EXHIBIT R-2, RDT&E Budget Item Justification							DATE: February 2005	
APPROPRIATION/BUDGET ACTIVITY **RESEARCH DEVELOPMENT TEST & EVALUATION, NAVY/BA-4**					R-1 ITEM NOMENCLATURE Advanced Submarine Systems Development/0603561N			
COST ($ in Millions)	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
Total PE Cost	**85.693**	**88.188**	**162.953**	**208.732**	**225.092**	**247.091**	**249.240**	**227.436**
Adv. Sub. Systems Development/2033	**49.155**	**39.058**	**100.728**	**147.742**	**156.788**	**191.738**	**191.932**	**166.659**
Rotary Electromagnetic Torpedo Launcher/9191	**0.986**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**
Adv. Sub. Combat Sys. Dev/0223	**25.721**	**44.474**	**62.225**	**60.990**	**68.304**	**55.353**	**57.308**	**60.777**
Fiber Optic Multi-Line Towed Array/9189	**5.784**	**1.585**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**
MK 48 ADCAP Torpedo Improve/9039	**4.047**	**2.080**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**
Speciality Optical Fiber w/ Embedded Sensors/9526	**0.000**	**0.991**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**

Defense Emergency Response Funds (DERF) Funds: N/A

A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:

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 Future Naval Capabilities (FNC's).

Project Unit 2033: The Advanced Submarine Research and Development (R&D) Program is a non-ACAT program that transitions Hull, Mechanical, and Electrical (HM&E) technologies from Science and Technology (S&T) to platforms, provides the genesis for 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 VIRGINIA Class technology insertion, future submarine concepts, and core technologies. Focus is on the four SEA POWER 21 warfighting pillars, SEA BASE, SEA SHIELD, FORCENET, and SEA STRIKE. Focus is also on SEA TRIAL. SEA TRIALS emphasize warfighting capabilities in the areas of Anti-Submarine Warfare, Mine Countermeasures, Strike Warfare, and Counter Weapons of Mass Destruction. Payloads and Sensors demonstrations and SEA TRIALS conducted in a joint warfighting context with other services, i.e. the U.S. Marines, U.S. Army, and the U.S. Air Force, enable early assessment of warfighting capabilities contributing to better technology selection decisions for potential spiral development. This program also supports Information Exchange Programs with the United Kingdom and Canada.

Congress appropriated the following FY04 Congressional Adds: $2.500M for Advanced Composite Sail Phase II, $7.400M for High Performance Metal Fiber Brushes, $10.000M for Submarine Payloads and Sensors, and $10.000M for Advanced Submarine Technology.

Congress included the following changes to the FY05 President's Budget in the FY05 Defense Appropriation Act: +$5.000M for Payloads and Sensors, +$1.400M for Advanced Composite Structure Programs, +$2.100M for MK-48 ADCAP torpedo improvement program, +$1.600M for Fiber Optic TB-16 Towed Array, +$1.000M for Improved Tactical Control in submarine Systems, +$2.000M for Special Optical Fiber with Embedded Sensors, and -$5.000M for Development and Demonstration of UUV in Submarine Operations.

CLASSIFICATION:

EXHIBIT R-2, RDT&E Budget Item Justification	DATE: **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RESEARCH DEVELOPMENT TEST & EVALUATION, NAVY/BA-4**	R-1 ITEM NOMENCLATURE Advanced Submarine Systems Development/0603561N

Project Unit 0223: The Advanced Submarine Combat Systems Development non-acquisition (Non-ACAT) program supports the Navy Submarine Acoustic Superiority and Technology Insertion Initiatives by the application of advanced development and testing of sonar and combat control systems improvements. This program element transitions technologies developed by Navy technology bases, the private sector, Office of Naval Research (ONR), Future Naval Capabilities and the Defense Advanced Research Projects Agency. The program addresses technology challenges to improve tactical control in littoral and open ocean environments for a variety of operational missions including peacetime engagement, surveillance, battlespace 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) and Advanced Processing Build-Tactical (APB-T) tactical control and Advanced Hull Arrays.. APB's develop and demonstrate improvements to current and future sonar/combat control systems. Program is funded under demonstration and validation because it develops and integrates hardware for experimental test related to specific platform applications.

Project Unit 9039 is congressional add to develop MK48 ADCAP torpedo improvements.

Project Unit 9189 is acongressional add to develop Fiber Optic Mulit-Line Towed Array.

Project Unit 9191 is congressional add to develop Rotary Electromagnetic Torpedo Launcher.

Project Unit 9526 is congressional add to develop Speciality Optical Fiber with Embedded Sensors improvements.

R-1 SHOPPING LIST - Item No. 46

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification							DATE: **February 2005**	
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA-4**	PROGRAM ELEMENT NUMBER AND NAME PE0603561N Advanced Submarine Systems Development				PROJECT NUMBER AND NAME 2033/Advanced Submarine Systems Development			
COST ($ in Millions)	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
2033/Adv. Sub. Systems Development	**49.155**	**39.058**	**100.728**	**147.742**	**156.788**	**191.738**	**191.932**	**166.659**
RDT&E Articles Qty								

A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:

This program 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 Future Naval Capabilities (FNC's).

Project Unit 2033: The Advanced Submarine Research and Development (R&D) Program is a non-ACAT program that transitions Hull, Mechanical, and Electrical (HM&E) technologies from Science and Technology (S&T) to platforms, provides the genesis for 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 VIRGINIA Class technology insertion, future submarine concepts, and core technologies. Focus is on the four SEA POWER 21 warfighting pillars, SEA BASE, SEA SHIELD, FORCENET, and SEA STRIKE. Focus is also on SEA TRIAL. SEA TRIALS emphasize warfighting capabilities in the areas of Anti-Submarine Warfare, Mine Countermeasures, Strike Warfare, and Counter Weapons of Mass Destruction. Payloads and Sensors demonstrations and SEA TRIALS conducted in a joint warfighting context with other services, i.e. the U.S. Marines, U.S. Army, and the U.S. Air Force, enable early assessment of warfighting capabilities contributing to better technology selection decisions for potential spiral development. This program also supports Information Exchange Programs with the United Kingdom and Canada.

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Congress included the following changes to the FY05 President's Budget in the FY05 Defense Appropriation Act: +$5.000M for Payloads and Sensors, +$1.400M for Advanced Composite Structure Programs, and -$5.000M for Development and Demonstration of UUV in Submarine Operations.

