CLASSIFICATION:	UNCLASSIFIED						
EXHIBIT R-2, RDT&E BUDGET ITEM JUSTIFICATION						DATE May 2009	
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 5**			R-1 ITEM NOMENCLATURE **0604558N/NEW DESIGN SSN**				
COST (In Millions)	FY 2008	FY 2009	FY 2010				
Total PE Cost	239.774	189.714	154.756				
1947 / NEW DESIGN SSN HM&E	164.424	123.628	118.030				
1950 / New Design SSN Combat Sys Dev	44.898	40.374	32.307				
3062 / Submarine Multi-Mission Team Trainer	6.231	2.773	4.419				
9999 / CONGRESSIONAL ADDS	24.221	22.939	0.000				

A. MISSION DESCRIPTION:

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.

(U) Project 3062: The Submarine Multi-Mission Team Trainer (SMMTT) funded in this RDT&E line provides 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.

(U) Project 9999: FY08 Congressional Plus-Ups include; Small Business Technology Insertion, Oxygen Generator, Combat Control for Distributed Netted Systems, and Submarine Electronic Chart Updates. FY09 Congressional Plus-Ups include; Small Business Technology Insertion, Submarine Automated Test and Retest (ATRT), ASW Enhancements, and Highly Corrosive Resistant Alloy Joining for Nuclear Components.

CLASSIFICATION:	UNCLASSIFIED	
EXHIBIT R-2, RDT&E BUDGET ITEM JUSTIFICATION (CONTINUATION)		DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 5**		R-1 ITEM NOMENCLATURE **0604558N/NEW DESIGN SSN**

B. PROGRAM CHANGE SUMMARY:

Funding:	FY 2008	FY 2009	FY 2010
FY09 President's Budget	244.135	167.357	157.789
FY10 President's Budget	239.774	189.714	154.756
Total Adjustments	-4.361	22.357	-3.033
(U) Summary of Adjustments			
Congressional Rescissions	0.000	0.000	0.000
Congressional Adjustments	0.000	22.939	0.000
SBIR/STTR/FTT Assessment	-2.554	0.000	0.000
Program Adjustments	-1.799	0.000	-2.483
Rate/Misc Adjustments	-0.008	-0.582	-0.550
Total	-4.361	22.357	-3.033

CLASSIFICATION:	UNCLASSIFIED						
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION					DATE May 2009		
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 5**	PROGRAM ELEMENT NUMBER AND NAME **0604558N/NEW DESIGN SSN**				PROJECT NUMBER AND NAME **1947/NEW DESIGN SSN HM&E**		
COST (In Millions)	FY 2008	FY 2009	FY 2010				
Project Cost	164.424	123.628	118.030				
RDT&E Articles Qty	0	0	0				

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.

CLASSIFICATION:	UNCLASSIFIED	
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION		DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 5**	PROGRAM ELEMENT NUMBER AND NAME **0604558N/NEW DESIGN SSN**	PROJECT NUMBER AND NAME **1947/NEW DESIGN SSN HM&E**

B. ACCOMPLISHMENTS/PLANNED PROGRAM:

	FY 2008	FY 2009	FY 2010
HM&E Development	121.912	103.527	107.505
RDT&E Articles Quantity	0	0	0

HM&E DEVELOPMENT

FY08 Accomplishments: Continued design, manufacturing, qualification testing, and logistics documentation of prototype technologies and components such as impressed current cathodic protection. Continued 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. Continued to support ship design and construction efforts with engineering evaluations and ship integration assessments for emergent ship design and systems development issues. Continued block upgrades of Ship Control Algorithms and software. Completed shock testing and qualification of the torpedo tube system. Completed component shock testing on the Floating Shock Platform and completed qualification certification. Completed shock test vehicle construction and testing for large penetrations shock qualification. Initiated control algorithm improvements for the TG set bearings. Assessed at-sea acoustic data, dockside testing, and develop plan responding to at-sea acoustic measurements. Continued software development for Advanced Electromagnetic Silencing capability. Continued development, demonstration, and design implementation of multiple Block III Cost Reduction technologies including, for example, Large Area Bow Array, payload tubes, vendor supplied reverse osmosis, low cost sound isolation coupling, and reduced cost integrated low pressure electrolyzer and transition of Office of Naval Research Manufacturing Technology Program manufacturing process developments. Continued risk reduction design and testing of CAVES array concept. Acquired large panel data from lake test facility. Efforts previously identified as program administrative are included in the efforts above.

FY09 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. 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 ship control station software upgrades. Continue block upgrades of Ship Control Algorithms and software. Complete shock qualification certification of large penetration components. Complete control algorithm improvements for the TG set bearings. Initiate developments responding to SSN774 OPEVAL and TECHEVAL findings. Continue software development for Advanced Electromagnetic Silencing capability. Continue development, demonstration, and design implementation of multiple Block III Cost Reduction technologies including, for example, Large Area Bow Array, payload tubes, vendor supplied reverse osmosis, low cost sound isolation coupling, and reduced cost integrated low pressure electrolyzer and transition of Office of Naval Research Manufacturing Technology Program manufacturing process developments. Initiate design and model scale evaluation of Flexible Payload Sail Continue risk reduction design and testing of CAVES array concept.

