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CLASSIFICATION:

EXHIBIT R-2, RDT&E Budget Item Justification							DATE: February 2007	
APPROPRIATION/BUDGET ACTIVITY RESEARCH DEVELOPMENT TEST & EVALUATION, NAVY / BA-5					R-1 ITEM NOMENCLATURE 0604558N/VIRGINIA Class Design Development			
COST (\$ in Millions)	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
Total PE Cost	168.891	201.364	223.958	168.377	158.692	178.263	206.902	196.632
1947/VIRGINIA Class HM&E Development	92.927	114.696	170.561	124.797	121.104	133.288	163.597	152.855
1950/VIRGINIA Class Combat Systems Dev	41.244	47.704	46.969	40.782	33.117	39.241	39.990	40.762
3062/Submarine Multi Mission Team Trainer	2.577	6.538	6.428	2.798	4.471	5.734	3.315	3.015
9999 / Congressional Plus-ups (FY06)	32.143	32.426						
Quantity of RDT&E Articles								
Defense Emergency Response Funds (DERF): NOT APPLICABLE								
<p>A. (U) Mission Description and Budget Item Justification: The U.S. Navy must maintain a submarine fleet that is of sufficient capability and numbers to defend American interests. The VIRGINIA Class Submarine, formerly the New Attack Submarine (New SSN), is being designed to fulfill this need. It will counter the potential threats of the next century in a multi-mission capable submarine that has the ability to provide covert, sustained combat presence in denied waters. The primary goal of the program is to develop an affordable yet capable submarine by evaluating a broad range of system and technology alternatives, and pursuing cost reduction, producibility improvement, and technical risk management. This Program Element (PE) provides the technology, prototype components, and systems engineering needed to design and construct the VIRGINIA Class Submarine and build and its Command, Control, Communications, and Intelligence (C3I) System. This PE directly supports the following VIRGINIA Class Submarine missions: (1) covert strike warfare; (2) anti-submarine warfare; (3) covert intelligence collection/surveillance, indication and warning, and electronic warfare; (4) anti-surface ship warfare; (5) special warfare; (6) mine warfare; and (7) battle group support.</p>								
<p>(U) Project 3062: The Submarine Multi-Mission Team Trainer (SMMTT) program replaces the proprietary mainframe computer system by re-hosting functions on industry standard Local Area Network (LAN) workstations. The mainframes can no longer be upgraded due to service life. The SMMTT modification applies to both the Combat Control System (CCS) trainers and the Acoustic trainers and will occur in three distinct phases. SMMTT Phase 1 and Phase 2 were funded in OPN BLI 5661 to complete the trainer-unique software offload and enables further enhancements. SMMTT Phase 3, funded in this RDT&E line will provide the architectural foundation to replace all MIL Standard hardware with commercial emulation hardware, and rehost existing proprietary based software into COTS software systems, therefore enabling platform independence and wide area network capability. The use of open architecture trainer systems allows for the continuous growth of functional flexibility, ultimately leading to employment training conducted for any submarine combat system.</p>								
<p>(U) Project 9999: Reflects a summary of FY06 Congressional Plus-Ups consisting of; Multi-Mission Module, Large Aperture Bow (LAB) Array, ShipMATES, Network Centric capability, Command & Control System lower power, Common Electronics replacement, COTS web enabled services, Open architecture technology, submarine technology insertion and FY07 Advanced Submarine Research, Flex Payload Interface Module, Large Scale Demo Item - VIRGINIA Class Bow Dome, Multilevel Secure Wireless Network, Submarine Low Power Computing Advanced technology, and Submarine Modernization and Technology Insertion.</p>								

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EXHIBIT R-2a, RDT&E Project Justification			DATE: February 2007		
APPROPRIATION/BUDGET ACTIVITY RDT&E, N / BA-5	PROGRAM ELEMENT NUMBER AND NAME 0604558N/VIRGINIA Class Design Development	PROJECT NUMBER AND NAME			
B. PROGRAM CHANGE SUMMARY:					
Funding:		FY2006	FY2007	FY2008	FY2009
Previous President's Budget: (FY 07 Pres Controls)		175.567	169.580	206.013	150.702
Current President's Budget: (FY08/09 Pres Controls)		168.891	201.364	223.958	168.377
Total Adjustments		-6.676	31.784	17.945	17.675
Summary of Adjustments					
Congressional Undistributed Reductions		-0.141	-0.642	-1.234	0.935
Economic Assumptions		-0.060			
Reprogrammings		-6.475			
Program Adjustment				19.237	16.834
Pricing Adjustment				-0.058	-0.094
Congressional Plus Ups			32.426		
		-6.676	31.784	17.945	17.675
Schedule:					
"Not Applicable"					
Technical:					
"Not Applicable."					

R-1 SHOPPING LIST - Item No. 113

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Exhibit R-2a, RDTE Project Justification

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EXHIBIT R-2a, RDT&E Project Justification							DATE: February 2007	
APPROPRIATION/BUDGET ACTIVITY RDT&E, N / BA-5		PROGRAM ELEMENT NUMBER AND NAME 0604558N/VIRGINIA Class Design Development			PROJECT NUMBER AND NAME 1947/VIRGINIA Class HM&E DEVELOPMENT			
COST (\$ in Millions)	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
Project Cost	92.927	114.696	170.561	124.797	121.104	133.288	163.597	152.855
RDT&E Articles Qty								

A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:

A (U) Mission Description and Budget Item Justification: (U) This project encompasses all the ship system development efforts for the VIRGINIA Class Submarine and the Technology Insertion Program for reducing cost and upgrading performance of future hulls by virtue of improvements in ship and combat systems. Technology developments, training, and logistics for developmental items, and VIRGINIA Class test & evaluation are included. This project is essential to achieve balanced platform capability, affordability, and flexibility in a low rate production environment. The thrust of these efforts will be to develop and apply multiple advanced system technologies which are integrated into the design of the VIRGINIA Class Submarine. New technologies are being transitioned from industry and government research and development programs where doing so offers substantial performance improvement and/or affordability payoffs. Transition opportunities include those from the Defense Advanced Research Projects Agency (DARPA) Sensors & Payloads program. In the future, products from the DARPA TANGO/BRAVO Submarine technology program may transition to prototyping and/or applicability on VIRGINIA hulls.

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APPROPRIATION/BUDGET ACTIVITY RDT&E, N / BA-5	PROGRAM ELEMENT NUMBER AND NAME 0604558N/VIRGINIA Class Design Development	PROJECT NUMBER AND NAME 1947/VIRGINIA Class HM&E DEVELOPMENT
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B. Accomplishments/Planned Program

	FY 06	FY 07	FY 08	FY 09
Accomplishments/Effort/Subtotal Cost	72.171	65.428	134.547	104.175
RDT&E Articles Quantity				

HM&E DEVELOPMENT

FY06 Accomplishments: Continued design, manufacturing, qualification testing, and logistics documentation of prototype technologies and components such as ship service turbine generator (SSTG) and impressed current cathodic protection. Continued system verification studies, tests, and analyses in support of ship design including signature, hydrodynamics, materials, and survivability analyses and tests. Provided Integrated Product and Process Development (IPPD) Design/Build team support at shipyards, Navy laboratories and in-house. Continued to support ship design and construction efforts with engineering evaluations and ship integration assessments for emergent ship design and systems development issues. Initiated shock qualification of torpedo tube system and radar. Continued design integration of improved main seawater system components. Continued the study of potential for reducing amount of damping tiles in ballast tanks with initial testing completed. Completed design of improved rudder/anchor light and install TEMPALT. Initiated shock qualification of air induction diesel exhaust (AIDE) valve, large penetrations, Lock Out Trunk (LOT), Voltage Regulated Lead Acid (VRLA) batteries, high efficiency inlet and rotary shutter doors, and radar. Initiated implodable volume research with design of test chamber. Initiated Block 2 software upgrade for ship control system. Initiated redesign of ship control station to address and minimize costs of Obsolescence. Evaluated design modifications to reduce propulsor construction and maintenance cost. Generated propulsor logistics products. Continued development of technology insertions including completion of the scale model design for the composite advanced sail, risk reduction technologies for Conformal Acoustic Velocity Sensor (CAVES) acoustic array, and validation of computational tools to be used in developing advanced electromagnetic signature control systems. Completed upgrade of electromagnetic calibration capability. Further work on the Advanced Sail has been deferred to future years due to budget priorities. Initiated development of plans for reduction in VIRGINIA Class ship construction and support costs.