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification		DATE: **February 2004**
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND NAME
RDT&E, N / BA-4	PE0603561N Advanced Submarine Systems Developmen	2033/Advanced Submarine Systems Development

B. Accomplishments/Planned Program

	FY 04	FY 05	FY06	FY07
Payloads and Sensors/Subtotal Cost	26.894	14.510	18.132	16.542
RDT&E Articles Quantity				

Pursue development of promising technologies and or concepts capable of revolutionizing submarine design, improving payload flexibility, 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 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. Develop and demonstrate promising and innovative maneuvering-related concepts and methods to improve maneuvering performance in the littoral and ability to deliver payloads.

FY04 Accomplishments include the following: defined the specifications for submarine electric actuation systems designed to replace maintenance intensive hydraulic actuation systems and procured prototype electric systems for testing commencing in FY05, completed energy storage systems source solicitation and prototype launch motor design for full scale electromagnetic launcher prototype at the Naval Undersea Warfare Center using the launch test facility, completed development of analytic modeling techniques for fatigue and shock loading and validation of critical design elements for the Composite Advanced Sail targeted for insertion in the FY09 VIRGINIA ship. FY04 accomplishments for SILENT HAMMER include: Flexible Payload Module (FPM) and Stealthy Affordable Capsule System (SACS) off-hull testing of universal encapsulation prior to the SILENT HAMMER experiment, execution of the Risk reduction Limited Objective Experiment (LOE) with the TRIDENT WARRIOR 04 experiment, development of the SSGN Battle Management Center (BMC), initiation of an Experiment Data Collection and Analysis Plan (DCAP), and preparation/installation of the Temporary Alteration (TEMPALT) onboard the USS Georgia. FY04 accomplishments for Task Force ASW Experiment 04: UNDERSEA DOMINANCE and theater ASW Exercise 04 include: development of a Concept of Operations (CONOPS), a baseline Mission Analysis to determine capability prior to introduction of experiment objectives, the Test and Evaluation Measurement Plan, the Measurement Analysis Plan (MAP), preparation/installation of TEMPALTS onboard three SSNs, two SSKs, two Cruiser-Destroyers (CRUDES), one P-3 Maritime Patrol Aircraft, two SURTASS ships, and two Auxiliary ships, and the experiment Schedule of Events and Water-Space Management Plans. FY04 accomplishments for maneuvering and control include: developed a maneuvering simulation software and trial data base tool, fabricated and tested a Flexible Tab Assisted Control System demonstrating the potential to improve low-speed maneuvering performance at reduced costs without using traditional steering and diving hardware and hydraulics, and opened the Center for Concept Visualization (CCV) at the Hydrodynamic/Hydroacoustic Technology Center.

FY04 includes a Congressional Add of $2.500M for the procurement of full scale critical elements and an expanded shock modeling and validation of the Composite Advanced Sail, one $10.000M Congressional Add for Submarine Payloads and Sensors, and a second $10.000M Congressional Add for Advanced Submarine Technology.

FY05 includes a Congressional Add of $1.4M for the Advanced Composite Structures Program and a $5M Congressional Add for Payloads and Sensors..

EXHIBIT R-2a, RDT&E Project Justification		DATE: February 2005
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND NAME
RDT&E, N / BA-4	PE0603561N Advanced Submarine Systems Developmen	Advanced Submarine Systems Development/2033

B. Accomplishments/Planned Program (Cont.)

	FY 04	FY 05	FY06	FY07
Stealth/Subtotal Cost	11.913	17.990	17.518	14.498
RDT&E Articles Quantity				

Pursue 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 1 and LSV 2) and the Intermediate Scale Measurement System (ISMS) at Lake Pend Oreille, Idaho to conduct large model experiments for submarines focusing on stealth, maneuvering and control, affordability, and operational effectiveness.

FY04 accomplishments include: completed piping radiated prediction model, identified outer decoupler material for Conformal Acoustic Velocity Sonar (CAVES), managed an Electromagnetic Project Arrangement with the United Kingdom, completed preliminary wake-signature assessments for VIRGINIA, conducted 17 successful LSV 1 underway operations for VIRGINIA class steel sail project leading to reduced full scale radiated noise signature, conducted six successful LSV 2 underway operations leading to LSV 2 Acceptance and Characterization, retired LSV 1, and completed maintenance overhaul of ISMS resulting in the system being ready to support advanced submarine and surface ship technology assessments leading to improved submarine stealth and combat system performance.

	FY 04	FY 05	FY06	FY07
Total Ownership/Affordability/Subtotal Cost	7.241	0.263	0.000	0.000
RDT&E Articles Quantity				

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

FY04 accomplishments include: laboratory testing of Higher Performance Brush Technology (HPBT) on the DC end of a 500 KW motor generator set, developed an alternate rotor protection methodology for use with HPBT, and developed an OPALT for the DC end of the 500 KW motor generator set. FY04 includes a Congressional Add of $7.400M which was used to expand application to other motors and generators. Efforts in FY05 will also address scaling up prototype manufacturing processes to production rate processes.

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification		DATE: **February 2005**
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND NAME
RDT&E, N / BA-4	PE0603561N Advanced Submarine Systems Development	Advanced Submarine Systems Development/2033

B. Accomplishments/Planned Program (Cont.)

	FY 04	FY 05	FY06	FY07
Advanced Propulsion/Ship Concept Development/Subtotal Costs	3.107	6.295	65.078	116.702
RDT&E Articles Quantity				

DARPA/NAVY TANGO BRAVO: 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 reduced-size submarine with VIRGINIA Class capability in five technical areas: Shaftless Propulsion, External Weapon Stow and Launch, Hull Adaptable Sonar Array, Radical Ship (HM&E) Infrastrcuture Reduction, Reduced Crew/Automated Attack Center.

FY 05 and FY06: Funding level for each technology area is not predetermined. in each of the five technology areas, subject to scope of tasks awarded, complete Detailed system design and modeling, Innovative system development, Concept demonstration, and Full scale performance prediction

FY07: For technologies selected for further development, complete demonstrator builds and demonstrations and conduct limited at-sea testing where applicable

UNDERSEA SUPERIORITY SYSTEM: Pursue design of a future undersea superiority alternative to the reduced submarine program including consideration of alternate propulsion methods. The project will incorporate technologies developed through technology demonstrations under the joint DARPA/Navy Tango Bravo initiative. The scope of work will result in a preliminary design and acquisition plan.

FY06 Planned accomplishments include: Establish threshold and objective cost goals, draft operational requirements, complete concept development, develop draft CONOPS, finalize acquisition strategy, conduct Milestone A.

FY07 Planned accomplishments include: Initiate preliminary design of preferred alternative (completes FY08), develop Test, Evaluation, and system Engineering plans, and investigate environment, safety, and occupational health associated with new technologies, integrate DARPA/Navy Tango Bravo techologies.