FY10 Plan: Continue block upgrades of Ship Control Algorithms and software. Continue developments responding to SSN774 OPEVAL and TECHEVAL findings. Continue software development for Advanced Electromagnetic Silencing capability. Continue development, demonstration, and design implementation of multiple Block III Cost Reduction

CLASSIFICATION:	UNCLASSIFIED	
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION (CONTINUATION)		DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 5**	PROGRAM ELEMENT NUMBER AND NAME **0604558N/NEW DESIGN SSN**	PROJECT NUMBER AND NAME **1947/NEW DESIGN SSN HM&E**

technologies including, for example, Large Area Bow Array, payload tubes, vendor supplied reverse osmosis, low cost sound isolation coupling, and reduced cost integrated low pressure
electrolyzer and transition of Office of Naval Research Manufacturing Technology Program manufacturing process developments. Develop detailed plan for Block IV Cost Reduction Program. Continue design and model scale evaluation of Flexible Payload Sail. Continue risk reduction design and testing of CAVES array concept.

	FY 2008	FY 2009	FY 2010
Test and Evaluation	42.512	20.101	10.525
RDT&E Articles Quantity	0	0	0

TEST AND EVALUATION

FY08 Accomplishments: Issued Vulnerability Assessment Report (VAR) update and continued LFT&E related analysis in support of the final VAR update. Performed developmental and operational testing including Acoustic Trials, Post NPES Modernization certification testing, supplemental Active Target Strength, platform TECHEVAL and OPEVAL testing, and Dry Deck Shelter TECHEVAL and OPEVAL testing. Continued development of FOT&E requirements and testing plans.

FY09 Plan: Complete LFT&E, TECHEVAL and OPEVAL testing, analysis, and reporting in support of Milestone III decision. Continue analysis of acoustic trials data, development of FOT&E requirements and testing plans, and issue a TEMP revision. Initiate Arctic developmental and operational testing.

FY10 Plan: Complete Arctic developmental and operational testing, analysis and reporting. Perform Dry Deck Shelter (DDS) developmental and operational testing, analysis and reporting. Initiate TI-08 developmental and operational testing. Perform secure search rate operational and developmental testing. Continue development of FOT&E requirements and testing plans for Advanced SEAL Delivery System and Block III efforts.

C. OTHER PROGRAM FUNDING SUMMARY:

Line Item No. and Name	FY 2008	FY 2009	FY 2010
SCN Line 201300 PE: 0204281N	3,174.291	3,573.127	3,924.042
O&M, N BA-2 1B2B PE: 0204283N	42.039	56.717	57.695
OPN BA-8 Line Item 094200	145.365	182.664	103.153

CLASSIFICATION:	UNCLASSIFIED	
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION (CONTINUATION)		DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 5**	PROGRAM ELEMENT NUMBER AND NAME **0604558N/NEW DESIGN SSN**	PROJECT NUMBER AND NAME **1947/NEW DESIGN SSN HM&E**

D. ACQUISITION STRATEGY:

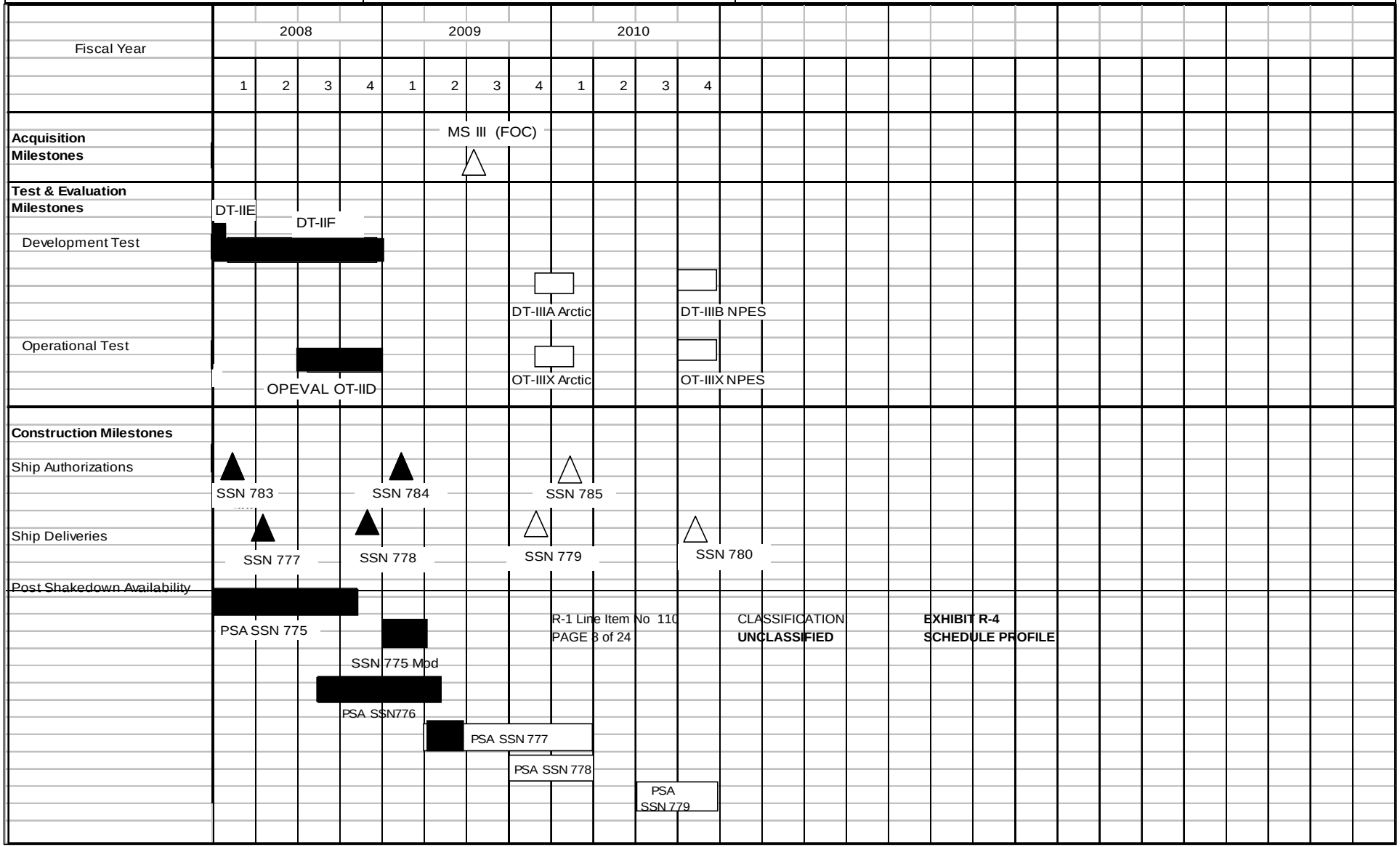
The VIRGINIA Class Submarine Program has implemented Integrated Product and Process Development (IPPD). The traditional distinct phasing of the design process has been replaced with the continuous concurrent engineering IPPD process. The IPPD approach has facilitated a smoother transition from design 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 is managing two multi-year contracts the first is for the FY04-08 ships and the second was awarded in December 2008 for the FY09-13 ships.

