EXHIBIT R-2a, RDT&E Budget Item Justification					DATE: **FEBRUARY 2005**			
APPROPRIATION/BUDGET ACTIVITY **RESEARCH DEVELOPMENT TEST & EVALUATION, NAVY / BA-5**					R-1 ITEM NOMENCLATURE Submarine Tactical Warfare System/0604562N			
COST ($ in Millions)	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
Total PE Cost	**31.456**	**48.456**	**40.690**	**55.089**	**57.068**	**58.199**	**59.467**	**60.715**
0236/SSN COMB CONT SYS IMP (ENG)	**31.456**	**47.497**	**40.690**	**55.089**	**57.068**	**58.199**	**59.467**	**60.715**
9576/Submarine MFOP	**0.000**	**0.959**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**

A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: This program develops Commercial-Off-The-Shelf (COTS) based software and hardware upgrades to integrate improved weapons and tactical control capabilities for all submarine classes (SSN688, 688I, SSGN, SEAWOLF, and VIRGINIA (after the Post Shakedown Availability (Post PSA))).   The hardware upgrades (technology insertions) will be developed on a bi-annual basis to provide improved capability and address COTS obsolescence.   The AN/BYG-1 is the combat control system common across all submarine platforms which incorporates tactical control, weapon control and tactical Local Area Network (LAN) functions into a single development program. Funding also accomodates the annual integration of Advanced Processing Builds (APBs) software to both tactical control (APB(T)) and weapon control (APB(W)) subsystems. The tactical control integration effort incorporates the integration of other sensor (ESM, sonar, radar, etc.) inputs to provide a common operation picture and improve situational awareness in an information assurance (IA) compliant environment. The weapon control development effort provides improvements to the weapons control subsystem based on improvements to missiles and torpedos. AN/BYG-1 allows the submarine Navy to rapidly update the ship safety tactical picture, integrates the common tactical picture into the battlegroup, improves torpedo interfaces and provides tactical TOMAHAWK (TOMAHAWK Block IV) capability as this weapon is delivered to the fleet..

This program also develops and tests a COTS-based software weapons launch capability for all SSN688/688I and SEAWOLF submarines. This upgrade addresses weapons launch hardware component obsolescence while providing a more reliable launching capability for missiles and torpedos.

FY05 Congressional Adds: +$1.000M Submarine Maintenance Free Operating Periods (MFOP), +$1.600M Submarine Warfare Systems (SWS) Weapon status control, remote maintenance and FORCENet integration, and +$3.000M Submarine Warfare system strike weapon status control.

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EXHIBIT R-2a, RDT&E Project Justification		DATE: **FEBRUARY 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N /BA-5**	PROGRAM ELEMENT NUMBER AND NAME 0604562N/SUBMARINE TACTICAL WARFARE SYSTEM	PROJECT NUMBER AND NAME 0236/SSN COMB CONT SYS IMP (ENG)

B. Accomplishments/Planned Program (Cont.)

	FY 04	FY 05	FY 06	FY 07
AN/BYG-1 TI02	15.031	2.000	0.000	0.000
RDT&E Articles Quantity				

FY04:   Delivery of BYG-1 TI02/APB-02 to USS Louisville. Successfully conduct Developmental Testing (FOT&E) and Operational Testing (OT) which included launch of Tomahawk Block IV missle.

FY05:   Continue to resolve DT/OT discrepancies associated with BYG-1 TI00/TI02.

	FY 04	FY 05	FY 06	FY 07
AN/BYG-1 TI04	3.753	18.200	7.100	0.000
RDT&E Articles Quantity				

FY04:   Continued software development of BYG-1 TI04.
FY05:   Continue development, integration and test of the next generation BYG-1 (TI04) for 688I Class/SSN 21 scheduled for delivery in FY05.
FY06:   Complete development, integration and test of the next generation BYG-1 (TI04) for 688 Class/ SSGN scheduled for delivery in FY06.