FY07 Plan: Continue design, manufacturing, qualification testing, and logistics documentation of prototype technologies and components such as impressed current cathodic protection. Continue system verification studies, tests, and analyses in support of ship design including for example signature, hydrodynamics, materials, and survivability analyses and tests. Provided Integrated Product and Process Development (IPPD) Design/Build team support at shipyards, Navy laboratories and in-house. Continue to support ship design and construction efforts with engineering evaluations and ship integration assessments for emergent ship design and systems development issues. Complete evaluation of the acceptability of reducing damping in ballast tanks. Resolve sea trial acoustic issues. Complete design integration of improved main seawater components. Complete Block 2 software upgrade for ship control system. Update ship control simulator. Complete shock qualification of torpedo tube system, VRLA batteries, and high efficiency inlet and rotary shutter doors. Continue shock qualification testing of air induction diesel exhaust (AIDE) valve, large penetrations, lock out trunk (LOT). Continue development of technology insertions including risk reduction technologies for Conformal Acoustic Velocity Sensor (CAVES) and validation of computational tools to be used in developing advanced electromagnetic signature control systems. Initiate design of CAVES WAA array. Initiate broad program to introduce components and technology to reduce VIRGINIA construction and support costs including for example electrification of weapon handling module, simplified propulsion lube oil system, vendor supplied reverse osmosis system, fusion slicing of fiber optic cables, and reduced cost propulsion components. Initiate additional cost reduction efforts as required.

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EXHIBIT R-2a, RDT&E Project Justification		DATE: February 2007
APPROPRIATION/BUDGET ACTIVITY RDT&E, N / BA-5	PROGRAM ELEMENT NUMBER AND NAME 0604558N/VIRGINIA Class Design Development	PROJECT NUMBER AND NAME 1947/VIRGINIA Class HM&E DEVELOPMENT
B. Accomplishments/Planned Program		
<p>HM&E DEVELOPMENT (continued)</p> <p><u>FY08 Plan:</u> Continue design, manufacturing, qualification testing, and logistics documentation of prototype technologies and components such as impressed current cathodic protection. Continue system verification studies, tests, and analyses in support of ship design including for example signature, hydrodynamics, materials, and survivability analyses and tests. Provide Integrated Product and Process Development (IPPD) Design/Build team support at shipyards, Navy laboratories and in-house. Continue to support ship design and construction efforts with engineering evaluations and ship integration assessments for emergent ship design and systems development issues. Initiate developments responding to SSN774 OPEVAL and TECHEVAL findings. Continue ship control station software upgrades. Continue detailed design of CAVES array. Initiate software development for electromagnetic signature reduction. Complete shock qualification of all components including air induction diesel exhaust (AIDE) valve, large penetrations, lock out trunk (LOT), and radar. Manufacture implodable volumes test chamber. Continue broad program to introduce components and technology to reduce VIRGINIA construction and support costs including for example electrification of weapon handling module, simplified propulsion lube oil system, vendor supplied reverse osmosis system and reduced cost propulsion components. Continue cost reduction efforts as required.</p> <p><u>FY09 Plan:</u> Continue design, manufacturing, qualification testing, and logistics documentation of prototype technologies and components such as impressed current cathodic protection. Continue system verification studies, tests, and analyses in support of ship design including for example signature, hydrodynamics, materials, and survivability analyses and tests. Provide Integrated Product and Process Development (IPPD) Design/Build team support at shipyards, Navy laboratories and in-house. Continue to support ship design and construction efforts with engineering evaluations and ship integration assessments for emergent ship design and systems development issues. Continue design of CAVES array. Continue software development for reduced electromagnetic signature reduction. Continue ship control station software upgrades. Continue developments responding to SSN774 OPEVAL and TECHEVAL findings. Continue broad program to introduce components and technology to reduce VIRGINIA construction and support costs. Continue cost reduction efforts as required.</p>		

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APPROPRIATION/BUDGET ACTIVITY RDT&E, N / BA-5	PROGRAM ELEMENT NUMBER AND NAME 0604558N/VIRGINIA Class Design Development	PROJECT NUMBER AND NAME 1947/VIRGINIA Class HM&E DEVELOPMENT
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B. Accomplishments/Planned Program (continued)

	FY 06	FY 07	FY 08	FY 09
Accomplishments/Effort/Subtotal Cost	3.302	4.538	0.502	0.520
RDT&E Articles Quantity				

ADMINISTRATIVE/ENVIRONMENTAL

FY06 Accomplishments - to complete environmental compliance and pollution prevention under VIRGINIA design efforts.

FY07 - FY09 Plans: Continue analyses and evaluations relating to force effectiveness assessment and component performance tradeoffs. Maintain cost based approach to VIRGINIA Class submarine construction through use of IPPD's concurrent engineering processes. Continue coordination of VIRGINIA Class submarine specification at the shipbuilder. Continue cost estimating and validation of cost reduction ideas for VIRGINIA Class submarine overall design development.

	FY 06	FY 07	FY 08	FY 09
Accomplishments/Effort/Subtotal Cost	0.343	0.000	0.000	0.000
RDT&E Articles Quantity				

LOGISTIC SUPPORT

FY06 - Accomplishments - Provided government technical support services to the Design Yard for OBTT Integration with the NSWC Ownship Motion Model. Provided technical expertise for the development of the VIRGINIA C3I Onboard Team Trainer (OBTT) at NUWC, Newport. Delivered the Diesel Front Panel Simulator to Naval Submarine School, Groton. Provided Upgrade for Ship Control Maintenance Trainer, OBTT Master Controller and Hydrodynamic Simulation Update for VIRGINIA Ship Control Operator Trainer (VSCOT)

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APPROPRIATION/BUDGET ACTIVITY RDT&E, N / BA-5	PROGRAM ELEMENT NUMBER AND NAME 0604558N/VIRGINIA Class Design Development
	PROJECT NUMBER AND NAME 1947/VIRGINIA Class HM&E DEVELOPMENT

B. Accomplishments/Planned Program (Cont.)

	FY 06	FY 07	FY 08	FY 09
Accomplishments/Effort/Subtotal Cost	17.111	44.730	35.512	20.102
RDT&E Articles Quantity				

TEST AND EVALUATION

FY06 Accomplishments: Evaluated SSN 774 Pre-PSA Acoustic Trials, EM Trials, Hydrodynamic Performance testing, Target Strength Testing, Launcher Trials and C3I testing. Continued planning for TECHEVAL/OPEVAL. Continued LFT&E modeling and analysis. Continued development of the Test and Evaluation Master Plan (TEMP) revision, Vulnerability Analysis Report (VAR) and Total Ship Survivability Trial (TSST) drills.

FY07 Plan: Conduct SSN 774 Post PSA testing including EM Silencing, Acoustic Trials, Target Strength Verification, and Hydrodynamic trials. Conduct remaining Total Ship Survivability Test drills on SSN 775. Plan for and perform Lock-out Trunk (LOT) DT/OT on SSN 776. Begin conduct of TECHEVAL/OPEVAL. Obtain final concurrence on Test and Evaluation Master Plan (TEMP) Rev E. Continue LFT&E modeling and analysis. Continue development of the Vulnerability Analysis Report (VAR). Begin planning for DDS and ASDS Performance Trials. Begin development of FOT&E requirements..

FY08 Plan: Evaluate SSN 774 Post PSA testing including EM Silencing, Acoustic Trials, Target Strength Verification, and Hydrodynamic trials. Complete TECHEVAL/OPEVAL. Continue LFT&E modeling and analysis. Continue development of the Vulnerability Analysis Report (VAR). Continue planning for DDS and ASDS Performance Trials. Continue development of FOT&E requirements..

FY09 Plan: Evaluate TECHEVAL/OPEVAL data. Obtain final concurrence on the Vulnerability Analysis Report (VAR). Continue planning for DDS and ASDS Performance Trials. Continue development of FOT&E requirements.

