CLASSIFICATION:	UNCLASSIFIED						
EXHIBIT R-2, RDT&E BUDGET ITEM JUSTIFICATION						DATE February 2008	
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**			R-1 ITEM NOMENCLATURE **0603561N/ADVANCED SUBMARINE SYSTEM DEVELOPMENT**				
COST (In Millions)	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
Total PE Cost	140.870	149.576	141.720	152.854	132.910	109.151	114.775
0223 / Sub Combat System Improvement (ADV)	54.689	51.988	47.135	52.649	53.037	52.563	53.618
2033 / Adv Submarine System Development	73.383	79.901	57.652	62.435	57.449	56.588	61.157
3197 / Undersea Superiority	0.000	0.000	36.933	37.770	22.424	0.000	0.000
9999 / Congressional Add	12.798	17.687	0.000	0.000	0.000	0.000	0.000

A. MISSION DESCRIPTION:

This program element supports innovative research and development in submarine hull and combat systems technologies and the subsequent evaluation, demonstration, and validation for submarine platforms. It will increase the submarine technology base and provide subsystem design options not currently feasible. The program element also supports programs transitioning from Science and Technology (S&T), Defense Advanced Research Projects Agency (DARPA), Industry Research and Development, and Small Business Innovative Research (SBIR) projects.

Project Unit 2033:

The Advanced Submarine Research and Development (R&D) Program is a non-acquisition program that develops, matures, and transitions Hull, Mechanical, and Electrical (HM&E) technologies from S&T to operational platforms, develops submarine design and naval architecture products destined for backfit, forward fit, and/or future submarines, and operates unique R&D experimentation, modeling, and simulation facilities to enhance submarine stealth, maneuverability, and affordability. The program is structured to support near term technology insertion to achieve VIRGINIA Class cost reductions and influence future submarine concepts and core technologies. In support of Sea Power 21, Sea Trial experimentation supports the naval enterprises in identifying and prototyping capabilities and technologies that support the warfighter. Focus is on the Undersea Enterprise (USE), the Naval Network/FORCENET (NNFE), Naval Expeditionary Combat Enterprise (NECE), Surface Warfare Enterprise (SWE), and Special Operations Force Enterprise (SOFE). In addition to enterprise support, experimentation will identify technologies that support the Global War on Terror (GWOT). Experimentation and demonstration is conducted in a joint warfighting context with other services, (i.e. the U.S. Marines, U.S. Army, and the U.S. Air Force), to enable early assessment of warfighting capabilities, and to contribute to better technology selection decisions for potential spiral development. This program also supports Information Exchange Programs with the United Kingdom, Canada, Germany and Australia.

Project Unit 0223:

The Advanced Submarine Combat Systems Development non-acquisition (NON-ACAT) program supports Navy Submarine Acoustic Superiority and Technology Insertion Initiatives through the application of advanced development and testing of sonar and tactical control systems improvements. This Project transitions technologies developed by Navy Technology

bases, the private sector, Office of Naval Research (ONR), Future Naval Capabilities, and DARPA. The Project addresses technology challenges to improve tactical control in littoral and open ocean environments for a variety of operational missions including peacetime engagement, surveillance, battle space preparation, deterrence, regional sea denial, precision strike, task group support, and ground warfare support. Prototype hardware / software systems are developed to demonstrate technologically promising system concepts in laboratory and at-sea submarine environments. Specifically, the focus of the technology efforts will be Advanced Processing Build-Acoustic (APB-A), Advanced Processing Build-Tactical (APB-T), tactical control, and Advanced Sonar Arrays. APBs develop and demonstrate improvements to current and future sonar/combat control systems. The Advanced Sonar Arrays program develops and tests new sensors and demonstrates large array configuration. This Project is funded under demonstration and validation, as it develops and integrates hardware for experimental test related to specific platform applications.

Project Unit 3197:

The Undersea Superiority Project supports offboard Anti-Submarine Warfare (ASW) technologies selected by the Chief of Naval Operations (CNO) ASW Cross Functional Team for technologies that hold the potential for deployment and/or use by submarine platforms.

B. PROGRAM CHANGE SUMMARY:

Funding:	FY 2007	FY 2008	FY 2009
FY08 President's Budget Controls	156.875	134.882	143.050
FY09 President's Budget Controls	140.870	149.576	141.720
Total Adjustments	-16.005	14.694	-1.330
Execution Realignments	-9.343	-1.220	0.000
Cancelled Accounts	-0.176	-0.798	0.000
Section 8104: Revised Economic Assumption	0.000	-0.641	0.000
Section 8106	0.010	0.000	0.000
SBIR	-3.846	0.000	0.000
Section 8025: FFRDC Reduction	0.000	-0.118	0.000
Section 8097: Contractor Efficiencies	0.000	-0.216	0.000
Congressional Adds/Project Unit Moves	-2.650	17.687	0.000
Tactical Contr	0.000	0.000	2.000
Transfer for Geo-Acoustic Sensing to N84 PE 0603207N	0.000	0.000	-4.500
Navy Working Capital Fund	0.000	0.000	-0.130
VRLA Battery Program Re-alignment	0.000	0.000	1.300
Subtotal	-16.005	14.694	-1.330

CLASSIFICATION:	UNCLASSIFIED						
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION					DATE February 2008		
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603561N/ADVANCED SUBMARINE SYSTEM DEVELOPMENT**				PROJECT NUMBER AND NAME **0223/Sub Combat System Improvement (ADV)**		
COST (In Millions)	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
Project Cost	54.689	51.988	47.135	52.649	53.037	52.563	53.618
RDT&E Articles Qty	0	0	0	0	0	0	0

A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:

Project Unit 0223: The Advanced Submarine Combat Systems Development non-acquisition (Non-ACAT) program supports Navy Submarine Acoustic Superiority and Technology Insertion Initiatives by the application of advanced development and testing of sonar and tactical control systems improvements. This Project transitions technologies developed by Navy technology bases, the private sector, Office of Naval Research (ONR), Future Naval Capabilities, and DARPA. The Project addresses technology challenges to improve tactical control in littoral and open ocean environments for a variety of operational missions including peacetime engagement, surveillance, battle space preparation, deterrence, regional sea denial, precision strike, task group support, and ground warfare support. Prototype hardware / software systems are developed to demonstrate technologically promising system concepts in laboratory and at-sea submarine environments. Specifically, the focus of the technology efforts will be Advanced Processing Build-Acoustic (APB-A), Advanced Processing Build-Tactical (APB-T), tactical control, and Advanced Sonar Arrays. APBs develop and demonstrate improvements to current and future sonar/combat control systems. The Advanced Sonar Arrays program develops and tests new sensors and demonstrates large array configuration. This Project is funded under demonstration and validation, as it develops and integrates hardware for experimental test related to specific platform applications.

CLASSIFICATION:	UNCLASSIFIED	
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION		DATE February 2008
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603561N/ADVANCED SUBMARINE SYSTEM DEVELOPMENT**	PROJECT NUMBER AND NAME **0223/Sub Combat System Improvement (ADV)**

B. ACCOMPLISHMENTS/PLANNED PROGRAM:

	FY 2007	FY 2008	FY 2009
Advanced Sonar System Processing	32.281	24.624	27.795
RDT&E Articles Quantity	0	0	0

APB(A)-06 transitioned to PMS401 for fleet introduction. FY07 APB(A) continued improvements in sonar detection and classification via improved algorithms and automation for towed and hull mounted passive arrays, and initiated improvements to medium and high frequency active systems. These enhancements will continue to be refined over the near term in concert with a special focus on automated vulnerability detectors, improved tracking and localization and enhanced target acoustic state estimation. Efforts for FY08 and FY09 will focus on automating systems operations, in support of reduced workload and manning, while continuing efforts on improving the acoustic contribution to ASW in the littorals. Primary improvements are planned for the Wide Aperture Array (WAA), Low Cost Conformal Array (LCCA), and 688 Class sphere array signal processing, contact followers, trackers, refined automation, ranging tools, search space reduction tools, environmental prediction, and monitoring and active systems. Signal processing for a new fat-line towed array will be developed. Recently implemented Signal processing for the TB-29 Towed Array will continue to be refined to ensure improved performance in shallow water and through maneuvers.

	FY 2007	FY 2008	FY 2009
Advanced Tactical Control	8.000	13.864	11.000
RDT&E Articles Quantity	0	0	0

APB(T)-06 transitioned to PMS425 for fleet introduction. FY07 APB(T) focused on enhancing functionality through continued improvements in Command Information Management, acoustic and non-acoustic contact association, and the initial steps required to automate combat systems operations, in support of work load and manning reductions. FY08 and FY09 work will continue on improving the tactical commander's ability to manage close in and high density scenarios through advanced target motion analysis, contact management, tactical scene rendering, uncertainty management, and close encounter decision management.

	FY 2007	FY 2008	FY 2009
Advanced Sensors	14.408	13.500	8.340
RDT&E Articles Quantity	0	0	0

The Advanced Sensor Systems program is developing improved, larger aperture sonars and digital acoustic communications systems in order to achieve acoustic superiority. Current projects include: Low Cost Conformal Array (LCCA), a modular High Frequency (HF) contact management sonar that could be mounted on submarine sails;

Large Vertical Array (LVA), a CAVES-based Medium Frequency (MF) ASW sonar that may be either stand alone or combined with two other LVAs to form a Large Wide Aperture Array (LgWAA) for VIRGINIA Class forward-fit; Fiber-Optic CAVES (FOCAVES) sensors and processing; Advanced Towed Array Technology (ATAT - provides Twin Line Towed Array (TLTA) Capability); and ACOMMs, a digital Acoustic Communications system for submarines and surface ships. In FY07, continued development of ATAT; coordinated with PMS401 on the development of the LCCA Engineering Development Model (EDM); began fabrication of the LVA Advanced Development Model (ADM); built and tested a partial LVA mockup; tested a FOCAVES array component; continued development of the Rapid COTS Insertion Next Generation (RCINextGen); and began MF ACOMMS surface ship development. In FY08, continue development of ATAT and initiate TLTL array and handler Component Integration Tests (CITs); install LVA ADM; complete surface ship MF ACOMMS development; continue

coordination with PMS401 developing the LCCA EDM; complete development of RCI NextGen; and build ADM electronics for the LCCA ADM ship. In FY09, test LVA; test RCI NextGen; begin transition of CAVES to PMS450; complete ACOMMS encryption and Information Assurance (IA) development; complete TLTL array CITs and start lake testing of TLTL array prototypes.