E. MAJOR PERFORMERS:

1. Electric Boat Corporation, Groton CT - Virginia Class Lead Shipbuilder
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

CLASSIFICATION:		UNCLASSIFIED								
EXHIBIT R-3, RDT&E PROJECT COST ANALYSIS							DATE May 2009			
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 5**		PROGRAM ELEMENT NUMBER AND NAME **0604558N/NEW DESIGN SSN**			PROJECT NUMBER AND NAME **1947/NEW DESIGN SSN HM&E**					
Cost Categories	Contract Method & Type	Performing Activity & Location	Total PY Cost ($000)	FY 2009 Cost ($000)	FY 2009 Award Date	FY 2010 Cost ($000)	FY 2010 Award Date			
Test and Evaluation	Contract	EB-2103 Groton, CT	0.866	0.000		0.000				
Test and Evaluation	WR	NSWC Carderock MD	84.825	6.283	NOV-08	0.350	NOV-09			
Test and Evaluation	WR	NUWC Newport	90.164	7.601	NOV-08	2.375	NOV-09			
Test and Evaluation	C/CPAF	SEAPORT D7019 Rockville MD	17.708	1.075	NOV-08	0.300	NOV-09			
Test and Evaluation	Contract	Progeny 06C6256	1.908	0.713	NOV-08	0.000				
Test and Evaluation	PD	COMOPTEVFOR	7.988	4.150	NOV-08	4.600	NOV-09			
Test and Evaluation	Various	Miscellaneous	11.655	0.210	NOV-08	2.900	NOV-09			
Test and Evaluation	WR	NSWC Dahlgren, VA	0.175	0.070	NOV-08	0.000				
Subtotal Test and Evaluation			**215.289**	**20.102**		**10.525**				
Remarks:										
Contractor Engineering Support	C/CPAF	SEAPORT D7019 Rockville MD	16.325	2.138	NOV-08	2.083	NOV-09			
Travel			1.919	0.000		0.000				
Subtotal Management			**18.244**	**2.138**		**2.083**				
Remarks:										
Component Development	Contract	EB-2103 Groton, CT	117.088	72.546	NOV-08	85.585	NOV-09			
Component Development	PD	SOS/Groton	35.473	3.992	JAN-09	0.854	JAN-10			
Component Development	WR	NSWC Carderock MD	546.069	12.360	NOV-08	11.619	NOV-09			
Component Development	WR	NUWC Newport RI	94.348	0.754	NOV-08	0.745	NOV-09			
Miscellaneous	Various	Various	39.409	4.336	JAN-09	4.619	JAN-10			
Component Development	Contract	EB 04-C-2100	22.964	0.000		0.000				
Component Development	SS/CPFF	LM - D-4079	1.715	0.000		0.000				
Component Development	SS/CPFF	LM - C-6207	10.785	7.400	DEC-08	2.000	DEC-09			
Subtotal Product Development			**867.851**	**101.388**		**105.422**				
Remarks:										
Total Cost			**1.101.384**	**123.628**		**118.030**				

CLASSIFICATION:	UNCLASSIFIED	
EXHIBIT R-4, SCHEDULE PROFILE		DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 5**	PROGRAM ELEMENT NUMBER AND NAME **0604558N/NEW DESIGN SSN**	PROJECT NUMBER AND NAME **1947/NEW DESIGN SSN HM&E**



