

CLASSIFICATION:

UNCLASSIFIED

EXHIBIT R-2, RDT&E Budget Item Justification							DATE:	
							February 2004	
APPROPRIATION/BUDGET ACTIVITY					R-1 ITEM NOMENCLATURE			
RESEARCH DEVELOPMENT TEST & EVALUATION , NAVY/ BA-5					0604503N/Submarine Systems Equipment Development			
COST (\$ in Millions)	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009
Total PE Cost		120.050	76.997	75.359	70.144	76.174	75.130	75.849
0775/Submarine Support Equipment		1.259	1.432	1.387	1.410	1.691	1.357	1.384
0219/Submarine Sonar Improvements		80.671	61.762	40.705	31.807	46.310	51.097	51.729
0742/Submarine Integrated Antenna Systems		6.111	7.313	25.557	32.335	25.649	20.120	20.134
1411/Submarine Tactical Communications Systems		24.393	5.106	7.710	4.592	2.524	2.556	2.602
9228/SSN/SSBN Modernization		5.998						
9229/Sub Common Electronic Equip Replacement		1.618						
9384 Littoral Tactical Array System (LTAS)			1.384					
Defense Emergency Responses Funds (DERF) Funds: NOT APPLICABLE								
A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: The Submarine Support Equipment Program develops and improves submarine Electronic Warfare Support (EWS) techniques, components, equipment, and systems that will increase submarine operational effectiveness, safety of ship, and survivability in the increasingly dense and sophisticated electromagnetic environment caused by the proliferation of complex radar, communications, and navigation equipment of potential adversaries. Improvements are necessary for submarine EWS to be operationally effective in the following mission areas: Joint Littoral Warfare, Joint Surveillance, Space and Electronic Warfare and Intelligence Collection, Maritime Protection, and Joint Strike.								
The Submarine Sonar Improvement Program delivers block updates to Sonar Systems installed on SSN 688, 688I, 21, TRIDENT and SSGN Class Submarines to maintain clear acoustic, tactical and operational superiority over submarine and surface combatants in all scenarios through detection, classification, localization and contact following. Current developments are focused on supporting Littoral Warfare, Regional Sea Denial, Battle Group Support, Diesel Submarine Detection, Surveillance, and Peacetime Engagement.								
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.								

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Exhibit R-2, RDTEN Budget Item Justification  
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EXHIBIT R-2, RDT&E Budget Item Justification		DATE:		February 2004	
APPROPRIATION/BUDGET ACTIVITY			R-1 ITEM NOMENCLATURE		
RESEARCH DEVELOPMENT TEST & EVALUATION, NAVY / BA-5			0604503N/ Submarine Systems Equipment Development		
B. (U) Program Change Summary:					
Funding:		FY 2003	FY 2004	FY 2005	
Previous President's Budget: (FY 04/05 Pres Controls)		123.765	80.815	66.797	
Current BES/Current FMB:		120.050	76.997	75.359	
Total Adjustments		-3.715	-3.818	8.562	
Summary of Adjustments					
OPEVAL Delay			-4.000		
ATAC			1.400		
X-Band Development			-3.200		
Submarine Antenna Technology Improvements			1.500		
LTAS			1.400		
Miscellaneous adjustments		-3.450	-0.425	7.886	
NWCF Rate Adjustments		-0.265	-0.493	0.676	
		-3.715	-3.818	8.562	

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Exhibit R-2, RD TEN Budget Item Justification  
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EXHIBIT R-2a, RDT&E Project Justification							DATE: <b>February 2004</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			
COST (\$ in Millions)	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009
Project Cost		1.259	1.432	1.387	1.410	1.691	1.357	1.384
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, EVS, LPI, etc. and (3) Integration, test, and installation of COTS technology for system enhancements.</p> <p>The program is divided into the three project categories; Threat Warning/Self Protection; Situational Awareness; and Intelligence, Surveillance and Reconnaissance. Threat Warning/Self Protection projects evaluate the vulnerability of submarine masts, periscopes and sensors to visual, radar, and infrared detection. It also and evaluates the 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 Intelligence, Surveillance, and Reconnaissance 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, modify AN/BLQ-10 software resulting from APB changes, follow on testing of Specific Emitter Identification, and Block II TEMPALT development.</p> <p>Situational Awareness sub-projects include: Insertion of covert Data Link, Integration of Automatic Identification System (AIS), Enhanced AN/BLQ-10(V) displays, Communications Acquisition Direction Finding (CADF)/IW antenna, and Situational Awareness Bouy.</p> <p>Intelligence, Surveillance and Reconnaissance sub-projects include: Passive Surveillance Radar (PSR), Submarine Offboard Sensors (UAV/UUV Pay Load) insertion, Advanced EW Tuners, and Modular Sensor System (Imaging/SIGINT modules).</p>								

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EXHIBIT R-2a, RDT&E Project Justification			DATE: <b>February 2004</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> Threat Warning/ Self Protection																
<table border="1" style="width: 100%; border-collapse: collapse;"><thead><tr><th style="width: 25%;"></th><th style="width: 15%;">FY 03</th><th style="width: 15%;">FY 04</th><th style="width: 15%;">FY 05</th></tr></thead><tbody><tr><td>Accomplishments/Effort/Subtotal Cost</td><td style="text-align: center;">0.259</td><td></td><td></td></tr><tr><td>RDT&amp;E Articles Quantity</td><td></td><td></td><td></td></tr></tbody></table>						FY 03	FY 04	FY 05	Accomplishments/Effort/Subtotal Cost	0.259			RDT&E Articles Quantity			
	FY 03	FY 04	FY 05													
Accomplishments/Effort/Subtotal Cost	0.259															
RDT&E Articles Quantity																
<div>Completed assessment of conceptual LPI designs for insertion into AN/BLQ-10. Completed integration and testing of Non-Propulsion Electronic System (NPES) software baseline changes into AN/BLQ-10.</div>																
<table border="1" style="width: 100%; border-collapse: collapse;"><thead><tr><th style="width: 25%;"></th><th style="width: 15%;">FY 03</th><th style="width: 15%;">FY 04</th><th style="width: 15%;">FY 05</th></tr></thead><tbody><tr><td>Accomplishments/Effort/Subtotal Cost</td><td></td><td style="text-align: center;">0.986</td><td></td></tr><tr><td>RDT&amp;E Articles Quantity</td><td></td><td></td><td></td></tr></tbody></table>						FY 03	FY 04	FY 05	Accomplishments/Effort/Subtotal Cost		0.986		RDT&E Articles Quantity			
	FY 03	FY 04	FY 05													
Accomplishments/Effort/Subtotal Cost		0.986														
RDT&E Articles Quantity																
<div>Initiate integration of LPI receiver into AN/BLQ-10. Complete development of Block 2 TEMPALT, includes LPI. Complete At Sea Test of Specific Emitter Identification and Automatic Contact Correlation. Complete update of AN/BLQ-10 Submarine network interface baseline changes to accomodate APB04 requirements.</div>																
<table border="1" style="width: 100%; border-collapse: collapse;"><thead><tr><th style="width: 25%;"></th><th style="width: 15%;">FY 03</th><th style="width: 15%;">FY 04</th><th style="width: 15%;">FY 05</th></tr></thead><tbody><tr><td>Accomplishments/Effort/Subtotal Cost</td><td></td><td></td><td style="text-align: center;">0.586</td></tr><tr><td>RDT&amp;E Articles Quantity</td><td></td><td></td><td></td></tr></tbody></table>						FY 03	FY 04	FY 05	Accomplishments/Effort/Subtotal Cost			0.586	RDT&E Articles Quantity			
	FY 03	FY 04	FY 05													
Accomplishments/Effort/Subtotal Cost			0.586													
RDT&E Articles Quantity																
<div>Initiate integration of LPI Spiral 2 (Ultra Wide Chirp). Update NPES software baseline changes resulting from advanced processing builds over the network.</div>																

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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> Situational Awareness Enhancements			
	FY 03	FY 04	FY 05
Accomplishments/Effort/Subtotal Cost	0.108		
RDT&E Articles Quantity			
Completed system specification for the enhanced communications acquisition direction finding (CADF), subsystem into AN/BLQ-10. Completed assessment of software specification requirements for implementation of Information Assurance.			
	FY 03	FY 04	FY 05
Accomplishments/Effort/Subtotal Cost		0.279	
RDT&E Articles Quantity			
Integration of Galelite into AN/BLQ-10.			
	FY 03	FY 04	FY 05
Accomplishments/Effort/Subtotal Cost			0.729
RDT&E Articles Quantity			
Initiate interface design and integrate AIS into AN/BLQ-10 Initiate interface design for PATRIOT Phase B covert data link with AN/BLQ-10.			