ADVANCED PROPULSION: Develop submarine alternative propulsion and stern configurations with potential to significantly reduce submarine acquisition cost. Demonstrate maneuvering, stealth, and other critical performance parameters via Appropriate Scale Demonstrators in realistic environmental conditions.

FY04 accomplishments include the following: completed initial hydrodynamic design of the Improved Advanced Hybrid propulsor that potentially reduces propulsor changeout time, completed Main Seawater Pump pipe loop test on a Distributed Pump and Jet Propulsion model, and demonstrated Gap Control Technology performance improvements in the High Reynolds Number Pump (HIREP) Facility at the Pennsylvania State University/Applied Research Laboratory.

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification		DATE: **February 2005**
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND NAME
RDT&E, N / BA-4	PE0603561N Advanced Submarine Systems Development	2033/Advanced Submarine Systems Development/0603561N

C. PROGRAM CHANGE SUMMARY:

Funding:	FY 2004	FY 2005	FY 2006	FY2007
FY05 President's Budget	54.687	38.155	53.571	51.758
FY06 President's Budget	49.155	39.058	100.728	147.742
Total Adjustments	-5.532	0.903	47.157	95.984
Summary of Adjustments				
FY04 OMNIBUS VIRGINIA Class Submarine	-4.050			
Execution Realignment	-0.400			
Cancelled Accounts	-0.064			
Advanced Composite Structues		1.400		
Develop & Demonstrate UUV in Sub Operations		-5.000		
Submarine Payloads & Sensors		5.000		
Undistributed congressional reductions	-1.018	-0.497	-1.616	-3.065
Programmatic adjustments			48.773	99.049
Subtotal	-5.532	0.903	47.157	95.984

Schedule: not applicable.
Technical: not applicable.

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification		DATE: **February 2005**
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND NAME
RDT&E, N / BA-4	PE0603561N Advanced Submarine Systems Developmer	Advanced Submarine Systems Development/2033

D. OTHER PROGRAM FUNDING SUMMARY:

Line Item No. & Name	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	To Complete	Total Cost
Not applicable.										

E. ACQUISITION STRATEGY:

Competitively awarded contracts from Broad Agency Announcement (BAA) solicitations.

F. MAJOR PERFORMERS:

Newport News Shipbuild, Newport News, Va R&D Support	12/03	12/04	12/05	12/06
Electric Boat Corp., Groton, CT. R&D support	12/03	12/04	12/05	12/06
Noesis, Inc., Manassas, Va. Fiber Brush R&D	12/03			
Naval Surf Warfare Ctr, Carderock, MD. R&D support	10/03	10/04	10/05	10/06
Naval Undersea Warfare Ctr, Newport, R.I. R&D support	10/03	10/04	10/05	10/06
Raytheon, Portsmouth, RI	01/04		12/05	12/06
Lockheed Martin, Manassas, VA	01/04		12/05	12/06

R-1 SHOPPING LIST - Item No. 46

CLASSIFICATION:

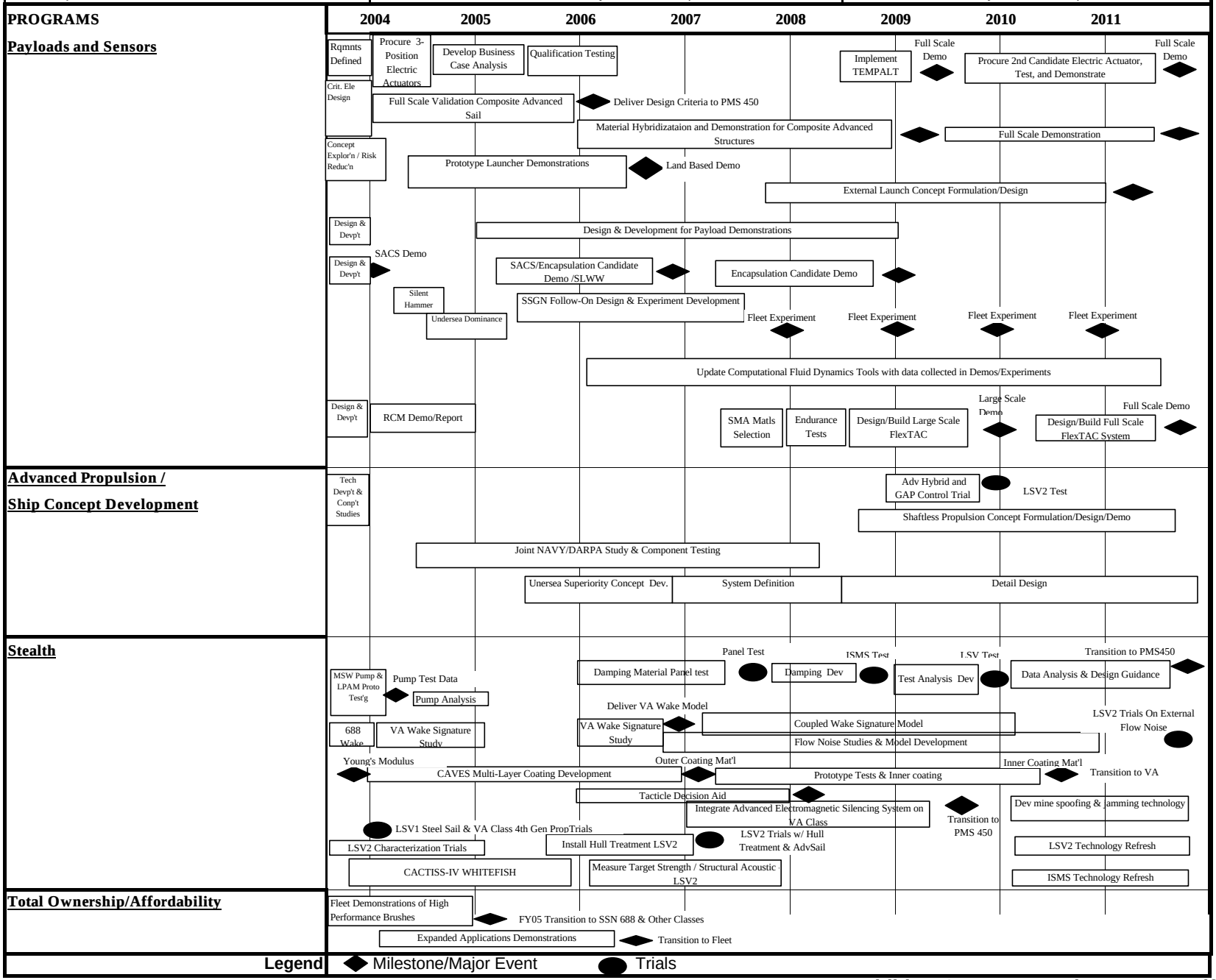
Exhibit R-3 Cost Analysis (page 1)					DATE: **February 2005**									
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N/BA-4**		PROGRAM ELEMENT PE0603561N Advanced Submarine Systems Developme			PROJECT NAME AND NUMBER Advanced Submarine Systems Development/2033									
Cost Categories	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 04 Cost	FY 04 Award Date	FY05 Cost	FY 05 Award Date	FY06 Cost	FY 06 Award Date	FY07 Cost	FY 07 Award Date	Cost to Complete	Total Cost	Targ Value of Contract
Product Development	S/CPFF	NNS Newport News, VA	61.036	0.065	12/03							0.000	61.101	67.224
Product Development	S/CPIF	NNS Newport News, VA	24.219	0.602	12/03	0.587	12/04	2.047	12/05	1.970	12/06	17.216	44.671	44.671
Product Development	S/CPFF	EB Groton, CT	79.037	1.478	12/03	0.624	12/04	1.651	12/05	1.645	12/06	0.770	83.560	83.560
Product Development	S/CPFF	National Design Team	0.000	0.000		0.000		25.000	10/05	60.000	10/06	TBD	TBD	TBD
Product Development	WR	NSWC Bethesda, MD	235.893	16.186	10/03	19.874	10/04	27.954	10/05	34.703	10/06	CONT.	CONT.	
Product Development	S/CPFF	ARL/PSU, State College,P.	35.028	1.387	12/03	1.285	12/04	1.534	12/05	1.400	12/06	CONT.	CONT.	
Product Development	S/CPFF	Noesis	12.157	1.461	12/03								13.618	13.618
Product Development	S/CPFF	Noesis	0.000	5.448	06/04							0.000	0.000	5.727
Product Development	Various	Various	97.468	4.906	Various	0.928	Various	7.129	Various	4.966	Various	CONT.	CONT.	
Product Development	WX	NUWC Newport	0.000	1.115	Various	1.378	10/04	8.439	10/05	15.985	10/06	CONT.	CONT.	
Product Development	S/CPFF	Raytheon	0.971	0.000		1.225	01/05					0.000	2.196	
Product Development	S/CPFF	Lockheed Martin	0.185	0.000		3.350	03/05					0.000	3.535	
Subtotal Product Development			545.994	32.648		29.251		73.754		120.669				
Remarks:														
Development Support Equipment													0.000	
Software Development													0.000	
Training Development													0.000	
Integrated Logistics Support													0.000	
Configuration Management													0.000	
Technical Data													0.000	
GFE													0.000	
Subtotal Support			0.000	0.000		0.000		0.000		0.000		0.000	0.000	
Remarks:														