C. OTHER PROGRAM FUNDING SUMMARY:
Not applicable.

D. ACQUISITION STRATEGY:
Use competitively awarded contracts from Broad Agency Announcement (BAA) solicitations.

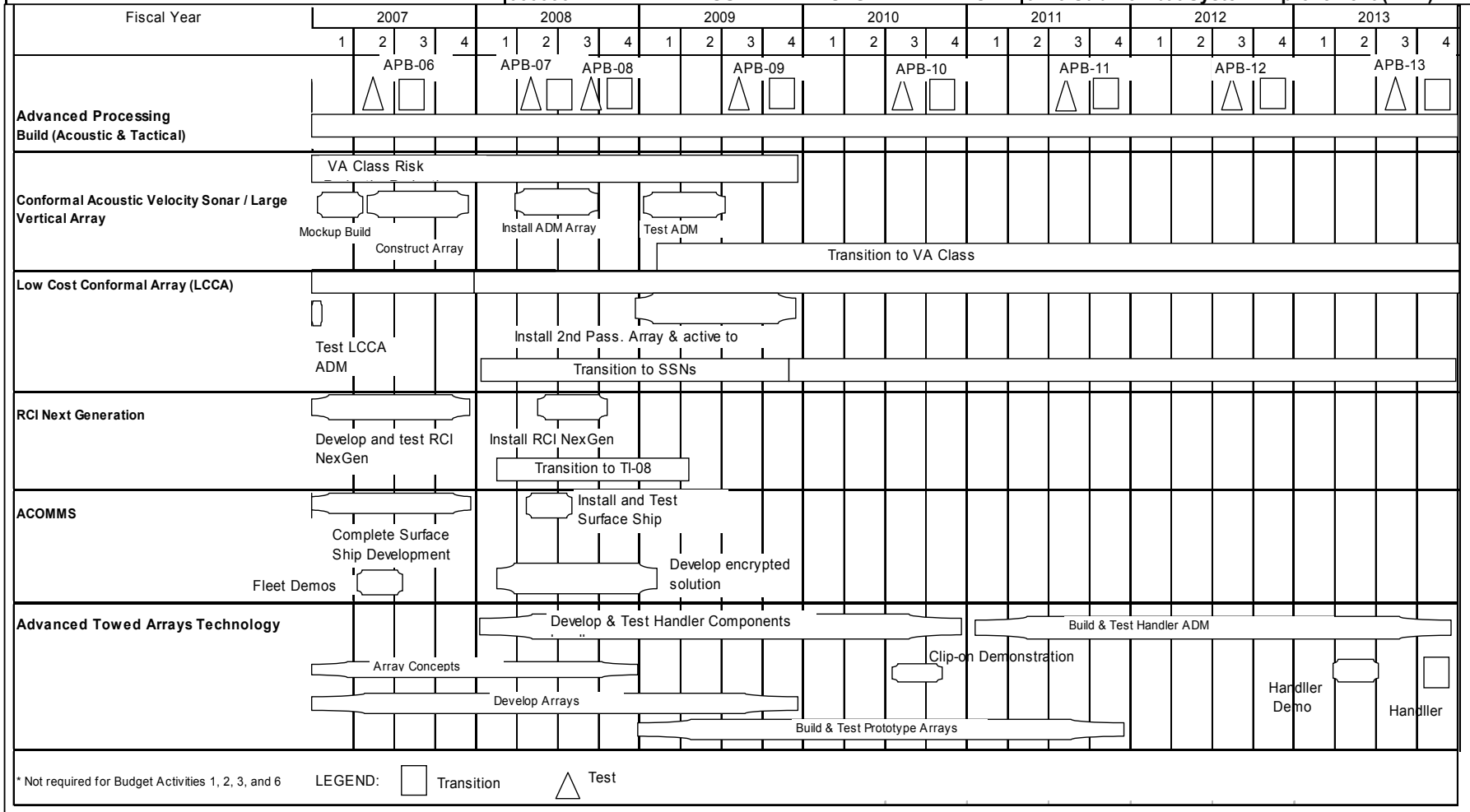
E. MAJOR PERFORMERS:
- Naval Undersea Warfare Center (NUWC), Newport, RI
- Naval Research Laboratory (NRL), Washington, DC.
- Naval Surface Warfare Center (NSWC), Carderock, MD.
- John Hopkins University/Applied Physics Lab (JHU/APL), Laurel, MD
- University of Texas/Applied Research Laboratory (UT/ARL), Austin, TX
- MITRE Corporation, McLean, VA
- Lincoln Laboratories, Cambridge, MA
- General Dynamic/Advanced Information Systems, Fairfax, VA
- Lockheed Martin, Manassas, VA
- Raytheon, Portsmouth, RI

Note: All performers support APB(A) and APB(T).

CLASSIFICATION:	UNCLASSIFIED											
EXHIBIT R-3, RDT&E PROJECT COST ANALYSIS									DATE February 2008			
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**		PROGRAM ELEMENT NUMBER AND NAME **0603561N/ADVANCED SUBMARINE SYSTEM DEVELOPMENT**					PROJECT NUMBER AND NAME **0223/Sub Combat System Improvement (ADV)**					
Cost Categories	Contract Method & Type	Performing Activity & Location	Total PY Cost ($000)	FY 2007 Cost ($000)	FY 2007 Award Date	FY 2008 Cost ($000)	FY 2008 Award Date	FY 2009 Cost ($000)	FY 2009 Award Date	Cost to Complete ($000)	Total Cost ($000)	Target Value of Contract
Product Development	WR	NUWC/Newport, RI	14.218	13.971	OCT-06	10.380	DEC-07	10.529	OCT-08	CONT	CONT	0.000
Product Development	WR	NRL, DC	0.356	0.090	OCT-06	0.000		0.000		0.000	0.446	0.000
Product Development	C/CPFF	Adaptive Methods, VA	0.000	0.200	DEC-06	0.200	JAN-08	0.200	DEC-08	CONT	CONT	0.000
Product Development	C/CPFF	AAC, NY	0.000	0.000		0.375	JAN-08	0.000		0.000	0.375	0.000
Product Development	C/CPFF	GA Tech Research Institute, GA	0.250	0.940	DEC-06	0.930	JAN-08	0.150	DEC-08	CONT	CONT	0.000
Product Development	C/CPFF	Multisensor Science, VA	0.000	0.000		0.150	JAN-08	0.150	DEC-08	CONT	CONT	0.000
Product Development	MIPR	U.S. Army Research Lab, MD	0.000	0.350	DEC-06	0.300	JAN-08	0.300	DEC-08	CONT	CONT	0.000
Product Development	C/CPFF	Chesapeake Science, MD	0.000	0.000		0.300	JAN-08	0.700	DEC-08	CONT	CONT	0.000
Product Development	C/CPFF	Lockheed Martin, NY	0.000	1.000	DEC-06	2.000	JAN-08	2.000	JAN-09	CONT	CONT	0.000
Product Development	WR	NSWC/Carderock, MD	2.705	4.620	OCT-06	6.336	JAN-08	5.024	OCT-08	CONT	CONT	0.000
Product Development	WR	NSWC/Dahlgren, VA	0.360	0.080	OCT-06	0.050	JAN-08	0.050	OCT-08	CONT	CONT	0.000
Product Development	WR	ONI, DC	0.045	0.000	DEC-06	0.000	JAN-08	0.000	DEC-08	CONT	CONT	0.000
Product Development	C/CPFF	NSMA, VA	2.020	2.400	OCT-06	1.000	JAN-08	1.000	NOV-08	CONT	CONT	0.000
Product Development	WR	ONR, VA	0.250	0.705	DEC-06	0.970	JAN-08	0.730	DEC-08	CONT	CONT	0.000
Product Development	WR	SSC/San Diego, CA	0.140	0.600	OCT-06	0.600	JAN-08	0.050	OCT-08	CONT	CONT	0.000
Product Development	WR	COMSUBLANT, VA	0.100	0.120	OCT-06	0.120	JAN-08	0.100	OCT-08	CONT	CONT	0.000
Product Development	WR	COMSUBPAC, HI	0.100	0.130	OCT-06	0.130	JAN-08	0.100	OCT-08	CONT	CONT	0.000
Product Development	MIPR	U.S. Army/MITRE, NJ	1.800	1.000	DEC-06	0.000		0.000		0.000	2.800	0.000
Product Development	MIPR	U.S. AFB/MIT Lincoln Labs, MA	1.744	1.750	DEC-06	1.890	NOV-07	1.890	DEC-08	CONT	CONT	0.000
Product Development	C/CPFF	PSU/ARL, PA	0.150	0.240	JAN-07	0.000		0.000		0.000	0.390	0.000
Product Development	C/CPFF	PSU/ARL, PA	0.350	0.350	DEC-06	0.400	JAN-08	0.200	DEC-08	CONT	CONT	0.000
Product Development	C/CPFF	UT/ARL, TX	4.601	4.280	DEC-06	4.550	JAN-08	4.550	DEC-08	CONT	CONT	0.000
Product Development	C/CPFF	JHU/APL, MD	12.006	10.787	DEC-06	6.110	JAN-08	6.660	DEC-08	CONT	CONT	0.000
Product Development	C/CPFF	Lockheed Martin, VA	5.056	3.100	DEC-06	7.420	JAN-08	5.000	DEC-08	CONT	CONT	0.000
Product Development	C/CPFF	Progeny, VA	0.237	0.220	DEC-06	1.500	JAN-08	0.200	DEC-08	CONT	CONT	0.000
Product Development	C/CPFF	METRON, VA	1.508	0.750	DEC-06	0.600	JAN-08	0.600	DEC-08	CONT	CONT	0.000
Product Development	C/CPFF	Alion Sciences, VA	0.000	1.617	DEC-06	1.317	JAN-08	1.417	DEC-08	CONT	CONT	0.000
Product Development	C/CPFF	SEDNA, VA	0.000	1.664	DEC-06	0.500	JAN-08	0.500	DEC-08	CONT	CONT	0.000
Product Development	C/CPFF	DSR/GD, VA	8.151	1.000	DEC-06	2.250	JAN-08	2.500	DEC-08	CONT	CONT	0.000