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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 (Cont.)</b> ISR Enhancements			
	FY 03	FY 04	FY 05
Accomplishments/Effort/Subtotal Cost	0.892		
RDT&E Articles Quantity			
Completed integration and at sea testing of Passive Surveillance Radar (PSR) with AN/BLQ-10 . Completed development of host libraries to support at sea test with AN/BLQ-10.			
	FY 03	FY 04	FY 05
Accomplishments/Effort/Subtotal Cost		0.167	
RDT&E Articles Quantity			
Initiate modification of Passive Surveillance Radar (PSR) to make use of Mobile Host radars.			
	FY 03	FY 04	FY 05
Accomplishments/Effort/Subtotal Cost			0.072
RDT&E Articles Quantity			
Complete modification of Passive Surveillance Radar (PSR) Mobile Host Modification.			

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EXHIBIT R-2a, RDT&E Project Justification							DATE:			
							February 2004			
APPROPRIATION/BUDGET ACTIVITY			PROGRAM ELEMENT NUMBER AND NAME			PROJECT NUMBER AND NAME				
RDT&E, N / BA-5			0604503N/Submarine System Equipment Development			0775/Submarine Support Equipment				
D. OTHER PROGRAM FUNDING SUMMARY:										
Line Item No. & Name		FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	To Complete	Total Cost
OPN Line 256000/256005										
ML007 CADF LITE		12.840	13.251	9.079	8.678	8.323	8.982	9.138	Continuing	70.291
ML008 CADF LITE Antenna		10.575	9.289	10.529	9.408	9.587	9.549	9.731	Continuing	68.668
ML009 APB-EW		0.657	0.668	1.452	0.814	0.758	2.259	1.612	Continuing	8.220
ML010 Tech Refresh Upgrades		-	3.456	2.093	0.961	0.803	2.296	1.668	Continuing	11.277
ML011 AN/WLR-8 R&M FCKs		0.826	0.509	0.519	0.389	0.299	0.208	0.212	Continuing	2.962
ML013 ESM IMA Support		0.157	0.176	0.179	0.182	0.186	0.190	0.193	Continuing	1.263
ML015 AN/BLQ-10(V) SSN ES Backfit System		33.596	18.288	36.244	59.671	45.040	52.010	46.284	Continuing	291.133
ML016 AN/BLQ-10(V) SSBN ES Systems		-	-	-	-	-	-	6.126	Continuing	6.126
ML017 AN/BLQ-10 Field Change Kits		0.737	3.758	5.218	6.682	0.108	8.401	16.648	Continuing	41.552
SCN LI 201300										
PE 0204287N		13155.000	18896.000	19327.000	19752.000	20320.000	20824.000	51131.000	Continuing	163,405.000
Partial (AN/BLQ-10 ES Only)										
Related RDT&E:										
(U) PE 0603562N/Submarine Tactical Warfare System/ F0770 Advanced Submarine Support Equipment Program (ASSEP)										
(U) PE 064558N/New SSN Combat Systems Development/Project F1950										
E. ACQUISITION STRATEGY:										
(U) Acquisition Strategy: LRIP approved November 99 and Full Rate production approved October 2000. Current efforts in this project consist of Product Improvements (Tech Insertion) to the AN/BLQ-10(V) ES system.										
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-2a, RDT&E Project Justification		DATE:
		<b>February 2004</b>
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND NAME
<b>RDT&amp;E, N / BA-5</b>	0604503N/Submarine System Equipment Development	0775/Submarine Support Equipment

### C. PROGRAM CHANGE SUMMARY:

Funding:	FY 2003	FY 2004	FY 2005
Previous President's Budget: (FY 04/05 Pres Budget Controls)	1.488	1.448	1.552
Current BES/President's Budget: (FY05 Pres Budget Controls)	1.259	1.432	1.387
Total Adjustments	-0.229	-0.016	-0.165

Summary of Adjustments			
Unobligated funds on hold	0.225	0.000	0.000
BSO Adjustments	0.004	0.000	0.155
Sea Enterprise (LOE II)	0.000	0.000	0.004
NWCF Rates - NUWC Rates	0.000	0.004	0.000
Section 8094: Management Improvements	0.000	0.012	0.000
Section 8126: Efficiencies/ Revisions	0.000	0.000	0.004
Inflation	0.000	0.000	0.001
Non Purchase Inflation	0.000	0.000	0.001
Subtotal	0.229	0.016	0.165

Not Applicable.

Technical:

Not Applicable

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**Exhibit R-2a, RDTE Project Justification**  
(Exhibit R-2a, page 8 of 49)



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Exhibit R-3 Cost Analysis (page 1)										DATE: February 2004		
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 03 Cost	FY 03 Award Date	FY 04 Cost	FY 04 Award Date	FY 05 Cost	FY 05 Award Date	Cost to Complete	Total Cost	Target Value of Contract
AN/BLQ-10 ES Product Improvement	CPFF	Lockheed Syracuse, NY	1.666	0.000	NA	0.418	12/03	0.545	12/04	CONT	CONT	NA
Systems Engineering	WR	NUWC Newport, RI	5.419	0.483	10/02	0.613	12/03	0.465	11/04	CONT	CONT	N/A
	WR	NAWC China Lake	0.000	0.150	01/03	0.100	11/03	0.079	11/04	0.000	0.329	NA
	WR	JHU/APL	0.000	0.150	03/03	0.000	NA	0.000	NA	0.000	0.150	NA
Miscellaneous	VARIOUS	VARIOUS	12.845	0.000	NA	0.000	NA	0.000	NA	0.000	12.845	N/A
Subtotal Product Development			19.930	0.783		1.131		1.089		0.000	CONT	N/A
Remarks:												
Development Support											0.000	
Software Development	WR	CDSA Dam Neck	0.084	0.150	01/03	0.000	NA	0.000	NA	0.000	0.234	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	2.700	0.250	11/02	0.200	11/03	0.200	11/04	CONT	CONT	NA
Travel			0.049	0.075	11/02	0.015	11/03	0.015	11/04	CONT	CONT	NA
GFE											0.000	
Subtotal Support			2.833	0.475		0.215		0.215		0.000	3.738	
Remarks: Does not include SBIR assessments and taxes.												

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Exhibit R-4a, Schedule Detail					DATE: February 2004		
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT			PROJECT NUMBER AND NAME			
RDT&E, N /BA-5	0604503N/Submarine Sys Equip Development			0775/Submarine Support Equipment			
Schedule Profile	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009
SEI/Auto Contact Correlation							
At -Sea Test		3Q					
AN/BLQ-10 Baseline Software Updates	2Q	3Q	3Q	3Q	3Q	3Q	3Q
Low Probability of Intercept (LPI) Receiver							
Concept Design		2Q					
Integration/At sea Test		4Q					
Spiral 2 (Ultra Wide Chirp)			3Q				
Spiral 3 (Phase Coded)				4Q			
Automatic Identification System							
Integration/At Sea Test			4Q				
Enhanced EW Displays							
Integration							1Q
Situational Awareness Bouy							
Integration				2Q			
Test					4Q		
PATRIOT Phase B Covert Data Link							
Integration			1Q				
At-Sea Test				4Q			
GALE Lite							
Integration		2Q					
At -Sea Test				2Q			
CADF/IW Multifunction Antenna							
S/W Specification	2Q						
Integration				3Q			
Spiral 2					4Q		
Spiral 3						4Q	
Spiral 4							4Q
Passive Surveillance Radar (PSR)							
At -Sea Test	4Q						
Spiral 2 (Mobile Host)		3Q					
At -Sea Test			4Q				
Advanced EW Tuners							
Integration						2Q	
Off Board Sensors							
Integration					2Q		
Spiral 2						3Q	
Spiral 3							3Q
							Start

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Exhibit R-3 Cost Analysis (page 2)								DATE: <b>February 2004</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 03 Cost	FY 03 Award Date	FY 04 Cost	FY 04 Award Date	FY 05 Cost	FY 05 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	
Remarks:												
Contractor Engineering Support											0.000	
Government Engineering Support											0.000	
Management Support Services											0.000	
Travel											0.000	
Labor (Research Personnel)											0.000	
SBIR Assessment						0.086					0.169	
Subtotal Management				0.000		0.086		0.000		0.000	0.169	
Remarks:												
Total Cost			22.763	1.259		1.432		1.387		CONT	CONT	CONT
Remarks:												

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APPROPRIATION/BUDGET ACTIVITY		PROGRAM ELEMENT NAME AND NUMBER		PROJECT NAME AND NUMBER					
	SSEP F0775 SCHEDULE		FY03	FY04	FY05	FY06	FY07	FY08	FY09
Threat Warning / Self Protection				At Sea Test △					
	Specific Emitter ID/Auto Contact Correlation		IA S/W assess	S/W Update	S/W Update	S/W Update	S/W Update	S/W Update	S/W Update
	AN/BLQ-10 Baseline Changes		△	△	△	△	△	△	△
	Low Probability of Intercept (LPI) Receiver		Design	Integration/ At Sea Test	Spiral 2	Spiral 3			
Situational Awareness Enhancements	Automatic Identification System (AIS)				Integration/ At Sea Test △				
	Enhanced EW Displays								Integration △
	Situational Awareness Bouy				Integration	At Sea Test			
	PATRIOT Phase B Covert Data Link				Integration	At Sea Test			
	GALE Lite			Integration	At Sea Test				
	CADF/Multifunctional Antenna		S/W Spec			Integration	Spiral 2	Spiral 3	Spiral 4
			△			△	△	△	△
ISR Enhancements	Passive Surveillance Radar (PSR)		At Sea Test	Mobile Host	At Sea Test				
			△	△	△				
	Advanced EW Tuners							System Integration	
	Off Board Sensors						System Integration	Spiral 2	Spiral 3
			△			△	△	△	△