	FY 04	FY 05	FY 06	FY 07
AN/BYG-1 TI06	0.000	3.933	12.042	13.592
RDT&E Articles Quantity				

FY05:   Begin engineering process for selection and prototyping of new technologies for TI06.
FY06:   Update current BYG-1 TI baseline to TI06 for 688/688i Class.
FY07:   Update current BYG-1 TI baseline to TI06 for 688/688i Class.

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Exhibit R-2a, RDTEN Budget Item Justification
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EXHIBIT R-2a, RDT&E Project Justification			DATE: **FEBRUARY 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N /BA-5**	PROGRAM ELEMENT NUMBER AND NAME 0604562N/SUBMARINE TACTICAL WARFARE SYSTEM	PROJECT NUMBER AND NAME 0236/SSN COMB CONT SYS IMP (ENG)	

B. Accomplishments/Planned Program (Cont.)

	FY 04	FY 05	FY 06	FY 07
AN/BYG-1 TI08	0.000	0.000	0.000	4.957
RDT&E Articles Quantity				

FY07: Begin engineering process for selection and prototyping of new technologies for AN/BYG-1 TI08.

Advanced Processor Builds (APB)	FY 04	FY 05	FY 06	FY 07
Accomplishments/Effort/Subtotal Cost	12.272	18.062	13.996	18.400
RDT&E Articles Quantity				

FY04: Continued integration of Advanced Processor Builds for 03/04 (APB03/04) into the Tech Insertion 04 baseline.
FY05: Begin integration of APB(T)-05 and APB(W)-05 into BYG-1.
FY06: Begin integration of APB(T)-06 into BYG-1.
FY07: Begin integration of APB(T)-07 and APB(W)-07 into BYG-1.

T&E	FY 04	FY 05	FY 06	FY 07
Accomplishments/Effort/Subtotal Cost	0.400	6.302	3.500	4.300
RDT&E Articles Quantity				

FY04: Completed FOT&E efforts for TI02 baseline. Resolve DT/OT issues with TI00 baseline.
FY05: Plan and begin conduct of Development Testing of TI04 on 688 and Seawolf.
FY06: Plan and begin BYG-1 TI04 FOT&E on 688/SSGN/Seawolf.
FY07: Plan and conduct APB(T)-05 testing.

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EXHIBIT R-2a, RDT&E Project Justification	DATE: **FEBRUARY 2005**

APPROPRIATION/BUDGET ACTIVITY **RDT&E, N /BA-5**	PROGRAM ELEMENT NUMBER AND NAME 0604562N/SUBMARINE TACTICAL WARFARE SYSTEM	PROJECT NUMBER AND NAME 0236/SSN COMB CONT SYS IMP (ENG)

B. Accomplishments/Planned Program (Cont.)

	FY 04	FY 05	FY 06	FY 07
Common Weapon Launcher (CWL)	0.000	0.000	4.052	13.840
RDT&E Articles Quantity				

Develop, integrate and test Common Weapon Launcher (CWL) (FY06-FY07).

	FY 04	FY 05	FY 06	FY 07
Accomplishments/Effort/Subtotal Cost				
RDT&E Articles Quantity				

	FY 04	FY 05	FY 06	FY 07
Accomplishments/Effort/Subtotal Cost				
RDT&E Articles Quantity				

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EXHIBIT R-2a, RDT&E Project Justification	DATE:
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APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND NAME
RDT&E, N / BA-5	0604562N/SUBMARINE TACTICAL WARFARE SYSTEM	0236/SSN COMB CONT SYS IMP (ENG)

C. PROGRAM CHANGE SUMMARY:

Funding:	FY 2004	FY 2005	FY 2006	FY 2007
FY2005 Presidents Budget	32.354	43.404	40.425	54.467
FY2006/FY2007 Presidents Budget	31.456	47.497	40.690	55.089
Total Adjustments	-0.898	4.093	0.265	0.622
Summary of Adjustments:				
SBIR	-0.414			
Programmatic Adjustments	-0.454	4.549	0.265	0.622
Undistributed Congressional Reductions	-0.030	-0.456		
TOTAL:	-0.898	4.093	0.265	0.622

Schedule:

 -None

Technical:

 - FY06 budget reflects the submarine combat systems business strategy embodied in the AN/BYG-1 program. This strategy incorporates integration of annual performance improvements and bi-annual technology refresh to address COTS obsolescence issues.