CLASSIFICATION:	UNCLASSIFIED											
EXHIBIT R-3, RDT&E PROJECT COST ANALYSIS									DATE February 2008			
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**		PROGRAM ELEMENT NUMBER AND NAME **0603561N/ADVANCED SUBMARINE SYSTEM DEVELOPMENT**					PROJECT NUMBER AND NAME **0223/Sub Combat System Improvement (ADV)**					
Cost Categories	Contract Method & Type	Performing Activity & Location	Total PY Cost ($000)	FY 2007 Cost ($000)	FY 2007 Award Date	FY 2008 Cost ($000)	FY 2008 Award Date	FY 2009 Cost ($000)	FY 2009 Award Date	Cost to Complete ($000)	Total Cost ($000)	Target Value of Contract
Product Development	C/CPFF	Northrop Grumman, VA	0.400	0.000		0.000		0.000		0.000	0.400	0.000
Product Development	WR	SPAWAR, CA	0.400	0.000		0.000		0.000		0.000	0.400	0.000
Product Development	MIPR	U.S. Army Research Lab, MD	0.000	0.350	DEC-06	0.000		0.000		0.000	0.350	0.000
Product Development	C/CPFF	SAIC, VA	0.000	0.300	DEC-06	0.200	JAN-08	1.000	DEC-08	CONT	CONT	0.000
Subtotal Product Development			**56.947**	**52.614**		**50.578**		**45.600**		**CONT**	**CONT**	**0.000**
Remarks:												
Program Management Support	C/CPFF	Stanley and Associates, VA	1.000	0.000	DEC-06	0.000		0.000		0.000	1.000	0.000
Program Management Support	C/CPAF	BAE Systems, MD	1.000	2.000	DEC-06	1.335	JAN-08	1.460	DEC-08	CONT	CONT	0.000
Program Management Support	C/CPFF	EG&G, VA	0.950	0.000	DEC-06	0.000		0.000		0.000	0.950	0.000
Travel	WR	NAVSEA PEO IWS 5, DC	0.075	0.075		0.075	OCT-07	0.075	OCT-08	CONT	CONT	0.000
Subtotal Management Services			**3.025**	**2.075**		**1.410**		**1.535**		**CONT**	**CONT**	**0.000**
Remarks:												
Total Cost			**59.972**	**54.689**		**51.988**		**47.135**		**CONT**	**CONT**	**0.000**

CLASSIFICATION:	UNCLASSIFIED	
EXHIBIT R-4, SCHEDULE PROFILE		DATE February 2008
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603561N/ADVANCED SUBMARINE SYSTEM DEVELOPMI**	PROJECT NUMBER AND NAME **0223/Sub Combat System Improvement (ADV)**



CLASSIFICATION:	UNCLASSIFIED						
EXHIBIT R-4a, SCHEDULE DETAIL					DATE February 2008		
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603561N/ADVANCED SUBMARINE SYSTEM DEVELOPMENT**			PROJECT NUMBER AND NAME **0223/Sub Combat System Improvement (ADV)**			
Schedule Profile	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
Advanced Processing Builds (Acoustic/Tactical)							
APB-06 Sea Test	2Q						
Transition APB-06 to ARCI/BYG-1	3Q						
APB-07 Sea Test		2Q					
Transition APB-07 to ARCI/BYG-1		3Q					
APB-08 Shore Test		3Q					
Transition APB-08 to ARCI/BYG-1		4Q					
APB-09 Sea Test			3Q				
Transition APB-09 to ARCI/BYG-1			4Q				
APB-10 Shore Test				3Q			
Transition APB-10 to ARCI/BYG-1				4Q			
APB-11 Sea Test					3Q		
Transition APB-11 to ARCI/BYG-1					4Q		
APB-12 Shore Test						3Q	
Transition APB-12 to ARCI/BYG-1						4Q	
APB-13 Sea Test							3Q
Transition APB-13 to ARCI/BYG-1							4Q
Conformal Acoustic Velocity Sonar/Large Vertical Array							
Mock-up Build	1Q-2Q						
Construct ADM array	2Q-4Q						
Install ADM array		2Q-3Q					
Test ADM array			1Q-3Q				
Transition to VIRGINIA Class			1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q
Low Cost Conformal Array (LCCA)							
Test ADM array	1Q						
Install 2nd Passive Array & add active staves to ADM & gather data			1Q-4Q	1Q-4Q			
Transition to SSNs		1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q

CLASSIFICATION:	UNCLASSIFIED						
EXHIBIT R-4a, SCHEDULE DETAIL (CONTINUATION)					DATE February 2008		
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603561N/ADVANCED SUBMARINE SYSTEM DEVELOPMENT**			PROJECT NUMBER AND NAME **0223/Sub Combat System Improvement (ADV)**			
Schedule Profile	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
RCI Next Generation							
Develop and Test RCI Next Gen	1Q-4Q						
Install RCI Next Gen		2Q-4Q					
Transition to TI08		1Q-4Q	1Q-2Q				
ACOMMS							
Fleet Demos	2Q-3Q						
Complete Surface Ship Development	1Q-4Q						
Install and Test Surface Ship ACOMMS		2Q-3Q					
Developed Encrypted Solution		1Q-4Q	1Q				
Advanced Towed Array Technology							
Develop TLTL Concepts	1Q-4Q	1Q-4Q					
Develop Array	1Q-4Q	1Q-4Q	1Q-4Q				
Build & Test Prototype TLTL Arrays			1Q-4Q	1Q-4Q	1Q-4Q		
SSN Clip-on TLTL Array Demonstration				3Q-4Q			
Transition TLTL Array to PMS 401					4Q		
Develop TLTL Handler Components		1Q-4Q	1Q-4Q	1Q-2Q			
Build & Test TLTL ADM Handler				3Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q
SSN TLTL ADM Handler Demonstration							1Q-2Q
Transition TLTL Handler to PMS401							4Q

CLASSIFICATION:	UNCLASSIFIED						
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION					DATE February 2008		
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603561N/ADVANCED SUBMARINE SYSTEM DEVELOPMENT**				PROJECT NUMBER AND NAME **2033/Adv Submarine System Development**		
COST (In Millions)	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
Project Cost	73.383	79.901	57.652	62.435	57.449	56.588	61.157
RDT&E Articles Qty	0	0	0	0	0	0	0

A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:

The Advanced Submarine Research and Development (R&D) Program is a non-acquisition program that develops, matures, and transitions Hull, Mechanical, and Electrical (HM&E) technologies from S&T to operational platforms, develops submarine design and naval architecture products destined for backfit, forward fit, and/or future submarines, and operates unique R&D experimentation, modeling, and simulation facilities to enhance submarine stealth, maneuverability, and affordability. The program is structured to support near term technology insertion to achieve VIRGINIA Class cost reduction and influence future submarine concepts and core technologies. In support of Sea Power 21, Sea Trial experimentation supports the naval enterprises in identifying and prototyping capabilities and technologies that support the warfighter. Focus is on the Undersea Enterprise (USE), the Naval Network/FORCENET Enterprise (NNFE), Naval Expeditionary Combat Enterprise (NECE), Surface Warfare Enterprise (SWE), and Special Operations Force Enterprise (SOFE). In addition to enterprise support, experimentation will identify technologies that support the Global War on Terror (GWOT). Experimentation and demonstration is conducted in a joint warfighting context with other services, (i.e. the U.S. Marines, U.S. Army, and the U.S. Air Force), to enable early assessment of warfighting capabilities, and to contribute to better technology selection decisions for potential spiral development. This program also supports Information Exchange Programs with the United Kingdom, Canada, Germany, and Australia.

CLASSIFICATION:	UNCLASSIFIED	
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION		DATE February 2008
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603561N/ADVANCED SUBMARINE SYSTEM DEVELOPMENT**	PROJECT NUMBER AND NAME **2033/Adv Submarine System Development**

B. ACCOMPLISHMENTS/PLANNED PROGRAM:

	FY 2007	FY 2008	FY 2009
Payloads and Sensors/Subtotal Cost	17.332	18.192	18.264
RDT&E Articles Quantity	0	0	0

Develop promising advanced technologies and/or concepts capable of revolutionizing submarine design, reducing cost, improving payload flexibility, increasing capability, reducing weight and space requirements, exploring alternative payload launch mechanisms, increasing reliability with concomitant decreases in required maintenance, and improving material strength. Develop payload demonstrations targeted at improving flexible ocean interface, Intelligence/Surveillance/Reconnaissance (ISR) requirements, and universal encapsulation methods from undersea platforms. Conduct Navy and joint SEA TRIALS that take the demonstrations to the Fleet in order to assess the operational value of the technologies and systems under consideration. The SEA TRIALS/experiments support examination and assessment of potential new Fleet capabilities based on the Sea Power 21 Pillars of SEA SHIELD, SEA BASING, SEA STRIKE, and FORCENET.