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Exhibit R-4, RDT&E Project Justification

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Exhibit R-4a, Schedule Detail						DATE:		
						February 2004		
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT				PROJECT NUMBER AND NAME			
RDT&E, N /BA-5	0604503N/Submarine Sys Equip Development				0775/Submarine Support Equipment			
Schedule Profile	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009
SEI/Auto Contact Correlation								
At -Sea Test			3Q					
AN/BLQ-10 Baseline Software Updates		2Q	3Q	3Q	3Q	3Q	3Q	3Q
Low Probability of Intercept (LPI) Receiver								
Concept Design			2Q					
Integration/At sea Test			4Q					
Spiral 2 (Ultra Wide Chirp)				3Q				
Spiral 3 (Phase Coded)					4Q			
Automatic Identification System								
Integration/At Sea Test				4Q				
Enhanced EW Displays								
Integration								1Q
Situational Awareness Bouy								
Integration					2Q			
Test						4Q		
PATRIOT Phase B Covert Data Link								
Integration				1Q				
At-Sea Test					4Q			
GALE Lite								
Integration			2Q					
At -Sea Test					2Q			
CADF/IW Multifunction Antenna								
S/W Specification		2Q						
Integration					3Q			
Spiral 2						4Q		
Spiral 3							4Q	
Spiral 4								4Q
Passive Surveillance Radar (PSR)								
At -Sea Test		4Q						
Spiral 2 (Mobile Host)			3Q					
At -Sea Test				4Q				
Advanced EW Tuners								
Integration							2Q	
Off Board Sensors								
Integration						2Q		
Spiral 2							3Q	
Spiral 3								3Q

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EXHIBIT R-2a, RDT&E Project Justification							DATE: <b>February 2004</b>	
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			
COST (\$ in Millions)		FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009
Project Cost		80.671	61.762	40.705	31.807	46.310	51.097	51.729
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 and carries on to FY03. 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 budget submit also reflects 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 for increased reliability, and the Next Generation Fatline Towed Array and Hull Mounted array which provide improved Littoral Operaitonal capability.

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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## CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification		DATE: <b>February 2004</b>												
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</b>														
<table border="1" style="width: 100%; border-collapse: collapse;"><thead><tr><th style="width: 30%;"></th><th style="width: 20%;">FY 03</th><th style="width: 20%;">FY 04</th><th style="width: 30%;">FY 05</th></tr></thead><tbody><tr><td>Accomplishments/Effort/Subtotal Cost</td><td style="text-align: center;">19.378</td><td style="text-align: center;">20.435</td><td style="text-align: center;">34.042</td></tr><tr><td>RDT&amp;E Articles Quantity</td><td></td><td></td><td></td></tr></tbody></table>				FY 03	FY 04	FY 05	Accomplishments/Effort/Subtotal Cost	19.378	20.435	34.042	RDT&E Articles Quantity			
	FY 03	FY 04	FY 05											
Accomplishments/Effort/Subtotal Cost	19.378	20.435	34.042											
RDT&E Articles Quantity														
<div style="border: 1px solid black; padding: 5px; min-height: 40px;">Continue Advanced Processing Build (APB) Sea Testing, Integration and Certification. This includes upgrades to Towed, Sphere, Hull and High Frequency Arrays. This effort is primarily the transition of APB software from development to A-RCI for integration and test, and formal certification. This includes HF Tactical Control Sonar.</div>														
<table border="1" style="width: 100%; border-collapse: collapse;"><thead><tr><th style="width: 30%;"></th><th style="width: 20%;">FY 03</th><th style="width: 20%;">FY 04</th><th style="width: 30%;">FY 05</th></tr></thead><tbody><tr><td>Accomplishments/Effort/Subtotal Cost</td><td style="text-align: center;">2.500</td><td style="text-align: center;">0.500</td><td style="text-align: center;">0.500</td></tr><tr><td>RDT&amp;E Articles Quantity</td><td></td><td></td><td></td></tr></tbody></table>				FY 03	FY 04	FY 05	Accomplishments/Effort/Subtotal Cost	2.500	0.500	0.500	RDT&E Articles Quantity			
	FY 03	FY 04	FY 05											
Accomplishments/Effort/Subtotal Cost	2.500	0.500	0.500											
RDT&E Articles Quantity														
<div style="border: 1px solid black; padding: 5px; min-height: 40px;">Continue Precision Bottom Mapping transition, integration and testing. This effort includes the initial integration and test, and formal certification of Precision Mapping in the A-RCI system. In the outyears this effort is for integration, test and certification of Precision Bottom Mapping APB upgrades.</div>														
<table border="1" style="width: 100%; border-collapse: collapse;"><thead><tr><th style="width: 30%;"></th><th style="width: 20%;">FY 03</th><th style="width: 20%;">FY 04</th><th style="width: 30%;">FY 05</th></tr></thead><tbody><tr><td>Accomplishments/Effort/Subtotal Cost</td><td style="text-align: center;">0.900</td><td style="text-align: center;">0.800</td><td style="text-align: center;">0.800</td></tr><tr><td>RDT&amp;E Articles Quantity</td><td></td><td></td><td></td></tr></tbody></table>				FY 03	FY 04	FY 05	Accomplishments/Effort/Subtotal Cost	0.900	0.800	0.800	RDT&E Articles Quantity			
	FY 03	FY 04	FY 05											
Accomplishments/Effort/Subtotal Cost	0.900	0.800	0.800											
RDT&E Articles Quantity														
<div style="border: 1px solid black; padding: 5px; min-height: 40px;">Continue development, integration, test and certification of Sonar Tactical Decision Aids in the A-RCI system. In the outyears this effort is for integration, test and certification of Sonar Tactical Decision Aid APB upgrades.</div>														

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## CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification		DATE: <b>February 2004</b>	
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 03	FY 04	FY 05
Accomplishments/Effort/Subtotal Cost	18.704	24.301	
RDT&E Articles Quantity			
<p>Provides funds for integration of A-RCI software updates to increase submarine combat system capabilities under a Phase 3 SBIR program. Extends APB/MPP technology insertion to enable submarines to achieve Navy network-centric warfare objectives and to accelerate development and extend common processing efforts..</p>			
	FY 03	FY 04	FY 05
Accomplishments/Effort/Subtotal Cost	10.561		
RDT&E Articles Quantity			
<p>Continued ARCI-(V)5 development, integration, test and certification. The A-RCI-(V)5 is the A-RCI variant for the SSN 21 platform. The development effort is primarily SSN-21 unique interfaces, including the legacy AN/BSY-2 combat control system. Formal certification will complete in the 4th quarter of FY03 in preparation for the 1st quarter of FY04 installation on the SSN21.</p>			
	FY 03	FY 04	FY 05
Accomplishments/Effort/Subtotal Cost	8.000		
RDT&E Articles Quantity			
<p>Development, integration, test and certification of an A-RCI variant for SSGN. This effort includes the development of SSGN unique interfaces, integration and test, and formal certification of the SSGN variant of A-RCI.</p>			

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**Exhibit R-2a, RDTEN Project Justification**  
(Exhibit R-2a, page 17 of 49)

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## CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification		DATE: <b>February 2004</b>	
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 03	FY 04	FY 05
Accomplishments/Effort/Subtotal Cost	9.200		
RDT&E Articles Quantity			
<p>Active Intercept and Ranging (AI&amp;R) development, integration, test and certification. This effort includes the completion of the development effort that was initiated under a Small Business Innovative Research (SBIR) contract. AI&amp;R integration, test and certification will be completed, as well as system integration, test and certification with A-RCI system.</p>			
	FY 03	FY 04	FY 05
Accomplishments/Effort/Subtotal Cost	5.500		
RDT&E Articles Quantity			
<p>Total Ship Monitoring System (TSMS) development, integration, test , and certification. This effort includes the completion of the development effort that was initiated under a Small Business Innovative Research (SBIR) contract. TSMS integration, test and certification will be completed, as well as system integration, test and certification with the A-RCI system.</p>			
	FY 03	FY 04	FY 05
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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## CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification		DATE: <b>February 2004</b>	
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 03	FY 04	FY 05
Accomplishments/Effort/Subtotal Cost	0.352		
RDT&E Articles Quantity			
Completed development, TECHEVAL and OPEVAL of TB-29(A) Towed Array.			
	FY 03	FY 04	FY 05
Accomplishments/Effort/Subtotal Cost	5.576	7.761	5.217
RDT&E Articles Quantity			
Continue development of Affordable Towed Array Technology Initiatives. Develop Fiber Optic ThinlineTowed Array.			
	FY 03	FY 04	FY 05
Accomplishments/Effort/Subtotal Cost		4.775	0.146
RDT&E Articles Quantity			
Develop Next Generation Fatline Towed Array.			