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C. OTHER PROGRAM FUNDING SUMMARY:										
<u>Line Item No. & Name</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>FY 2012</u>	<u>FY 2013</u>	<u>To Complete</u>	<u>Total Cost</u>
SCN Line 201300 PE: 0204281N	2549.6	2552.7	2499.0	3392.9	3657.8	3689.3	4753.2	4956.9	37444.1	83600.5
SCN Line 201310 PE: 0204281N	0	0	0	0	0	0	0	0	0	589.2
O&M/N BA-2 1B2B PE: 0204283N	16.9	30.2	54.9	58.0	57.9	61.7	63.0	64.3	cont.	cont.
OPN BA-8 Line Item 094200	144.4	155.8	146.8	175.9	182.7	266.4	234.9	239.4	cont.	cont.
(U) Related RDT&E (U) PE 0603561N (Advanced Submarine System Development) (U) PE 0603570N (Advanced Nuclear Power Systems) (U) PE 0602121N (Surface Ship Technology)										
D. ACQUISITION STRATEGY: *										
The VIRGINIA Class Submarine Program has implemented Integrated Product and Process Development (IPPD). The traditional distinct phasing of the design process has been replaced with the continuous concurrent engineering IPPD process. The IPPD approach has facilitated a smoother transition from design to manufacturing and has reduced the number of changes typically encountered during construction of the lead and early follow-on ships. In September 1997, Congress passed a law allowing Electric Boat (EB) and Northrop Grumman Newport News (NGNN) to team for production of the first four VIRGINIA Class Submarines. Under the teaming agreement, EB remained the design yard for the VIRGINIA Class Submarine and NGNN became a part of the IPPD process. The Program Office awarded a multi-year contract for the FY04-08 ships. Future focus will be planning for the FY09-13 multiyear contract and efforts to reduce costs for the FY12 and beyond VIRGINIA Class submarines to \$2B (FY05\$) when procurement rate increases to 2 per year.										
E. MAJOR PERFORMERS: **										
1. Electric Boat Corporation, Groton CT - Virginia Class Lead Shipbuilder - Contract Award Date 28 Sept. 1998. 2. Naval Surface Warfare Center, Carderock Division, Bethesda, MD - Research, Development, Test & Evaluation Laboratory 3. Naval Undersea Warfare Center, Newport, RI - Research, Development, Test & Evaluation Laboratory										

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Exhibit R-3 Cost Analysis (page 1)											DATE: February 2007			
APPROPRIATION/BUDGET ACTIVITY			PROGRAM ELEMENT			PROJECT NUMBER AND NAME								
RDT&E, N / BA-5			0604558N/VIRGINIA Class Design Development			1947/VIRGINIA Class HM&E DEVELOPMENT								
Cost Categories	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 06 Cost	FY 06 Award Date	FY 07 Cost	FY 07 Award Date	FY 08 Cost	FY 08 Award Date	FY 09 Cost	FY 09 Award Date	Cost to Complete	Total Cost	Target Value of Contract
Component Development	Contract	EB-2112 Groton, CT	492.909	0.000		0.000		0.000		0.000		0.000	492.909	
Component Development	Contract	EB-2103 Groton, CT	13.000	33.911	11/05	33.509	11/06	113.822	11/07	79.416	11/08	479.912	753.570	
Component Development	SS/CPFF	EB-4030 Groton, CT	236.311	0.000		0.000	11/06	0.000		0.000		0.000	236.311	
Component Development	PD	SOS/Groton	13.370	2.990		0.000		0.000		0.000		0.000	16.360	
Component Development	SS/CPFF	LM-6226	18.171	0.490		0.000		0.000		0.000		0.000	18.661	
Component Development	WR	NSWC Carderock MD	470.914	25.037	11/05	17.039	11/06	2.343	11/07	13.688	11/08	76.086	605.107	
Component Development	WR	NSWC Crane, IA	4.085	0.000		0.000		0.000		0.000		0.000	4.085	
Component Development	WR	NUWC Newport, RI	84.168	2.006	11/05	2.593	11/06	5.847	11/07	5.326	11/08	29.705	129.645	
Component Development	WR	NFPC Phila, PA	6.256	0.000		0.000		0.000		0.000		0.000	6.256	
Component Development	Various	Various	208.738	3.953	Various	9.808	Various	7.150	11/07	0.549		0.000	230.198	
Miscellaneous	Various	Various	29.183	5.235	Various	5.760	Various	5.080	11/07	4.889	Various	43.053	93.200	
Subtotal Product Development			1,577.105	73.622		68.709		134.242		103.868		628.756	2,586.302	
Remarks:														
Cost Categories	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 06 Cost	FY 06 Award Date	FY 07 Cost	FY 07 Award Date	FY 08 Cost	FY 08 Award Date	FY 09 Cost	FY 09 Award Date	Cost to Complete	Total Cost	Target Value of Contract
Integrated Logistics Support	WR	NSWC Carderock MD	0.867	0.075								0.000	0.942	
Integrated Logistics Support	WR	NAWC Orlando, FL	26.599	0.116								0.000	26.715	
Integrated Logistics Support	WR	NUWC Newport, RI	2.611	0.100								0.000	2.711	
Integrated Logistics Support	C/CPAF	SEAPORT D7019 Rockville MD	3.406	0.000								0.000	3.406	
Integrated Logistics Support	SS/CPFF	EB - C2100, Groton CT	0.053	0.037	11/05							0.000	0.090	
Integrated Logistics Support	SS/CPFF	EB-2112 Groton, CT	0.000	0.015									0.015	
Misc	Various	Misc	0.000	0.000								0.000	0.000	
Award Fees													0.000	
Subtotal Support			33.536	0.343								0.000	33.879	
Remarks:														

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Exhibit R-3 Cost Analysis (page 2)										DATE: February 2007				
APPROPRIATION/BUDGET ACTIVITY			PROGRAM ELEMENT				PROJECT NUMBER AND NAME							
RDT&E, N / BA-5			0604558N/VIRGINIA Class Design Development				1947/VIRGINIA Class HM&E DEVELOPMENT							
Cost Categories	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 06 Cost	FY 06 Award Date	FY 07 Cost	FY 07 Award Date	FY 08 Cost	FY 08 Award Date	FY 09 Cost	FY 09 Award Date	Cost to Complete	Total Cost	Target Value of Contract
Test & Evaluation	Contract	EB-2112 Groton, CT	5.616	0.000		0.000		0.000		0.000		0.000	5.616	
Test & Evaluation	Contract	EB-2103 Groton, CT	0.000	0.315	11/05	0.296	11/06	0.045	11/07	0.000		0.000	0.656	
Test & Evaluation	WX	NSWC Carderock MD	57.817	5.167	11/05	19.476	11/06	7.776		10.448	11/08	25.997	126.681	
Test & Evaluation	WX	NUWC Newport, RI	32.090	8.678	11/05	19.879	11/06	8.284		3.929	11/08	8.011	80.871	
Test & Evaluation	C/CPAF	EG&G C6411 Rockville, MD	7.469	0.000		0.000		0.000		0.000		0.000	7.469	
Test & Evaluation	C/CPAF	SEAPORT D7019 Rockville MD	13.934	1.303	11/05	0.939	11/06	0.963		0.000		0.000	17.139	
Test & Evaluation	Contract	Progeny 00C6226	2.273	0.000		0.000		0.000		0.000		0.000	2.273	
Test & Evaluation	Contract	Progeny 06C6256	0.000	0.538	02/06	0.673	10/06	0.706	10/07	0.588	11/08	3.918	6.423	
Test & Evaluation	PD	COMOPTVFOR	5.009	0.599	10/05	1.136	10/06	14.810	10/07	1.650	11/08	5.250	28.454	
Test & Evaluation	Various	Miscellaneous	8.494	0.511	11/05	2.331	11/06	2.928	11/07	3.487	11/08	5.711	23.462	
Subtotal T&E			132.702	17.111		44.730		35.512		20.102		48.887	299.044	
Remarks:														
Cost Categories	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 06 Cost	FY 06 Award Date	FY 07 Cost	FY 07 Award Date	FY 08 Cost	FY 08 Award Date	FY 09 Cost	FY 09 Award Date	Cost to Complete	Total Cost	Target Value of Contract
Contractor Engineering Support	C/CPAF	SEAPORT D7019 Rockville MD	12.093	1.366	11/05	0.757	11/06	0.597	11/07	0.607	11/08	2.532	17.952	
Program Management Support	C/CPAF	EG&G C6411 Rockville, MD	21.537	0.000		0.000						0.000	21.537	
Program Management Support	Various	Miscellaneous	19.856	0.000		0.000						0.000	19.856	
Travel			1.032	0.485		0.500		0.210		0.220		1.530	3.977	
Subtotal Management			54.518	1.851		1.257		0.807		0.827		4.062	63.322	
Remarks:														
Total Cost			1,797.861	92.927		114.696		170.561		124.797		681.705	2,857.750	

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EXHIBIT R4, Schedule Profile																														DATE: February 2007						
APPROPRIATION/BUDGET A / PROGRAM ELEMENT NUMBER AND NAME		PROJECT NUMBER AND NAME																																		
RDT&E, N / BA-5		0604558N/VIRGINIA Class Design Development																												1947 / VIRGINIA Class HM&E Development						
Fiscal Year	2006				2007				2008				2009				2010				2011				2012				2013							
	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																																				
Test & Evaluation Milestones																																				
Development Test																																				
Operational Test																																				
Construction Milestones																																				
Ship Authorizations																																				
Ship Deliveries																																				
Post Shakedown Availability																																				