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Exhibit R-2a, RDTEN Budget Item Justification
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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-5**			0604562N/SUBMARINE TACTICAL WARFARE SYSTEM	0236/SSN COMB CONT SYS IMP (ENG)

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
OPN/BA-4 5420	69.041	114.777	131.199	88.138	106.849	99.641	108.381	114.799	CONT.	CONT.

Related RDT&E:
PE 0204229N (Tomahawk & Tomahawk Missile Planning Center)
PE 0205632N (MK 48 ADCAP)
PE 0603504N (Advanced Submarine Combat Systems Dev.)
PE 0604503N (SSN-688 and Trident Modernization)
PE 0604707N (Submarine Electronic Warfare Architecture/Eng. Support)

E. ACQUISITION STRATEGY: AN/BYG-1:

- Competitive contracts awarded in Dec 02 which started the development of a combat control system which segregates tactical control from weapons control system.
- This budget integrates APBs developed by the advanced development community.
- Advanced Processing Builds-Tactical (APB (T)) products associated with AN/BYG-1 Release-To-Fleet 4Q 2003, 3Q 2004, 3Q 2006, 3Q 2007, 3Q 2008, and 3Q 2009.
- Advanced Processing Builds-Weapons (APB (W)) integration associated with AN/BYG-1 begins FY2005 and will be Released-To-Fleet bi-annually and concurrently with an annual APB(T) product. APB(W) are integrated bi-annually due to increased time for weapon certification and safety issues.
- Follow-On contract for both tactical and weapons control subsystems are planned for award in FY2008.
- This program has been tailored in accordance with the new DoD5000 directive to incorporate annual MDA production reviews.

F. MAJOR PERFORMERS:

   Raytheon Portsmouth, RI - Software Development for AN/BYG-1 weapon control subsystem - December 2002.
   General Dynamics (GD AIS) Fair Lakes, VA - Software Development for AN/BYG-1 tactical control system - December 2002.
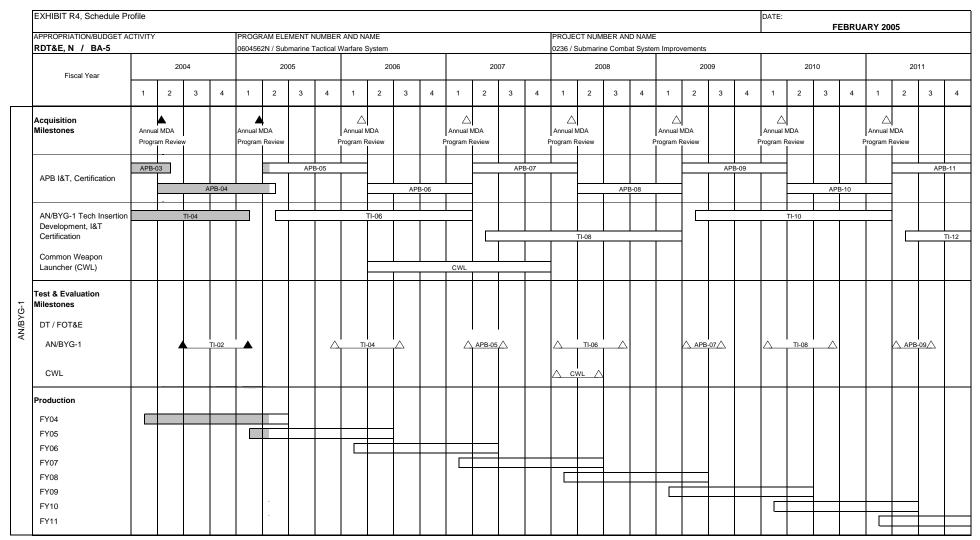   NUWC Newport, RI - Government Engineering

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CLASSIFICATION:

Exhibit R-3 Cost Analysis (page 1)												DATE: **FEBRUARY 2005**		
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA-5**			PROGRAM ELEMENT 0604562N/SUBMARINE TACTICAL WARFARE SYSTEM				PROJECT NUMBER AND NAME 0236/SSN COMB CONT SYS IMP (ENG)							
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
Multi-Tube Weapon Simulator	SBIR	Progeny	1.635	1.000								0.000	2.635	
AN/BYG-1 Tech Insertion	CPIF/CPAF	Raytheon Portsmouth, RI		5.333	10/03	8.316	10/04	7.386	10/05	7.193	10/06	CONT.	CONT.	
AN/BYG-1 Tech Insertion	CPIF/CPAF	General Dynamics (GD AIS)		5.202	10/03	5.962	10/04	7.251	10/05	6.976	10/06	CONT.	CONT.	
Government Engineering	WR	NUWC Newport, RI	54.601	2.635	Various	3.744	Various	3.671	Various	3.533	Various	CONT.	CONT.	
AN/BYG-1 Tech Insertion	FFRDC	MITRE	1.137	0.365	10/03	0.513	10/04	0.475	10/05	0.475	10/06	CONT.	CONT.	
AN/BYG-1	CPIF/CPAF	ANTEON		4.000	12/03	4.600	03/05						8.600	
Common Weapons Launcher	CPIF/CPAF	Competitive						4.100	10/05	13.800	10/06	CONT.	CONT.	
COTS Hardware & Software	CPFF	DDL Omni	8.500										8.500	
													0.000	
Subtotal Product Development			93.778	18.535		23.135		22.883		31.977		0.000	190.308	

Remarks:

	Contract	Award/Oblig
	AN/BYG-1	Dec 02

Development Support Equipment													0.000	
APB Software Integration	CPIF/CPAF	Raytheon Portsmouth, RI		4.970	10/03	7.299	10/04	5.668	10/05	7.452	10/06	CONT.	25.389	
APB Software Integration	CPIF/CPAF	General Dynamics (GD AIS)		4.847	10/03	7.118	10/04	5.528	10/05	7.268	10/06	CONT.	24.761	
APB Software Integration	WR	NUWC Newport, RI		2.454	Various	3.645	Various	2.799	Various	3.680	Various	CONT.	12.578	
Software Development (Mod 1-5)	Various	Various	36.679										36.679	
													0.000	
													0.000	
Subtotal Support			36.679	12.271		18.062		13.995		18.400		0.000	99.407	

Remarks:

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Exhibit R-3 Cost Analysis (page 2)													DATE: **FEBRUARY 2005**	
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA-5**			PROGRAM ELEMENT 0604562N/SUBMARINE TACTICAL WARFARE SYSTEM			PROJECT NUMBER AND NAME 0236/SSN COMB CONT SYS IMP (ENG)									
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	Various	Various	8.912	0.300	10/03	3.750	10/04	2.350	10/05	2.700	10/06	CONT.	CONT.	
Operational Test & Evaluation	Various	Various	7.669	0.100	10/03	2.250	10/04	1.151	10/05	1.600	10/06	CONT.	CONT.	
Test & Evaluation			1.295										1.295	
.													0.000	
													0.000	
													0.000	
													0.000	
Subtotal T&E			17.876	0.400		6.000		3.501		4.300		0.000	32.077	
Remarks:														
Contractor Engineering Support													0.000	
Government Engineering Support													0.000	
Program Management Support	CPFF	EG&G Arlington, VA	8.481	0.250	10/03	0.300	10/04	0.311	10/05	0.412	10/06	CONT.	CONT.	
Travel	PD	NAVSEA Arlington, VA	0.350									CONT.	0.350	
Labor (Research Personnel)													0.000	
SBIR Assessment													0.000	
Subtotal Management			8.831	0.250		0.300		0.311		0.412		0.000	10.104	
Remarks: Contract Award/Oblig EG&G Dec 01														
Total Cost			157.164	31.456		47.497		40.690		55.089		0.000	331.896	
Remarks:														

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Exhibit R-2a, RDTEN Budget Item Justification
(Exhibit R-2a, page 8 of 10)