CLASSIFICATION:	UNCLASSIFIED						
EXHIBIT R-4a, SCHEDULE DETAIL					DATE May 2009		
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 5**	PROGRAM ELEMENT NUMBER AND NAME **0604558N/NEW DESIGN SSN**			PROJECT NUMBER AND NAME **1947/NEW DESIGN SSN HM&E**			
Schedule Profile	FY 2008	FY 2009	FY 2010				
Post Shakedown Availability (PSA SSN 775)	1Q-2Q						
Developmental Test (DT-IIE)	1Q						
Developmental Test (DT-IIF)	1Q-4Q						
Ship Authorization (SSN 783)	1Q						
Ship Delivery (SSN 777)	2Q						
Operational Evaluation (OT-IID) (OPEVAL)	2Q-4Q						
Post PSA Modernization (SSN 775)	4Q	1Q					
Post Shakedown Availability (PSA SSN 776)	3Q-4Q	1Q-2Q					
Post PSA Modernization (SSN 776)	3Q-4Q	1Q-2Q					
Ship Delivery (SSN 778)	4Q						
Ship Authorization (SSN 784)		1Q					
Post Shakedown Availability (PSA SSN 777)		2Q-4Q	1Q				
Milestone III (MSIII)		3Q					
Full Operational Capability (FOC)		3Q					
Ship Delivery (SSN 779)		4Q					
Post Shakedown Availability (PSA SSN 778)		4Q	1Q				
DT-IIIA (Arctic)		4Q	1Q				
OT-IIIX (Arctic)		4Q	1Q				
Ship Authorization (SSN 785)			1Q				
Post Shakedown Availability (SSN 779)			3Q-4Q				
Ship Delivery (SSN 780)			4Q				
DT-IIIB (NPES)			4Q				
OT-IIIX (NPES)			4Q				

CLASSIFICATION:	UNCLASSIFIED						
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION					DATE May 2009		
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 5**	PROGRAM ELEMENT NUMBER AND NAME **0604558N/NEW DESIGN SSN**				PROJECT NUMBER AND NAME **1950/New Design SSN Combat Sys Dev**		
COST (In Millions)	FY 2008	FY 2009	FY 2010				
Project Cost	44.898	40.374	32.307				
RDT&E Articles Qty	0	0	0				

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 F1950 project mission includes 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.

CLASSIFICATION:	UNCLASSIFIED	
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION		DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 5**	PROGRAM ELEMENT NUMBER AND NAME **0604558N/NEW DESIGN SSN**	PROJECT NUMBER AND NAME **1950/New Design SSN Combat Sys Dev**

B. ACCOMPLISHMENTS/PLANNED PROGRAM:

	FY 2008	FY 2009	FY 2010
C3I Systems Engineering	28.112	28.820	14.730
RDT&E Articles Quantity	0	0	0

ACCOMPLISHMENTS:

1. (U) FY 2008 PLAN ($28.112M): Continued development of high priority ship safety/self-protect deficiencies identified during integration and lead ship sea test efforts. Completed C3I System/subsystems testing as part of VIRGINIA Class TECH/OPEVAL. Began the development of System Level and other subsystem improvements to maintain VIRGINIA Class Commonality to backfit fleet.

2. (U) FY 2009 PLAN ($28.820M): 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.

3. (U) FY 2010 PLAN ($14.730M): Continue the development of System Level and other subsystem Improvements to maintain VIRGINIA Class Commonality to backfit fleet.

	FY 2008	FY 2009	FY 2010
Sonar Combat Control and Architecture Subsystems	16.786	11.554	17.577
RDT&E Articles Quantity	0	0	0

ACCOMPLISHMENTS:

1. (U) FY 2008 PLAN ($16.786M): Continued 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. Continued the development of S/CC/A System Improvements to maintain VIRGINIA Class Commonality to backfit fleet.

2. (U) FY 2009 PLAN ($11.554M): 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.

3. (U) FY 2010 PLAN ($17.577M): Continue the development of S/CC/A System Improvements to maintain VIRGINIA Class Commonality to backfit fleet.

CLASSIFICATION:	UNCLASSIFIED	
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION (CONTINUATION)		DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 5**	PROGRAM ELEMENT NUMBER AND NAME **0604558N/NEW DESIGN SSN**	PROJECT NUMBER AND NAME **1950/New Design SSN Combat Sys Dev**

C. OTHER PROGRAM FUNDING SUMMARY:

Line Item No. and Name	FY 2008	FY 2009	FY 2010
SCN Line 201300 PE: 0204281N	3,174.291	3,573.127	3,924.042
O&M,N BA-2 1B2B PE: 0204283N	42.039	56.717	57.695
OPN BA-8 Line Item 094200	145.365	182.664	103.153

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.