FY07 Accomplishments include the following: Conducted an underwater encapsulation demonstration applicable to a small missile. Provided analytical support to the Joint Test and Evaluation (JT&E) program Joint Command and Control for War on Terror Activities (JC2WTA). Completed REML full-scale integration test and conducted land based concept demonstration test. Developed final design guidance for designing non-pressure hull structural components from composite materials. Conduct the Water Piercing Missile Launch (WPML) missile fly out test from a submerged static platform to demonstrate water-piercing technology. Update report to Congress on "Submarine Technology Insertion."

FY08 Planned Accomplishments include the following: Prepare for FY09 demonstration of an underwater launch of an encapsulated All-Up Round (AUR) against a surface target in a test range. Conduct End-To-End lab test full-scale at NUWC, Newport. Conduct two additional tests needed to complete the underwater encapsulation tests. Conduct an at-sea demonstration of the procedures developed and technologies selected under the JT&E program JC2WTA. Conduct data analysis on WPML test and conduct additional missile fly out tests from a moving submerged translator platform. Update report to Congress on "Submarine Technology Insertion."

FY09 Planned Accomplishments include the following: Conduct a demonstration of an underwater launch of an encapsulated AUR against a surface target in a test range, then assess the results and determine the need for an at-sea demonstration launching an encapsulated small missile at a surface target from a submarine prior to transition to an acquisition program. Prepare and procure long lead items for at-sea full scale demonstration of WPML concept.

	FY 2007	FY 2008	FY 2009
Stealth/Subtotal Cost	11.751	11.330	15.837
RDT&E Articles Quantity	0	0	0

Develop technologies and tools to increase the safety of submarines by recognizing and mitigating sources of noise, improving the probability of safe transit in the vicinity of mine fields, ensuring that submarines can penetrate contested waters by reduced acoustic observables, and remaining undetected in the littorals. Operate the Large Scale Vehicles (LSV 2) and the Intermediate Scale Measurement System (ISMS) to conduct large model experiments for submarines focusing on stealth, maneuvering and control, affordability, and operational effectiveness.

CLASSIFICATION:	UNCLASSIFIED	
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION (CONTINUATION)		DATE February 2008
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603561N/ADVANCED SUBMARINE SYSTEM DEVELOPMENT**	PROJECT NUMBER AND NAME **2033/Adv Submarine System Development**

FY07 Accomplishments include the following: Continued Large Scale Vehicle operations and maintained LSV and ISMS test ranges. Completed CAVES outer decoupler level two and began inner decoupler level one qualification. Performed scale measurements to support investigation of direct radiation phenomena. Developed and fabricated external damping treatment. Obtained full scale data from a naval vessel to support investigation of alternating current electromagnetic (AC EM) signatures.

FY08 Planned Accomplishments include the following: Continue Large Scale Vehicle operations and maintain LSV and ISMS test ranges. Conduct material characterization of inner decoupler material and complete level one qualification. Conduct scaled test of external damping treatment. Complete analysis of AC EM signature data.

FY09 Planned Accomplishments include the following: Continue Large Scale Vehicle operations and maintain LSV and ISMS test ranges. Complete level two qualification of inner decoupler material and conduct full scale patch test. Develop user interface and conduct performance testing of tactical decision aid.

	FY 2007	FY 2008	FY 2009
Total Ownership/Affordability/Subtotal Cost	1.917	4.546	8.196
RDT&E Articles Quantity	0	0	0

Demonstrate technologies that have the potential to reduce total life cycle costs of the system by providing reduced construction costs, commonality of interfaces, longer life of parts, and/or lower maintenance requirements.

FY07 Accomplishments include the following: Studied the remaining hydraulic actuators in the sail and in the external hydraulics supply system for potential replacement with EAS. Completed development of the Universal Modular Mast (UMM)EAS performance specification and developed EAS performance specification for control surfaces. Developed a standard rotary EAS test plan and initiated qualification testing on additional 10,000 and/or 20,000 3-position rotary EAS ADMs.

Conducted panel and scaled cylindrical shell testing on damping material. Modified acoustic tile configuration on candidate SSN-668i submarine. Obtained acoustic data during acoustic trials on candidate SSN-688 and SSN-688i submarines. Initiated development of a Common Electric Hull Penetrator (CEHP) for communications Imaging and Electronic Warfare (I&EW) sensors in the submarine sail. Developed new EAS technology and composite materials for the existing UMM. Completed Small Business Innovative Research (SBIR) development and fabrication of two prototype composite UMM System guide trunks for testing.

FY08 Planned Accomplishments: Initiate qualification on 10,000 and/or 20,000 in-lb 3-position rotary EAS ADMs. Continue development of BCA to replace 35 rotary 2 and 3 position hydraulic actuators with EAS's. Complete BCA to replace the current UMM hydraulic actuation system with an EAS. Complete study to replace remaining hydraulic actuators with EAS in the sail and in the external hydraulics supply system. Develop EAS performance specification for snorkel induction valve, head valve, mast hoist system, and the radar in the sail. Develop BCA to replace stern plane, bow plane, and rudder control surface hydraulic actuators with EAS. Conduct pop up and Intermediate Scale Measurement System tests to assess damping configuration. Develop a business case for installing CEHP's on new construction VIRGINIA Class hulls. Develop performance specification for the CEHP and procure two prototypes for shore-based testing and evaluation. Conduct an engineering analysis and evaluation of laboratory scale chemical

trials and alternate chemistries for CO2 capture material to determine the optimum form of solid phase sorbent for an advanced CO2 removal system for submarine air purification.

FY09 Planned Accomplishments: Continue qualification testing on 10,000 and/or 20,000 in-lb 3-position rotary EAS ADM's. Develop EAS performance specification for selected external hydraulics system applications. Complete BCA to replace stern plane, bow plane, and rudder control surface hydraulic actuators with EAS. Procure EAS ADM for snorkel induction valve, mast hoist system, and the radar. Conduct pop up and Intermediate Scale Measurement System tests to assess damping configuration. Complete testing and transition of a new CEHP to VIRGINIA Class for implementation during new construction. Perform shore-based UMM system level tests and evaluate performance of UMM EAS and guide trunk composite material. Design a full scale prototype CO2 removal system.

	FY 2007	FY 2008	FY 2009
Advanced Propulsion/Ship Concept Developments/Subtotal Cost	42.383	45.833	15.355
RDT&E Articles Quantity	0	0	0

Overcome selected technological barriers that are expected to have significant impact on submarine hull, mechanical, and electrical (HM&E) systems to enable design options for a submarine with VIRGINIA Class capability in three technical areas: Shaftless Propulsion, External Weapon Stow and Launch, and Radical Ship HM&E Infrastructure Reduction. Develop submarine alternative propulsion and stern configurations with potential to significantly reduce submarine acquisition cost. Demonstrate critical performance parameters via Appropriate Scale Demonstrators in realistic environmental conditions. Evaluate integration of technologies and approaches for cost reduction in future nuclear submarines. Develop understanding of ship concept studies and submarine cost drivers and model analysis.

This work will apply to future submarine designs and will begin the long-lead concept work on the next undersea strategic deterrent platform, for which design work must begin in earnest early next decade. Conduct concept studies and mission utility studies for variant submarine designs, including VIRGINIA derivatives. Develop a future undersea superiority system alternative to the reduced submarine program.

FY07 Accomplishments include the following: Completed small scale TANGO BRAVO demonstrations and concept development. Provided Go/No Go Assessment and Phase 2 contract awards for TANGO BRAVO External Weapons Stow and Launch and Radical Ship Infrastructure Reduction technology areas. Demonstrated Shaftless Propulsion at component level. Continued development of innovative technologies to support the undersea superiority initiative. Assessed feasibility and risk for Affordable Material Propulsors and developed R&D roadmap. Initiated development of a Deep Water Active Detection System (DWADS), Reliable Acoustic Path (RAP) Line Array system, Shallow Water Array Processing (SWAP) system, Distributed Netted Sensors (DNS) Command Control and Communication system, Medium Frequency Acoustic Communications system, Deployable Autonomous Distributed System (DADS) and ASW Command Common Tool Set. Also, conducted studies, analysis and assessments of potential transformational submarine and ASW technologies. Completed selected concept studies for future submarine variants to inform requirements setting process.

FY08 Planned Accomplishments: Complete component level TANGO BRAVO technology demonstrations. Demonstrate maneuvering and sea keeping aspects of Shaftless propulsion at small scale. Assess Go/No Go for TANGO BRAVO Phase 3 Shaftless Propulsion award. Continue development of innovative technologies to support the undersea superiority initiative.

Continue development of a Deep Water Active Detection System (DWADS), Reliable Acoustic Path (RAP) Line Array system, Shallow Water Array Processing (SWAP) system, Distributed Netted Sensors (DNS) Command Control and Communication system, Medium Frequency Acoustic Communications system, Deployable Autonomous Distributed System (DADS) and as ASW Command Common Tool Set. Continue studies, analysis and assessments of potential transformational submarine and ASW technologies. Initiate planning for development of new technologies resulting from aforementioned studies.

FY09 Planned Accomplishments: Complete TANGO BRAVO Prototype level demonstrations. Commence Submarine Shaftless Stern Demonstrator (S3D) program. Initial efforts will include concept studies, demonstration platform down select and specification development.

