05	.075	12/06		1.703	
Award Fees	SS/CPAF	LMC, Syracuse N.Y.	0.495										0.495	
Miscellaneous	Various	Various	9.402										9.402	
Systems Engineering	WX	NSWC, Crane, IN	0.076	0.078	10/03	0.235	10/04	0.080	10/05	.873	10/06		1.342	
Hardware/Software Development													0.000	
Systems Engineering	WX	Naval Research Lab (NRL)	0.390	0.315	10/03	0.233	10/04	0.199	10/05	.256	10/06		1.393	
													0.000	
													0.000	
Subtotal Product Development			296.773	35.863		32.898		44.242		59.972		0.000	409.776	
Remarks:														

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APPROPRIATION/BUDGET ACTIVITY			PROGRAM ELEMENT			PROJECT NUMBER AND NAME								
RDT&E, N / BA-5			0604503N/Submarine Systems Equipment Development			0219/Submarine Sonar Improvement								
Cost Categories	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY04 Cost	FY04 Award Date	FY05 Cost	FY05 Award Date	FY06 Cost	FY06 Award Date	FY07 Cost	FY07 Award Date	Cost to Complete	Total Cost	Target Value of Contract
Ancillary Software Development	TBD	TBD											0.000	
Primary Software Development	SS/CPAF	Digital Systems Resources	106.248	23.142	12/03	5.965	11/04	8.478	11/05	12.043	11/06		155.876	
Integrated Logistics Support													0.000	
Configuration Management													0.000	
Technical Data													0.000	
Studies & Analyses													0.000	
GFE													0.000	
Award Fees													0.000	
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													0.000	

R-1 SHOPPING LIST - Item No. 108

**UNCLASSIFIED**

**Exhibit R-2, RD TEN Budget Item Justification**  
(Exhibit R-2, page 19 of 52)

## UNCLASSIFIED

## CLASSIFICATION:

Exhibit R-3 Cost Analysis (page 2)										DATE: <b>February 2005</b>				
APPROPRIATION/BUDGET ACTIVITY			PROGRAM ELEMENT			PROJECT NUMBER AND NAME								
<b>RDT&amp;E, N / BA-5</b>			0604503N/Submarine Systems Equipment Development			0219/Submarine Sonar Improvement								
Cost Categories	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY04 Cost	FY04 Award Date	FY05 Cost	FY05 Award Date	FY06 Cost	FY06 Award Date	FY07 Cost	FY07 Award Date	Cost to Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation													0.000	
Operational Test & Evaluation	WX	OPTEVFOR	1.051	0.368	10/03	0.468	10/04	0.663	10/05	.368	10/06		2.918	
Developmental/Operational T&E	Various	Various	6.118										6.118	
Test Assets													0.000	
Tooling													0.000	
GFE													0.000	
Award Fees													0.000	
Subtotal T&E			7.169	0.368		0.468		0.663		.368		0.000	9.036	
Remarks:														
Contractor Engineering Support													0.000	
Management Support Services	Various	Various	3.514	0.675	11/03	0.675	11/04	0.675	11/05	.675	11/06		5.539	
Program Management Support	SS/CP	Mitre	0.523		11/03		11/04		11/05		11/06		0.523	
Travel	PD	NAVSEA	0.175	0.300	11/03	0.275	11/04	0.275	11/05	.285	11/06		1.025	
Transportation													0.000	
SBIR Assessment													0.000	
Subtotal Management			4.212	0.975		0.950		0.950		.960		0.000	7.087	
Remarks:														
Total Cost			414.402	60.348		40.281		54.333		73.343		0.000	515.031	
Remarks:														

R-1 SHOPPING LIST - Item No. 108

UNCLASSIFIED

**UNCLASSIFIED**

**CLASSIFICATION:**

EXHIBIT R4, Schedule Profile																												DATE:							
																												February 2005							
APPROPRIATION/BUDGET ACTIVITY												PROGRAM ELEMENT NUMBER AND NAME												PROJECT NUMBER AND NAME											
RDT&E, N / BA-5												0604503N/Submarine Systems Equipment Development												0219/Submarine Sonar Improvement											
Fiscal Year		2002				2003				2004				2005				2006				2007				2008				2009					
		1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4						
Acquisition Milestones		FY95 MS II		Annual Program Review				Annual MDA Review				Annual MS III				Annual MDA APB Review				Annual MDA APB Review				Annual MDA APB Review				Annual MDA APB Review				Annual MDA APB Review			
				▲				▲				▲				▲				△				△				△				△			
A-RCI & HF Upgrade Dev.		Development completed in FY01				SSN 21				A-RCI(V)5 Installation																									
A-RCI-(V)5 Development		Blk 3C1 ▲				Blk 3D ▲				▲ △				▲																					
SSGN Development																																			
APB I&T, Certification		APB-02				APB-03				APB-04				APB-05				APB-06				APB-07				APB-08				APB-09					
Tech Insertion Development, I&T, Certification		TI-02								TI-04								TI-06								TI-08									
Test & Evaluation Milestones																																			
Phase III Operational Test						▲																													
Phase IV Operational Test		▲								▲																									
APB Test Readiness Reviews		▲								▲				△				△				△				△				△					
APB Sea Tests		▲				▲				△				△				△				△				△				△					
Production																																			
FY02		▬				▬				▬				▬				▬				▬				▬				▬					
FY03						▬				▬				▬				▬				▬				▬				▬					
FY04										▬				▬				▬				▬				▬				▬					
FY05										▬				▬				▬				▬				▬				▬					
FY06														▬				▬				▬				▬				▬					
FY07																		▬				▬				▬				▬					
FY08																						▬				▬				▬					

\* Not required for Budget Activities 1, 2, 3, and 6

R-1 SHOPPING LIST - Item No. 108

**UNCLASSIFIED**

**Exhibit R-2, RD TEN Budget Item Justification**  
(Exhibit R-2, page 21 of 52)

**UNCLASSIFIED**

**CLASSIFICATION:**

[illegible]

R-1 SHOPPING LIST - Item No. 108

**UNCLASSIFIED**

### Exhibit R-2, RDTEN Budget Item Justification

(Exhibit R-2, page 22 of 52)

## CLASSIFICATION:

EXHIBIT R4, Schedule Profile																								DATE:								
Next Generation Fatline Development																								Febraury 2005								
APPROPRIATION/BUDGET ACTIVITY										PROGRAM ELEMENT NUMBER AND NAME										PROJECT NUMBER AND NAME												
RDT&E, N / BA-5										0604503N: SSN-688 and Trident Modernization										0219: Submarine Sonar Improvement												
Fiscal Year	2002				2003				2004				2005				2006				2007				2008				2009			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Acquisition Milestones																																
Next Generation Fatline Development																																
Production Representative Delivery																																
Test & Evaluation Milestones																																
Lake Test																																
Operational Test																																
Procurement Production Contract																																
Deliveries																																

R-1 SHOPPING LIST - Item No. 108

\* Not required for Budget Activities 1, 2, 3, and 6

**UNCLASSIFIED**

**CLASSIFICATION:**

[illegible]