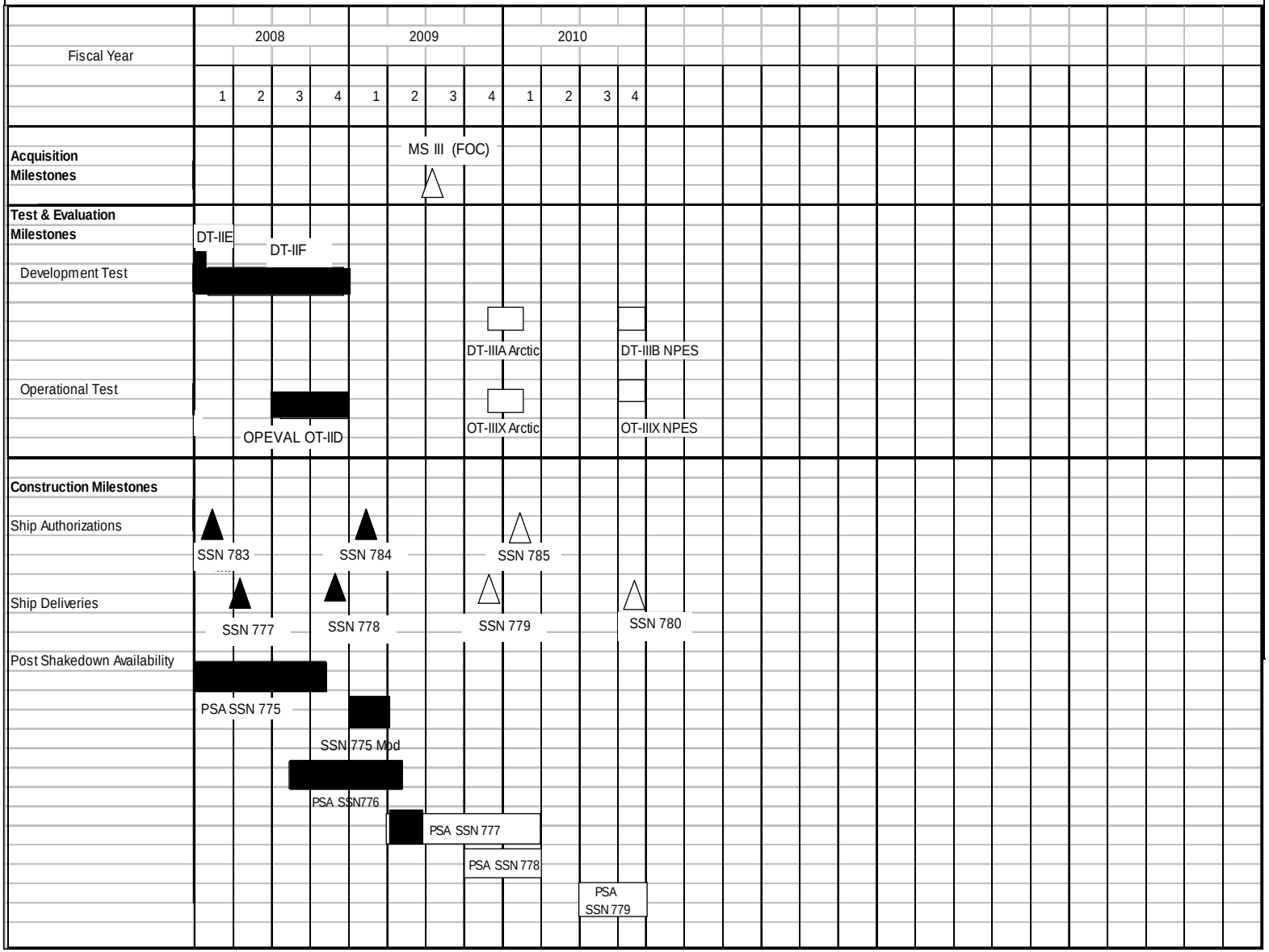
E. MAJOR PERFORMERS:

Lockheed Martin, Manassas, Virginia. C3I Prime Contractor, Development and Limited Production of the S/CC/A Subsystems

Naval Undersea Warfare Center, Newport, Rhode, Island, Technical Direction Agent for all Virginia Class Electronics.

CLASSIFICATION:		UNCLASSIFIED								
EXHIBIT R-3, RDT&E PROJECT COST ANALYSIS							DATE May 2009			
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 5**		PROGRAM ELEMENT NUMBER AND NAME **0604558N/NEW DESIGN SSN**			PROJECT NUMBER AND NAME **1950/New Design SSN Combat Sys Dev**					
Cost Categories	Contract Method & Type	Performing Activity & Location	Total PY Cost ($000)	FY 2009 Cost ($000)	FY 2009 Award Date	FY 2010 Cost ($000)	FY 2010 Award Date			
PTR Corrections	Various	Various/TBD	17.349	12.739	JUL-09	0.000				
Unique Virginia Class Improvements	TBD	Various/TBD	4.737	4.117	NOV-08	10.491	NOV-09			
Advanced Display Sys (AN/UYQ-70)	SS/CPIF	Lockheed St. Paul, MN	29.337	0.749	NOV-08	1.019	NOV-09			
Photonics	C/CPIF	Kollmorgen Northhampton, MA	38.543	1.145	MAY-09	1.300	MAY-10			
Electronic Support Measures	C/FFP	Lockheed Syracuse, NY	38.067	0.000		0.000				
Platform Integration	SS/CPFF	EB Corp Groton, CT	42.276	1.000	NOV-08	1.100	NOV-09			
Technology Refreshment	Various	Various/TBD	18.687	1.668	NOV-08	0.000				
Technical Direction Agent	N/A	NUWC Newport, RI	249.505	8.000	JAN-09	8.000	JAN-10			
Technology Refreshment/Info. Assurance	C/CPFF	Progeny Systems, Manassas, VA	27.986	1.000	NOV-08	1.200	NOV-09			
Systems Engineering	N/A	NSWC Carderock, MD	7.243	0.680	NOV-08	0.720	NOV-09			
Systems Engineering	N/A	SSC Charleston, SC	4.515	0.530	NOV-08	0.500	NOV-09			
Systems Engineering	N/A	NUWC Keyport, WA	9.865	0.188	NOV-08	0.200	NOV-09			
Miscellaneous	Various	Various	111.773	6.358	VAR	5.427	VAR			
Subtotal Product Development			**599.883**	**38.174**		**29.957**				
Remarks:										
Test and Evaluation	Various	Various	6.212	0.000		0.000				
Subtotal Test and Evaluation			**6.212**	**0.000**		**0.000**				
Remarks:										
Contractor Support Services/ETS	C/CPAF	EG&G Rockville, MD	14.721	2.200	DEC-08	2.350	DEC-09			
Subtotal Management Services			**14.721**	**2.200**		**2.350**				
Remarks:										
Total Cost			**620.816**	**40.374**		**32.307**				

CLASSIFICATION:	UNCLASSIFIED	
EXHIBIT R-4, SCHEDULE PROFILE		DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 5**	PROGRAM ELEMENT NUMBER AND NAME **0604558N/NEW DESIGN SSN**	PROJECT NUMBER AND NAME **1950/New Design SSN Combat Sys Dev**