C. OTHER PROGRAM FUNDING SUMMARY:
Not applicable.

D. ACQUISITION STRATEGY:
Sole source conform studies contracts with Electric Boat (EB) and Northrup Grumman Newport News (NGNN).

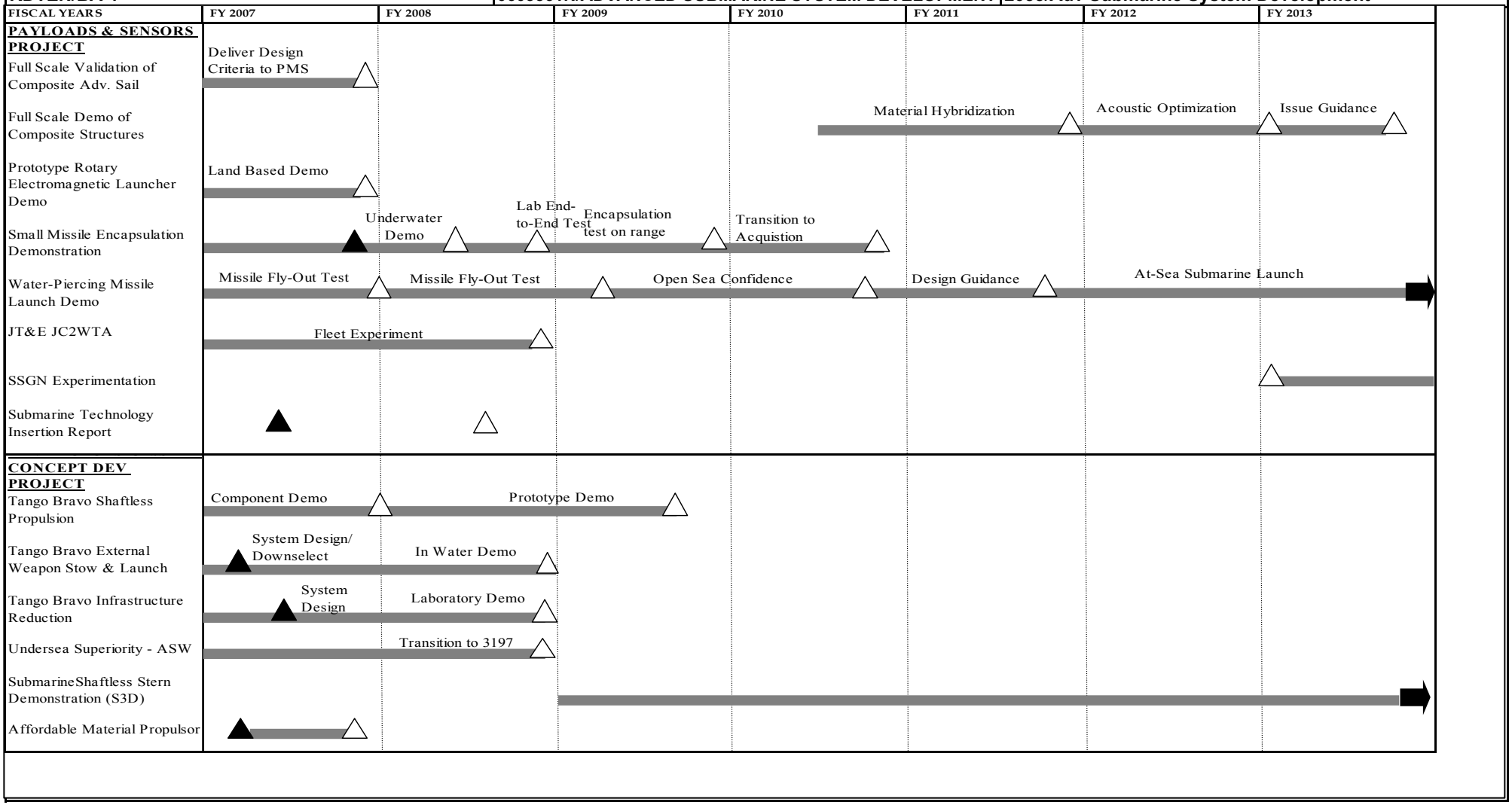
E. MAJOR PERFORMERS:

Northrop Grumman Newport News, Newport News, VA	04/07	11/07	11/08
Electric Boat Corp., Groton, CT	11/06	11/07	11/08
Naval Surf Warfare Ctr, Carderock, MD	10/06	10/07	10/08
Naval Undersea Warfare Ctr, Newport, R.I	10/06	10/07	10/08
Raytheon, Portsmouth, RI	11/06	12/07	12/08

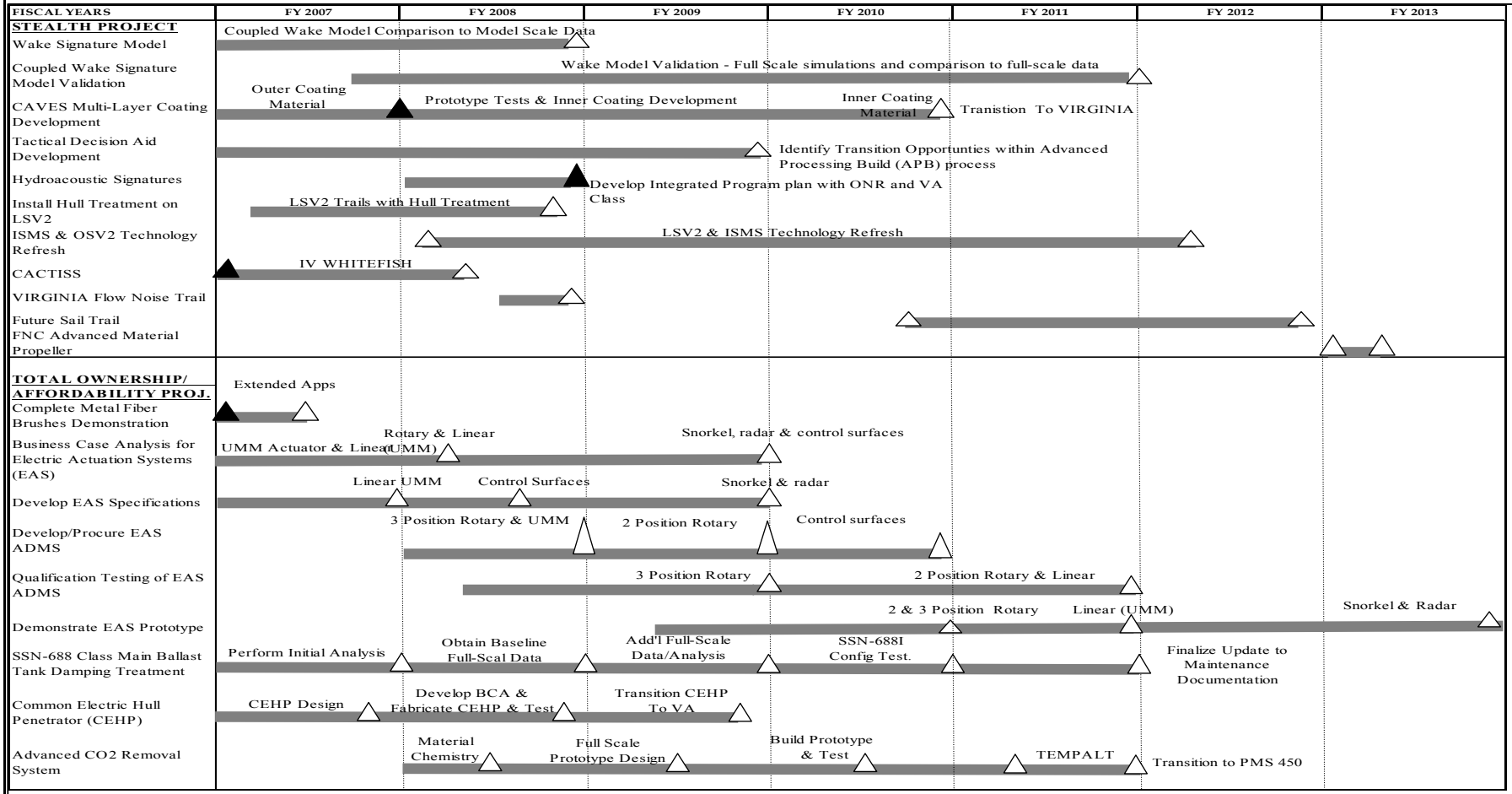
CLASSIFICATION:	UNCLASSIFIED											
EXHIBIT R-3, RDT&E PROJECT COST ANALYSIS									DATE February 2008			
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**		PROGRAM ELEMENT NUMBER AND NAME **0603561N/ADVANCED SUBMARINE SYSTEM DEVELOPMENT**					PROJECT NUMBER AND NAME **2033/Adv Submarine System Development**					
Cost Categories	Contract Method & Type	Performing Activity & Location	Total PY Cost ($000)	FY 2007 Cost ($000)	FY 2007 Award Date	FY 2008 Cost ($000)	FY 2008 Award Date	FY 2009 Cost ($000)	FY 2009 Award Date	Cost to Complete ($000)	Total Cost ($000)	Target Value of Contract
Product Development	SS/CPFF	NGNN Newport News, VA	0.763	0.826	VAR	0.549	VAR	2.071	DEC-08	0.000	4.209	0.000
Product Development	SS/CPFF	EB Groton, CT	20.594	2.328	VAR	2.062	VAR	7.509	DEC-08	0.000	32.493	0.000
Product Development	SS/CPFF	Raytheon	4.518	4.294	VAR	1.316	VAR	6.188	DEC-08	0.000	16.316	0.000
Product Development	WR	NSWC Bethesda, MD	20.506	10.866	VAR	12.928	VAR	15.566	OCT-08	0.000	59.866	0.000
Product Development	SS/CPFF	ARL/PSU, State College,PA	0.671	0.437	VAR	0.185	VAR	0.528	DEC-08	0.000	1.821	0.000
Product Development	SS/CPFF	UT/ARL, Austin TX	2.000	3.400	MAR-07	2.500	VAR	0.000		0.000	7.900	0.000
Product Development	SS/CPFF	JHU/APL Laurel MD	0.000	5.317	VAR	6.721	VAR	0.000		0.000	12.038	0.000
Product Development	Various	Various	1.400	9.045	VAR	13.778	VAR	6.877	VAR	0.000	31.100	0.000
Product Development	WR	NUWC Newport, RI	3.010	5.493	VAR	6.140	VAR	0.887	OCT-08	0.000	15.530	0.000
Product Development	WR	NUWC Newport, RI	9.397	11.013	VAR	11.958	VAR	2.700	DEC-08	0.000	35.068	0.000
Product Development	WR	ONR, Arlington, VA	0.372	3.756	VAR	4.310	VAR	0.000		0.000	8.438	0.000
Product Development	WR	Lockheed Martin	0.000	3.985	VAR	4.949	VAR	0.000		0.000	8.934	0.000
Product Development	WR	SPAWAR San Diego CA	0.000	3.850	VAR	1.400	VAR	0.000		0.000	5.250	0.000
Product Development	WR	SSP, Arlington VA	0.000	0.000		1.200	VAR	0.000		0.000	1.200	0.000
Subtotal Product Development			**63.231**	**64.610**		**69.996**		**42.326**		**0.000**	**240.163**	**0.000**
Remarks: Various/VAR is used for lines with funding associated because multiple activities are being funded for these Cost Categories and there are different award dates for the different activities.												
Contractor Engineering Support	SS/CPFF	Various	2.654	1.706	NOV-06	2.463	OCT-07	0.706	OCT-08	0.000	7.529	0.000
Government Engineering Support	WR	Various	1.026	0.700	OCT-06	1.040	OCT-07	0.729	OCT-08	0.000	3.495	0.000
Travel	WR	NAVSEA HQ	0.060	0.080	OCT-06	0.080	OCT-07	0.080	OCT-08	0.000	0.300	0.000
Subtotal Support Costs			**3.740**	**2.486**		**3.583**		**1.515**		**0.000**	**11.324**	**0.000**
Remarks:												
Developmental Test & Evaluation	SS/CPFF	EB	0.413	0.100	FEB-07	0.500	NOV-07	0.000		0.000	1.013	0.000
Developmental Test & Evaluation	SS/CPFF	Raytheon	4.000	4.210	VAR	2.500	DEC-07	6.188	DEC-08	0.000	16.898	0.000
Developmental Test & Evaluation	WR	NAVAIR	0.868	0.191	MAY-07	1.204	OCT-07	0.075	OCT-08	0.000	2.338	0.000
Developmental Test & Evaluation	Various	Various	3.303	0.545	VAR	1.200	OCT-07	3.050	OCT-08	0.000	8.098	0.000