EXHIBIT R4, Schedule Profile	DATE: **FEBRUARY 2005**

APPROPRIATION/BUDGET ACTIVITY
RDT&E, N / BA-5

PROGRAM ELEMENT NUMBER AND NAME
0604562N / Submarine Tactical Warfare System

PROJECT NUMBER AND NAME
0236 / Submarine Combat System Improvements

Fiscal Year: 2004 – 2011 (quarters 1-4 each)

Acquisition Milestones

Annual MDA Program Review (2004 Q2, 2005 Q1, 2006 Q1, 2007 Q1, 2008 Q1, 2009 Q2, 2010 Q2, 2011 Q2)

APB I&T, Certification: APB-03, APB-04, APB-05, APB-06, APB-07, APB-08, APB-09, APB-10, APB-11

AN/BYG-1 Tech Insertion Development, I&T Certification: TI-04, TI-06, TI-08, TI-10, TI-12

Common Weapon Launcher (CWL): CWL

Test & Evaluation Milestones

DT / FOT&E

AN/BYG-1: TI-02, TI-04, APB-05, TI-06, APB-07, TI-08, APB-09

CWL: CWL

Production

FY04, FY05, FY06, FY07, FY08, FY09, FY10, FY11

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AN/BYG-1

CLASSIFICATION:

Exhibit R-4a, Schedule Detail						DATE: **FEBRUARY 2005**		
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA-5**	PROGRAM ELEMENT 0604562N / Submarine Tactical Warfare System					PROJECT NUMBER AND NAME 0236 / Submarine Combat System Improvements		
Schedule Profile	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
AN/BYG-1 - APB03 Integration & Test, Certification	1Q - 2Q							
AN/BYG-1 (TI04) - Development	1Q - 4Q	1Q						
AN/BYG-1 (TI04) - MDA Review	2Q							
AN/BYG-1 - APB04 Integration & Test, Certification	2Q - 4Q	1Q						
AN/BYG-1 - TI00/TI02 DT/OT	2Q - 4Q	1Q						
AN/BYG-1 (TI06/TI02) - MDA Review		2Q						
AN/BYG-1 - APB05 Integration & Test, Certification		2Q - 4Q	1Q					
AN/BYG-1 (TI06) - Development		2Q - 4Q	1Q - 4Q	1Q				
AN/BYG-1 - TI04 DT/OT		4Q	1Q - 3Q					
AN/BYG-1 (APB06) - MDA Review			2Q					
AN/BYG-1 - APB06 Integration & Test, Certification			2Q - 4Q	1Q				
Common Weapon Launcher - Development			2Q - 4Q	1Q - 4Q				
AN/BYG-1 (TI08/APB07) - MDA Review				2Q				
AN/BYG-1 - APB07 Integration & Test, Certification				2Q - 4Q	1Q			
AN/BYG-1 - APB05 DT/OT				1Q - 3Q				
AN/BYG-1 (TI08) - Development				2Q - 4Q	1Q - 4Q	1Q		
AN/BYG-1 - TI06 DT/OT					1Q - 3Q			
CWL DT/OT					1Q - 2Q			
AN/BYG-1 (APB08) - MDA Review					2Q			
AN/BYG-1 - APB08 Integration & Test, Certification					2Q - 4Q	1Q		
AN/BYG-1 (TI10/APB09) - MDA Review						2Q		
AN/BYG-1 - APB09 Integration & Test, Certification						2Q - 4Q	1Q	
AN/BYG-1 - APB07 DT/OT						1Q - 3Q		
AN/BYG-1 (TI10) - Development						2Q - 4Q	1Q - 4Q	
AN/BYG-1 - TI08 DT/OT							1Q - 3Q	
AN/BYG-1 (APB10) - MDA Review							2Q	
AN/BYG-1 - APB10 Integration & Test, Certification							2Q - 4Q	
AN/BYG-1 (TI12/APB11) - MDA Review								2Q
AN/BYG-1 - APB11 Integration & Test, Certification								2Q - 4Q
AN/BYG-1 - APB09 DT/OT								2Q - 3Q
AN/BYG-1 (TI12) - Development								2Q - 4Q

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