R-1 Shopping List ITEM NO. 108

**UNCLASSIFIED**

**Exhibit R-2, RD TEN Budget Item Justification**  
(Exhibit R-2, page 24 of 52)



## CLASSIFICATION:

EXHIBIT R4, Schedule Profile																								DATE:									
Thinline Fiber Optic Array												February 2005																					
APPROPRIATION/BUDGET ACTIVITY										PROGRAM ELEMENT NUMBER AND NAME										PROJECT NUMBER AND NAME													
RDT&E, N / BA-5										0604503N: SSN-688 and Trident Modernization										0219: Submarine Sonar Improvement													
Fiscal Year	2002				2003				2004				2005				2006				2007				2008				2009				
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4					
Acquisition Milestones																																	
Thinline Fiber Optic Array System Design																																	
Detailed Design																																	
EDM Fabrication																																	
Test & Evaluation Milestones																																	
Operational Test																																	
Procurement Production Contract																																	
Deliveries																																	

R-1 SHOPPING LIST - Item No. 108

\* Not required for Budget Activities 1, 2, 3, and 6

**UNCLASSIFIED**

**CLASSIFICATION:**

[illegible]

R-1 SHOPPING LIST - Item No. 108

**UNCLASSIFIED**

### Exhibit R-2, RD TEN Budget Item Justification

(Exhibit R-2, page 26 of 52)

## R-1 SHOPPING LIST - Item No. 108

EXHIBIT R4, Schedule Profile																										DATE:						
																										<b>February 2005</b>						
APPROPRIATION/BUDGET ACTIVITY										PROGRAM ELEMENT NUMBER AND NAME										PROJECT NUMBER AND NAME												
<b>RDT&amp;E, N / BA-5</b>										0604503N: SSN-688 and Trident Modernization										0219: Submarine Sonar Improvement												
Fiscal Year	2002				2003				2004				2005				2006				2007				2008				2009			
	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				
<b>Acquisition Milestones</b>																																
TB-29A Development	Eng. & Manufacturing Development																															
<b>Test &amp; Evaluation Milestones</b>																																
Development Test																																
Operational Test																																
<b>Procurements</b>																																
LRIP I Completed																																
LRIP II Completed																																
LRIP III																																
Production Contract																																
Deliveries																																

**Exhibit R-2, RD TEN Budget Item Justification**  
(Exhibit R-2, page 27 of 52)

**UNCLASSIFIED**

**CLASSIFICATION:**

[illegible]

## R-1 SHOPPING LIST - Item No. 108

**UNCLASSIFIED**

## Exhibit R-2, RD TEN Budget Item Justification

(Exhibit R-2, page 28 of 52)

## CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification							DATE: <b>February 2005</b>		
APPROPRIATION/BUDGET ACTIVITY <b>RDT&amp;E, N / BA-5</b>		PROGRAM ELEMENT NUMBER AND NAME PE 0604503N Title: SSN 688 & Trident Modernization			PROJECT NUMBER AND NAME 0742 Submarine Integrated Antenna S				
COST (\$ in Millions)		FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
Project Cost Project Cost		7.186	25.274	24.972	18.492	31.913	41.599	27.689	25.289
RDT&E Articles Qty									

**(U) A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:**

The Submarine Integrated Antenna System (SIAS) project (X0742) provides for the development and testing of submarine antennas designed to meet emerging submarine communications 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 receiver 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) P3I efforts to existing antennas including OE-538/BRC Multi-Function Antenna improved UHF (iUHF) gain, RFDACS efforts and the OE-562 Submarine High Data Rate (SubHDR) system development of X-band and (SHF) K-band capabilities, (2) Development of new antenna systems including Advanced High Data Rate Antenna (AdvHDR) and (3) Communication at Speed and Depth design efforts. These efforts will provide SSN, SSBN and SSGN platforms with an improved communications capability while operating at speed and depth thus enhancing operational flexibility and maintaining stealth in Littoral mission applications.

**U) JUSTIFICATION FOR BUDGET ACTIVITY:**

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.

R-1 SHOPPING LIST - Item No. 108

# UNCLASSIFIED

## CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification			DATE: <b>February 2005</b>																
APPROPRIATION/BUDGET ACTIVITY <b>RDT&amp;E, N / BA 5</b>	PROGRAM ELEMENT NUMBER AND NAME 0604503N SSN 688 & Trident Modernization	PROJECT NUMBER AND NAME 0742 Submarine Integrated Antenna System																	
<b>(U) B. Accomplishments/Planned Program</b>																			
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th style="width: 30%;"></th> <th style="width: 15%;">FY 04</th> <th style="width: 15%;">FY 05</th> <th style="width: 15%;">FY 06</th> <th style="width: 15%;">FY 07</th> </tr> <tr> <td>Advanced HDR/SubHDR P-3I</td> <td style="text-align: center;">2.612</td> <td style="text-align: center;">14.968</td> <td style="text-align: center;">15.032</td> <td style="text-align: center;">8.064</td> </tr> <tr> <td>RDT&amp;E Articles Quantity</td> <td></td> <td></td> <td></td> <td></td> </tr> </table>						FY 04	FY 05	FY 06	FY 07	Advanced HDR/SubHDR P-3I	2.612	14.968	15.032	8.064	RDT&E Articles Quantity				
	FY 04	FY 05	FY 06	FY 07															
Advanced HDR/SubHDR P-3I	2.612	14.968	15.032	8.064															
RDT&E Articles Quantity																			
<p><b>FY04:</b> Completed the digital navigation interface development for the SubHDR system (\$1.717). Commenced design development for SCA compliant SHF modification to Extremely High Frequency (EHF) Medium Data Rate (MDR)/Low Data Rate (LDR) and Follow-on Terminal (FOT) for joint US/UK initiative (\$ .733). Provided FOT&amp;E testing and support EMP testing completion (\$.162). <b>FY05:</b> Continue development of SHF FOT to accommodate SHF capability and meet the high priority fleet requirement to provide a secondary global IP connectivity. Develop prototype unit, initial logistics development and testing requirements. (\$11.509) Begin FOT modification development for simultaneous GBS and EHF functionality (GBS Open Loop Point Mod and APU Power Supply Upgrade). (\$3.459) <b>FY06:</b> Continue FOT modification development for SHF functionality and SCA compliance (\$14.633) Commence program planning and generation of acquisition documentation for AdvHDR (\$ .399) <b>FY07:</b> Complete SHF FOT development/test and SCA compliance (\$1.258). Commence APU Power Supply Upgrade and Mast Flood Protection P3I for SubHDR (\$1.842). Commence development of systems engineering, detailed specification documentation, and the Engineering Development Model (EDM) antenna mast assembly, source selection, award of contract and conduct risk reduction and technology insertion investigations.for AdvHDR \$4.964).</p>																			
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th style="width: 30%;"></th> <th style="width: 15%;">FY 04</th> <th style="width: 15%;">FY 05</th> <th style="width: 15%;">FY 06</th> <th style="width: 15%;">FY 07</th> </tr> <tr> <td>Comms at Speed and Depth</td> <td style="text-align: center;">0.000</td> <td style="text-align: center;">5.242</td> <td style="text-align: center;">4.532</td> <td style="text-align: center;">4.870</td> </tr> <tr> <td>RDT&amp;E Articles Quantity</td> <td></td> <td></td> <td></td> <td></td> </tr> </table>						FY 04	FY 05	FY 06	FY 07	Comms at Speed and Depth	0.000	5.242	4.532	4.870	RDT&E Articles Quantity				
	FY 04	FY 05	FY 06	FY 07															
Comms at Speed and Depth	0.000	5.242	4.532	4.870															
RDT&E Articles Quantity																			
<p><b>FY05:</b> Perform Analysis of Alternatives, technical risk reduction studies, and initiate systems engineering, environmental impact analysis, and generation of acquisition documentation for Comms at Speed and Depth systems. Commence development of Expendable Buoy (Increment I.)(\$.3.242). Initiate technical development of interface, requirements, installation, and environmental test plan documentation package to enable installation of the US/UK Recoverable Tethered Fibre Optic (RTOF) (\$2.000). <b>FY06:</b> Continue technology development of Expendable Buoy. Complete the acquisition documentation and processes required to obtain MS B approval. Award contract for development of Expendable Buoy Engineering Development Model (EDM). Commence EDM development (\$2.121)). Complete technical development of documentation package for RTOF submarine installation. Award contract for RTOF installation aboard US Navy submarine and initiate development of installation plan (\$2.411). <b>FY07:</b> Execute sea developmental testing and sea trials for Increment I. Generate aquisition documentation and award contract for Increment II system (\$3.352). Install RTOF system aboard OHIO Class submarine, provide technical oversight to sea test, remove RTOF system, and restore original capability to submarine (\$1.518).</p>																			