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EXHIBIT R-2a, RDT&E Project Justification		DATE: <b>February 2004</b>
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

**C. PROGRAM CHANGE SUMMARY:**

Funding:	FY 2003	FY 2004	FY 2005
Previous President's Budget: (FY 04/05 Pres Controls)	56.601	65.071	30.384
Current BES/President's Budget: (FY04/05 OSD/OMB Controls)	80.671	61.762	40.705
Total Adjustments	24.070	-3.309	10.321

### Summary of Adjustments

Miscellaneous adjustments	7.271	-0.709	10.321
FY03 SBIR	-1.961	0.000	0.000
Economic Assumptions	-0.368	0.000	0.000
Affordable Towed Array (ATAC)	1.000	0.000	0.000
Realign F9070 to F0219	18.704	0.000	0.000
Inflation Savings	-0.696	0.000	0.000
Business Process Reform	-0.262	0.000	0.000
Affordable Towed Array	0.000	1.400	0.000
Sec. 8126 Efficiencies/Revision	0.000	-4.000	0.000
Subtotal	23.688	-3.309	10.321

Schedule:

The A-RCI TECHEVAL/OPEVAL and TB-29 TECHEVAL/OPEVAL has been completed. The both programs obtained approval to proceed with the FY04 Production Buys in the MDA (Milestone Decision Authority) Review held in October 2003.

Technical:

Not applicable

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## CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification							DATE: <b>February 2004</b>		
APPROPRIATION/BUDGET ACTIVITY <b>RDTE&amp;E, N / BA-5</b>			PROGRAM ELEMENT NUMBER AND NAME 0604503N/Submarine Systems Equipment Development			PROJECT NUMBER AND NAME 0219/Submarine Sonar Improvements			

**D. OTHER PROGRAM FUNDING SUMMARY:**

Line Item No. & Name	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	To Complete	Total Cost
OPN BLI 214700 SSN Acoustics	198.840	207.864	108.748	180.675	230.292	246.026	238.151	Continuing	Continuing
OPN BLI 214705 SSN Acoustics Installation	30.785	58.567	44.280	48.293	35.136	50.511	50.879	Continuing	Continuing

**E. ACQUISITION STRATEGY:**

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 will award a competitive contract for the development of a Fatline Towed Array which will provide better littoral operations and ranging.

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.

**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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EXHIBIT R-2a, RDT&E Project Justification		DATE: <b>February 2004</b>
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 Improvements
<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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**CLASSIFICATION:**

Exhibit R-3 Cost Analysis (page 1)								DATE: <b>February 2004</b>				
APPROPRIATION/BUDGET ACTIVITY <b>RDTE&amp;E, N / BA-5</b>			PROGRAM ELEMENT 0604503N/Submarine Systems Equipment Development			PROJECT NUMBER AND NAME 0219/Submarine Sonar Improvement						
Cost Categories	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY03 Cost	FY03 Award Date	FY04 Cost	FY04 Award Date	FY05 Cost	FY05 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	11.274	3.800	10/02	6.350	10/03	4.438	10/04		25.862	
Primary Hardware Development	SS/CPAF	LMC, Manassas, VA	105.311	23.366	11/02	15.836	11/03	15.400	11/04		159.913	
Ancillary Hardware Development	SS/CP	ARL University of Texas	1.127	1.611	12/02	0.545	12/03	4.337	12/04		7.620	
Systems Engineering	WX	NUWC, Newport R.I.	83.037	12.233	10/02	6.303	10/03	4.829	10/04		106.402	
Systems Engineering	SS/CPAF	LMC, Syracuse N.Y.	5.763								5.763	
Systems Engineering	Various	Various	12.035	0.185	11/02	0.088	10/03	0.087	10/04		12.395	
Software Development	SS/CP	Progeny Systems		4.981	12/02	2.500	11/03	3.100	11/04		10.581	
Systems Engineering	WX	NSWC, Carderock MD	1.534	1.612	10/02	1.630	10/03	0.641	10/04		5.417	
Systems Engineering	SS/CP	John Hopkins APL	1.201	1.850	12/02	1.304	12/03	2.174	12/04		6.529	
Hardware/Software Development	Various	SBIR's	0.328	0.975	11/02	0.150	10/03	0.300	12/04		1.753	
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	10/02						0.076	
Hardware/Software Development	C/CPIF	TBD				4.775	10/03	0.146	10/04		4.921	
Systems Engineering	WX	Naval Research Lab (NRL)		0.390	10/02	0.250	10/03	0.272	10/04		0.912	
											0.000	
											0.000	
Subtotal Product Development			245.694	51.079		39.731		35.724		0.000	372.228	
Remarks:												

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**Exhibit R-2a, RDTE Project Justification**  
(Exhibit R-2a, page 23 of 49)

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**Exhibit R-2a, RD TEN Project Justification**  
(Exhibit R-2a, page 24 of 49)

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## CLASSIFICATION:

Exhibit R-3 Cost Analysis (page 2)								DATE: <b>February 2004</b>				
APPROPRIATION/BUDGET ACTIVITY <b>RDT&amp;E, N / BA-5</b>			PROGRAM ELEMENT 0604503N/Submarine Systems Equipment Development			PROJECT NUMBER AND NAME 0219/Submarine Sonar Improvement						
Cost Categories	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY03 Cost	FY03 Award Date	FY04 Cost	FY04 Award Date	FY05 Cost	FY05 Award Date	Cost to Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation											0.000	
Operational Test & Evaluation	WX	OPTEVFOR	0.109	0.942	10/02	0.668	10/03	0.915	10/04		2.634	
Developmental/Operational T&E	Various	Various	6.118	0.100	12/02						6.218	
Test Assets											0.000	
Tooling											0.000	
GFE											0.000	
Award Fees											0.000	
Subtotal T&E			6.227	1.042		0.668		0.915		0.000	8.852	
Remarks:												
Contractor Engineering Support											0.000	
Management Support Services	Various	Various	3.514	0.642	11/02	0.493	11/03	0.384	11/04		5.033	
Program Management Support	SS/CP	Mitre	0.273	0.250	11/02	0.272	11/03	0.272	11/04		1.067	
Travel	PD	NAVSEA	0.000	0.175	10/02	0.297	10/04	0.207	10/04		0.679	
Transportation											0.000	
SBIR Assessment											0.000	
Subtotal Management			3.787	1.067		1.062		0.863		0.000	6.779	
Remarks:												
Total Cost			334.473	80.671		61.762		40.705		0.000	517.611	
Remarks:												