CLASSIFICATION:	UNCLASSIFIED						
EXHIBIT R-4a, SCHEDULE DETAIL					DATE May 2009		
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 5**	PROGRAM ELEMENT NUMBER AND NAME **0604558N/NEW DESIGN SSN**			PROJECT NUMBER AND NAME **1950/New Design SSN Combat Sys Dev**			
Schedule Profile	FY 2008	FY 2009	FY 2010				
Post Shakedown Availability (PSA SSN 775)	1Q-2Q						
Developmental Test (DT-IIE)	1Q						
Developmental Test (DT-IIF)	1Q-4Q						
Ship Authorization (SSN 783)	1Q						
Ship Delivery (SSN 777)	2Q						
Operational Evaluation (OT-IID) OPEVAL	2Q-4Q						
Post PSA Modernization (SSN 775)	4Q	1Q					
Post Shakedown Availability (PSA SSN 776)	3Q-4Q	1Q-2Q					
Post PSA Modernization (SSN 776)	3Q-4Q	1Q-2Q					
Ship Delivery (SSN 778)	4Q						
Ship Authorization (SSN 784)		1Q					
Post Shakedown Availability (PSA SSN 777)		2Q-4Q	1Q				
Milestone III (MSIII)		3Q					
Full Operational Capability (FOC)		3Q					
Ship Delivery (SSN 779)		4Q					
DT-IIIA (Arctic)		4Q	1Q				
OT-IIIX (Arctic)		4Q	1Q				
Ship Authorization (SSN 785)			1Q				
Post Shakedown Availability (SSN 779)			3Q-4Q				
Post Shakedown Availability (PSA SSN 778)			4Q				
Ship Delivery (SSN 780)			4Q				
DT-IIIB (NPES)			4Q				
OT-IIIX (NPES)			4Q				

CLASSIFICATION:	UNCLASSIFIED						
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION					DATE May 2009		
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 5**	PROGRAM ELEMENT NUMBER AND NAME **0604558N/NEW DESIGN SSN**				PROJECT NUMBER AND NAME **3062/Submarine Multi-Mission Team Trainer**		
COST (In Millions)	FY 2008	FY 2009	FY 2010				
Project Cost	6.231	2.773	4.419				
RDT&E Articles Qty	0	0	0	0	0	0	0

A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:

To achieve desired submarine force readiness levels, it is necessary to construct highly sophisticated shore based Combat System Team Trainers capable of training personnel in all aspects of submarine approach, attack and surveillance operations in a controlled, simulated environment.

The Combat Control System (CCS) MK1, CCS MK2, and AN/BYG-1, along with sonar systems AN/BSY-1, AN/BQQ-5, and AN/BQQ-10 are installed on SSN and SSGN Class submarines. These tactical systems are planned for future upgrades with the next hardware and software revisions which will provide enhanced war fighter capabilities. The Tactical Acoustic Rapid COTS (commercial-off-the-shelf) Insertion (ARCI) Phased upgrades are also being installed with future revisions. The Advanced Processing Builds (APB) and Technical Insertion (TI) sensors, which feed technology insertion into the CCS/Acoustic development, directly impact the trainers.

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.

CLASSIFICATION:	UNCLASSIFIED		
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION			DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 5**	PROGRAM ELEMENT NUMBER AND NAME **0604558N/NEW DESIGN SSN**	PROJECT NUMBER AND NAME **3062/Submarine Multi-Mission Team Trainer**	

B. ACCOMPLISHMENTS/PLANNED PROGRAM:

	FY 2008	FY 2009	FY 2010
Accomplishments/Effort/Subtotal Cost	6.231	2.773	4.419
RDT&E Articles Quantity	0	0	0

FY08 Develops implementation of latest Advanced Processor Build (APB), Technical Insertion (TI) and associated training displays. Develop standalone functionality of SMMTT SEAWOLF (SSN 21) Sonar and Combat Control.

FY09 Develops implementation of latest Advanced Processor Build (APB), Technical Insertion (TI) and associated training displays.

FY10 Develops implementation of latest Advanced Processor Build (APB), Technical Insertion (TI) and associated training displays. This effort also includes new sensor developments and simulation to match advancements in tactical systems supported by SMMTT.

C. OTHER PROGRAM FUNDING SUMMARY:

Line Item No. and Name	FY 2008	FY 2009	FY 2010
566100, TD009 Submarine Training Device Mods	25.541	27.413	17.313