CLASSIFICATION:	UNCLASSIFIED											
EXHIBIT R-3, RDT&E PROJECT COST ANALYSIS									DATE February 2008			
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**		PROGRAM ELEMENT NUMBER AND NAME **0603561N/ADVANCED SUBMARINE SYSTEM DEVELOPMENT**					PROJECT NUMBER AND NAME **2033/Adv Submarine System Development**					
Cost Categories	Contract Method & Type	Performing Activity & Location	Total PY Cost ($000)	FY 2007 Cost ($000)	FY 2007 Award Date	FY 2008 Cost ($000)	FY 2008 Award Date	FY 2009 Cost ($000)	FY 2009 Award Date	Cost to Complete ($000)	Total Cost ($000)	Target Value of Contract
Developmental Test & Evaluation	WR	NUWC Newport	0.116	0.517	OCT-06	0.418	OCT-07	0.580	OCT-08	0.000	1.631	0.000
Developmental Test & Evaluation	WR	NSWC Carderock	1.604	0.724	OCT-06	0.500	OCT-07	2.918	OCT-08	0.000	5.746	0.000
Developmental Test & Evaluation	SS/CPFF	NGNN	0.000	0.000		0.000		1.000	NOV-08	0.000	1.000	0.000
Subtotal Test and Evaluation			**10.304**	**6.287**		**6.322**		**13.811**		**0.000**	**36.724**	**0.000**
Remarks: Various/VAR is used for lines with funding associated because multiple activities are being funded for these Cost Categories and there are different award dates for the different activities.												
Total Cost			**77.275**	**73.383**		**79.901**		**57.652**		**0.000**	**288.211**	**0.000**

CLASSIFICATION:	UNCLASSIFIED	
EXHIBIT R-4, SCHEDULE PROFILE		DATE February 2008
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603561N/ADVANCED SUBMARINE SYSTEM DEVELOPMENT**	PROJECT NUMBER AND NAME **2033/Adv Submarine System Development**



CLASSIFICATION:	UNCLASSIFIED	
EXHIBIT R-4, SCHEDULE PROFILE		DATE February 2008
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603561N/ADVANCED SUBMARINE SYSTEM DEVELOPMENT**	PROJECT NUMBER AND NAME **2033/Adv Submarine System Development Continued**



CLASSIFICATION:	UNCLASSIFIED						
EXHIBIT R-4a, SCHEDULE DETAIL					DATE February 2008		
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603561N/ADVANCED SUBMARINE SYSTEM DEVELOPMENT**			PROJECT NUMBER AND NAME **2033/Adv Submarine System Development**			
Schedule Profile	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
Payloads & Sensors Project							
Complete Comp. Adv. Sail development, transition to VA class	1Q-4Q						
Rotary Electromagnetic Launcher Land Based Demo	2Q-4Q						
Small Missile Encapsulation Land Based Test							
Small Missile Encapsulation Underwater Demo	4Q						
Small Missile Encapsulation Full-Scale End-to-End Lab Test		4Q					
Small Missile Encapsulation All-Up Round Test			2Q-4Q				
Water Piercing Missile Launch Fly Out Test	3Q-4Q	3Q-4Q					
Water Piercing Missile Launch Open Sea Confidence Test			3Q				
Water Piercing Missile Launch At-Sea Prep & Demo				1Q-4Q	1Q-4Q	1Q-4Q	
SSGN Experimentation							1Q-4Q
JT&E JC2WTA - Fleet Experiment		2Q-4Q					
Advanced Propulsion/Ship Concept Development Project							
Tango Bravo Shaftless Propulsion	1Q-4Q	1Q-4Q	1Q-3Q				
Tango Bravo External Weapon Stow & Launch	1Q-4Q	1Q-4Q					
Tango Bravo Infrastructure Reduction	1Q-4Q	1Q-4Q					
Undersea Superiority - VA Cost Reduction							
Undersea Superiority - ASW	1Q-4Q	1Q-4Q					
Submarine Shaftless Stern Demonstration (S3D)			1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q
Affordable Material Propulsor Feasibility Study	2Q-4Q						
Stealth Project							
Wake Signature Prediction Capability	1Q-4Q	1Q-4Q					
Wake Signature Tool Validation	4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q		
CAVES Outer Decoupler Coating Development	1Q-4Q						
CAVES Outer Decoupler Prototype Tests and Qualification	3Q-4Q	1Q-3Q					
CAVES Inner Decoupler Development	4Q	1Q-4Q	1Q-4Q				
CAVES Inner Decoupler Prototype Tests and Qualification				1Q-4Q			
Tactical Decision Aid Interface Development & Testing	1Q-4Q	1Q-4Q	1Q-4Q				
Integrated Hydroacoustic Program Plan		1Q-4Q					
Composite Duct Eval, LSV2 (VIRGINIA Cost Savings)	1Q						

CLASSIFICATION:	UNCLASSIFIED						
EXHIBIT R-4a, SCHEDULE DETAIL (CONTINUATION)					DATE February 2008		
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603561N/ADVANCED SUBMARINE SYSTEM DEVELOPMENT**			PROJECT NUMBER AND NAME **2033/Adv Submarine System Development**			
Schedule Profile	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
LSV2 RAV install hull treatment on pressure hull and sail	2Q-4Q	1Q-3Q					
Future sail trials, LSV2				4Q	1Q-4Q	1Q-3Q	
VIRGINIA Flow Noise trial, LSV2		3Q-4Q					
ONR, FNC Advanced Material Propeller, LSV2							1Q-2Q
LSV2 Technology refresh		2Q	2Q	2Q	4Q	1Q	
Technology refresh of Intermediate Scale Meas. System					1Q-3Q		
Total Ownership/Affordability Project							
Comp. Adv. Metal Fiber Brushes Demonstration	1Q-2Q						
Complete three Business Case Analyses for implenting EAS's	1Q-4Q	1Q-4Q					
Develop four new EAS performance specifications	1Q-4Q		1Q-4Q				
Initiate/complete shore-based testing/validation on nine ADM's	1Q-4Q	1Q-4Q	1Q-4Q		1Q-4Q		
Conduct six at-sea full scale EAS demonstrations			1Q-4Q	1Q-4Q		1Q-4Q	1Q-4Q
Perform Intitial Analysis - SSN 688 Class Main Ballast Tank Damping	1Q-4Q						
Optain Baseline Full-Scale Data		1Q-4Q					
Add'l Full-Scale Data/Analysis			1Q-4Q				
SSN-688I Configuration Test				1Q-4Q			
Final Maintenance Documentation Update					1Q-4Q		
Develop and Test Electric Common Hull Penetrator (CEHP)	1Q-4Q	1Q-4Q	1Q-4Q				
Develop and Test UMM Composite Electric Mast	1Q-4Q	1Q-4Q	1Q-4Q				
Advanced CO2 Removal System		1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q		