CLASSIFICATION:

Exhibit R-3 Cost Analysis (page 2)											DATE: **February 2005**			
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N/BA-4**		PROGRAM ELEMENT PE0603561N Advanced Submarine Systems Developme				PROJECT NAME AND NUMBER Advanced Submarine Systems Development/2033								
Cost Categories	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 04 Cost	FY 04 Award Date	FY05 Cost	FY05 Award Date	FY06 Cost	FY06 Award Date	FY07 Cost	FY07 Award Date	Cost to Complete	Total Cost	Target Value of Contract
Developmental Test & E	S/CPFF	Raytheon	9.560	3.000	01/04			3.600	12/05	3.600	12/06	TBD	TBD	
Developmental Test & E	S/CPFF	Lockheed Martin	0.400	5.100	01/04			6.150	12/05	6.100	12/06	TBD	TBD	
Developmental Test & E	Various	Various	0.640	0.937	Various	0.870	Various	3.263	Various	3.283	Various	CONT.	CONT.	
Developmental Test & E	S/CPFF	MIT Lincoln Lab	0.000	0.600	04/04	2.000	11/04					0.000	2.600	
Developmental Test & E	WX	SSC San Diego	0.000	1.600	06/04	0.860	10/04					0.000	2.460	
Developmental Test & E	WX	NUWC Newport	0.000	0.650	05/04	0.634	10/04	0.751	10/05	0.751	10/06	CONT.	CONT.	
Developmental Test & E	S/CPFF	JHU/APL	0.000	0.459	05/04	1.540	12/04					0.000	1.999	
Developmental Test & E	S/CPFF	UT/ARL	0.000	0.300	07/04	0.500	12/04					0.000	0.800	
Subtotal T&E			10.600	12.646		6.404		13.764		13.734				
Remarks:														
Contractor Engineering Su	CPFF	Various	2.497	2.096	01/04	1.931	11/04	1.967	11/05	2.066	11/06		CONT.	
Government Engineering S	WR	Various	1.000	1.698	10/03	1.422	10/04	11.193	10/05	11.223	10/06		CONT.	
Travel			0.215	0.067	05/04	0.050	10/04	0.050	10/05	0.050	10/06		CONT.	
Subtotal Management			3.712	3.861		3.403		13.210		13.339				
Remarks:														
Total Cost			560.306	49.155		39.058		100.728		147.742				

CLASSIFICATION:

EXHIBIT R4, Schedule Profile		DATE: **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA-4**	PROGRAM ELEMENT NUMBER AND NAME PE0603561N Advanced Submarine Systems Development	PROJECT NUMBER AND NAME Advanced Submarine Systems Development/S2033



CLASSIFICATION:

Exhibit R-4a, Schedule Detail						DATE: **February 2005**		
APPROPRIATION/BUDGET ACTIVITY **RDT&E BA-4**	PROGRAM ELEMENT PE0603561N Advanced Submarine Systems Development				PROJECT NUMBER AND NAME Advanced Submarine Systems Development/S2033			
Schedule Profile	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
Payloads & Sensors								
Select electric actuation system candidates	4Q							
Business Case Analysis		1Q,2Q,3Q,4Q						
Conduct prototype benchmark testing & evaluation			1Q,2Q,3Q,4Q				1Q,2Q,3Q,4Q	
Conduct full scale demonstration						4Q		4Q
Fabricate and demo full scale composite Adv. Sail prototype	3Q,4Q	1Q,2Q,3Q,4Q						
Complete Comp. Adv. Sail development, transition to VA class			3Q					
Comp.Adv. Structures complete design criteria/req. doc./testing			3Q,4Q	1Q,2Q,3Q,4Q	1Q,2Q,3Q,4Q	1Q,2Q		
Full Scale Demo of Composite Structures			3Q			3Q,4Q	1Q,2Q,3Q,4Q	1Q,2Q
Rotary Electromagnetic Launcher Land Based Demo			4Q					
External Launch Concept Formulation/Design					1Q,2Q,3Q,4Q	1Q,2Q,3Q,4Q	1Q,2Q,3Q,4Q	1Q, 2Q
Advanced Payload Demonstrations Design & Development		1Q,2Q,3Q,4Q	1Q,2Q,3Q,4Q	1Q,2Q,3Q,4Q	1Q,2Q,3Q,4Q	1Q,2Q		
SILENT HAMMER SEA TRIAL		1Q						
UNDERSEA DOMINANCE 04 SEA TRIAL		1Q						
SACS Demonstrations		1Q						
Encapsulation Demonstrations		4Q	4Q			2Q		
Fleet Experiments					2Q	2Q	2Q	2Q
Complete Maneuvering & Control CFD tools	3Q							
Conduct FlexTAC RCM demonstration	4Q							
Complete endurance testing					1Q,2Q,3Q,4Q			
Design/Build large scale FlexTAC						1Q,2Q,3Q,4Q		
Conduct large scale demonstration							3Q	
Advanced Propulsion/Ship Concept Development								
Improved Advanced Hybrid & Gap Control LSV II Trial							1Q, 2Q	
Distributed Pump and Jet Submarine Concept Study	1Q, 2Q, 3Q							
Shatfless Propulsion Concept Forumlation/Design						1Q, 2Q, 3Q, 4Q	1Q, 2Q, 3Q, 4Q	1Q, 2Q, 3Q
Joint Navy/DARPA Study & Component Testing	3Q, 4Q	1Q, 2Q, 3Q, 4Q	1Q, 2Q, 3Q, 4Q	1Q, 2Q, 3Q, 4Q				
Concept Design			1Q,2Q,3Q,4Q					
Preliminary Design				1Q,2Q,3Q,4Q	1Q,2Q,3Q,4Q			
Engineering & Specification Development					3Q,4Q	1Q,2Q,3Q,4Q		
Detail Design							1Q,2Q,3Q,4Q	1Q,2Q,3Q,4Q

R-1 SHOPPING LIST - Item No. 46

CLASSIFICATION:

Exhibit R-4a, Schedule Detail						DATE: **February 2005**		
APPROPRIATION/BUDGET ACTIVITY **RDT&BA-4**	PROGRAM ELEMENT PE0603561N Advanced Submarine Systems Development				PROJECT NUMBER AND NAME Advanced Submarine Systems Development/2033			
Schedule Profile	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
Stealth								
MSW Pump & LPAM Prototype Testing	2Q, 3Q							
Dev & Validate Piping Acoustic Model		2Q, 3Q, 4Q	1Q,2Q,3Q,4Q	1Q				
Mount & Damping Development					1Q,2Q,3Q,4Q	1Q		
Structural Noise/Mount Testing			1Q,2Q,3Q,4Q	1Q, 2Q				
Transition to Advanced Demonstrations Model				3Q				
688 Wake Signature	1Q, 2Q							
VA Wake Signature Study	3Q, 4Q	1Q, 2Q, 3Q						
Deliver VA Wake Signature Model		4Q						
Flow Noise Studies & Model Development			4Q	1Q, 2Q, 3Q, 4Q	1Q, 2Q			
Deliver Young's Modulus	2Q							
CAVES Multi-Layer Development		1Q,2Q,3Q,4Q	1Q, 2Q, 3Q					
New Coating Material			4Q				3Q	
Prototype Tests				1Q,2Q,3Q,4Q	1Q,2Q,3Q,4Q	1Q,2Q,3Q,4Q		
EM Silencing Evaluate & Integrate Advanced Sys on VA Class			,3Q,4Q	1Q,2Q,3Q,4Q	1Q,2Q,3Q,4Q	3Q		
SEAWOLF steel sail trail, LSV 1	1Q, 2Q							
LSV evaluation of propulsor component improvements	3Q							
LSV 2 hydrodynamic performance trial	2Q							
LSV 2 maneuvering characterization trial	3Q,4Q	3Q,4Q	3Q					
LSV 2 RAV install hull treatment on pressure hull and sail			2Q, 3Q, 4Q					
Initiate VA advanced sea trials, LSV 2	3Q							
Complete VA advanced sail trials, LSV 2				3Q				
LSV 2 Technology refresh		1Q,2Q					3Q,4Q	1Q, 2Q, 3Q
Technology refresh of Intermediate Scale Meas. System				1Q,2Q			3Q,4Q	1Q, 2Q, 3Q
Total Ownership/Affordability								
Demo commutator operation for Adv. Brush - full scale	1Q							
Comp. Adv. Metal Brushes transition to PMS 392		3Q						

R-1 SHOPPING LIST - Item No. 46

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification							DATE: **February 2005**	
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA-4**	PROGRAM ELEMENT NUMBER AND NAME 0603561N/Advanced Submarine System Development				PROJECT NUMBER AND NAME 0223/Submarine Combat System Improv (Adv)			
COST ($ in Millions)	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
0223/Adv. Submarine Combat Sys. Improv.	**25.721**	**44.474**	**62.225**	**60.990**	**68.304**	**55.353**	**57.308**	**60.777**
RDT&E Articles Qty								

A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:

This program supports innovative research and development in submarine 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 available.

Project Unit 0223: The Advanced Submarine Combat Systems Development non-acquisition (Non-ACAT) program supports the Navy Submarine Acoustic Superiority and Technology Insertion Initiatives by the application of advanced development and testing of sonar and combat control systems improvements. This program element transitions technologies developed by Navy technology bases, the private sector, Office of Naval Research (ONR), Future Naval Capabilities and the Defense Advanced Research Projects Agency. The program addresses technology challenges to improve tactical control in littoral and open ocean environments for a variety of operational missions including peacetime engagement, surveillance, battlespace 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 Hull Arrays. APB's develop and demonstrate improvements to current and future sonar/combat control systems. Program is funded under demonstration and validation because it develops and integrates hardware for experimental test related to specific platform applications.

R-1 SHOPPING LIST - Item No. 46

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification		DATE: **February 2005**
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND NAME
RDT&E, N / BA-4	0603561N/Advanced Submarine System Development	0223/Submarine Combat System Improv (Adv)

B. Accomplishments/Planned Program

	FY 2004	FY 2005	FY 2006	FY 2007
Advanced Sonar System Processing/Subtotal Cost	17.221	27.974	36.225	35.090
RDT&E Articles Quantity				

Advanced Processing Build-Acoustic (APB-A) transitioned to PMS401 for fleet introduction in FY 04. FY 05 APB(A) has continued improvements in sonar detection and classification via improved algorithms and automation for towed arrays, is implementing the initial Precision Underwater Mapping functionality, improved sonar planning and environmental monitoring, and initiated processing enhancements for the Hull and Sphere Arrays. Recent efforts were focused on Acoustic Contact Correlation and improved integration with Tactical Control to enhance close aboard situational awareness and a contact avoidance functionality. These enhancements will continue to be refined over the near term in concert with a special focus on expanding HF Active close aboard capabilities. Other Future efforts for FY06 and FY07 will focus on improving the acoustic contribution to ASW in the littorals. Primary improvement candidates are thin-line towed array signal processing, precision tracking and refined automation. Signal processing for the TB-29 Towed Array will be redesigned to improve noise discrimination in shallow water environments and to enhance array shape estimation techniques to improve contact holding through maneuvers. A new integrated precision tracker is being developed as well as additional automation focused on SSK detection and shallow water noise suppression .