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Exhibit R-4a, Schedule Detail					DATE:				February 2007	
APPROPRIATION/BUDGET ACTIVITY					PROJECT NUMBER AND NAME					
RDT&E, N / BA-5					1947/VIRGINIA Class HM&E Development					
Schedule Profile	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013		
Operational Test (OT-IIC)	1Q-2Q									
Ship Authorization (SSN 779)										
Ship Delivery (SSN 774)										
Developmental Test (DT-IIC)	1Q-2Q									
Ship Authorization (SSN 780)										
Post Shakedown Availability (PSA SSN 774)	2Q-4Q	1Q								
Ship Delivery (SSN 775)	4Q									
Ship Authorization (SSN 781)	1Q									
Post PSA Modernization (SSN 774)		3Q-4Q								
Developmental Test (DT-IID)	2Q-4Q	1Q-2Q								
Initial Operating Capability (IOC)		1Q								
Post Shakedown Availability (PSA SSN 775)		2Q-4Q	1Q							
Developmental Test (DT-IIE)	3Q-4Q	1Q								
Developmental Test (DT-IIF)		1Q-4Q	1Q-3Q							
Ship Authorization (SSN 782)		1Q								
Ship Delivery (SSN 776)		1Q								
Operational Evaluation (OT-IID) (OPEVAL)			2Q-4Q							
Post PSA Modernization (SSN 775)			4Q	1Q						
Post Shakedown Availability (PSA SSN 776)			2Q-4Q	1Q						
Milestone III (MS III)				3Q						
Full Operational Capability (FOC)				3Q						
Ship Authorization (SSN 783)			1Q							
Ship Delivery (SSN 777)			3Q							
Post Shakedown Availability (PSA SSN 777)				2Q-4Q	1Q					
Ship Authorization (SSN 784)				1Q						
Post PSA Modernization (SSN 776)				2Q-3Q						
FOT&E (OT-III & DT-III)				TBD	TBD	TBD				
Ship Delivery (SSN 778)				3Q						
Ship Authorization (SSN 785)					1Q					
Post Shakedown Availability (PSA SSN 778)					1Q-3Q					
Ship Delivery (SSN 779)					3Q					
Ship Authorization (SSN 786)						1Q				
Post Shakedown Availability (SSN 779)						1Q-3Q				
Ship Delivery (SSN 780)						3Q				
Ship Authorization (SSNs 787/788)							1Q			
Post Shakedown Availability (PSA SSN 780)							1Q - 3Q			
Ship Delivery (SSN 781)							3Q			
Ship Authorization (SSNs 789/ 790)									1Q	
Post Shakedown Availability (PSA SSN 781)									1Q - 3Q	
Ship Delivery (SSN 782)									3Q	

R-1 SHOPPING LIST - Item No. 113

UNCLASSIFIED

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification							DATE: February 2007	
APPROPRIATION/BUDGET ACTIVITY RDT&E, N / BA-5		PROGRAM ELEMENT NUMBER AND NAME 0604558N/VIRGINIA Class Design Development			PROJECT NUMBER AND NAME 1950/VIRGINIA Class Combat System Development			
COST (\$ in Millions)	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
Project Cost	41.244	47.704	46.969	40.782	33.117	39.241	39.990	40.762
RDT&E Articles Qty								

A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:

A. (U) Mission Description and Budget Item Justification: (U) This project encompasses the top level systems development, test and integration into the ship of the VIRGINIA Class Submarine C3I System (formerly referred to as Combat Systems), which includes multiple subsystems. The scope of the system is expanded from Sonar and Combat Control subsystems to include AN/BLQ-10 Electronic Support (ES) Measures, Exterior Communications, Submarine Regional Warfare System, Navigation, Total Ship Monitoring, Imaging, Tactical Acoustic Communications, Radar, Interior Communications, Tactical Support Devices, Fiber Optic Cable Subsystem, and Special Purpose Subsystems, such as Battle Force Team Trainer and others. VIRGINIA Class Submarine specific development efforts include requirements definition, software, hardware development, software/hardware test, prototype production, and electronic integration as well as physical integration into the platform.

(U) The VIRGINIA Class Submarine implementation approach is based on Open System, Commercial-off-the-Shelf (COTS) Non-Developmental Items or subsystems. The program leverages on-going subsystems developments or developing new subsystems where needed to satisfy VIRGINIA Class requirements. The recurring cost of VIRGINIA Class Submarine C3I Systems is being reduced to meet the program's affordability goals. Modifications to many subsystems must be developed to: (1) reduce the shipbuilding and construction recurring costs through the use of COTS components; (2) use proven computer technologies to evolve to an Open System design; (3) enhance capabilities to support expanded operational requirements, reduced manning, and reduced shipboard component footprint.

(U) To meet the collective future threat, the submarine force must operate as effectively in littoral regions as it traditionally has in open ocean. Close coordination with surface battle groups and airborne units is essential to mission accomplishment. To meet the VIRGINIA Class Submarine mission, the following capabilities are provided by the VIRGINIA Class Submarine C3I System: (1) Passive and Active detection of multiple contacts, including early warning threat determination through processing and analysis of sensor data; (2) classification of sensor data for the purpose of identifying contacts; (3) localization (tracking) of contacts through target motion analysis; (4) preset, launch, and control of weapons and countermeasures; (5) improved communication and connectivity with other battle group elements, airborne units, and special operations forces; (6) incorporation of vertical launch system to enhance strike warfare; and (7) more effective covert surveillance through video imaging with onboard digital enhancement capabilities, and improved electronic warfare analysis capabilities.

(U) The FY04/05 budget submit expanded the original definition of the F1950 project mission to include an ongoing post VIRGINIA Class TECH/OPEVAL RDT&E effort to continue the development of VIRGINIA Unique Combat System Improvements. The VIRGINIA Class C3I will continue to leverage backfit communities efforts, but even with "common" systems that the Navy has developed there will continue to be VIRGINIA Unique capability improvements required. The FY08 and out funding identified is for those efforts.

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EXHIBIT R-2a, RDT&E Project Justification		DATE: February 2007
APPROPRIATION/BUDGET ACTIVITY RDT&E, N / BA-5	PROGRAM ELEMENT NUMBER AND NAME 0604558N/VIRGINIA Class Design Development	PROJECT NUMBER AND NAME 1950/VIRGINIA Class Combat System Development

B. Accomplishments/Planned Program --- C3I Systems Engineering

	FY 06	FY 07	FY 08	FY 09
Accomplishments/Effort/Subtotal Cost	29.560	32.765	35.594	29.073
RDT&E Articles Quantity				

1. (U) FY 2006 ACCOMPLISHMENTS:

- (U) (\$29.560M) Continued development of high priority ship safety/self-protect deficiencies identified during integration and lead ship sea test efforts. Continued the detailed planning for C3I System/subsystems testing as part of VIRGINIA Class TECH/OPEVAL. Continued the Voyage Management System and information assurance implementation for NPES system/subsystems.

2. (U) FY 2007 PLAN:

- (U) (\$32.765M) Continue development of high priority ship safety/self-protect deficiencies identified during integration and lead ship sea test efforts. Conduct C3I System/subsystems testing as part of VIRGINIA Class TECH/OPEVAL. Complete the Voyage Management System implementation. Continue the information assurance implementation for NPES system/subsystems.

3. (U) FY 2008 PLAN:

- (U) (\$35.594M) Continue development of high priority ship safety/self-protect and mission specific deficiencies identified during integration and lead ship sea test efforts including DT and OT events. Complete C3I System/subsystems testing as part of VIRGINIA Class TECH/OPEVAL. Begin the development of System Level and other subsystem Improvements to maintain VIRGINIA Class Commonality to backfit fleet.

4. (U) FY 2009 PLAN:

- (U) (\$29.073M) Complete development of high priority ship safety/self-protect and mission specific deficiencies identified during integration and lead ship sea test efforts including DT and OT events. Continue the development of System Level and other subsystem Improvements to maintain VIRGINIA Class Commonality to backfit fleet.