R-1 SHOPPING LIST - Item No. 108

UNCLASSIFIED

## UNCLASSIFIED

## CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification			DATE: <b>February 2005</b>																															
APPROPRIATION/BUDGET ACTIVITY <b>RDT&amp;E, N / BA 5</b>	PROGRAM ELEMENT NUMBER AND NAME 0604503N SSN 688 & Trident Modernization	PROJECT NUMBER AND NAME 0742 Submarine Integrated Antenna System																																
<b>(U) B. Accomplishments/Planned Program</b>																																		
<table border="1" style="width: 100%; border-collapse: collapse; margin-bottom: 10px;"> <tr> <th style="width: 30%;"></th> <th style="width: 15%;">FY 04</th> <th style="width: 15%;">FY 05</th> <th style="width: 15%;">FY 06</th> <th style="width: 15%;">FY 07</th> </tr> <tr> <td>Antenna Transition Engineering</td> <td style="text-align: center;">4.574</td> <td style="text-align: center;">5.064</td> <td style="text-align: center;">5.408</td> <td style="text-align: center;">5.558</td> </tr> <tr> <td>RDT&amp;E Articles Quantity</td> <td></td> <td></td> <td></td> <td></td> </tr> </table> <div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;"> <p><b>FY04:</b> Continued to provide emerging requirements and Satellite Communications Database/Link analysis for other development programs including (i.e. PCS/MCSS Commercial, WGS/AWS, Advanced EHF, and Wideband Commercial) (\$0.858). Continued P3I investigations and development efforts for legacy antenna systems (\$0.949). Continued concept engineering efforts, new technology evaluations and assessments in support of current and future submarine antenna applications (\$1.357). Commenced research engineering and hardware development leading to proof of concept demonstration for expendable buoy (\$1.410). <b>FY05:</b> Continue to provide emerging requirements and Satellite communications Database/Link analysis for other development programs (i.e. PCS/MCSS Commercial, WGS/AWS, Advanced EHF, and Wideband Commercial (\$1.040). Continue P3I investigations and development efforts for legacy antenna systems (\$1.726). Continue concept engineering, new technology evaluations and assessments in support of current and future submarine antenna applications (\$2.298). <b>FY06:</b> Continue to provide emerging requirements and Satellite communications Database/Link analysis for other development programs (i.e. MUOS/ANS, PCS/MCSS Commercial, WGS/AWS, Advanced EHF, and Wideband Commercial (\$1.439). Continue P3I investigations and development efforts for legacy antenna systems (\$1.326). Continue concept engineering, new technology evaluations and assessments in support of current and future submarine antenna applications (\$2.643) <b>FY07:</b> Continue to provide emerging requirements and Satellite communications Database/Link analysis for other development programs (i.e. MUOS/ANS, PCS/MCSS Commercial, WGS/AWS, Advanced EHF, and Wideband Commercial (\$1.138). Continue P3I investigations and development efforts for legacy antenna systems (\$1.726). Continue concept engineering, new technology evaluations and assessments in support of current and future submarine antenna applications (\$2.694)</p> </div> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th style="width: 30%;"></th> <th style="width: 15%;">FY 04</th> <th style="width: 15%;">FY 05</th> <th style="width: 15%;">FY 06</th> <th style="width: 15%;">FY 07</th> </tr> <tr> <td>Accomplishments/Effort/Subtotal Cost</td> <td style="text-align: center;">0.000</td> <td style="text-align: center;">0.000</td> <td style="text-align: center;">0.000</td> <td style="text-align: center;">0.000</td> </tr> <tr> <td>RDT&amp;E Articles Quantity</td> <td></td> <td></td> <td></td> <td></td> </tr> </table> <div style="border: 1px solid black; height: 80px; margin-top: 10px;"></div>						FY 04	FY 05	FY 06	FY 07	Antenna Transition Engineering	4.574	5.064	5.408	5.558	RDT&E Articles Quantity						FY 04	FY 05	FY 06	FY 07	Accomplishments/Effort/Subtotal Cost	0.000	0.000	0.000	0.000	RDT&E Articles Quantity				
	FY 04	FY 05	FY 06	FY 07																														
Antenna Transition Engineering	4.574	5.064	5.408	5.558																														
RDT&E Articles Quantity																																		
	FY 04	FY 05	FY 06	FY 07																														
Accomplishments/Effort/Subtotal Cost	0.000	0.000	0.000	0.000																														
RDT&E Articles Quantity																																		

R-1 SHOPPING LIST - Item No. 108

UNCLASSIFIED

# UNCLASSIFIED

## CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification			DATE:	
			February 2005	
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND NAME		
RDT&E, N / BA 5	0604503N SSN 688 & Trident Modernization	0742 Submarine Integrated Antenna System		
(U) C. PROGRAM CHANGE SUMMARY:				
(U) Funding:	FY 2004	FY 2005	FY 2006	FY 2007
FY05 President's Budget	7.313	25.557	32.335	25.649
FY06 President's Budget	7.186	25.274	24.972	18.492
Total Adjustments	-0.127	-0.283	-7.363	-7.157
Summary of Adjustments				
Programmatic adjustments	-0.082	-0.256	-7.363	-7.157
Undistributed congressional reductions	-0.045	-0.027		
Subtotal	-0.127	-0.283	-7.363	-7.157
(U) Schedule:				
SubHDR FOT/SHF IOC rephased from 2nd qtr FY06 to 4th qtr FY07.				
K-band no longer applicable to SubHDR due to antenna development being ahead of requirement for UAV connectivity.				
Comms at Speed and Depth MS-B moved to FY 2006 2Q following Analysis of Alternatives planned in FY 2005.				
(U) Technical:				
Not Applicable				

R-1 SHOPPING LIST - Item No. 108

UNCLASSIFIED



# UNCLASSIFIED

## CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification								DATE: <b>February 2005</b>	
APPROPRIATION/BUDGET ACTIVITY <b>RDT&amp;E, N / BA-5</b>			PROGRAM ELEMENT NUMBER AND NAME 0604503N SSN 688 & Trident Modernization			PROJECT NUMBER AND NAME 0742 Submarine Integrated Antenna System			

**(U) D. OTHER PROGRAM FUNDING SUMMARY:**

Line Item No. & Name	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	To Complete	Total Cost
3130 Submarine Communications	80.234	98.927	127.409	88.725	85.482	79.755	120.235	159.456	Continue	Continue

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.