	FY 2004	FY 2005	FY 2006	FY 2007
Advanced Tactical Control/Subtotal Cost	8.500	8.000	12.000	12.000
RDT&E Articles Quantity				

Advanced Processing Build-Tactical (APB-T) transitioned to PMS425 for fleet introduction in FY 04. FY 05 APB(T) delivered the first automated Close Encounter Management tool-set for submarine combatants. Future efforts will focus on enhancing this functionality through refined all source data fusion algorithms and in improving the tactical commander's ability to manage close in and high density scenarios through advanced target motion analysis, contact management, tactical scene rendering, sensor performance prediction models, search planning, uncertainty management, acoustic and non-acoustic vulnerability management, close encounter decision management, and automation. In FY 05 start advanced processing techniques in data fusion and state estimation leveraged from ONR/DARPA. FY06 and FY07 will focus on integrating non-acoustic sensor data such as imaging and radar into tactical contact management algorithms. Automation will be introduced to reduce operator work load through increased surface and subsurface target recognition in tactical scene rendering plots. Automated route planning aides to improve covertness and contact management will be addressed. Efforts will also be applied to improving the advanced development processes that feed Tactical Employment Manuals and Operaltional Guidance for Fleet use of the combat systems.

	FY 2004	FY 2005	FY 2006	FY 2007
Advanced Hull Arrays/Subtotal Cost	0.000	8.500	14.000	13.900
RDT&E Articles Quantity				

The Advanced Hull Arrays project is developing improved, larger aperture sonars in order to achieve acoustic superiority over potential threat submarines in the littorals. The end products will be large aperture sail and flank array Advanced Development Models (ADMs). In FY05 conduct Low Cost Conformal Array (LCCA) ADM test (first side) on a 688I Class SSN, supporting both contact avoidance and SSK detection. Develop a Conformal Acoustic Velocity Sonar (CAVES) Large Wide Aperture Array (Lg WAA) panel ADM Design and Initiate construction of a Large Hull Segment (Mock Up), to test system performance and validate the installation process (including development and implementation of the required environmental enclosure and holding fixture), in FY06. This program supports CAVES Lg WAA on VIRGINA Class SSNs.

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CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification		DATE: **February 2005**
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND NAME
RDT&E, N / BA-4	PE0603561N Advanced Submarine Systems Development	0223/Advanced Submarine Systems Development/0603561N

C. PROGRAM CHANGE SUMMARY:

Funding:	FY 2004	FY 2005	FY 2006	FY 2007
FY05 President's Budget	26.877	43.005	63.740	64.307
FY06 President's Budget	25.721	44.474	62.225	60.990
Total Adjustments	-1.156	1.469	-1.515	-3.317
Summary of Adjustments				
FY04 OMNIBUS VIRGINIA CLASS SUBMARINE	-0.550			
Speciality Optical Fiber with Embedded Sensors		2.000		
Undistributed congressional reductions	-0.539	-0.522		
Inflation Adjustment			0.420	0.511
Programmatic adjustments		-0.009	-1.935	-3.828
Cancelled Account	-0.067			
Subtotal	-1.156	1.469	-1.515	-3.317

Schedule:

Technical:

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CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification		DATE: **February 2005**
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND NAME
RDT&E, N / BA-4	0603561N/Advanced Submarine System Development	0223/Submarine Combat System Improv (Adv)

D. OTHER PROGRAM FUNDING SUMMARY:

Line Item No. & Name	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	To Complete	Total Cost
Not applicable.										

E. ACQUISITION STRATEGY: * Plan to use competitively awarded contracts from Broad Agency Announcement (BAA) solicitations.

F. MAJOR PERFORMERS: **

Naval Undersea Warfare Center, Newport, R.I. R&D support. Naval Research Laboratory, Washington, DC. Naval Surface Warfare Center, Carderock, MD. R&D Support. John Hopkins University/Applied Physics Lab, Laurel, MD R&D support. Applied Research Lab., The University of Texas, Austin, TX. R&D Support. MITRE Corporation, McLean, VA R&D Support. Lincoln Lab, Cambridge, MA R&D Support. General Dynamic/Advanced Information Systems, Fairfax, VA. R&D Support. Lockheed Martin, Manassas, VA R&D Support. Raytheon, Portsmouth, RI R&D Support. (All performers support APB (A) and APB(T).

R-1 SHOPPING LIST - Item No. 46

CLASSIFICATION:

Exhibit R-3 Cost Analysis (page 1) | DATE: **February 2005**

APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT	PROJECT NUMBER AND NAME
RDT&E, N / BA-4	0603561N/Advanced Submarine System Development	0223/Submarine Combat System Improv (Adv)