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EXHIBIT R-2a, RDT&E Project Justification		DATE: February 2007
APPROPRIATION/BUDGET ACTIVITY RDT&E, N / BA-5	PROGRAM ELEMENT NUMBER AND NAME 0604558N/VIRGINIA Class Design Development	PROJECT NUMBER AND NAME 1950/VIRGINIA Class Combat System Development

B. Accomplishments/Planned Program (Cont.) --- Sonar Combat Control and Architecture Subsystems

	FY 06	FY 07	FY 08	FY 09
Accomplishments/Effort/Subtotal Cost	11.684	14.939	11.375	11.709
RDT&E Articles Quantity				

1. (U) FY 2006 ACCOMPLISHMENTS:

- (U) (\$11.684M) Continued development of high priority S/CC/A ship safety/self-protect deficiencies identified during integration and lead ship sea test efforts. Continued the detailed planning for S/CC/A subsystems testing as part of VIRGINIA Class TECH/OPEVAL. Begin the development of S/CC/A System Improvements to maintain VIRGINIA Class Commonality to backfit fleet.

3. (U) FY 2007 PLAN:

- (U) (\$14.939M) Continue development of high priority S/CC/A ship safety/self-protect deficiencies identified during integration and lead ship sea test efforts. Conduct S/CC/A subsystems testing as part of VIRGINIA Class TECH/OPEVAL. Continue the development of S/CC/A System Improvements to maintain VIRGINIA Class Commonality to backfit fleet.

4. (U) FY 2008 PLAN:

- (U) (\$11.375M) Continue development of high priority S/CC/A ship safety/self protect and mission specific deficiencies identified during integration and lead ship test efforts including DT and OT events. Continue the development of S/CC/A System Improvements to maintain VIRGINIA Class Commonality to backfit fleet.

4. (U) FY 2009 PLAN:

- (U) (\$11.709M) Continue development of high priority S/CC/A ship safety/self protect and mission specific deficiencies identified during integration and lead ship test efforts including DT and OT events. Continue the development of S/CC/A System Improvements to maintain VIRGINIA Class Commonality to backfit fleet.

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CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification							DATE: February 2007				
APPROPRIATION/BUDGET ACTIVITY RDT&E, N / BA-5			PROGRAM ELEMENT NUMBER AND NAME 0604558N/VIRGINIA Class Design Development				PROJECT NUMBER AND NAME 1950/VIRGINIA Class Combat System Development				
C. OTHER PROGRAM FUNDING SUMMARY:											
<u>Line Item No. & Name</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>FY 2012</u>	<u>FY 2013</u>	<u>To Complete</u>	<u>Total Cost</u>	
SCN Line 201300 PE: 0204281N	2549.6	2552.7	2499.0	3392.9	3657.8	3689.3	4753.2	4956.9	37444.1	83600.5	
SCN Line 201310 PE: 0204281N	0	0	0	0	0	0	0	0	0	589.2	
O&M/N BA-2 1B2B PE: 0204283N	16.9	30.2	54.9	58.0	57.9	61.7	63.0	64.3	cont.	cont.	
OPN BA-8 Line Item 094200	144.4	155.8	146.8	175.9	182.7	266.4	234.9	239.4	cont.	cont.	
(U) Related RDT&E											
(U) PE 0603504N (Advanced Submarine Combat Systems Development)											
(U) PE 0603561N (Advanced Submarine System Development)											
(U) PE 0603562N (Submarine Tactical Warfare Systems)											
(U) PE 0603570N (Advanced Nuclear Power Systems)											
(U) PE 0604503N (Submarine System Equipment Development)											
(U) PE 0604574N (Navy Tactical Computer Resources)											
(U) PE 0604777N (Navigation/ID Systems)											
(U) PE 0101226N (Submarine Acoustic Warfare Development)											
(U) PE 0604562N (Submarine Tactical Warfare System)											
(U) PE 0604524N (Submarine Combat System)											
D. ACQUISITION STRATEGY: *											
<p>The VIRGINIA Class Submarine Program has implemented Integrated Product and Process Development (IPPD). The traditional distinct phasing of the design process has been replaced with the continuous concurrent engineering IPPD process. The IPPD approach has facilitated a smoother transition from design to manufacturing and has reduced the number of changes typically encountered during construction of the lead and early follow-on ships. In September 1997, Congress passed a law allowing Electric Boat (EB) and Northrop Grumman Newport News (NGNN) to team for production of the first four VIRGINIA Class Submarines. Under the teaming agreement, EB remained the design yard for the VIRGINIA Class Submarine and NGNN became a part of the IPPD process. The Program Office awarded a multi-year contract for the FY04-08 ships. Future focus will be planning for the FY09-13 multiyear contract and efforts to reduce costs for the FY12 and beyond VIRGINIA Class submarines to \$2B (FY05\$) when procurement rate increases to 2 per year.</p>											
E. MAJOR PERFORMERS: **											
Lockheed Martin, Manassas, Virginia. C3I Prime Contractor, Development and Limited Production of the S/CC/A Subsystems, Contract Award Date 24 April 1996.											
Naval Undersea Warfare Center, Newport, Rhode, Island, Technical Direction Agent for all Virginia Class Electronics.											

DATE: **February 2007**

Exhibit R-3 Cost Analysis (page 1)

APPROPRIATION/BUDGET ACTIVITY		PROGRAM ELEMENT				PROJECT NUMBER AND NAME								
RDT&E, N / BA-5		0604558N/VIRGINIA Class Design Development				1950/VIRGINIA Class Combat System Development								
Cost Categories	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 06 Cost	FY 06 Award Date	FY 07 Cost	FY 07 Award Date	FY 08 Cost	FY 08 Award Date	FY 09 Cost	FY 09 Award Date	Cost to Complete	Total Cost	Target Value of Contract
C3I Prime Contract E&MD Total	C/CPAF	Lockheed Manassas, VA	258.854									0.000	258.854	258.854
C3I Prime Contract E&MD Award Fee	C/CPAF	Lockheed Manassas, VA	7.891									0.000	7.891	7.891
C3I Prime Contract Post Delivery	C/FFP	Lockheed Manassas, VA	22.372									0.000	22.372	22.372
ARCI Prime Contract	SS/CPAF	Lockheed Manassas, VA	6.128	4.684	Various							0.000	10.812	10.812
PTR Corrections	Various	Various/TBD	0.000	5.293	Various	14.451	Various	12.898	Various	12.648	Various	0.000	45.290	45.290
Weapons Control Contract	C/CPIF	Raytheon, Portsmouth, RI										0.000	0.000	0.000
Unique Virginia Class Improvements	TBD	Various/TBD	0.000			4.706	11/06	4.737	11/07	6.538	11/08	80.519	96.500	96.500
Advanced Display Sys (AN/UJYQ-70)	SS/CPIF	Lockheed St. Paul, MN	27.421	0.500	Various	0.956	11/06	0.728	11/07	0.749	11/08	6.410	36.764	36.764
Multi-Purpose Processor	SS/CPIF	Digital Sys Fairfax, VA	41.449										41.449	41.449
Multi-Purpose Processor	SS/CPIF	Lockheed Manassas, VA	1.755										1.755	1.755
Photonics	C/CPIF	Kollmorgen Northhampton, MA	33.242	3.120	Various	2.136	11/06	0.763	11/07	1.145	11/08	6.410	46.816	46.816
Non-Penetrating Periscope	C/CPIF	Kollmorgen Northhampton, MA	4.060										4.060	4.060
Electronic Support Measures	C/FFP	Lockheed Syracuse, NY	38.067									6.410	44.477	44.477
Platform Integration	SS/CPFF	EB Corp Groton, CT	31.777	6.035	Various	1.400	11/06	1.000	11/07	1.000	11/08	12.823	54.035	54.035
Platform Integration	SS/CPFF	NNews Shipbuilding NNews, VA	3.065										3.065	3.065
Integrated Electronic Mast	SS/CPIF	Goleta Portsmouth, RI	8.897										8.897	8.897
Tactical Simulator	SS/CPFF	Goleta Portsmouth, RI	2.750										2.750	2.750
High Frequency Sail Array	SS/CPFF	Applied Research Austin, TX	3.273										3.273	3.273
Navigation/Radar	SS/CPFF	Sperry Corp Charlottesville, VA	7.626										7.626	7.626
Technology Refreshment	Various	Various/TBD	10.765					7.922	11/07	1.668	11/08		20.355	20.355
Open System Module	SS/CPFF	UNISYS Corp St. Paul, MN	2.500										2.500	2.500
Technical Direction Agent	N/A	NUWC Newport, RI	218.769	5.105	Various	6.500	Various	6.000	Various	6.000	Various	38.466	280.840	
Technology Refreshment/Info. Assur.	C/CPFF	Progeny Systems, Manassas, VA	23.276	1.583	Various	1.000	11/06	1.000	11/07	1.000	11/08	5.372	33.231	
NTDPS Network Centric Architecture	SS/CPFF	GD-AIS, Fairfax, Virginia	5.397	3.232	Various								8.629	
Systems Engineering	N/A	NSWC Carderock, MD	5.308	0.675	Various	0.330	11/06	0.340	11/07	0.350	11/08	2.160	9.163	
Systems Engineering	N/A	NSWC Crane, IN	3.742										3.742	
Systems Engineering	N/A	SSC Charleston, SC	2.805	0.696	Various	0.500	11/06	0.515	11/07	0.530	11/08	3.300	8.346	
Systems Engineering	N/A	SSC San Diego, CA	2.545										2.545	
Systems Engineering	N/A	NUWC Keyport, WA	9.249	0.272	11/05	0.180	11/06	0.184	11/07	0.188	11/08	7.800	17.873	
Miscellaneous	Various	Various	94.347	8.745	Various	8.204	Various	7.182	Various	6.766	Various	43.118	168.362	
Subtotal Product Development			877.330	39.940		40.363		43.269		38.582		212.788	1,252.272	
Remarks:														
Development Support			0.000										0.000	
Software Development			0.000										0.000	
Training Development			0.000										0.000	
Integrated Logistics Support			0.000										0.000	
Configuration Management			0.000										0.000	
Technical Data			0.000										0.000	
GFE			0.000										0.000	
Award Fees			0.000										0.000	
Subtotal Support			0.000	0.000		0.000		0.000		0.000		0.000	0.000	