**(U) E. ACQUISITION STRATEGY: \***

Program Milestones: FY 2006 2Q Comms at Speed and Depth MS-B; FY2007 1Q Adv HDR MS-B  
 T&E Milestones:  
 Contract Milestones:

\* Not required for Budget Activities 1,2,3, and 6

R-1 SHOPPING LIST - Item No. 108

UNCLASSIFIED

## UNCLASSIFIED

## CLASSIFICATION:

Exhibit R-3 Cost Analysis (page 1)

DATE:

February 2005

APPROPRIATION/BUDGET ACTIVITY

PROGRAM ELEMENT

PROJECT NUMBER AND NAME

RDT&amp;E, N / BA-5

0604503N SSN 688 &amp; Trident Modernization

0742 Submarine Integrated Antenna System

Cost Categories	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 05 Cost	FY 05 Award Date	FY 06 Cost	FY 06 Award Date	FY 07 Cost	FY 07 Award Date	Cost to Complete	Total Cost	Target Value of Contract
Digital Interface Dev (HDR)	CPAF	Raytheon, Marlboro, MA	3.545								3.545	3.545
Hardware Dev (HDR/Adv HDR)	WX	NUWC, Newport, RI	7.674			1.411					0.000	0.000
Hardware Dev (HDR SHF/FOT)	TBD	Raytheon, Marlboro, MA	1.717	9.777	TBD	4.300	TBD	1.069	TBD		16.863	16.863
Hardware Dev (Trans Eng)	CPAF	Sippican Marion, MA	1.410								1.410	1.410
Systems Engineering (Comms)	TBD	TBD		1.705		3.669		4.514				
Systems Engineering (HDR/AdvHDR)	TBD	TBD				5.395		1.846				
System Engineering (HDR/AdvHDR)	WX	NUWC, Newport, RI	6.215	4.150		1.261		3.307			14.933	0.000
System Engineering (Trans Eng)	WX	NUWC, Newport, RI	4.731	5.052		4.631		4.192			18.606	
Systems Engineering (Comms)	WX	NUWC, Newport, RI		2.805		2.896		2.285			7.986	0.000
Subtotal Product Development			25.292	23.489		23.563		17.213		0.000	89.557	0.000

Remarks:

Development Support											0.000	0.000
Software Development	WX	NUWC, Newport, RI	0.739								0.739	0.000
Training Development											0.000	0.000
Integrated Logistics Support	Various	Various	0.530	0.599		0.438		0.441			2.008	0.000
Configuration Management											0.000	0.000
Technical Data											0.000	0.000
GFE											0.000	0.000
Subtotal Support			1.269	0.599		0.438		0.441		0.000	2.747	0.000

Remarks:

R-1 SHOPPING LIST - Item No. 108

UNCLASSIFIED

Exhibit R-2, RD TEN Budget Item Justification

(Exhibit R-2, page 34 of 52)

## UNCLASSIFIED

<b>CLASSIFICATION:</b>												
Exhibit R-3 Cost Analysis (page 2)										DATE: <b>February 2005</b>		
APPROPRIATION/BUDGET ACTIVITY			PROGRAM ELEMENT			PROJECT NUMBER AND NAME						
<b>RDT&amp;E, N / BA-5</b>			0604503N SSN 688 & Trident Modernization			0742 Submarine Integrated Antenna System						
Cost Categories	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 05 Cost	FY 05 Award Date	FY 06 Cost	FY 06 Award Date	FY 07 Cost	FY 07 Award Date	Cost to Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation											0.000	0.000
Operational Test & Evaluation											0.000	0.000
Developmental/Operational T&E	Various	Various	1.167	0.100							1.267	0.000
Test Assets											0.000	0.000
Tooling											0.000	0.000
GFE											0.000	0.000
Subtotal T&E			1.167	0.100		0.000		0.000		0.000	1.267	0.000
Remarks:												
Contractor Engineering Support											0.000	0.000
Government Engineering Support											0.000	0.000
Program Management Support	Various	Various	1.595	1.086		0.971		0.838			4.490	0.000
Travel											0.000	0.000
Subtotal Management			1.595	1.086		0.971		0.838		0.000	4.490	0.000
Remarks:												
Total Cost			29.323	25.274		24.972		18.492		0.000	98.061	0.000
Remarks:												

R-1 SHOPPING LIST - Item No. 108

UNCLASSIFIED

UNCLASSIFIED

## CLASSIFICATION:

EXHIBIT R4, Schedule Profile																DATE: February 2005																
APPROPRIATION/BUDGET A PROGRAM ELEMENT NUMBER AND NAME												PROJECT NUMBER AND NAME																				
RDT&E, N /				PE: 0604503N TITLE: SSN 688 & TRIDENT MODERNIZATION												X0742 Submarine Integrated Antenna System																
Fiscal Year	2004				2005				2006				2007				2008				2009				2010				2011			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Acquisition (SubHDR) Milestones																																
Prototype Phase																																
System Development																																
EDM Delivery																																
Software Delivery																																
Test & Evaluation Milestones																																
Development Test																																
Technical Evaluation																																
Operational Evaluation																																
Production Milestones																																
Full Rate Production Start-up (ECP drawer)																																
Full Rate Production Delivery																																
Low-Rate Initial Production (LRIP) Start-up																																
Low-Rate Initial Production (LRIP) Delivery																																

R-1 SHOPPING LIST - Item No. 108

\* Not required for Budget Activities 1, 2, 3, and 6

UNCLASSIFIED

# UNCLASSIFIED

## CLASSIFICATION:

Exhibit R-4a, Schedule Detail					DATE: <b>February 2005</b>			
APPROPRIATION/BUDGET ACTIVITY <b>RDT&amp; BA-5</b>	PROGRAM ELEMENT PE: 0604503N TITLE: SSN 688 & TRIDENT MODERNIZATION				PROJECT NUMBER AND NAME X0742 Submarine Integrated Antenna System			
Schedule Profile (SubHDR)	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
FOT/SHF Critical Design Review (CDR)		3Q						
FOT/SHF Eng Dev Model (EDM)			3Q					
FOT/SHF Developmental Testing (DT)			3Q-	4Q				
FOT/SHF Technical Evaluation (TECHEVAL)				3Q				
FOT/SHF Operational Evaluation (OPEVAL)				4Q				
FOT/SHF Software Delivery			3Q					
FOT/SHF Preproduction Readiness Review (PRR)			2Q					
FOT/SHF Low Rate Production (LRIP) Start-up			2Q					
FOT/SHF Low Rate Production (LRIP) delivery				2Q				
FOT/SHF Full Rate Production (FRP) Start-up					1Q			
FOT/SHF Full Rate Production (FRP) First Delivery						1Q		
FOT/SHF IOC				4Q				