Cost Categories	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 04 Cost	FY 04 Award Date	FY 05 Cost	FY 05 Award Date	FY 06 Cost	FY 06 Award Date	FY 07 Cost	FY 07 Award Date	Cost to Complete	Total Cost	Target Value of Contract
Product Development	WR	NUWC Newport, RI	68.261	8.775	10/03	12.635	10/04	15.526	10/05	13.148	10/06	CONT.	CONT.	
Product Development	RCP	NUWC Newport, RI	1.000										1.000	
Product Development	WR	NRL/Washington	4.700	0.339	10/03	0.000	10/04	0.656	10/05	0.656	10/06	CONT.	CONT.	
Product Development	RCP	NRL/Washington	0.490										0.490	
Product Development	WR	NSWC Carderock, MD	10.511										CONT.	
Product Development	RCP	NSWC Carderock, MD	0.036										10.511	
Product Development	WR	NSWC Dahlgren	0.178	0.080	10/03	0.080	10/04	0.080	10/05	0.080	10/06	CONT.	CONT.	
Product Development	PD	ONI, Washington	2.785	0.900	12/03	1.007	12/04	1.007	12/05	0.900	12/06	CONT.	CONT.	
Product Development	C/CPFF	Lockheed Martin, VA	19.378	0.198	12/03	1.304	12/04	3.466	12/05	3.304	12/06	CONT.	CONT.	
Product Development	C/CPFF	BAE, NH	3.402										3.402	
Product Development	RCP	NSMA	0.675	0.180	12/03	0.180	11/04	0.180	11/05	0.180	11/06	CONT.	CONT.	
Product Development	MIPR	U.S. Army/MITRE	6.540	1.200	12/03	1.185	12/04	1.800	12/05	1.800	12/06	CONT.	CONT.	
Product Development	MIPR	U.S. Air Force/MIT Lincoln Labs	5.620	1.200	12/03	1.244	12/04	1.744	12/05	1.744	12/06	CONT.	CONT.	
Product Development	RCP	ONR/MCCI	2.800										2.800	
Product Development	MIPR	METRON	1.650	0.515	12/03	1.508	12/04	1.508	12/05	1.508	12/06	CONT.	CONT.	
Product Development	C/CPFF	Progeny, VA	2.090	0.200	12/03	0.237	12/04	0.237	12/05	0.237	12/06	CONT.	CONT.	
Product Development	C/CPFF	BBN, VA	2.836										2.836	
Product Development	RCP	ONR/GTRI	2.050										2.050	
Product Development	SS/CPFF	APL/JHU, MD	30.101	5.350	01/04	7.839	12/04	10.339	12/05	9.839	12/06	CONT.	CONT.	
Product Development	SS/CPFF	APL/UW, WA	0.175	0.050	12/03	0.050	12/04	0.050	12/05	0.050	12/06	CONT.	CONT.	
Product Development	SS/CPFF	ARL/UT, TX	23.937	2.050	12/03	3.601	12/04	4.601	12/05	4.601	12/06	CONT.	CONT.	
Product Development	SS/CPFF	ARL/PSU, PA	1.875	0.000	12/03	0.246	12/04	0.350	12/05	0.350	12/06	CONT.	CONT.	
Product Development	MD	ARL/PSU, PA	0.842	0.208	01/04	0.000	01/05	0.150	01/06	0.150	01/06	CONT.	CONT.	
Product Development	WR	NAVAIR PAX/NSWC Indian H	0.140	0.030	10/03	0.030	10/04	0.030	10/05	0.030	10/06	CONT.	CONT.	
Product Development	WR	SPWAR, CA	0.640	0.073	10/03		10/04	0.140	10/05	0.140	10/06	CONT.	CONT.	
Product Development	PD	SPWAR, CA	0.988	0.048	10/03	0.400	10/04	0.400	10/05	0.400	10/06	CONT.	CONT.	
Product Development	C/CPFF	DSR, VA	17.050	1.154	12/03	4.754	10/04	8.754	10/05	8.448	10/06	CONT.	CONT.	
Product Development	WR	COMSUBLANT	0.295	0.100	10/03	0.178	10/04	0.100	10/05	0.100	10/06	CONT.	CONT.	
Product Development	C/CPFF	Electric Boat, CT	5.603										5.603	
Product Development	CPFF	Lockheed Martin	1.250	1.000	12/03	1.889	12/04	1.590	12/05	1.420	10/06	CONT.	CONT.	
Product Development	MIPR	DARPA, VA	21.600										21.600	
Product Development	Various	Various	2.645										2.645	
Product Development	C/CPFF	Northrop Grumman	1.100										1.100	
SBIRs / BAAs	C/CPFF	Various	6.500	0.000		4.232	Various	7.492	Various	9.830	Various	CONT.	CONT.	
Advanced Towed Array BAA	C/CPFF	Lockheed Martin, NY	1.315										1.315	
Subtotal Product Development			251.058	23.650		42.599		60.200		58.915		CONT.	CONT.	

Remarks:

R-1 SHOPPING LIST - Item No. 46

CLASSIFICATION:

Exhibit R-3 Cost Analysis (page 2)										DATE: **February 2005**				
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N /BA-4**		PROGRAM ELEMENT 0603561N/Advanced Submarine System Development						PROJECT NUMBER AND NAME 0223/Submarine Combat System Improv (Adv)						
Cost Categories	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 04 Cost	FY 04 Award Date	FY 05 Cost	FY 05 Award Date	FY 06 Cost	FY 06 Award Date	FY 07 Cost	FY 07 Award Date	Cost to Complete	Total Cost	Target Value of Contract
Development Test & Evaluation	S/CPFF	NOESIS	6.000										6.000	
Development Test & Evaluation	S/CPFF	EB Groton, CT	0.600										0.600	
Development Test & Evaluation	S/CPFF	NNS Norfolk, VA	0.700										0.700	
Development Test & Evaluation	S/CPFF	NSWC Bethesda, MD	0.700										0.700	
Subtotal Support			8.000	0.000		0.000		0.000		0.000		0.000	8.000	

Remarks:

CLASSIFICATION:

Exhibit R-3 Cost Analysis (page 3)

DATE: **February 2005**

APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT	PROJECT NUMBER AND NAME
RDT&E, N / BA-4	0603561N/Advanced Submarine System Development	0223/Submarine Combat System Improv (Adv)

Cost Categories	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 04 Cost	FY 04 Award Date	FY 05 Cost	FY 05 Award Date	FY 06 Cost	FY 06 Award Date	FY 07 Cost	FY 07 Award Date	Cost to Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation	WR	NUWC Newport, RI	2.693										2.693	
Developmental Test & Evaluation	C/CPFF	RAYTHEON	4.211										4.211	
Operational Test & Evaluation														
Live Fire Test & Evaluation														
Test Assets														
Tooling														
GFE														
Award Fees														
Subtotal T&E			6.904	0.000		0.000		0.000		0.000			6.904	

Remarks:

Contractor Engineering Support														
Government Engineering Support														
Program Management Support	C/CPFF	Integrated Product Dec, CT	0.450										0.450	
Program Management Support	C/CPFF	Stanley Associates, VA	4.388	1.000	12/03	1.000	12/04	1.000	12/05	1.000	12/06	CONT.	CONT.	
Program Management Support	C/CPFF	Various	0.444	0.996	12/03	0.800	12/04	0.950	12/05	1.000	12/06	CONT.	CONT.	
Program Management Support	C/CPFF	EG&G	1.787										1.787	
Program Management Support	C/CPFF	Anteon Corporation	0.198										0.198	
Travel			0.275	0.075		0.075		0.075		0.075		CONT.	CONT.	
Transportation														
SBIR Assessment														
Subtotal Management			7.542	2.071		1.875		2.025		2.075		CONT.	CONT.	

Remarks:

Total Cost			273.504	25.721		44.474		62.225		60.990		CONT.	CONT.	