D. ACQUISITION STRATEGY:

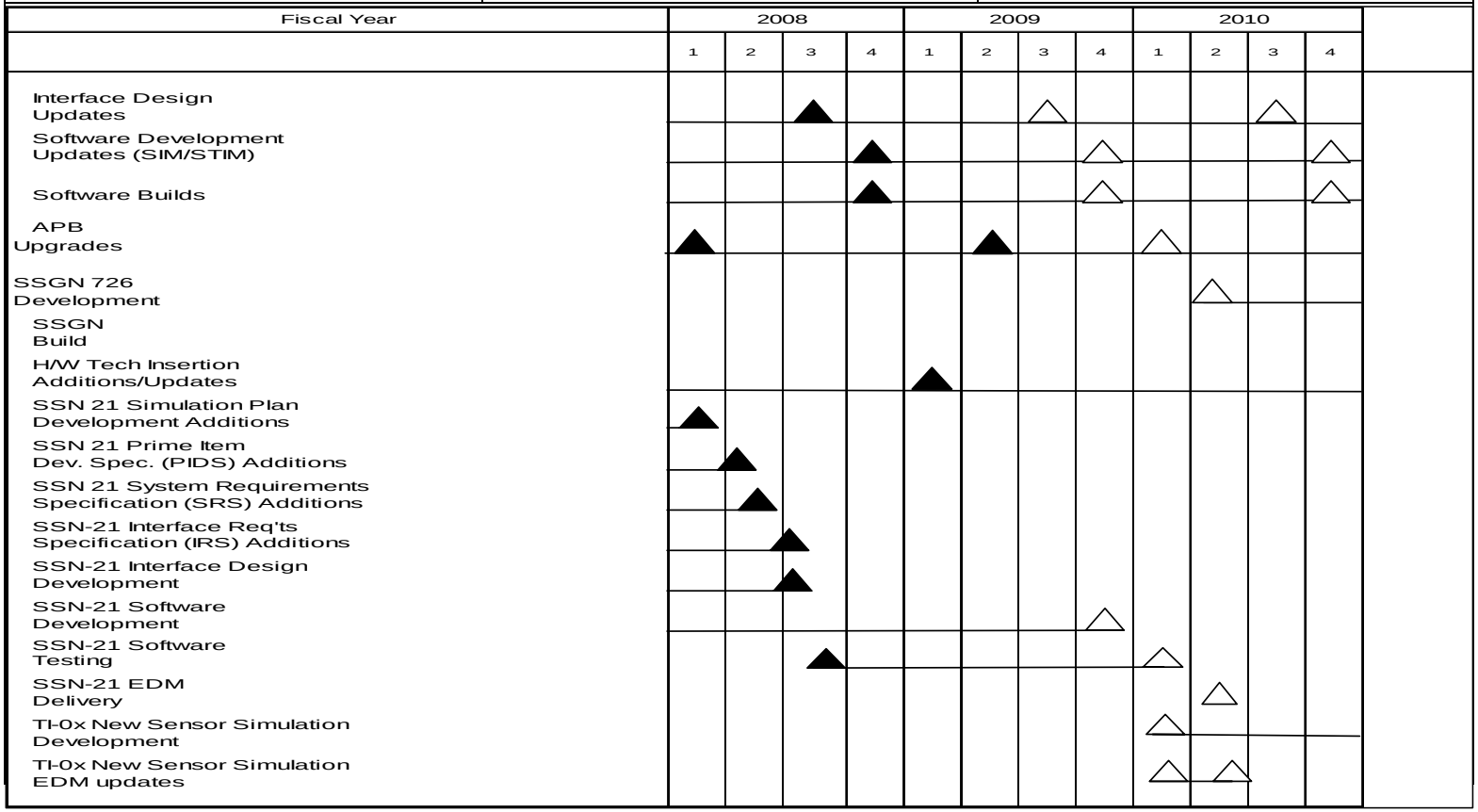
The SMMTT program software development is accounted for in this RDT&E line. All production kits are procured in OPN PE 0804731N BLI 566100, cost code TD009.

E. MAJOR PERFORMERS:

NSWC/CD Bethesda, MD

CLASSIFICATION:		UNCLASSIFIED								
EXHIBIT R-3, RDT&E PROJECT COST ANALYSIS							DATE May 2009			
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 5**		PROGRAM ELEMENT NUMBER AND NAME **0604558N/NEW DESIGN SSN**			PROJECT NUMBER AND NAME **3062/Submarine Multi-Mission Team Trainer**					
Cost Categories	Contract Method & Type	Performing Activity & Location	Total PY Cost ($000)	FY 2009 Cost ($000)	FY 2009 Award Date	FY 2010 Cost ($000)	FY 2010 Award Date			
Component Development	REQN	NSWC/CD, Bethesda, MD	13.623	2.373	DEC-08	4.019	DEC-09			
Component Development	C\CPFF	UT Austin ARL	1.555	0.400	JAN-09	0.400	JAN-10			
Subtotal Product Development			**15.178**	**2.773**		**4.419**				
Remarks:										
Total Cost			**15.178**	**2.773**		**4.419**				

CLASSIFICATION:	UNCLASSIFIED	
EXHIBIT R-4, SCHEDULE PROFILE		DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 5**	PROGRAM ELEMENT NUMBER AND NAME **0604558N/NEW DESIGN SSN**	PROJECT NUMBER AND NAME **3062/Submarine Multi-Mission Team Trainer**



CLASSIFICATION:	UNCLASSIFIED						
EXHIBIT R-4a, SCHEDULE DETAIL					DATE May 2009		
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 5**	PROGRAM ELEMENT NUMBER AND NAME **0604558N/NEW DESIGN SSN**			PROJECT NUMBER AND NAME **3062/Submarine Multi-Mission Team Trainer**			
Schedule Profile	FY 2008	FY 2009	FY 2010				
Interface Design Updates	3Q	3Q	3Q				
Software Development Updates (SIM/STIM)	4Q	4Q	4Q				
Software Builds	4Q	4Q	4Q				
Advanced Processing Build (APB) Upgrades	1Q	2Q	1Q				
SSGN 726 Development			2Q				
Hard Ware Tech Insertion Updates		1Q					
SSN 21 Simulation Plan Development Additions	1Q						
SSN 21 Prime Item Dev Spec. (PIDS) Additions	1Q-2Q						
SSN 21 System Requirements Spec (SRS) Additions	1Q-2Q						
SSN 21 Interface Reqt's Spec (IRS) Additions	1Q-3Q						
SSN 21 Interface Design Development	1Q-3Q						
SSN 21 Software Development	1Q-4Q	1Q-4Q					
SSN 21 Software Testing	3Q-4Q	1Q-4Q	1Q				
SSN 21 EDM Delivery			2Q				
TI-0x New Sensor Simulation Development			1Q-4Q				
TI-0x New Sensor Simulation EDM Updates			1Q-2Q				