R-1 SHOPPING LIST - Item No. 108

UNCLASSIFIED

UNCLASSIFIED

CLASSIFICATION:

EXHIBIT R4, Schedule Profile																DATE: February 2005																
APPROPRIATION/BUDGET /PROGRAM ELEMENT NUMBER AND NAME												PROJECT NUMBER AND NAME																				
RDT&E, N / BA5				PE: 0604305N TITLE: SSN 688 & TRIDENT MODERNIZATION												X0742 Submarine Integrated Antenna System																
Fiscal Year	2004				2005				2006				2007				2008				2009				2010				2011			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Acquisition (Comms) Milestones																																
Technology Development & Requirements																																
System Development Increment I																																
Engineering Dev. Model Increment I																																
Deliveries																																
System Development Increment II																																
Engineering Dev. Model Increment II																																
Deliveries																																
DT/OT Increment I																																
DT/OT Increment II																																
Production Milestones																																
LRIP																																
Deliveries																																
RTOF Tech Demo (US/UK)																																

MS B

MS C (I)

MS C (II)

DRR (I)

MS C (I)

IOC (I)

MSC (II)

CPD (II)

CPD (I)

CDR

EDM DEVELOPMENT (I)

Lab 1

Lab 2

SDR

PDR

CDR

EDM DEVELOPMENT (II)

Lab 1

Lab 2

TRR

DT-IIA

DT-IIB

OT-IIA

TRR

DT-IIA

DT-IIB

OT-IIA

LRIP Start (I)

LRIP (I): QTY 5

FRP (I)

LRIP (II): QTY 1

LRIP Start (II)

SEA TEST PLANNING & ENGINEERING

INSTALL, TEST, & RESTORE SSBN SUBMARINE

(5)

R-1 SHOPPING LIST - Item No. 108

\* Not required for Budget Activities 1, 2, 3, and 6

UNCLASSIFIED

Exhibit R-2, RDTE Budget Item Justification  
(Exhibit R-2, page 38 of 52)

# UNCLASSIFIED

## CLASSIFICATION:

Exhibit R-4a, Schedule Detail						DATE:			
						<b>February 2005</b>			
APPROPRIATION/BUDGET ACTIVITY		PROGRAM ELEMENT				PROJECT NUMBER AND NAME			
<b>RDT&amp;E, N / BA5</b>		PE: 0604305N TITLE: SSN 688 & TRIDENT MODERNIZATION				X0742 Submarine Integrated Antenna System			
Schedule Profile (Comms)	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	
Technology Development	1Q--	1Q--	2Q						
Approval of Initial Capability Document (ICD)		1Q--							
RTOF Test Planning & Engineering		1Q--	1Q--						
Analysis of Alternatives		2Q-	1Q						
Approval of Capability Development Document (CDD)			2Q						
Milestone B Decision (MS B)			2Q						
EDM Development for Increment I			2Q--	1Q--					
RTOF Install, Test, & Restore				1Q-4Q					
System Design Review (SDR) for Increment I			3Q						
Preliminary Design Review (PDR) for Increment I			4Q						
Critical Design Review (CDR) for Increment I				4Q					
Approval of CDD for Increment II				4Q					
Design Readiness Review (DRR) for Increment I					1Q				
EDM Development for Increment II					1Q--	1Q--	1Q--	1Q	
Test Readiness Review (TRR) for Increment I					1Q				
System Design Review (SDR) for Increment II					1Q				
Eng Dev Model (EDM) - Lab 1 Delivery for Increment I					2Q				
Development Test DT-IIA for Increment I					2Q-3Q				
Preliminary Design Review (PDR) for Increment II					3Q				
Eng Dev Model (EDM) - Lab 2 Delivery for Increment I					4Q				
Development Test DT-IIB for Increment I					4Q				
Approval of Capability Production Document (CPD) (Inc. I)					4Q				
Milestone C (MS C) Decision for Increment I					4Q				
Low-Rate Initial Production (LRIP) for Increment I						1Q-2Q			
Operational Testing (OT-IIA) for Increment I						3Q			
Critical Design Review (CDR) for Increment II						3Q			
Initial Operational Capability (IOC) for Increment I						4Q			
Full Rate Production Decision for Increment I							1Q		
Test Readiness Review (TRR) for Increment II							1Q		
Development Test DT-IIA for Increment II							2Q-3Q		
Eng Dev Model (EDM) - Lab 1 Delivery for Increment II							3Q		
Development Test DT-IIB for Increment II							4Q		
Eng Dev Model (EDM) - Lab 2 Delivery for Increment II								1Q	
Approval of CPD for Increment II								1Q	
Milestone C (MS C) Decision for Increment II								2Q	
Low-Rate Initial Production (LRIP) for Increment II								2Q-4Q	
Operational Testing (OT-IIA) for Increment II								4Q	

R-1 SHOPPING LIST - Item No. 108

UNCLASSIFIED

Exhibit R-2, RDTEN Budget Item Justification  
(Exhibit R-2, page 40 of 52)

UNCLASSIFIED

## CLASSIFICATION:

EXHIBIT R4, Schedule Profile																	DATE: February 2005																	
APPROPRIATION/BUDGET / PROGRAM ELEMENT NUMBER AND NAME													PROJECT NUMBER AND NAME																					
RDT&E, N / BA5					PE: 0604305N TITLE: SSN 688 & TRIDENT MODERNIZATION													X0742 Submarine Integrated Antenna System																
Fiscal Year	2004				2005				2006				2007				2008				2009				2010				2011					
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4		
Acquisition (AdvHDR) Milestones									ACQUISITION PLANNING & DOCUMENTATION				MS B								DRR										MS C			
Requirements								ICD					CDD																		CPD			
System Development														SDR		PDR			CDR															
Engineering Dev. Model														EDM DEVELOPMENT																				
Deliveries													SOURCE SELECTION								Lab 1			Lab 2				Lab 3						
Development Test																				TRR	DT-IIA			DT-IIB				DT-IIC						

R-1 SHOPPING LIST - Item No.108

\* Not required for Budget Activities 1, 2, 3, and 6

UNCLASSIFIED



# UNCLASSIFIED

## CLASSIFICATION:

Exhibit R-4a, Schedule Detail						DATE: February 2005			
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT				PROJECT NUMBER AND NAME				
<b>RDT&amp;E, N / BA5</b>	PE: 0604305N TITLE: SSN 688 & TRIDENT MODERNIZATION				X0742 Submarine Integrated Antenna System				
Schedule Profile (AdvHDR)	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	
Approval of Initial Capability Document (ICD)		4Q							
Acquisition Planning & Documentation			1Q-4Q						
Approval of Capability Development Document (CDD)				1Q					
Milestone B Decision (MS B)				1Q					
Source Selection				1Q-3Q					
Engineering Development Model Development				3Q--	1Q--	1Q--	1Q--	1Q--	
System Design Review (SDR)				4Q					
Preliminary Design Review (PDR)					2Q				
Critical Design Review (CDR)						1Q			
Design Readiness Review (DRR)						2Q			
Test Readiness Review (TRR)						3Q			
Eng Dev Model (EDM) - Lab 1 Delivery						3Q			
Development Test DT-IIA						3Q-4Q			
Eng Dev Model (EDM) - Lab 2 Delivery							2Q		
Development Test DT-IIB							2Q-3Q		
Eng Dev Model (EDM) - Lab 3 Delivery								2Q	
Development Test DT-IIC								2Q-3Q	
Approval of Capability Production Document (CPD)								3Q	
Milestone C (MS C) Decision								4Q	