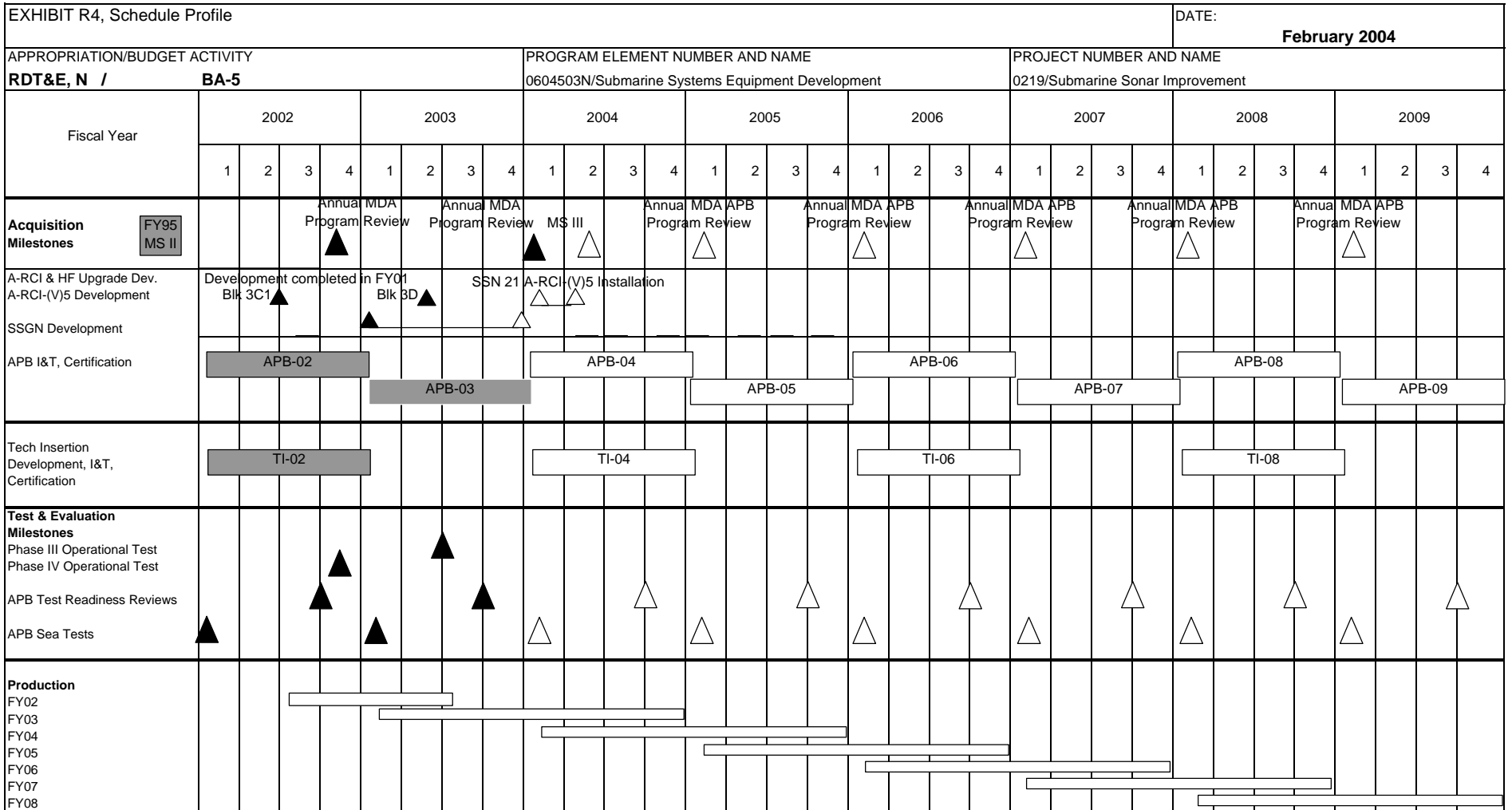
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Exhibit R-3, Project Cost Analysis  
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\* Not required for Budget Activities 1, 2, 3, and 6

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**Exhibit R-3, Project Cost Analysis**  
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EXHIBIT R4, Schedule Profile																											DATE: <b>February 2004</b>					
APPROPRIATION/BUDGET ACTIVITY										PROGRAM ELEMENT NUMBER AND NAME										PROJECT NUMBER AND NAME												
<b>RDTE&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																															
			▲					▲																								
			LRIP III					MS III																								
<b>Test &amp; Evaluation Milestones</b>																																
Development Test		▲						OT-IIB																								
Operational Test								▲																								
<b>Procurementa</b>																																
LRIP I Completed																																
LRIP II Completed																																
LRIP III				▲	▲																											
Production Contract												△																				
Deliveries	▲			▲	▲			△				△		△		△		△														
	LRIP I Array				LRIP II Array							LRIP III			FY03 Array		Production Arrays															

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**Exhibit R-4, Schedule Profile**  
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**CLASSIFICATION:**

[illegible]

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**Exhibit R-4, Schedule Profile**  
(Exhibit R-4, page 29 of 49)

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## CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification									DATE: <b>February 2004</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 System					
COST (\$ in Millions)	Prior Years Cost	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009		Cost to Complete	Total Program
Project Cost	<b>14.905</b>	<b>6.111</b>	<b>7.313</b>	<b>25.557</b>	<b>32.335</b>	<b>25.649</b>	<b>20.120</b>	<b>20.134</b>		<b>Continuing</b>	<b>Continuing</b>
RDT&E Articles Qty											<b>0</b>

**(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.

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**Exhibit R-4, Schedule Profile**  
(Exhibit R-4, page 30 of 49)

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## CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification			DATE: <b>February 2004</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;"><thead><tr><th style="width: 30%;"></th><th style="width: 15%;">FY 03</th><th style="width: 15%;">FY 04</th><th style="width: 15%;">FY 05</th><th style="width: 25%;"></th></tr></thead><tbody><tr><td>Advanced HDR/SubHDR P-3I</td><td style="text-align: center;">3.818</td><td style="text-align: center;">2.732</td><td style="text-align: center;">15.069</td><td></td></tr><tr><td>RDT&amp;E Articles Quantity</td><td></td><td></td><td></td><td></td></tr></tbody></table>						FY 03	FY 04	FY 05		Advanced HDR/SubHDR P-3I	3.818	2.732	15.069		RDT&E Articles Quantity				
	FY 03	FY 04	FY 05																
Advanced HDR/SubHDR P-3I	3.818	2.732	15.069																
RDT&E Articles Quantity																			
<div style="border: 1px solid black; padding: 5px;"><b>FY03 ACCOMPLISHMENTS:</b> Developed navigation interface modifications for SubHDR system to support SSGN, Seawolf, and Virginia (\$1.828). Provided EMP testing, UNDEX testing, shock test for 688 class submarines, and closeout of the testing program. (\$1.990) <b>FY04:</b> Complete the digital navigation interface development for the SubHDR system (\$1.257). Provide FOT&amp;E support EMP testing and mast upgrade support (\$1.075). Provide SSBN MMG modifications (\$0.400). <b>FY05:</b> Commence 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. (\$10.497) Begin FOT modification development for simultaneous GBS and EHF functionality (GBS Open Loop Point Mod and APU Power Supply Upgrade). (\$3.022) Begin K band system definition. (\$1.550)</div>																			
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	FY 03	FY 04	FY 05																
Comms at Speed and Depth	0.000	0.000	5.241																
RDT&E Articles Quantity																			
<div style="border: 1px solid black; padding: 5px;"><b>FY05:</b> Begin system definition including system specification development, system concept development, multi-class ship alteration assessment, risk reduction studies, and technology insertion studies (\$2.735). Begin system definition including system specification development, concept development, risk reduction studies for RTOF demonstration. (\$2.506)</div>																			
<table border="1" style="width: 100%; border-collapse: collapse;"><thead><tr><th style="width: 30%;"></th><th style="width: 15%;">FY 03</th><th style="width: 15%;">FY 04</th><th style="width: 15%;">FY 05</th><th style="width: 25%;"></th></tr></thead><tbody><tr><td></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></td></tr><tr><td>RDT&amp;E Articles Quantity</td><td></td><td></td><td></td><td></td></tr></tbody></table>						FY 03	FY 04	FY 05			0.000	0.000	0.000		RDT&E Articles Quantity				
	FY 03	FY 04	FY 05																
	0.000	0.000	0.000																
RDT&E Articles Quantity																			

# UNCLASSIFIED

## CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification		DATE: <b>February 2004</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 03</th> <th style="width: 15%;">FY 04</th> <th style="width: 15%;">FY 05</th> <th style="width: 25%;"></th> </tr> <tr> <td>Antenna Transition Engineering</td> <td>2.293</td> <td>4.581</td> <td>5.247</td> <td></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;"> <p><b>FY03 ACCOMPLSHMENTS:</b> Provided continued program definition, system specifications, and risk reduction to the next generation antenna systems. Continued technology performance and maturity assessment for rapid insertion potential to upgrade current antenna systems for support of emerging SATCOM circuits to meet evolving fleet requirements (\$2.293). <b>FY04:</b> Continue to provide emerging requirements and Satellite Communications Database/Link analysis for other development programs including (i.e. MUOS/ANS, PCS/MCSS Commercial, WGS/AWS, Advanced EHF, and Wideband Commercial) (\$0.940). Continue P3I investigations and development efforts for legacy antenna systems (\$0.873). Continue concept engineering efforts, new technology evaluations and assessments in support of current and future submarine antenna applications (\$1.268). Conduct research and development efforts leading to the demonstration of an expendable two-way satellite communications buoy that is compatible with existing launchers and legacy/future communications radios and networks. Efforts will include assessing the viability of a non-expendable two-way satellite communications buoy for deployment from TRIDENT platforms. (\$1.500) <b>FY05:</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) (\$1.071). 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 (\$2.450).</p> </div>					FY 03	FY 04	FY 05		Antenna Transition Engineering	2.293	4.581	5.247		RDT&E Articles Quantity				
	FY 03	FY 04	FY 05															
Antenna Transition Engineering	2.293	4.581	5.247															
RDT&E Articles Quantity																		

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# UNCLASSIFIED

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification		DATE: <b>February 2004</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) C. PROGRAM CHANGE SUMMARY:**

	FY 2003	FY 2004	FY 2005
(U) Funding:			
PB04 President's Budget:	17.757	9.096	27.096
PB05 President's Budget	6.111	7.313	25.557
Total Adjustments	-11.646	-1.783	-1.539
Summary of Adjustments			
SBIR/STTR Transfer	-0.245		
Economic Assumptions	-0.100		
Inflation Savings	-0.188		
Realign to X1411 for IETM development	-0.300		
Realign to X1411 for CSRR software development	-5.894		
Realign to X1411 for MCS development	-4.800		
Realign to X1411 for ITF NRE	-0.005		
Business Process Reform (Sec 8100)	-0.071		
IT Cost Growth (Sec 8109)	-0.033		
FFRDC Reduction (Sec 8029)	-0.010		
Miscellaneous adjustments			-1.418
NWCF Rates - NUWC			-0.035
Management Improvements		-0.020	
Efficiencies/Revised Econ. Assumptions		-0.063	
X-band development		-3.200	
Submarine Antenna Improvements		1.500	
WCF - R&D - NUWC - PBD 430			-0.007
Rates - NUWC			0.004
Inflation			-0.068
Non purchase inflation			-0.015
Subtotal	-11.646	-1.783	-1.539

(U) Schedule:  
Not Applicable

(U) Technical:  
Not Applicable

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## CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification							DATE: <b>February 2004</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 0742 Submarine Integrated Antenna System				

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

Line Item No. & Name	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	To Complete	Total Cost
3130000 Submarine Communications	89.305	87.288	94.533	91.359	104.333	143.315	154.029	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 2005 2Q Comms at Speed and Depth MS-B  
 T&E Milestones:  
 Contract Milestones:

**(U) F. MAJOR PERFORMERS: \*\***

Not Applicable.