CLASSIFICATION:	UNCLASSIFIED	
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION		DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 5**	PROGRAM ELEMENT NUMBER AND NAME **0604558N/NEW DESIGN SSN**	PROJECT NUMBER AND NAME **9999/CONGRESSIONAL ADDS**

B. ACCOMPLISHMENTS/PLANNED PROGRAM:

	FY 2008	FY 2009	FY 2010
Accomplishments/Effort/Subtotal 9C19A	2.603	0.000	0.000
RDT&E Articles Quantity	0	0	0

9C19A Submarine Electronic Chart Updates

Research, design and develop updates to the common Navy solution for the Submarine digital nautical charts. These updates will enhance the current Voyage Management System/Enhanced Control Display Unit capabilities on the VIRGINIA Class and backfit submarines. Establish an interim chart update repository ashore to support the Navy until formal transition to NGA production. Develop and evaluate potential bandwidth reduction options for vector data products, and establish related certification requirements and procedures. Demonstrate navigation task reduction through automated chart updates by data consumers, such as certified ECDIS-N systems. Complete operational testing of developed services and web clients for release to the Fleet.

	FY 2008	FY 2009	FY 2010
Accomplishments/Effort/Subtotal Cost 9C16A	1.563	0.000	0.000
RDT&E Articles Quantity	0	0	0

9C16A Combat Control for Distributed Netted Systems

Conduct research, design, develop and prototype an advanced submarine war fighter command and control supporting Distributed Netted System directed toward implementation in the 3rd flight or later of the VIRGINIA Class submarine program with applicability across the submarine fleet. Specific problems to be addressed in the FY08 time-frame include net-centric warfighter control and information assurance of planned and conceptual payload systems for the VIRGINIA Class payload tubes. The methodology for this development includes a detailed requirements analysis, a detailed design phase and followed by a spiral development approach which evolves the Concept of Operations (CONOPS) and technological development in parallel.

	FY 2008	FY 2009	FY 2010
Accomplishments/Effort/Subtotal Cost 9C17A	0.775	0.000	0.000
RDT&E Articles Quantity	0	0	0

9C17A Oxygen Generator

Develop and extend existing commercial efficiencies in electrolyzer design to result in a improved Low Pressure Electrolyzer (LPE) electrolysis cell that 50% cheaper than current, resulting in a potential savings of $150M over 15 years. Existing patented low-cost cell-stack construction technology will be rugged-ized for submarine use. The improved LPE electrolysis cell has potential application in the VIRGINIA Class Integrated Low Pressure Electrolyzer (ILPE) as well the LPE being implemented in OHIO and SEAWOLF Class submarines.

CLASSIFICATION:	UNCLASSIFIED		
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION (CONTINUATION)			DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 5**	PROGRAM ELEMENT NUMBER AND NAME **0604558N/NEW DESIGN SSN**	PROJECT NUMBER AND NAME **9999/CONGRESSIONAL ADDS**	

Accomplishments/Effort/Subtotal Cost 9C18A	19.280	15.957	0.000
RDT&E Articles Quantity	0	0	0

9C18A Small Business Technology Insertion

Research and development efforts for fresh, creative, and innovative solutions to the Navy's requirements for high risk/high reward components of submarine combat system development. Various combat system component technology insertions/upgrades (torpedo, photonics, navigation data distribution, etc.) to reduce the cost of ship acquisition.

Accomplishments/Effort/Subtotal Cost 9A46A	FY 2008	FY 2009	FY 2010
RDT&E Articles Quantity	0.000	1.795	0.000
9A46A Large Scale Demonstration Item For Virginia Class	0	0	0

Complete efforts associated with manufacturing a composite bow dome with the objective of establishing an alternate source for submarine bow domes.

	FY 2008	FY 2009	FY 2010
Highly Corrosive-Resistant Alloy Joining for Nuclear Applications 9D82A	0.000	0.798	0.000
RDT&E Articles Quantity	0	0	0
9D82A Highly Corrosive-Resistant Alloy Joining for Nuclear Applications			

Highly Corrosive-Resist Alloy Joining for Nuclear Applications Assist the Naval Nuclear Propulsion Program Laboratory in developing a system for packaging and sealing nuclear material in highly corrosion-resistant alloy cans for disposal.

	FY 2008	FY 2009	FY 2010
Submarine Automated Test and Re-Test (ATRT) 9D83A	0.000	1.995	0.000
RDT&E Articles Quantity	0	0	0
9D83A Submarine Automated Test and Re-Test (ATRT)			

Submarine Automated Test and Re-Test (ATRT) Develop an application to use Automated Test and Re-Test (ATRT) technology in testing of submarine systems.

	FY 2008	FY 2009	FY 2010
VIRGINIA Class Design Development 9D84A	0.000	2.394	0.000
RDT&E Articles Quantity	0	0	0
9D84A VIRGINIA Class Design Development			

Conduct analyses to support high priority performance issues with the outboard sonar sensors needed for ship safety/self protect. Consider engineering required for the migration of the Acoustic-Rapid COTS Insertion (ARCI) inboard processing to align with the (backfit) TI-10 baseline.