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Exhibit R-3 Cost Analysis (page 2)												DATE: February 2007		
APPROPRIATION/BUDGET ACTIVITY			PROGRAM ELEMENT			PROJECT NUMBER AND NAME								
RDT&E, N / BA-5			0604558N/VIRGINIA Class Design Development			1950/VIRGINIA Class Combat System Development								
Cost Categories	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 06 Cost	FY 06 Award Date	FY 07 Cost	FY 07 Award Date	FY 08 Cost	FY 08 Award Date	FY 09 Cost	FY 09 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	
Test & Evaluation	Various	Various	0.000			4.712	Various	1.500	Various				6.212	
Test Assets			0.000										0.000	
Tooling			0.000										0.000	
GFE			0.000										0.000	
Award Fees			0.000										0.000	
Subtotal T&E			0.000	0.000		4.712		1.500		0.000		0.000	6.212	
Remarks:														
Contractor Engineering Support			0.000										0.000	
Contractor Support Services/ETS	C/CPAF	EG&G Rockville, MD	8.502	1.304	Various	2.629	Various	2.200	Various	2.200	Various	19.233	36.068	
Contractor Support Services/ETS	C/CPAF	EG&G Rockville, MD	14.406										14.406	
CSS/ETS Award Fee	C/CPFF	EG&G Rockville, MD	1.195										1.195	
Contractor Support Services/ETS	C/CPFF	EG&G Rockville, MD	8.857										8.857	
Contractor Support Services/ETS	C/CPFF	SWL Inc. Vienna, VA	5.705										5.705	
Contractor Support Services/ETS	C/CPFF	American Sys Chantilly, VA	2.099										2.099	
Miscellaneous	Various	Various	4.765										4.765	
Program Management Support			0.000										0.000	
Travel			0.000										0.000	
Subtotal Management			45.529	1.304		2.629		2.200		2.200		19.233	73.095	
Remarks:														
Total Cost			922.859	41.244		47.704		46.969		40.782		232.021	1,331.579	
Remarks:														

CLASSIFICATION:

EXHIBIT R4, Schedule Profile																														DATE:						
APPROPRIATION/BUDGET A / PROGRAM ELEMENT NUMBER AND NAME		PROJECT NUMBER AND NAME																												February 2007						
RDT&E, N / BA-5		1950 / VIRGINIA Class Combat System Development																																		
Fiscal Year	2006				2007				2008				2009				2010				2011				2012				2013							
	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																																				
Test & Evaluation Milestones																																				
Development Test																																				
Operational Test																																				
Construction Milestones																																				
Ship Authorizations																																				
Ship Deliveries																																				
Post Shakedown Availability																																				

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CLASSIFICATION:

Exhibit R-4a, Schedule Detail				DATE:				
				February 2007				
APPROPRIATION/BUDGET ACTIVITY			PROJECT NUMBER AND NAME					
RDT&E, N / BA-5			1950/VIRGINIA Class Combat Systems Development					
Schedule Profile	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
Operational Test (OT-IIC)	1Q-2Q							
Ship Authorization (SSN 779)								
Ship Delivery (SSN 774)								
Developmental Test (DT-IIC)	1Q-2Q							
Ship Authorization (SSN 780)								
Post Shakedown Availability (PSA SSN 774)	2Q-4Q	1Q						
Ship Delivery (SSN 775)	4Q							
Ship Authorization (SSN 781)	1Q							
Post PSA Modernization (SSN 774)		3Q-4Q						
Developmental Test (DT-IID)	2Q-4Q	1Q-2Q						
Initial Operating Capability (IOC)		1Q						
Post Shakedown Availability (PSA SSN 775)		2Q-4Q	1Q					
Developmental Test (DT-IIE)	3Q-4Q	1Q						
Developmental Test (DT-IIF)		1Q-4Q	1Q-3Q					
Ship Authorization (SSN 782)		1Q						
Ship Delivery (SSN 776)		1Q						
Operational Evaluation (OT-IID) (OPEVAL)			2Q-4Q					
Post PSA Modernization (SSN 775)			4Q	1Q				
Post Shakedown Availability (PSA SSN 776)			2Q-4Q	1Q				
Milestone III (MS III)				3Q				
Full Operational Capability (FOC)				3Q				
Ship Authorization (SSN 783)			1Q					
Ship Delivery (SSN 777)			3Q					
Post Shakedown Availability (PSA SSN 777)				2Q-4Q	1Q			
Ship Authorization (SSN 784)				1Q				
Post PSA Modernization (SSN 776)				2Q-3Q				
FOT&E (OT-III & DT-III)				TBD	TBD	TBD		
Ship Delivery (SSN 778)				3Q				
Ship Authorization (SSN 785)					1Q			
Post Shakedown Availability (PSA SSN 778)					1Q-3Q			
Ship Delivery (SSN 779)					3Q			
Ship Authorization (SSN 786)						1Q		
Post Shakedown Availability (SSN 779)						1Q-3Q		
Ship Delivery (SSN 780)						3Q		
Ship Authorization (SSNs 787/788)							1Q	
Post Shakedown Availability (PSA SSN 780)							1Q - 3Q	
Ship Delivery (SSN 781)							3Q	
Ship Authorization (SSNs 789/790)								1Q
Post Shakedown Availability (PSA SSN 781)								1Q - 3Q
Ship Delivery (SSN 782)								3Q

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CLASSIFICATION:

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EXHIBIT R-2a, RDT&E Project Justification							DATE: February 2007	
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME				PROJECT NUMBER AND NAME			
RDT&E, N / BA-5	0604558N/VIRGINIA Class Design Development				3062/Submarine Multi-Mission Team Trainer			
COST (\$ in Millions)	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
3062 / Submarine Multi Mission Team Trainer	2.577	6.538	6.428	2.798	4.471	5.734	3.315	3.015
RDT&E Articles Qty								
<p>A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:</p> <p>To achieve desired submarine force readiness levels, it is necessary to construct highly sophisticated shorebased Combat System Team Trainers capable of training personnel in all aspects of submarine approach, attack and surveillance operations in a controlled, simulated environment.</p> <p>The Combat Control System (CCS) MK 1 and CCS MK 2 are installed on SSN and SSGN Class submarines, and there are currently plans to further upgrade these systems with the next H/W and S/W revisions which provide enhanced warfighter capabilities. The Tactical Acoustic Rapid COTS (commercial-off-the-shelf) Insertion (ARCI) Phased upgrades are also being installed with the next revision which provides enhanced warfighter capabilities. These CCS (AN/BYG-1) and ARCI (AN/BQQ-10) upgrades directly impact shore based Team Trainers. In addition, the Advanced Processing Builds (APB) and new TI-0x sensors, which feed technology insertion into the CCS/Acoustic development, also impact the trainers.</p> <p>The Submarine Multi-Mission Team Trainer (SMMTT) supports operator, employment, strike, and Battle Group training for enlisted and officer pipelines. The SMMTT provides operators and combat teams the opportunity to train ashore, prior to, and between deployments. The shore based training provides a means of maintaining team proficiency in stand alone or in combined team mode prior to ship deployment.</p>								

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Exhibit R-2a, RDTEN Project Justification

(Exhibit R-2a, page 21 of 32)

CLASSIFICATION:

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EXHIBIT R-2a, RDT&E Project Justification			DATE: February 2007	
APPROPRIATION/BUDGET ACTIVITY RDT&E, N /BA-5	PROGRAM ELEMENT NUMBER AND NAME 0604558N/VIRGINIA Class Design Development	PROJECT NUMBER AND NAME 3062/Submarine Multi-Mission Team Trainer		
B. Accomplishments/Planned Program				
	FY 06	FY07	FY 08	FY09
Accomplishments/Effort/Subtotal Cost	2.577	6.538	6.428	2.798
RDT&E Articles Quantity				
FY06 Develop implementation of latest Advanced Processor Build (APB), Technical Insertion (TI) and associated training displays. FY07 Develop implementation of latest Advanced Processor Build (APB), Technical Insertion (TI) and associated training displays. Develop stand-alone functionality of SMMTT3 SEAWOLF Sonar and Combat Control FY08 Develop implementation of latest Advanced Processor Build (APB), Technical Insertion (TI) and associated training displays. Develop stand-alone functionality of SMMTT3 SEAWOLF Sonar and Combat Control FY09 Develop implementation of latest Advanced Processor Build (APB), Technical Insertion (TI) and associated training displays.				
	FY 06	FY07	FY08	FY09
Accomplishments/Effort/Subtotal Cost	0.000	0.000	0.000	0.000
RDT&E Articles Quantity				
	FY 06	FY07	FY08	FY09
Accomplishments/Effort/Subtotal Cost	0.000	0.000	0.000	0.000
RDT&E Articles Quantity				

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Exhibit R-2a, RDTEN Project Justification
(Exhibit R-2a, page 22 of 32)

CLASSIFICATION:

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EXHIBIT R-2a, RDT&E Project Justification	DATE: February 2007
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APPROPRIATION/BUDGET ACTIVITY RDT&E, N /BA-5	PROGRAM ELEMENT NUMBER AND NAME 0604558N/VIRGINIA Class Design Development	PROJECT NUMBER AND NAME 3062/Submarine Multi-Mission Team Trainer
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C. OTHER PROGRAM FUNDING SUMMARY:

<u>Line Item No. & Name</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>FY 2012</u>	<u>FY 2013</u>	To <u>Complete</u>	Total <u>Cost</u>
566100, Submarine Training Device Modification	24.8	17.1	25.5	26.9	16.8	26.1	30.3	16.2	0.0	183.7

D. ACQUISITION STRATEGY: *

The SMMTT program phase 3 software development is accounted for in this RDT&E line. All production kits are procured in OPN PE 0804731N BLI 566100.

E. MAJOR PERFORMERS: **

NSWCCD

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CLASSIFICATION:

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Exhibit R-3 Cost Analysis (page 1)										DATE: February 2007		
APPROPRIATION/BUDGET ACTIVITY			PROGRAM ELEMENT				PROJECT NUMBER AND NAME					
RDT&E, N /BA-5			0604558N/VIRGINIA Class Design Development				3062/Submarine Multi-Mission Team Trainer					
Cost Categories	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 07 Cost	FY 07 Award Date	FY 08 Cost	FY 08 Award Date	FY 09 Cost	FY 09 Award Date	Cost to Complete	Total Cost	Target Value of Contract
											0.000	
											0.000	
Component Development	WX	NSWCCD, Bethesda, MD	26.588	6.313	various	6.028	various	2.398	various	28.535	69.862	N/A
Component Development	FR	UT Austin ARL	0.933	0.225	various	0.400	various	0.400	various	1.600	3.558	3.558
											0.000	
											0.000	
											0.000	
											0.000	
											0.000	
											0.000	
											0.000	
Subtotal Product Development			27.521	6.538		6.428		2.798		30.135	73.420	
Remarks:												
											0.000	
											0.000	
											0.000	
											0.000	
											0.000	
											0.000	
											0.000	
Subtotal Support			0.000	0.000		0.000		0.000		0.000	0.000	
Remarks:												

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Exhibit R-3 Cost Analysis (page 2)										DATE: February 2007		
APPROPRIATION/BUDGET ACTIVITY			PROGRAM ELEMENT			PROJECT NUMBER AND NAME						
RDT&E, N /BA-5			0604558N/VIRGINIA Class Design Development			3062/Submarine Multi-Mission Team Trainer						
Cost Categories	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 07 Cost	FY 07 Award Date	FY 08 Cost	FY 08 Award Date	FY 09 Cost	FY 09 Award Date	Cost to Complete	Total Cost	Target Value of Contract
												0.000
												0.000
												0.000
												0.000
												0.000
												0.000
Subtotal T&E			0.000	0.000		0.000		0.000		0.000	0.000	
Remarks:												
												0.000
												0.000
												0.000
												0.000
												0.000
Subtotal Management			0.000	0.000		0.000		0.000		0.000	0.000	
Remarks:												
Total Cost			21.755	6.538		6.428		2.798		30.135	67.654	
Remarks:												

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EXHIBIT R4, Schedule Profile																DATE: February 2007																
APPROPRIATION/BUDGET ACTIVITY PROGRAM ELEMENT NUMBER AND NAME																PROJECT NUMBER AND NAME																
RDT&E, N/BA-5																0604558N/VIRGINIA Class Design Development				3062/Submarine Multi-Mission Team Trainer												
Fiscal Year	2006				2007				2008				2009				2010				2011				2012				2013			
	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
Interface Design Updates			▲				△				△				△				△				△				△				△	
Software Development Updates (SIM/STIM)			▲				△				△				△				△				△				△				△	
Software Builds			▲				△				△				△				△				△				△				△	
EDM Delivery	▲																															
APB Upgrades	▲			▲				△				△				△				△				△				△				△
SSGN 726 Development		▲					△																									
SSGN Build							△																									
H/W Tech Insertion Additions/Updates				▲							△									△								△				
SSN 21 Simulation Plan Development Additions						△				△																						
SSN 21 Prime Item Dev. Spec. (PIDS) Additions						△				△																						
SSN 21 System Requirements Specification (SRS) Additions						△				△																						
SSN-21 Interface Req'ts Specification (IRS) Additions						△				△																						
SSN-21 Interface Design Development						△				△																						
SSN-21 Software Development						△				△					△																	
SSN-21 Software Testing											△				△																	
SSN-21 EDM Delivery																			△													
TI-0x New Sensor Simulation Development																															△	
TI-0x New Sensor Simulation EDM updates																			△	△			△	△			△	△				

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Exhibit R-4a, Schedule Detail						DATE: February 2007		
APPROPRIATION/BUDGET ACTIVITY RDT&E, N/BA-5		PROGRAM ELEMENT 0604558N/VIRGINIA Class Design Development			PROJECT NUMBER AND NAME 3062/Submarine Multi-Mission Team Trainer			
Schedule Profile	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
Interface Design Updates	3Q	3Q	3Q	3Q	3Q	3Q	3Q	3Q
Software Development Updates (SIM/STIM)	4Q	4Q	4Q	4Q	4Q	4Q	4Q	4Q
Software Builds	4Q	4Q	4Q	4Q	4Q	4Q	4Q	4Q
EDM Delivery	1Q							
APB Upgrades	1Q	1Q	1Q	1Q	1Q	1Q	1Q	1Q
SSGN 726 Development	2Q-4Q	1Q-2Q						
SSGN Build		2Q						
H/W Tech Insertion Updates		1Q		1Q		1Q		1Q
SSN 21 Simulation Plan Development Additions		2Q-4Q	1Q					
SSN 21 Prime Item Dev Spec. (PIDS) Additions		3Q-4Q	1Q-2Q					
SSN 21 System Requirements Spec (SRS) Additions		3Q-4Q	1Q-2Q					
SSN 21 Interface Reqt's Spec (IRS) Additions		4Q	1Q-3Q					
SSN 21 Interface Design Development		4Q	1Q-3Q					
SSN 21 Software Development		4Q	1Q-4Q	1Q-2Q				
SSN 21 Software Testing			3Q-4Q	1Q-4Q				
SSN 21 EDM Delivery					1Q			
TI-0x New Sensor Simulation Development					1Q-4Q	1Q-4Q	1Q-4Q	
TI-0x New Sensor Simulation EDM Updates					2Q	2Q	2Q	

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Exhibit R-4a, Schedule Detail
(Exhibit R-4a, page 27 of 32)

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CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification		DATE: February 2007
APPROPRIATION/BUDGET ACTIVITY RDT&E, N / BA-5	PROGRAM ELEMENT NUMBER AND NAME 0604558N/VIRGINIA Class Design Development	PROJECT NUMBER AND NAME Project Unit (PU) No. and Name: Congressional Plus-Ups : VARIOUS

CONGRESSIONAL PLUS-UPS:

	FY 06	FY 07		
Identify Project Number: 1950C				
Title: ShipMATES integrated learning environment	2.298			

Complete development of NTDPs Build #3, CNO's Revolution in Training (Task Force Excel), which brings a component of SEA WARRIOR, the Navy's Shipboard Integrated Learning Environment to sea; integrate and test NTDPs Build #4, (Advanced Shipboard Training Module) and the Personnel module developed under the Submarine Non-tactical Automated Distribution Information System (SNADIS). Train the crews on NTDPs operation and update the configurations of fielded Maintenance, Administration Training, Education, and Support (MATES) Applications within NTDPs based on changes in commercial technologies or fleet requirements.