\* Not required for Budget Activities 1,2,3, and 6  
 \*\* Required for DON and OSD submit only.

R-1 SHOPPING LIST - Item No. 108

UNCLASSIFIED

# UNCLASSIFIED

CLASSIFICATION:

Exhibit R-3 Cost Analysis (page 1)										DATE: <b>February 2004</b>		
APPROPRIATION/BUDGET ACTIVITY <b>RDTE&amp;E, N / BA-5</b>			PROGRAM ELEMENT 0604503N SSN 688 & TRIDENT MODERNIZATION				PROJECT NUMBER AND NAME 0742 Submarine Integrated Antenna System					
Cost Categories	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 03 Cost	FY 03 Award Date	FY 04 Cost	FY 04 Award Date	FY 05 Cost	FY 05 Award Date	Cost to Complete	Total Cost	Target Value of Contract
Primary Hardware Development											0.000	
Digital Interface Development (HDR)	CPAF	Raytheon Marlboro, MA		1.828	02/03	1.257	01/04					
Hardware Development (HDR)	WX	NUWC Newport, RI	7.674	0.000	Various	0.000	Various	0.000	Various	Complete	Complete	7.674
Hardware Dev. (HDR SHF/FOT)	CPFF	Raytheon Marlboro, MA		0.000	Various	1.075	Various	13.604	Various	Continuing	Continuing	Continuing
Hardware Development (K)	CPFF	Raytheon Marlboro, MA						1.550	Various	Continuing	Continuing	Continuing
Hardware Development (Trans Eng)	CPAF	Sippican Marion, MA				1.500	03/04					
Systems Dev Engineering (Commx)	TBD	TBD						0.000	Various	Continuing	Continuing	Continuing
Systems Engineering (HDR)	WX	NUWC Newport, RI	4.962	0.828	Various	0.000	Various	0.000	Various	Complete	Complete	5.790
Systems Engineering (Trans Eng)	WX	NUWC Newport, RI		2.293	Various	2.431	Various	3.714	Various	Continuing	Continuing	Continuing
Systems Dev Engineering (Commx)	CPFFWX	Industry				0.000	Various	5.241	Various	Continuing	Continuing	Continuing
Subtotal Product Development			12.636	4.949		6.263		24.109		Continuing	Continuing	Continuing
Remarks:												
Development Support											0.000	
Software Development	WX	NUWC Newport, RI		0.339	Various	0.400	Various	0.357	Various	Continuing	Continuing	Continuing
Integrated Logistics Support	Various	Various	0.255	0.075	Various	0.200	Various	0.200	Various	Continuing	Continuing	Continuing
Configuration Management											0.000	
Technical Data											0.000	
Studies & Analyses											0.000	
GFE											0.000	
Award Fees											0.000	
Subtotal Support			0.255	0.414		0.600		0.557		0.000	Continuing	Continuing
Remarks:												

# UNCLASSIFIED

## CLASSIFICATION:

Exhibit R-3 Cost Analysis (page 2)										DATE: <b>February 2004</b>		
APPROPRIATION/BUDGET ACTIVITY <b>RDTE&amp;E, N / BA-5</b>			PROGRAM ELEMENT 0604503N SSN 688 & TRIDENT MODERNIZATION			PROJECT NUMBER AND NAME 0742 Submarine Integrated Antenna System						
Cost Categories	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 03 Cost	FY 03 Award Date	FY 04 Cost	FY 04 Award Date	FY 05 Cost	FY 05 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	1.167								1.167	
Test Assets											0.000	
Tooling											0.000	
GFE											0.000	
Award Fees											0.000	
Subtotal T&E			1.167	0.000		0.000		0.000		Continuing	Continuing	
Remarks:												
Contractor Engineering Support											0.000	
Government Engineering Support											0.000	
Program Management Support	Various	Various	0.847	0.748	Various	0.450	Various	0.891	Various	Continuing	Continuing	
Travel											0.000	
Transportation											0.000	
SBIR Assessment											0.000	
Subtotal Management			0.847	0.748		0.450		0.891		Continuing	Continuing	
Remarks:												
Total Cost			14.905	6.111		7.313		25.557		Continuing	Continuing	
Remarks:												

R-1 SHOPPING LIST - Item No. 108

UNCLASSIFIED

Exhibit R-2a, RDTE Project Justification  
(Exhibit R-2a, page 36 of 49)

CLASSIFICATION:

EXHIBIT R4, Schedule Profile																								DATE:								
APPROPRIATION/BUDGET ACTIVITY												PROGRAM ELEMENT NUMBER AND NAME												PROJECT NUMBER AND NAME								
RDT&E, N / BA-5												PE: 0604503N TITLE: SSN 688 & TRIDENT MODERNIZATION												0742 Submarine Integrated Antenna 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 (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)																																
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

## CLASSIFICATION:

Exhibit R-4a, Schedule Detail						DATE: February 2004		
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT				PROJECT NUMBER AND NAME			
RDT&BA-5	PE: 0604503N TITLE: SSN 688 & TRIDENT MODERNIZATION				0742 Submarine Integrated Antenna System			
Schedule Profile (SubHDR)	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009
K-band System Development					1Q --	4Q		
K-band Critical Design Review (CDR)					3Q			
K-band Eng Dev Model (EDM)							1Q	
K-band Software Delivery							1Q	
K-band Preproduction Readiness Review (PRR)							1Q	
K-band Developmental Testing (DT)						1Q --	1Q	
K-band Low-Rate Initial Production (LRIP) Start-up							1Q	
K-band Low-Rate Initial Production (LRIP) First Delivery								2Q
K-band Technical Evaluation (TECHEVAL)							2Q	
K-band Operational Evaluation (OPEVAL)							3Q	
K-band Full Rate Production (FRP) Start-up								1Q
FOT/SHF System Development				2Q				
FOT/SHF Critical Design Review (CDR)				2Q				
FOT/SHF Eng Dev Model (EDM)					2Q			
FOT/SHF Developmental Testing (DT)					1Q - 3Q			
FOT/SHF Technical Evaluation (TECHEVAL)					3Q			
FOT/SHF Operational Evaluation (OPEVAL)						1Q		
FOT/SHF Software Delivery					2Q			
FOT/SHF Preproduction Readiness Review (PRR)					2Q			
FOT/SHF Full Rate Production (FRP) Start-up					1Q			
FOT/SHF Full Rate Production (FRP) First Delivery						1Q		
FOT/SHF IOC						1Q		

R-1 SHOPPING LIST - Item No. 108

UNCLASSIFIED

**Exhibit R-4, Schedule Profile**  
(Exhibit R-4, page 38 of 49)

UNCLASSIFIED

CLASSIFICATION:

EXHIBIT R4, Schedule Profile																								DATE:											
APPROPRIATION/BUDGET ACTIVITY												PROGRAM ELEMENT NUMBER AND NAME												PROJECT NUMBER AND NAME											
RDT&E, N / BA5												PE: 0604305N TITLE: SSN 688 & TRIDENT MODERNIZATION												0742 Submarine Integrated Antenna 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 (Comms) Milestones								CONCEPT DECISION					MS A/B				DRR					MS C													
AoA and Requirements Development							ICD					CDD									CPD														
System Development												SDR		PDR		CDR					PRR				FCA										
EDM Delivery																				Lab 1															
Software 1XXSW Delivery 2XXSW Delivery														SSR																					
Test & Evaluation Milestones																				TRR															
Development Test																					DT-IIA		DT-IIB				DT-IIC								
Operational Test																												OT-IIA							
Production Milestones																																			
LRIP I FY 08																																			
LRIP II FY 09																																			
Deliveries																																			