R-1 SHOPPING LIST - Item No. 108

UNCLASSIFIED

Exhibit R-2, RDTEN Budget Item Justification  
(Exhibit R-2, page 42 of 52)

UNCLASSIFIED

## CLASSIFICATION:

EXHIBIT R4, Schedule Profile																								DATE: February 2005											
APPROPRIATION/BUDGET ACTIVITY												PROGRAM ELEMENT NUMBER AND NAME												PROJECT NUMBER AND NAME											
RDT&E, N / BA5												PE: 0604503N TITLE: SSN 688 & TRIDENT MODERNIZATION												X1411 Submarine Tactical Communications System											
Fiscal Year	2002				2003				2004				2005				2006				2007				2008				2009						
	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 (CSRR) Milestones															MS C △			IOC ☆	☆		First Deployment △														
Prototype Phase																																			
Software System Development																FAT △△																			
Q-70 Delivery																																			
Software Interim Delivery #1 Fleet SW Delivery													ITF ▲							Fleet △															
Test & Evaluation Milestones																																			
Development Test																																			
Operational Test																																			
Production Milestones																																			
LRIP																																			
FRP																																			
Deliveries																																			

R-1 SHOPPING LIST - Item No. 108

\* Not required for Budget Activities 1, 2, 3, and 6

UNCLASSIFIED

## UNCLASSIFIED

## CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification							DATE: <b>February 2005</b>		
APPROPRIATION/BUDGET ACTIVITY <b>RDT&amp;E, N / BA-5</b>		PROGRAM ELEMENT NUMBER AND NAME PE 0604503N Title: SSN 688 & Trident Modernization			PROJECT NUMBER AND NAME 1411 Submarine Tactical Communicat				
COST (\$ in Millions)		FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
Project Cost	Project Cost	11.857	7.573	14.789	17.982	17.792	15.695	11.123	10.725
RDT&E Articles Qty									

**(U) A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:**

The Submarine Tactical Communications System project (X1411) provides submarines with communications systems designed to: (a) enhance data throughput through automation and integrated network management; (b) copy tactical data networks, (c) provide submarines IP connectivity; (d) be interoperable with other U.S. and allied military networks; and (e) improve reliability, maintainability, and availability. This is accomplished by providing the submarine with a properly integrated mix of Navy standard and commercial off-the-shelf communication equipment covering a wide range of frequencies and modes. The Common Submarine Radio Room (CSRR) integrates COTS and GOTS components into a single radio room configuration for all classes of submarines. CSRR will leverage the development of VIRGINIA Class Exterior Communications System (ECS) which includes Open Systems Architecture (OSA) and install the VIRGINIA based ECS architecture on all classes of submarines. In support of the CSRR, funding is provided to expedite the Navy standard Multi-functional Crypto System (MCS) to meet CSRR need dates. The project provides for the development of a single Land-Based Integration and Test Facility that will consolidate existing Land -Based Testing Facilities into one facility that will support all classes of submarines. This project funds the development of a replacement of the Multi-Link Transmit Simulator (MLTS) to support future testing and training requirements. The project includes system engineering efforts associated with demonstration of new technology which will allow the submarine to participate in battle group and joint operations. The new technology will increase the submarine's communications, command, and control capability and interoperability with the rest of the Navy and exploit its stealth capabilities for battlefield dominance.

**U) JUSTIFICATION FOR BUDGET ACTIVITY:**

This program is funded under SYSTEMS DEVELOPMENT and DEMONSTRATION because it encompasses development and demonstration of new end-items prior to production approval decision.

R-1 SHOPPING LIST - Item No. 108

UNCLASSIFIED

## CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification			DATE: <b>February 2005</b>																
APPROPRIATION/BUDGET ACTIVITY <b>RDT&amp;E, N / BA-5</b>	PROGRAM ELEMENT NUMBER AND NAME 0604503N SSN 688 & TRIDENT MODERNIZATION	PROJECT NUMBER AND NAME 1411 Submarine Tactical Communications System																	
<b>(U) B. Accomplishments/Planned Program</b>																			
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 30%;">Common Submarine Radio Room (CSRR)/</td> <td style="width: 15%;">FY04</td> <td style="width: 15%;">FY05</td> <td style="width: 15%;">FY06</td> <td style="width: 15%;">FY07</td> </tr> <tr> <td>Submarine Communications Support System (SCSS)</td> <td>5.852</td> <td>6.754</td> <td>13.946</td> <td>17.155</td> </tr> <tr> <td>RDT&amp;E Articles Quantity</td> <td></td> <td></td> <td></td> <td></td> </tr> </table>					Common Submarine Radio Room (CSRR)/	FY04	FY05	FY06	FY07	Submarine Communications Support System (SCSS)	5.852	6.754	13.946	17.155	RDT&E Articles Quantity				
Common Submarine Radio Room (CSRR)/	FY04	FY05	FY06	FY07															
Submarine Communications Support System (SCSS)	5.852	6.754	13.946	17.155															
RDT&E Articles Quantity																			
<div style="border: 1px solid black; padding: 10px;"> <p><b>FY04:</b> Modified OHIO Class Control &amp; Management software development to include Extremely High Frequency (EHF) Follow-on Terminal (FOT) interface, router update for obsolescence, and update of associated documentation. (\$1.235) Continued CSRR integration and test in support of OHIO class submarines. (\$4.190) Continued INFOSEC certification of OHIO Class CSRR. (\$427) <b>FY05:</b> Perform system engineering/design development for 688 Class SCSS modernization (\$351). Complete CSRR integration and test support for OHIO class submarines (\$4.943). Continue INFOSEC certification of all classes CSRR and commence IA recertification of legacy 688 class radio rooms (\$760) Commence ECP development supporting Integration Test Facility (\$700). <b>FY06:</b> Continue system engineering/design development for 688 SCSS modernization (\$300). Commence system engineering and development of Multi Purpose Reconfigurable Training System (MRTS) (\$3.238). Continue Information Assurance (IA) and continue INFOSEC certification of all classes CSRR and continue IA recertification of legacy 688 class radio rooms (\$776) Commence system engineering, design development testing, software design development supporting CSRR modernization (\$9.632) <b>FY07:</b> Continue system engineering/design development for 688 SCSS modernization (\$306). Continue Information Assurance (IA) and continue INFOSEC certification of all classes CSRR and continue IA recertification of legacy 688 class radio rooms (\$792) Continue system engineering, test plan design development, software development, Integrated Logistics product development and curricula development for CSRR modernization (\$6.647). Commence design/integration engineering, development testing, Follow-on Test and Evaluation support, software development and Subschool curricula development in support of unique 688 class CSRR requirements (\$7.740). Commence unique 688 class software development (\$1.670).</p> </div>																			
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 30%;"></td> <td style="width: 15%;">FY04</td> <td style="width: 15%;">FY05</td> <td style="width: 15%;">FY06</td> <td style="width: 15%;">FY07</td> </tr> <tr> <td>BCA OPLAN architecture</td> <td>0.856</td> <td>0.819</td> <td>0.843</td> <td>0.827</td> </tr> <tr> <td>RDT&amp;E Articles Quantity</td> <td></td> <td></td> <td></td> <td></td> </tr> </table>						FY04	FY05	FY06	FY07	BCA OPLAN architecture	0.856	0.819	0.843	0.827	RDT&E Articles Quantity				
	FY04	FY05	FY06	FY07															
BCA OPLAN architecture	0.856	0.819	0.843	0.827															
RDT&E Articles Quantity																			
<div style="border: 1px solid black; padding: 10px;"> <p><b>FY04 Accomplishments:</b> Commenced system engineering supporting BCA/OPCON architecture (\$856). <b>FY05:</b> Continue system engineering supporting BCA/OPCON architecture (\$819). <b>FY06:</b> Continue system engineering supporting BCA/OPCON architecture (\$843). <b>FY07:</b> Continue system engineering supporting BCA/OPCON architecture (\$827).</p> </div>																			