Remarks:

R-1 SHOPPING LIST - Item No. 46

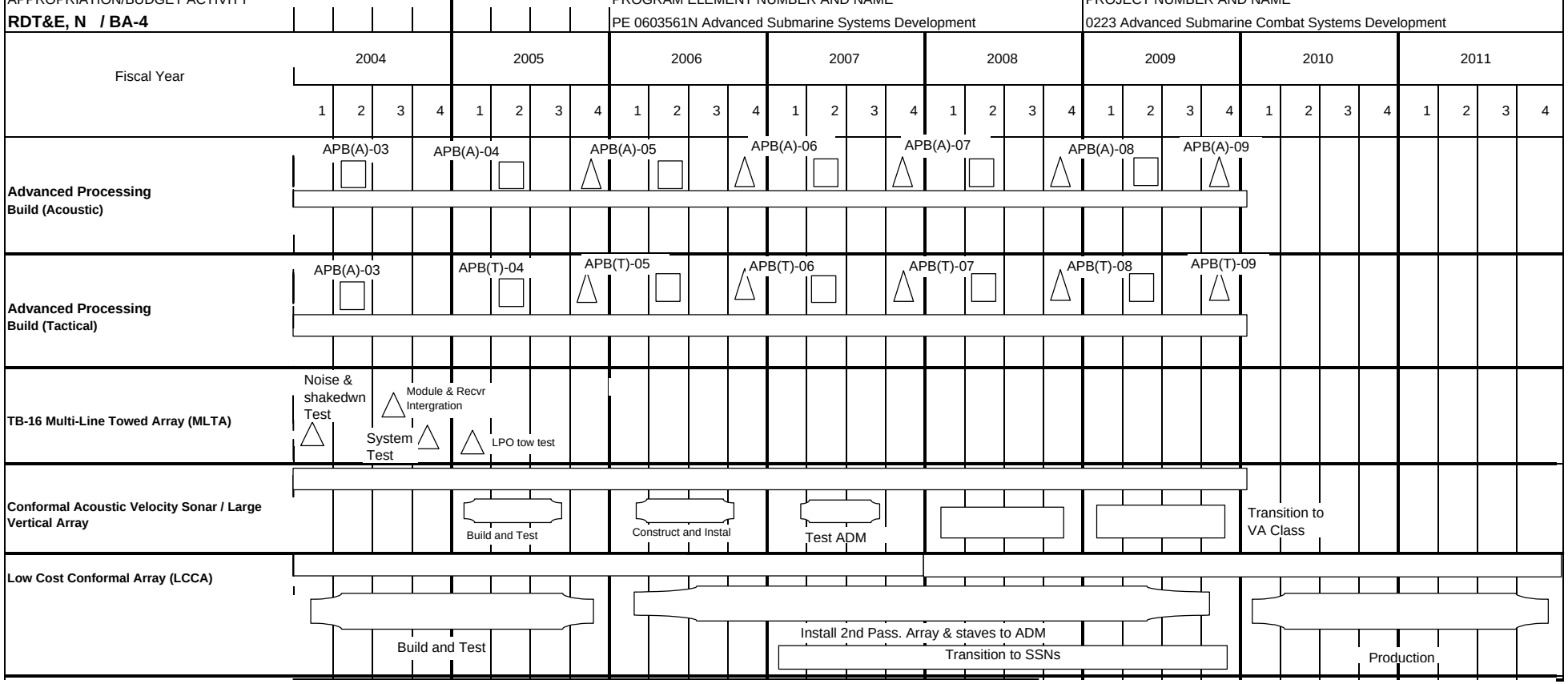
CLASSIFICATION: **UNCLASSIFIED**

EXHIBIT R4, Schedule Profile — DATE: **February 2005**

APPROPRIATION/BUDGET ACTIVITY: **RDT&E, N / BA-4**

PROGRAM ELEMENT NUMBER AND NAME: PE 0603561N Advanced Submarine Systems Development

PROJECT NUMBER AND NAME: 0223 Advanced Submarine Combat Systems Development



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

LEGEND:

△ Sea Test □ Transition

Note: For APB 04 only, decision to transition based on laboratory vs Sea Test.

CLASSIFICATION:

Exhibit R-4a, Schedule Detail					DATE: **February 2005**			
APPROPRIATION/BUDGET ACTIVITY **RDT&E BA-4**	PROGRAM ELEMENT PE 0603561N Advanced Submarine Systems Development				PROJECT NUMBER AND NAME 0223 Advanced Submarine Combat Systems Development			
Schedule Profile	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
Advanced Processing Builds (Acoustic)								
Transition APB-03 to ARCI	2Q							
APB(A)-04 Laboratory Test	4Q							
Transition APB-04 to ARCI		2Q						
APB(A)-05 Sea Test		4Q						
Transition APB-05 to ARCI			2Q					
APB(A)-06 Sea Test			4Q					
Transition APB-06 to ARCI				2Q				
APB(A)-07 Sea Test				4Q				
Transition APB-07 to ARCI					2Q			
APB(A)-08 Sea Test					4Q			
Transition APB-08 to ARCI						2Q		
APB(A)-09 Sea Test						4Q		
Transition APB-09 to ARCI								
Advanced Processing Builds (Tactical)								
Transition APB(T)-03 to CCS	2Q							
APB(T)-04 LabTest	4Q							
Transition to CCS		2Q						
APB(T)-05 Sea Test		4Q						
Transition to CCS			2Q					
APB(T)-06 Sea Test			4Q					
Transition to CCS				2Q				
APB(T)-07 Sea Test				4Q				
Transition to CCS					2Q			
APB(T)-08 Sea Test					4Q			
Transition to CCS						2Q		
APB(T)-09 Sea Test						4Q		
Transition to CCS								

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CLASSIFICATION:

Exhibit R-4a, Schedule Detail						DATE: **September 2004**		
APPROPRIATION/BUDGET ACTIVITY **RDT&E BA-4**	PROGRAM ELEMENT PE 0603561N Advanced Submarine Systems Developmen				PROJECT NUMBER AND NAME 0223 Advanced Submarine Combat Systems Development			
Schedule Profile	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
TB-16 Multi-Line Towed Array (MLTA)								
24-channel acoustic module LPO self noise & shakedown test	1Q							
96-channel acoustic module and receiver intergration	3Q							
96-channel system test	4Q							
96-channel system LPO tow test		1Q						
Conformal Acoustic Velocity Sonar/Large Vertical Array								
Begin detail design, advanced procurement		1Q-4Q						
Construct and install array			1Q-4Q	1Q-4Q	1Q-4Q			
Test ADM					1Q-4Q	1Q-4Q		
Transition to VA Class						1Q-4Q	1Q-4Q	
Low Cost Conformal Array (LCCA)								
Build and test single ADM array	1Q-4Q	1Q-4Q						
Install 2nd Passive Array and add active staves to ADM and		1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q			
Transition to SSNs				1Q-4Q	1Q-4Q	1Q-4Q		
Production (Note: continues to FY16)							1Q-4Q	1Q-4Q

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