R-1 SHOPPING LIST - Item No. 108

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

# UNCLASSIFIED

## CLASSIFICATION:

Exhibit R-4a, Schedule Detail						DATE: <b>February 2004</b>		
APPROPRIATION/BUDGET ACTIVITY <b>RDT&amp;E, N / BA5</b>	PROGRAM ELEMENT PE: 0604305N TITLE: SSN 688 & TRIDENT MODERNIZATION				PROJECT NUMBER AND NAME 0742 Submarine Integrated Antenna System			
Schedule Profile (Comms)	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009
Approval of Initial Capabilities Document (ICD)		4Q						
Concept Decision			2Q					
Approval of Capability Development Document (CDD)				1Q				
Analysis of Alternatives			3Q-4Q	1Q-2Q				
Milestone A & B Decision (MS A/B)				2Q				
Start System Development & Demonstration Phase				2Q				
System Design Review (SDR)				2Q				
Software Specification Review (SSR)				4Q				
Preliminary Design Review (PDR)					1Q			
Critical Design Review (DRR)					3Q			
Design Readiness Review (DRR)					4Q			
Test Readiness Review (TRR)						1Q		
Developmental Testing (DT-IIA)						1Q-3Q		
Eng Dev Model (EDM) - Lab 1 Delivery						3Q		
Software Delivery (1XXSW)					1Q-4Q	1Q-3Q		
Preproduction Readiness Review (PRR)							1Q	
EDM for LRIP - Delivery						4Q		
Approval of Capability Production Document (CPD)						4Q		
Milestone C (MS C) Decision							1Q	
Developmental Testing (DT-IIB)						4Q		
Start Low-Rate Initial Production I (LRIP I)							2Q	
Software Delivery (2XXSW)						3Q-4Q		
Start Low-Rate Initial Production II								2Q
Operational Testing (OT-IIA)								1Q-2Q
Developmental Testing (DT-IIC)							2Q-4Q	1Q
Functional Configuration Audit (FCA)								1Q
Low-Rate Initial Production I Delivery								1Q
Start Low-Rate Initial Production II (LRIP II)								2Q

R-1 SHOPPING LIST - Item No. 108

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Exhibit R-4a, Schedule Detail  
(Exhibit R-4a, page 40 of 49)



# UNCLASSIFIED

## CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification								DATE: February 2004			
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME					PROJECT NUMBER AND NAME					
RDT&E, N / BA-5	PE: 0604503N		TITLE: SSN 688 & TRIDENT MODERNIZATION			1411 Submarine Tactical Communications System					
COST (\$ in Millions)	Prior Years Cost	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009		Cost to Complete	Total Program
Project Cost	24.350	24.393	5.106	7.710	4.592	2.524	2.556	2.602		Continuing	Continuing
RDT&E Articles Qty											0

### (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

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Exhibit R-4a, Schedule Detail  
(Exhibit R-4a, page 41 of 49)

# UNCLASSIFIED

## CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification		DATE: <b>February 2004</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-bottom: 10px;"> <tr> <th style="width: 30%;"></th> <th style="width: 15%;">FY 03</th> <th style="width: 15%;">FY 04</th> <th style="width: 15%;">FY 05</th> <th style="width: 25%;"></th> </tr> <tr> <td>Common Submarine Radio Room (CSRR)</td> <td>18.237</td> <td>4.250</td> <td>6.891</td> <td></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-bottom: 10px;"> <p><b>FY03 Accomplishments:</b> Continued design and integration efforts of CSRR for OHIO Class submarines (\$2.890). Commenced Integration and Certification of Integration Test Facility (\$2.361). Commenced development of unique OHIO software (\$8.325). Commenced the CSRR conversion of the TRIDENT Land-Based Evaluation Facility into a CSRR configuration which will support all classes of submarines (\$4.361). Commenced IETM development for SSBN. (\$.300). <b>FY04:</b> Complete development of unique OHIO software (\$.350). Continue INFOSEC certification of OHIO Class CSRR (\$.428). Complete integration and installation design in support of OHIO Class CSRR (\$3.472). <b>FY05:</b> Commence design and integration efforts for 688 Class submarines (\$1.546). CSSR - Begin prime contractor software design efforts for 688 Class submarines (\$3.829). Commence CSRR curriculum development for Subschool (\$.537). Provide system engineering including operational, cost effectiveness studies and analysis in support of 688 Class submarines (\$.979).</p> </div>					FY 03	FY 04	FY 05		Common Submarine Radio Room (CSRR)	18.237	4.250	6.891		RDT&E Articles Quantity				
	FY 03	FY 04	FY 05															
Common Submarine Radio Room (CSRR)	18.237	4.250	6.891															
RDT&E Articles Quantity																		
<table border="1" style="width: 100%; border-collapse: collapse; margin-bottom: 10px;"> <tr> <th style="width: 30%;"></th> <th style="width: 15%;">FY 03</th> <th style="width: 15%;">FY 04</th> <th style="width: 15%;">FY 05</th> <th style="width: 25%;"></th> </tr> <tr> <td>BCA OPCON architecture</td> <td>0.856</td> <td>0.856</td> <td>0.819</td> <td></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;"> <p><b>FY03 Accomplishments:</b> Commenced system engineering supporting BCA/OPCON architecture (\$.856). <b>FY04:</b> Continue system engineering supporting BCA/OPCON architecture (\$.856). <b>FY05:</b> Continue system engineering supporting BCA/OPCON architecture (\$.819).</p> </div>					FY 03	FY 04	FY 05		BCA OPCON architecture	0.856	0.856	0.819		RDT&E Articles Quantity				
	FY 03	FY 04	FY 05															
BCA OPCON architecture	0.856	0.856	0.819															
RDT&E Articles Quantity																		

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**Exhibit R-4a, Schedule Detail**  
(Exhibit R-4a, page 42 of 49)

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## CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification			DATE: <b>February 2004</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;"><thead><tr><th style="width: 30%;"></th><th style="width: 15%;">FY 03</th><th style="width: 15%;">FY 04</th><th style="width: 15%;">FY 05</th><th style="width: 25%;"></th></tr></thead><tbody><tr><td>Multi-functional Crypto System (MCS)</td><td style="text-align: center;">5.300</td><td style="text-align: center;">0.000</td><td style="text-align: center;">0.000</td><td></td></tr><tr><td>RDT&amp;E Articles Quantity</td><td></td><td></td><td></td><td></td></tr></tbody></table>						FY 03	FY 04	FY 05		Multi-functional Crypto System (MCS)	5.300	0.000	0.000		RDT&E Articles Quantity				
	FY 03	FY 04	FY 05																
Multi-functional Crypto System (MCS)	5.300	0.000	0.000																
RDT&E Articles Quantity																			
<div style="border: 1px solid black; padding: 10px; min-height: 100px;"><b>FY03 Accomplishments:</b> Completed environmental and qualification testing consisting of airborne/structureborne noise, TEMPEST, humidity, overpressure, temperature, shock, inclination, EMI/EMC, and drip. Developed partial KWR-46 functionality. Developed partial KG 84-A and received initial certification from NSA (\$5.300).</div>																			
<table border="1" style="width: 100%; border-collapse: collapse;"><thead><tr><th style="width: 30%;"></th><th style="width: 15%;">FY 03</th><th style="width: 15%;">FY 04</th><th style="width: 15%;">FY 05</th><th style="width: 25%;"></th></tr></thead><tbody><tr><td></td><td></td><td style="text-align: center;">0.000</td><td style="text-align: center;">0.000</td><td></td></tr><tr><td>RDT&amp;E Articles Quantity</td><td></td><td></td><td></td><td></td></tr></tbody></table>						FY 03	FY 04	FY 05				0.000	0.000		RDT&E Articles Quantity				
	FY 03	FY 04	FY 05																
		0.000	0.000																
RDT&E Articles Quantity																			
<div style="border: 1px solid black; height: 70px; width: 100%;"></div>																			
<table border="1" style="width: 100%; border-collapse: collapse;"><thead><tr><th style="width: 30%;"></th><th style="width: 15%;">FY 03</th><th style="width: 15%;">FY 04</th><th style="width: 15%;">FY 05</th><th style="width: 25%;"></th></tr></thead><tbody><tr><td></td><td></td><td style="text-align: center;">0.000</td><td style="text-align: center;">0.000</td><td></td></tr><tr><td>RDT&amp;E Articles Quantity</td><td></td><td></td><td></td><td></td></tr></tbody></table>						FY 03	FY 04	FY 05				0.000	0.000		RDT&E Articles Quantity				
	FY 03	FY 04	FY 05																
		0.000	0.000																
RDT&E Articles Quantity																			
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CLASSIFICATION:

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EXHIBIT R-2a, RDT&E Project Justification		DATE: <b>February 2004</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

**(U) C. PROGRAM CHANGE SUMMARY:**

	FY 2003	FY 2004	FY 2005
(U) Funding:			
FY04 President's Budget:	14.635	5.200	7.765
FY05 President's Budget	24.393	5.106	7.710
Total Adjustments	9.758	-0.094	-0.055
Summary of Adjustments			
SBIR/STTR Transfer	-0.105		
Economic Assumptions (SEC 8135)	-0.082		
IT Cost Growth (SEC 8109)	-0.027		
Business Process Reform (SEC 8100)	-0.058		
FFRDC reduction (SEC 8029)	-0.056		
Inflation Savings	-0.155		
Realignment from X0742 for IETM development	0.300		
Realignment from X0742 for CSRR software development	5.136		
Realignment from X0742 for MCS development	4.800		
Realignment from X1411 for ITF NRE	0.005		
SPAWAR Service Cost Center Adj	0.000	-0.002	-0.001
NWCF Rates - SPAWAR SSC			-0.001
NWCF Rates - NUWC			-0.021
Management Improvements		-0.014	
FFRDC Reduction		-0.034	
Efficiencies/Revsied Econ. Assumptions		-0.044	
WCF - R&D - NUWC - PBD 430			-0.005
PBD 426 Rates - NUWC			0.002
Rates - SSC			0.001
Inflation			-0.021
Non purchase inflation			-0.004
Miscellaneous adjustments			-0.005
Subtotal	9.758	-0.094	-0.055

(U) Schedule:

Not Applicable.