CLASSIFICATION:	UNCLASSIFIED						
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION					DATE February 2008		
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603561N/ADVANCED SUBMARINE SYSTEM DEVELOPMENT**				PROJECT NUMBER AND NAME **3197/Undersea Superiority**		
COST (In Millions)	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
Project Cost	0.000	0.000	36.933	37.770	22.424	0.000	0.000
RDT&E Articles Qty	0	0	0	0	0	0	0

A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:

Project Unit 3197: This Project supports Navy Undersea Superiority through the application of advanced development and testing of organic and offboard sonar and tactical control systems. This Project transitions technologies developed by Navy technology bases, the private sector, ONR, Future Naval Capabilities, and DARPA. This non-acquisition Project addresses technology challenges to improve ASW in littoral and open ocean environments for a variety of operational missions by relevant tactical ASW capabilities. Prototype hardware / software systems are developed to demonstrate technologically promising system concepts in laboratory and at-sea submarine environments. Technologies are selected by the Chief of Naval Operation's (CNO) ASW Initiative which was established to support the CNO's vision to "fundamentally change the way ASW is currently conducted to render the enemy submarine irrelevant against US and coalition forces". It matures promising undersea warfare technologies via a spiral development methodology, establishes military utility through sea testing and self assessment, and supports transition to production as merited by results.

CLASSIFICATION:	UNCLASSIFIED	
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION		DATE February 2008
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603561N/ADVANCED SUBMARINE SYSTEM DEVELOPMENT**	PROJECT NUMBER AND NAME **3197/Undersea Superiority**

B. ACCOMPLISHMENTS/PLANNED PROGRAM:

	FY 2007	FY 2008	FY 2009
Undersea Superiority	0.000	0.000	36.933
RDT&E Articles Quantity	0	0	0

FY09 planned accomplishments include the following: Efforts will transition from funding under Project 2033 in FY08 to Project 3197 in FY09. Continue development of Deep Water Active Detection System (DWADS), Reliable Acoustic Path (RAP) Line Array system, Shallow Water Array Processing (SWAP) system, Distributed Netted Sensors (DNS) Command Control and Communication system, Medium Frequency Acoustic Communications system, Deployable Autonomous Distributed System (DADS) and ASW Command and Control Common Tool Set to include development, integration, prototyping, land based and at-sea testing of Advanced Development Models (ADMs). Continue studies, analysis and assessments of potential transformational ASW technologies. Initiate planning for development of new technologies resulting from aforementioned studies.

C. OTHER PROGRAM FUNDING SUMMARY:

Not applicable.

D. ACQUISITION STRATEGY:

Use competitively awarded contracts from Broad Agency Announcement (BAA) solicitations.

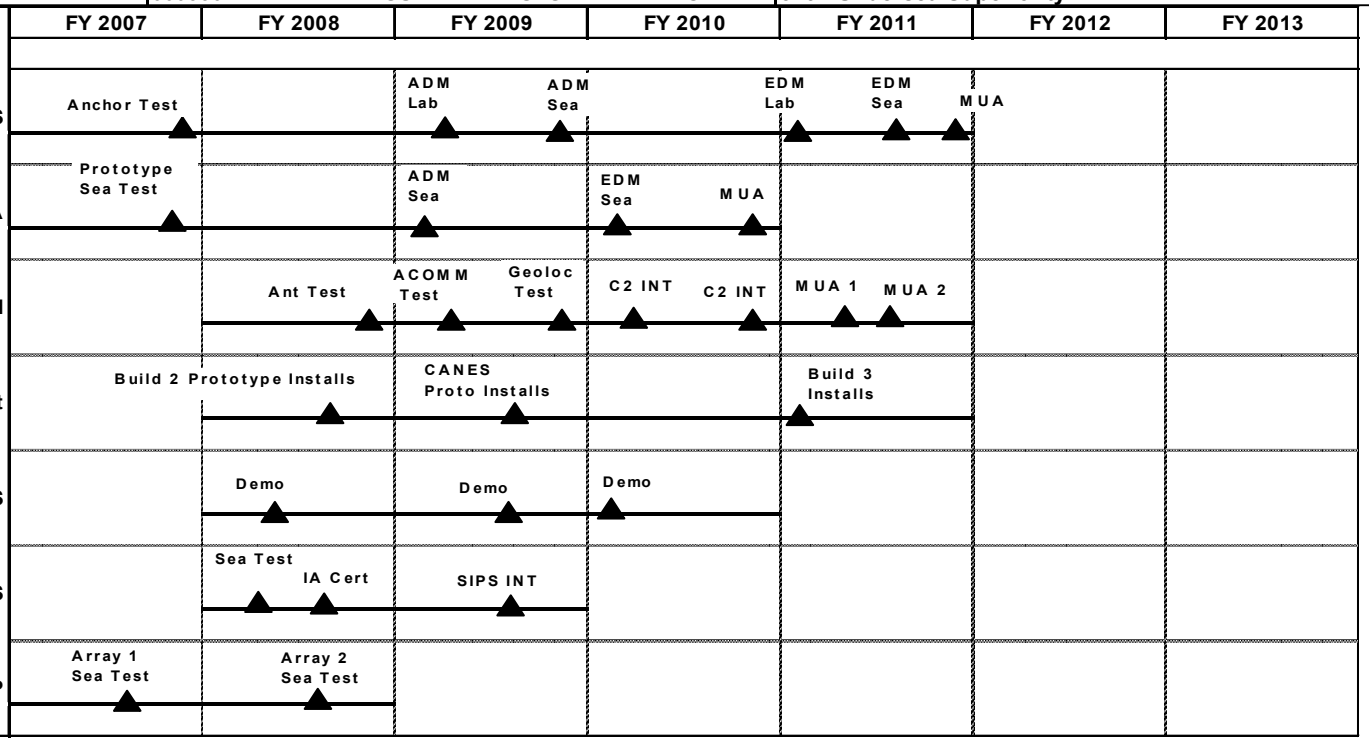
E. MAJOR PERFORMERS:

- Naval Undersea Warfare Center (NUWC), Newport, RI
- John Hopkins University/Applied Physics Lab (JHU/APL), Laurel, MD
- University of Texas/Applied Research Laboratory (UT/ARL), Austin, TX
- Lincoln Lab, Cambridge, MA
- Lockheed Martin, Manassas, VA

CLASSIFICATION:	UNCLASSIFIED											
EXHIBIT R-3, RDT&E PROJECT COST ANALYSIS									DATE February 2008			
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**		PROGRAM ELEMENT NUMBER AND NAME **0603561N/ADVANCED SUBMARINE SYSTEM DEVELOPMENT**					PROJECT NUMBER AND NAME **3197/Undersea Superiority**					
Cost Categories	Contract Method & Type	Performing Activity & Location	Total PY Cost ($000)	FY 2007 Cost ($000)	FY 2007 Award Date	FY 2008 Cost ($000)	FY 2008 Award Date	FY 2009 Cost ($000)	FY 2009 Award Date	Cost to Complete ($000)	Total Cost ($000)	Target Value of Contract
Product Development	WR	ONR, VA	0.000	0.000		0.000		2.000	NOV-08	CONT	CONT	0.000
Product Development	WR	NUWC/Newport, RI	0.000	0.000		0.000		1.220	OCT-08	CONT	CONT	0.000
Product Development	WR	Marine Acoustics, NC	0.000	0.000		0.000		1.200	DEC-08	CONT	CONT	0.000
Product Development	MIPR	U.S. AFB/MIT Lincoln Labs, MA	0.000	0.000		0.000		1.100	NOV-08	CONT	CONT	0.000
Product Development	C/CPFF	JHU/APL, MD	0.000	0.000		0.000		5.400	DEC-08	CONT	CONT	0.000
Product Development	C/CPFF	Lockheed Martin, VA	0.000	0.000		0.000		7.858	DEC-08	CONT	CONT	0.000
Product Development	C/CPFF	Sedna, VA	0.000	0.000		0.000		0.650	DEC-08	CONT	CONT	0.000
Product Development	C/CPFF	SAIC, VA	0.000	0.000		0.000		0.720	DEC-08	CONT	CONT	0.000
Subtotal Product Development			**0.000**	**0.000**		**0.000**		**20.148**		**CONT**	**CONT**	**0.000**
Remarks:												
Test and Evaluation	WR	SPAWAR, San Diego, CA	0.000	0.000		0.000		0.800	OCT-08	CONT	CONT	0.000
Test and Evaluation	WR	NUWC/Newport, RI	0.000	0.000		0.000		3.050	OCT-08	CONT	CONT	0.000
Test and Evaluation	C/CPFF	JHU/APL, MD	0.000	0.000		0.000		2.600	DEC-08	CONT	CONT	0.000
Test and Evaluation	C/CPFF	UT/ARL, TX	0.000	0.000		0.000		6.600	DEC-08	CONT	CONT	0.000
Test and Evaluation	MIPR	U.S. AFB/MIT Lincoln Labs, MA	0.000	0.000		0.000		0.125	DEC-08	CONT	CONT	0.000
Test and Evaluation	WR	Various, Various	0.000	0.000		0.000		3.200	DEC-08	CONT	CONT	0.000
Subtotal Test and Evaluation			**0.000**	**0.000**		**0.000**		**16.375**		**CONT**	**CONT**	**0.000**
Remarks: Note: Various is used for lines with funding associated because multiple activities are being funded for these Cost Categories and there are different award dates for the different activities.												
Program Management Support	C/CPAF	BAE SYSTEMS, MD	0.000	0.000		0.000		0.400	DEC-08	CONT	CONT	0.000
Travel	WR	NAVSEA PEO IWS 5, DC	0.000	0.000		0.000		0.010	OCT-08	CONT	CONT	0.000
Subtotal Management Services			**0.000**	**0.000**		**0.000**		**0.410**		**CONT**	**CONT**	**0.000**
Remarks:												