	FY 06	FY 07		
Identify Project Number: 2887C				
Title: Network centric capability Technology Insertion	2.682			

Research to establish and extend a technology insertion program and promote enhanced commonality with other class submarines. Complete the design, test and evaluation of the Photonics Mast Workstation.

	FY 06	FY 07		
Identify Project Number: 9845N				
Title: Sub command and control systems lower power	1.438			

Research Total Ownership Cost reduction technology insertion opportunities with Submarine Command and Control System electronics. Conduct research in engineering design alternatives and identify specific viable candidates to reduce the production and life cycle cost of the low power advanced technology electronics.

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EXHIBIT R-2a, RDT&E Project Justification		DATE: February 2007
APPROPRIATION/BUDGET ACTIVITY RDT&E, N / BA-5	PROGRAM ELEMENT NUMBER AND NAME 0604558N/VIRGINIA Class Design Development	PROJECT NUMBER AND NAME Project Unit (PU) No. and Name: Congressional Plus-Ups : VARIOUS

CONGRESSIONAL PLUS-UPS:

	FY 06	FY 07		
Identify Project Number: 9846N				
Title: Submarine common electronics replacement	1.628			

Engineering design and development of the upgrades to the display functions on VIRGINIA Class, TRIDENT, SSGN and SSN 688 Class submarines.

	FY 06	FY 07		
Identify Project Number: 9847N				
Title: Submarine COTS Web enabled Service Tool kit	1.915			

The COTS Web Enabled Service Toolkit (CWEST) will enable the submarine combat system to interface with Meteorological Oceanographic (METOC) services using COTS framework and web services. The COTS Framework and web services provide the interfaces for Data Oriented Services (DOS) and User Facing Services (UFS) in accordance with FORCENet and TFW requirements. The METOC services will be provided in support of acoustic environmental needs for all SONAR applications, and will serve as a model for future SONAR off-hull connectivity requirements.

	FY 06	FY 07		
Identify Project Number: 9848N				
Title: Surface Ship open architecture tech insertion	1.628			

Design and implement a standards compliant middle-ware for surface combat systems based on submarine implementation. Develop an integration approach for an existing submarine system working with the open architecture computing environment community. This effort will identify specific technical approaches that could be employed by PEO IWS to address interoperability and commonality opportunities which may be realized through compliance with the Navy open architecture computing environment (OACE). The focus is to evaluate the standards that are proposed in the OACE initiative and develop a plan that permits the large base OA systems developed by the Submarine community to use and interoperate with the OACE approved standard

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EXHIBIT R-2a, RDT&E Project Justification		DATE: February 2007
APPROPRIATION/BUDGET ACTIVITY RDT&E, N / BA-5	PROGRAM ELEMENT NUMBER AND NAME 0604558N/VIRGINIA Class Design Development	PROJECT NUMBER AND NAME Project Unit (PU) No. and Name: Congressional Plus-Ups : VARIOUS

CONGRESSIONAL PLUS-UPS:

	FY 06			
Identify Project Number: 9849N				
Title: VA Class sub tech insertion and cost reduction	4.405			

Research Total Ownership Cost reduction technology insertion opportunities with Virginia Class electronics. Conduct research in engineering design alternatives and identify specific viable candidates to reduce the production and life cycle cost of the active sonar transmit electronics.

	FY 06	FY07		
Identify Project Number: 1947C				
Title: Large Aperture Bow (LAB) Array	1.730	8.966		

The project will include the development of new beam-forming algorithms tailored for the geometry of the sonar transducer installation, develop the related software and complete detailed design for the ship modifications.

	FY 06			
Identify Project Number: 1947C				
Title: Multi-Mission Module (MMM)	14.419			

This project included the following four tasks: Multi-Mission Module (MMM) Platform Development, Flexible Payload Module, Payload Interface Module and Payload Launch and Control. It developed a preliminary design for a notional FY12 Spiral Ship with these payload options that was based on a notional FY09 Affordability Spiral Ship including Technology Insertion and Cost Reduction items. Preliminary design of the FY12 Spiral Ship included a concept to build on the FY09 Affordability Spiral Ship including all Tech Insertion and Cost Reduction items. Preliminary design also included the development of three dimensional electronic mockup level drawings, ship system diagrams, proposed ship specification mods, and integrated design and construction schedule, component R&D plans and budget quality estimates for detailed design and construction, ship displacement and weight summaries."

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EXHIBIT R-2a, RDT&E Project Justification	DATE: February 2007
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APPROPRIATION/BUDGET ACTIVITY RDT&E, N / BA-5	PROGRAM ELEMENT NUMBER AND NAME 0604558N/VIRGINIA Class Design Development	PROJECT NUMBER AND NAME Project Unit (PU) No. and Name: Congressional Plus-Ups : VARIOUS
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CONGRESSIONAL PLUS-UPS:

	FY 06	FY07		
Identify Project Number: 9A44N				
Advanced Submarine Research		5.18		

Funds will be used to evaluate and migrate unique military standard weapons systems, sensors, electronics, and software system components to common COTS based architectures and technologies. Specifically, the funds would be utilized to develop an integrated weapon and countermeasure launch & control system. This small business "Common Open Architecture" technology insertion effort will focus on high risk/high reward components of the submarine combat system weapon's control, launch, sonar, and communications systems. It will identify opportunities for commonality across submarine and surface ship electronic subsystems to provide significant life cycle cost reductions

	FY 06	FY07		
Identify Project Number: 9A45N				
Flex Payload Module & VA Payload Interface Module		6.724		

This project will pursue detail design of a Payload Interface Module (PIM) and a compatible Flexible Payload Module (FPM). The new design consists of a space created in the bow of the submarine by removal of the present vertical launch system design. The FPM will be inserted into the PIM. The initial concept for a FPM is one that hosts the equivalent of the 12 vertical launch tubes so that no VIRGINIA capability is lost. The design will accommodate inclusion of the Large Aperture Bow (LAB) Array in the same bow redesign.

	FY 06	FY07		
Identify Project Number: 9A46N				
Large Scale Demo Item-VA Class Bow Dome		4.981		

This project will qualify an alternative vendor, Seamann Composites, Gulfport, MS, for submarine bow domes promising a significant cost reduction.

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EXHIBIT R-2a, RDT&E Project Justification		DATE: February 2007
APPROPRIATION/BUDGET ACTIVITY RDT&E, N / BA-5	PROGRAM ELEMENT NUMBER AND NAME 0604558N/VIRGINIA Class Design Development	PROJECT NUMBER AND NAME Project Unit (PU) No. and Name: Congressional Plus-Ups : VARIOUS

CONGRESSIONAL PLUS-UPS:

	FY 06	FY07		
Identify Project Number: 9A47N				
Title: Multilevel Secure Wireless Network		1.295		

Develop a Multilevel Secure Wireless Network for deployment on the Virginia Class submarine with a full backfit capability across in service platforms. The use of a wireless network within the submarine will allow personnel and their workstations to be relocated dynamically within the available space in a highly mission-context specific manner. The employment of advanced MLS technology will function in synergy with the wireless network to enable all personnel to run any application appropriate to his/her clearance level regardless of the workstation at which he/she is working. This mobile deployment of personnel within the submarine will greatly increase the flexibility of the submarine platform and it's Concept of Operation.

	FY 06	FY07		
Identify Project Number: 9A48N				
Title: Submarine Low Power Computing Advanced Technology		0.996		

Research Total Ownership Cost reduction technology insertion opportunities with Submarine Command and Control System electronics. Conduct research in engineering design alternatives and identify specific viable candidates to reduce the production and life cycle cost of the low power advanced technology electronics.

	FY 06	FY07		
Identify Project Number: 9A49N				
Title: Submarine Modernization and Technology Insertion		4.284		

Research Total Ownership Cost reduction technology insertion opportunities with Virginia Class electronics. Conduct research in engineering design alternatives and identify specific viable candidates to reduce the production and life cycle cost of the active sonar transmit electronics.