(U) Technical:

Not Applicable

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Exhibit R-2a, RDTEN Project Justification  
(Exhibit R-2a, page 44 of 49)

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## CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification							DATE: <b>February 2004</b>		
APPROPRIATION/BUDGET ACTIVITY <b>RDTE&amp;E, N / BA5</b>		PROGRAM ELEMENT NUMBER AND NAME 0604503N SSN 688 & TRIDENT MODERNIZATION			PROJECT NUMBER AND NAME 1411 Submarine Tactical Communications System				

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

Line Item No. & Name	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	To Complete	Total Cost
3130000 Submarine Communications	89.305	87.288	94.533	91.359	104.333	143.315	154.029	Continue	Continue

Related RDT&E:  
PE 0602232N Space and Electronic Warfare (SEW) Technology  
PE 0204163N Fleet Communications

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

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 2004 CSRR 4Q -MS-C  
T&E Milestones: FY 2006 CSRR 3Q TECHEVAL, FY 2006 SSBN CSRR 4Q OPEVAL

**(U) F. MAJOR PERFORMERS: \*\***

Lockheed Martin Tactical Systems, Eagan, MN

\* Not required for Budget Activities 1,2,3, and 6  
\*\* Required for DON and OSD submit only.

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**CLASSIFICATION:**

Exhibit R-3 Cost Analysis (page 1)										DATE: <b>February 2004</b>		
APPROPRIATION/BUDGET ACTIVITY <b>RD T&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 03 Cost	FY 03 Award Date	FY 04 Cost	FY 04 Award Date	FY 05 Cost	FY 05 Award Date	Cost to Complete	Total Cost	Target Value of Contract
Primary Hardware Development											0.000	
Hardware Development*	CPFF	SSC-SD/NUWC Newport, RI	2.319	0.457		0.457	TBD	0.456	TBD		3.689	
Hardware Development**	CPFF	SSCs/NUWC Newport, RI	0.211							Continuing	Continuing	Continuing
MCS Development	Various	Motorola, misc labs	0.727	5.300	Various						#VALUE!	
H/W Development Facilities	Various	NUWC Newport, RI									0.000	
Software Development	CPFFWX	SSC-SD San Diego, CA	1.763	0.305		0.350	TBD	0.140	TBD	Continuing	Continuing	
Software Development	WX	NUWC Newport, RI	5.498					2.802	TBD	Continuing	Continuing	Continuing
MLTS Replacement	CFCC	SSC-SD		0.000			TBD				0.000	
Systems Engineering	Various	Misc Labs	5.612	4.094	Various						9.706	Continuing
Site Platform Integration/Certification	Various	NUWC Newport, RI		3.794		2.513		1.853			8.160	
BCA/OPCON architecture	WX	NUWC Newport, RI		0.856		0.858		0.819			2.533	
Subtotal Product Development			16.130	14.806		4.178		6.070		Continuing	Continuing	Continuing
Remarks: * SCSS Development for SSN 688 Class submarines **CSRR Development for OHIO Class submarines												
Development Support								1.050	TBD		1.050	
Software Development (CSRR)	CPAF	Lockheed Martin Tech Sys	0.000	7.908				0.000			7.908	
Integrated Logistics Support (IETM)	WX	NUWC Newport, RI		0.300							0.300	
Software Engineering	WX	SSC-SD San Diego, CA				0.200						
Configuration Management								0.190			0.190	
INFOSEC Certification	CPFF	Merdan		0.479		0.428					0.907	
Studies & Analyses											0.000	
GFE											0.000	
Award Fees											0.000	
Subtotal Support			0.000	8.687		0.628		1.240		0.000	10.555	
Remarks: *Supports the development of the Multi-Link Training Simulator replacement												

# UNCLASSIFIED

## CLASSIFICATION:

Exhibit R-3 Cost Analysis (page 2)										DATE: <b>February 2004</b>		
APPROPRIATION/BUDGET ACTIVITY <b>RDTE, 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 03 Cost	FY 03 Award Date	FY 04 Cost	FY 04 Award Date	FY 05 Cost	FY 05 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								4.530	
Test Assets											0.000	
Tooling											0.000	
GFE											0.000	
Award Fees											0.000	
Subtotal T&E			4.530	0.000		0.000		0.000		Continuing	Continuing	
Remarks:												
Contractor Engineering Support											0.000	
Government Engineering Support											0.000	
Program Management Support	Various	Various	3.690	0.900	Various	0.300	Various	0.400	Various	Continuing	Continuing	Continuing
Travel											0.000	
Transportation											0.000	
SBIR Assessment											0.000	
Subtotal Management			3.690	0.900		0.300		0.400		Continuing	Continuing	
Remarks:												
Total Cost			24.350	24.393		5.106		7.710		Continuing	Continuing	
Remarks:												

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Exhibit R-3, Project Cost Analysis  
(Exhibit R-3, page 47 of 49)

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CLASSIFICATION:

EXHIBIT R4, Schedule Profile																								DATE: February 2004									
APPROPRIATION/BUDGET ACTIVITY										PROGRAM ELEMENT NUMBER AND NAME										PROJECT NUMBER AND NAME													
RDT&E, N / BA5										PE: 0604503N TITLE: SSN 688 & TRIDENT MODERNIZATION										1411 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 △	FRP Decision										
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																																	

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

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Exhibit R-3, Project Cost Analysis  
(Exhibit R-3, page 48 of 49)



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## CLASSIFICATION:

Exhibit R-4a, Schedule Detail					DATE: February 2004			
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT				PROJECT NUMBER AND NAME			
RDT&BA-5	PE: 0604503N TITLE: SSN 688 & TRIDENT MODERNIZATION				1411 Submarine Tactical Communications System			
Schedule Profile (CSRR)	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009
CSRR SW/HW Requirements Definition	3Q							
System/Subsystem Specification	3Q-4Q	1Q-3Q						
Milestone C			2Q					
Software Requirements Specification		3Q						
Lead Q-70 Hardware		2Q-4Q						
CDR		3Q						
Software Design Implementation		2Q-4Q	1Q					
Outfitting Q-70 Hardware			1Q					
Q-70 Hardware Checkout (ITF Set)			1Q - 2Q					
ITF Installation Checkout of Entire System			2Q - 3Q					
VA/CSRR Conformance/Reconciliation			4Q					
Interim Software Delivery #1			3Q					
ITF C&M Q-70 Subsystem Check			2Q - 3Q					
ITF Subsystem Checks with Interim Software			4Q					
Software FAT			3Q					
SSBN TRID Submittal (Draft)			3Q					
ITF System Level & Interface Checks (Collect Metrics)			4Q --	1Q				
SSBN TRID Submittal (Preliminary)			4Q					
ITF Stress and Degraded Modes Tests (Collect Metrics)				2Q - 3Q				
ITF Operational Environments Test - (EMI/EMC/thermal)				2Q				
Assessment of System Maturity / HSE Readiness				2Q - 3Q				
Operational Test Readiness Review (OTRR)				4Q				
ITF HSE (Hardware/Software Evaluation)				2Q - 3Q				
CSRR Operational Assessment				4Q				
CSRR JTIC (Joint Interoperability Test and Certification)					4Q			
SSBN TRID Submittal (Final)				2Q				
CSRR Strategic Certification Test				3Q				
SSBN TRID Approval				3Q				
Fleet Software Delivery				4Q				
STRATCOM/JCS Review & STRATCOM CERT Approval				4Q				
Final TRID Approval				4Q				
CSRR SSBN OT&E					4Q			
CSRR SSBN IOC (Initial Operating Capability)						2Q		
Full Rate Production						2Q		

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Exhibit R-4a, Schedule Detail  
(Exhibit R-4a, page 49 of 49)