CLASSIFICATION:	UNCLASSIFIED											
EXHIBIT R-3, RDT&E PROJECT COST ANALYSIS									DATE February 2008			
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**		PROGRAM ELEMENT NUMBER AND NAME **0603561N/ADVANCED SUBMARINE SYSTEM DEVELOPMENT**					PROJECT NUMBER AND NAME **3197/Undersea Superiority**					
Cost Categories	Contract Method & Type	Performing Activity & Location	Total PY Cost ($000)	FY 2007 Cost ($000)	FY 2007 Award Date	FY 2008 Cost ($000)	FY 2008 Award Date	FY 2009 Cost ($000)	FY 2009 Award Date	Cost to Complete ($000)	Total Cost ($000)	Target Value of Contract
Total Cost			**0.000**	**0.000**		**0.000**		**36.933**		**CONT**	**CONT**	**0.000**

CLASSIFICATION:	UNCLASSIFIED	
EXHIBIT R-4, SCHEDULE PROFILE		DATE February 2008
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603561N/ADVANCED SUBMARINE SYSTEM DEVELOPMENT**	PROJECT NUMBER AND NAME **3197/Undersea Superiority**



Note: Previous to FY 09 this effort was funded via Project 2033.

CLASSIFICATION:	UNCLASSIFIED						
EXHIBIT R-4a, SCHEDULE DETAIL					DATE February 2008		
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603561N/ADVANCED SUBMARINE SYSTEM DEVELOPMENT**			PROJECT NUMBER AND NAME **3197/Undersea Superiority**			
Schedule Profile	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
Deep Water Active Distributed System (DWADS):							
Anchor Test	4Q						
Advance Development Model (ADM) Tests			2Q-4Q				
Engineering Development Model (EDM) Tests					1Q-3Q		
Military Utility Assessment (MUA)					4Q		
Reliable Acoustic Path Vertical Line Array (RAP VLA):							
Prototype At Sea Test	4Q						
ADM Sea Test			2Q				
EDM Sea Test				2Q			
MUA				4Q			
DNS C4I:							
Antenna Test		4Q					
Acoustic Comms Test			2Q				
GEO Location			4Q				
C2 Integration of DWAD-RAP				2Q-4Q			
MUA					2Q-3Q		
ASW Common Toolset:							
Build 2 Prototype (B2P) Installation		3Q					
CANES Installation and Test			3Q				
Build 3 Installation and Test					1Q		
Deployable Autonomous Distributed System (DADS):							
Technology Demonstrations		2Q	3Q	1Q			
MF Acomms:							
Sea Test		2Q					
Info Assurance Test		3Q					
SIPS/IPS Integration			3Q				
SWAP:							
Array 1 and 2 Sea Tests	3Q	3Q					

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EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION		DATE February 2008
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603561N/ADVANCED SUBMARINE SYSTEM DEVELOPMENT**	PROJECT NUMBER AND NAME **9999/Congressional Add**

B. ACCOMPLISHMENTS/PLANNED PROGRAM:

	FY 2007	FY 2008	FY 2009
9812N/9812C/Experimental Research Transformational Submersible	4.383	0.000	0.000
RDT&E Articles Quantity	0	0	0

The Congressional add will provide for the initial studies, conceptual designs, and concept of operations for a transformational submersible using cutting edge commercial technologies with a focus on affordable portability, modularity, reduction of vehicle size, manning and annual operational support cost. The Experimental Research Transformation Submersible (XRTS) will support mission criteria and be affordable using commercial (COTS) based materials and equipment. In FY07, the Navy will evaluate the feasibility of performing various R&D missions with a commercially owned, commercially operated submersible, and develop a business case analysis for such use.

	FY 2007	FY 2008	FY 2009
9813C/Inner & Outer Decoupler Matl-Fiberoptic Conformal	1.947	0.000	0.000
RDT&E Articles Quantity	0	0	0

Develop inner and outer decoupler materials to support the development and future application of large conformal arrays on submarines while maintaining or improving ship's stealth performance. The Congressional add will be used for the development, test, evaluation, and qualification of outer decoupler materials to support large conformal arrays such as the Conformal Velocity Sonar (CAVES) Large Vertical Array (LVA) and large Wide Aperture Array (lgWAA) concepts. Analysis will be performed to determine cost effective approaches for developing novel conformal array inner decouplers. Preliminary designs will be developed and supported by laboratory performance testing at small scale.

	FY 2007	FY 2008	FY 2009
0223C/Fiber Optic Conformal Acoustic Velocity System	1.112	0.000	0.000
RDT&E Articles Quantity	0	0	0

The Congressional add will be used to continue development of fiber optic functionality for the CAVES Large Vertical Array (LVA) Advanced Development Model (ADM) which is a precursor to the VIRGINIA program Large Wide Aperture Array (LgWAA) replacement array.

	FY 2007	FY 2008	FY 2009
9987N/Large Displacement UUV at Sea Launch & Recovery	4.385	0.000	0.000
RDT&E Articles Quantity	0	0	0

Funding will be used to define, document and provide interfaces, modular support equipment, and launch & recovery documentation for rapid affordable integration of Large Displacement UUVs and undersea payloads into SSGN Large Tubes. Land based facilities and in-water tests will be executed to demonstrate modular integration techniques and procedures. Payload interfaces and modular integration approach will maximize compatibility for potential use on other submarine classes.

	FY 2007	FY 2008	FY 2009
9988N/Low Cost Thin Line Fiber Optic Towed Array	0.971	0.000	0.000
RDT&E Articles Quantity	0	0	0

Develop a much lower cost, very low noise, vibration resistant laser required for shipboard fiberoptic sensor applications such as TB-33, VIRGINIA Lightweight WAA, and

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EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION (CONTINUATION)			DATE February 2008
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603561N/ADVANCED SUBMARINE SYSTEM DEVELOPMENT**	PROJECT NUMBER AND NAME **9999/Congressional Add**	

FiberOptic CAVES. Current lasers are either expensive, or noisy.

	FY 2007	FY 2008	FY 2009
9999/Acoustic Materials for Integral Bow Conformal Array	0.000	0.994	0.000
RDT&E Articles Quantity	0	0	0

This funding will support research and development into the design and configuration of acoustic materials to support Integrated Bow Conformal Array concepts.

	FY 2007	FY 2008	FY 2009
9999/Navy Submarine Hydraulic Oil Recycling and Waste Reduction	0.000	0.994	0.000
RDT&E Articles Quantity	0	0	0

This funding will support continuation of a Small Business Innovation Research (SBIR) project (N03-073) to develop an innovative high performance and high efficiency membrane hydraulic & lube oil filter. Plus-Up resources will fund a Phase II Base and Phase II Option Research and Development (R&D) effort.

	FY 2007	FY 2008	FY 2009
9999/Low Cost Laser Module Assembly for High Frequency Fiber Optics	0.000	0.994	0.000
RDT&E Articles Quantity	0	0	0

Funds will be used to develop and evaluate promising laser interrogation technologies for a common towed array fiber optic receiver that is lower cost, more insensitive to vibration, and more reliable than in current underwater fiber optic acoustic sensor systems. Service needs lower cost, more insensitive to vibration, and more reliable laser solutions for fiber optic towed array receivers.

	FY 2007	FY 2008	FY 2009
9999/Twinline Thinline Submarine Towed Array	0.000	3.180	0.000
RDT&E Articles Quantity	0	0	0

Funds will be used to continue the development of a submarine twinline thinline towed array capability to support navy plans for an in-water demonstration in FY09. Service needs a twinline thinline towed array capability to provide a cost effective means to achieve significant improvements in Submarine ASW detection, fire control and self defense capabilities. The add will be used to complete the design of the TLTLTA systems and initiate long lead procurements for material items.

	FY 2007	FY 2008	FY 2009
9999/CISRT Enabling Materials Technology	0.000	2.385	0.000
RDT&E Articles Quantity	0	0	0

TBD

	FY 2007	FY 2008	FY 2009
9999/Controllable Shock Absorber for Advanced Submarines	0.000	1.789	0.000
RDT&E Articles Quantity	0	0	0

This funding will be used to perform research and development associated with a controllable shock mitigation device for future submarine designs. This effort includes analysis, testing and evaluation of candidate concepts.

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EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION (CONTINUATION)			DATE February 2008
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603561N/ADVANCED SUBMARINE SYSTEM DEVELOPMENT**	PROJECT NUMBER AND NAME **9999/Congressional Add**	

	FY 2007	FY 2008	FY 2009
9999/Submarine Artificial-Intelligence (AI) Based Combat System Kernal	0.000	2.384	0.000
RDT&E Articles Quantity	0	0	0

Funds will be used to refine both the Process and Implementation aspects of the AI-based Mission-Focused Command Decision Support Module (MFCDSM) as an important component of the Combat System of the Future; to demonstrate several specific spirals; and to facilitate transitioning a basic capability to the fleet.

	FY 2007	FY 2008	FY 2009
9999/Undersea Launched Missile Studies (ULMS)	0.000	4.967	0.000
RDT&E Articles Quantity	0	0	0

This funding will used to conduct concept studies for a follow-on platform to the OHIO Class submarine and to perform analyses and trade studies to identify necessary R&D to begin in FY 09 and beyond.