R-1 SHOPPING LIST - Item No. 108

# UNCLASSIFIED

## CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification			DATE: <b>January 2005</b>																
APPROPRIATION/BUDGET ACTIVITY <b>RDT&amp;E, N /BA-5</b>	PROGRAM ELEMENT NUMBER AND NAME 0604503N SSN 688 & TRIDENT MODERNIZATION	PROJECT NUMBER AND NAME 1411 Submarine Tactical Communications System																	
<b>(U) B. Accomplishments/Planned Program</b> <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 10px;"> <tr> <th style="width: 30%;"></th> <th style="width: 15%;">FY 04</th> <th style="width: 15%;">FY 05</th> <th style="width: 15%;">FY 06</th> <th style="width: 15%;">FY07</th> </tr> <tr> <td>Multi-functional Crypto System (MCS)</td> <td style="text-align: center;">5.149</td> <td style="text-align: center;">0.000</td> <td style="text-align: center;">0.000</td> <td style="text-align: center;">0.000</td> </tr> <tr> <td>RDT&amp;E Articles Quantity</td> <td></td> <td></td> <td></td> <td></td> </tr> </table> <div style="border: 1px solid black; padding: 10px; margin-top: 10px;"> <p><b>FY04 Accomplishments:</b> Preliminary Cert 2 (R2.0) released for testing of KWR-46 features. Released Final Cert 2 (R2.1) with software corrections and additional KG-84A mode for testing. (\$5.149K)</p> </div>						FY 04	FY 05	FY 06	FY07	Multi-functional Crypto System (MCS)	5.149	0.000	0.000	0.000	RDT&E Articles Quantity				
	FY 04	FY 05	FY 06	FY07															
Multi-functional Crypto System (MCS)	5.149	0.000	0.000	0.000															
RDT&E Articles Quantity																			

R-1 SHOPPING LIST - Item No. 108

UNCLASSIFIED

# UNCLASSIFIED

## CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification			DATE: <b>February 2005</b>																																														
APPROPRIATION/BUDGET ACTIVITY <b>RDT&amp;E, N / BA-5</b>	PROGRAM ELEMENT NUMBER AND NAME 0604503N SSN 688 & TRIDENT MODERNIZATION	PROJECT NUMBER AND NAME 1411 Submarine Tactical Communications System																																															
<p><b>(U) C. PROGRAM CHANGE SUMMARY:</b></p> <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;"></th> <th style="text-align: right;">FY 2004</th> <th style="text-align: right;">FY 2005</th> <th style="text-align: right;">FY 2006</th> <th style="text-align: right;">FY2007</th> </tr> </thead> <tbody> <tr> <td>(U) Funding:</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>FY05 President's Budget</td> <td style="text-align: right;">5.106</td> <td style="text-align: right;">7.710</td> <td style="text-align: right;">4.592</td> <td style="text-align: right;">2.524</td> </tr> <tr> <td>FY06 President's Budget</td> <td style="text-align: right;">11.857</td> <td style="text-align: right;">7.573</td> <td style="text-align: right;">14.789</td> <td style="text-align: right;">17.982</td> </tr> <tr> <td>Total Adjustments</td> <td style="text-align: right; border-top: 1px solid black;">6.751</td> <td style="text-align: right; border-top: 1px solid black;">-0.137</td> <td style="text-align: right; border-top: 1px solid black;">10.197</td> <td style="text-align: right; border-top: 1px solid black;">15.458</td> </tr> <tr> <td colspan="5" style="padding-top: 10px;">Summary of Adjustments</td> </tr> <tr> <td>Undistributed congressional reductions</td> <td style="text-align: right;">-0.001</td> <td></td> <td></td> <td></td> </tr> <tr> <td>Programmatic adjustment</td> <td style="text-align: right;">6.752</td> <td style="text-align: right;">-0.137</td> <td style="text-align: right;">10.197</td> <td style="text-align: right;">15.458</td> </tr> <tr> <td>Subtotal</td> <td style="text-align: right; border-top: 1px solid black; border-bottom: 1px solid black;">6.751</td> <td style="text-align: right; border-top: 1px solid black; border-bottom: 1px solid black;">-0.137</td> <td style="text-align: right; border-top: 1px solid black; border-bottom: 1px solid black;">10.197</td> <td style="text-align: right; border-top: 1px solid black; border-bottom: 1px solid black;">15.458</td> </tr> </tbody> </table> <p style="margin-top: 20px;">(U) Schedule:</p> <p>CSRR program Milestone C scheduled for 3rd Qtr FY05.</p> <p style="margin-top: 40px;">(U) Technical:</p> <p>Not Applicable</p>						FY 2004	FY 2005	FY 2006	FY2007	(U) Funding:					FY05 President's Budget	5.106	7.710	4.592	2.524	FY06 President's Budget	11.857	7.573	14.789	17.982	Total Adjustments	6.751	-0.137	10.197	15.458	Summary of Adjustments					Undistributed congressional reductions	-0.001				Programmatic adjustment	6.752	-0.137	10.197	15.458	Subtotal	6.751	-0.137	10.197	15.458
	FY 2004	FY 2005	FY 2006	FY2007																																													
(U) Funding:																																																	
FY05 President's Budget	5.106	7.710	4.592	2.524																																													
FY06 President's Budget	11.857	7.573	14.789	17.982																																													
Total Adjustments	6.751	-0.137	10.197	15.458																																													
Summary of Adjustments																																																	
Undistributed congressional reductions	-0.001																																																
Programmatic adjustment	6.752	-0.137	10.197	15.458																																													
Subtotal	6.751	-0.137	10.197	15.458																																													

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UNCLASSIFIED

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CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification							DATE: <b>February 2005</b>			
APPROPRIATION/BUDGET ACTIVITY <b>RDT&amp;E, N / BA5</b>		PROGRAM ELEMENT NUMBER AND NAME 0604503N SSN 688 & TRIDENT MODERNIZATION			PROJECT NUMBER AND NAME 1411 Submarine Tactical Communications System					
<b>(U) D. OTHER PROGRAM FUNDING SUMMARY:</b>										
<u>Line Item No. &amp; Name</u>	<u>FY 2004</u>	<u>FY 2005</u>	<u>FY 2006</u>	<u>FY 2007</u>	<u>FY 2008</u>	<u>FY 2009</u>	<u>FY 2010</u>	<u>FY2011</u>	<u>To Complete</u>	<u>Total Cost</u>
3130000 Submarine Communications	80.234	98.927	127.409	88.725	85.482	79.755	120.235	159.456	Continue	Continue
Related RDT&E: PE 0602232N Space and Electronic Warfare (SEW) Technology PE 0204163N Fleet Communications										
<b>(U) E. ACQUISITION STRATEGY: *</b>										
SCSS provides the system engineering and integration for the N77/N6 narrowband and wideband modernization plans on SSN 688 Class Submarines. CSRR transforms SSN 688, SSBN 726 and SSN 21 Class radio room from suites of class-specific, closed system equipment to a common design that incorporates OSA communications equipment. CSRR will: leverage off VIRGINIA Class ECS design, use VIRGINIA Class ECS control and management software, apply a systems approach to design and implementation of JMCOMS, and maximize use of COTS products and emerging technologies. Program Milestones: FY 2005 CSRR 3Q-MS-C T&E Milestones: FY 2006 CSRR 3/4Q TECHEVAL, FY 2007 SSBN CSRR 1Q OPEVAL										

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## CLASSIFICATION:

Exhibit R-3 Cost Analysis (page 1)								DATE: <b>February 2005</b>				
APPROPRIATION/BUDGET ACTIVITY			PROGRAM ELEMENT			PROJECT NUMBER AND NAME						
<b>RDT&amp;E, N / BA-5</b>			0604503N SSN 688 & TRIDENT MODERNIZATION			1411 Submarine Tactical Communications System						
Cost Categories	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 05 Cost	FY 05 Award Date	FY 06 Cost	FY 06 Award Date	FY 07 Cost	FY 07 Award Date	Cost to Complete	Total Cost	Target Value of Contract
Primary Hardware Development											0.000	
Hardware Development*	CPFF	SSC-SD/NUWC Newport, RI	2.776								Continuing	Continuing
Hardware Development**	CPFF	SSCs/NUWC Newport, RI	0.211							Continuing	Continuing	Continuing
MCS Development	Various	Motorola, misc labs	10.214		Various							
H/W Development Facilities	Various	NUWC Newport, RI										
Software Development	CPFFWX	SSC-SD San Diego, CA	2.068					0.140	TBD	Continuing	Continuing	
Software Development	WX	NUWC Newport, RI	5.498					2.909	TBD	Continuing	Continuing	Continuing
MRTS Development	CFCC	NAVAIR, Orlando		0.000	TBD	2.238					2.238	2.238
Systems Engineering	Various	Misc Labs	11.448	0.315		3.386		4.789			19.938	Continuing
Systems Eng/Design 688 Class	Various	Misc Labs		0.000		4.674		6.672				
Site Platform Integration/Certification	Various	NUWC Newport, RI	4.794	4.779		0.748		1.853			12.174	
BCA/OPCON architecture	WX	NUWC Newport, RI	0.856	0.819		0.858		0.819			3.352	
Subtotal Product Development			37.865	5.913		11.904		17.182		Continuing	Continuing	Continuing
Remarks: * SCSS Development for SSN 688 Class submarines **CSRR Development for OHIO Class submarines												
Development Support												
Software Development (CSRR)	CPAF	Lockheed Martin Tech Sys	8.793								8.793	8.793
Integrated Logistics Support (IETM)	WX	NUWC Newport, RI	0.300								0.300	0.300
Software Engineering	WX	SSC-SD San Diego, CA	0.653			0.500					0.500	0.500
Configuration Management												
INFOSEC/IA Certification	CPFF	Merdan/SSC SD	0.906	0.760							1.666	1.666
Studies & Analyses											0.000	0.000
GFE											0.000	0.000
Award Fees											0.000	0.000
Subtotal Support			10.652	0.760		0.500		0.000		0.000	11.912	11.912
Remarks: *Supports the development of the Multi-Link Training Simulator replacement												

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## CLASSIFICATION:

Exhibit R-3 Cost Analysis (page 2)										DATE: <b>February 2005</b>		
APPROPRIATION/BUDGET ACTIVITY <b>RDTE&amp;E, N / BA-5</b>			PROGRAM ELEMENT 0604503N SSN 688 & TRIDENT MODERNIZATION			PROJECT NUMBER AND NAME 1411 Submarine Tactical Communications System						
Cost Categories	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 05 Cost	FY 05 Award Date	FY 06 Cost	FY 06 Award Date	FY 07 Cost	FY 07 Award Date	Cost to Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation											0.000	
Operational Test & Evaluation											0.000	
Developmental/Operational T&E	Various	Various	4.530	0.000		1.635		0.000			6.165	Continuing
Test Assets											0.000	
Tooling											0.000	
GFE											0.000	
Award Fees											0.000	
Subtotal T&E			4.530	0.000		1.635		0.000		Continuing	Continuing	Continuing
Remarks:												
Contractor Engineering Support											0.000	
Government Engineering Support											0.000	
Program Management Support	Various	Various	4.590	0.900	Various	0.750	Various	0.800	Various	Continuing	Continuing	Continuing
Travel											0.000	
Transportation											0.000	
SBIR Assessment											0.000	
Subtotal Management			4.590	0.900		0.750		0.800		Continuing	Continuing	Continuing
Remarks:												
Total Cost			57.637	7.573		14.789		17.982		Continuing	Continuing	Continuing
Remarks:												

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## CLASSIFICATION:

EXHIBIT R4, Schedule Profile																								DATE: February 2005											
APPROPRIATION/BUDGET ACTIVITY												PROGRAM ELEMENT NUMBER AND NAME												PROJECT NUMBER AND NAME											
RDT&E, N / BA5												PE: 0604503N TITLE: SSN 688 & TRIDENT MODERNIZATION												X1411 Submarine Tactical Communications System											
Fiscal Year	2002				2003				2004				2005				2006				2007				2008				2009						
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4			
Acquisition (CSRR) Milestones															MS C △			IOC ☆	☆		First Deployment △														
Prototype Phase																																			
Software System Development																FAT △△																			
Q-70 Delivery																																			
Software Interim Delivery #1 Fleet SW Delivery													ITF ▲																						
Test & Evaluation Milestones																																			
Development Test																																			
Operational Test																																			
Production Milestones																																			
LRIP																																			
FRP																																			
Deliveries																																			

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\* Not required for Budget Activities 1, 2, 3, and 6

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[illegible]

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## Exhibit R-2, RD TEN Budget Item Justification

(Exhibit R-2, page 52 of 52)