

CLASSIFICATION:	UNCLASSIFIED
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EXHIBIT R-2, RDT&E BUDGET ITEM JUSTIFICATION	DATE May 2009
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APPROPRIATION/BUDGET ACTIVITY RDTEN/BA 5	R-1 ITEM NOMENCLATURE 0604562N/SUBMARINE TACTICAL WARFARE SYSTEM		
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COST (In Millions)	FY 2008	FY 2009	FY 2010
Total PE Cost	55.128	66.364	59.703
0236 / SSN Comb Cont Sys Imprvmt (ENG)	52.042	58.386	59.703
9999 / CONGRESSIONAL ADDS	3.086	7.978	0.000

A. MISSION DESCRIPTION:

Project Unit 0236: This program develops Commercial-Off-The-Shelf (COTS) based software and hardware upgrades to integrate improved tactical and weapons control capabilities for multiple submarine Classes (SSN 688I, SSGN, SEAWOLF, and VIRGINIA (Post Shakedown Availability)). The AN/BYG-1 is the combat control system common across submarine platforms which incorporates tactical control, weapon control and tactical Local Area Network (LAN) functions into a single development program. The hardware upgrades (technology insertions (TI's)) are developed on a biennial basis to provide improved capability and address COTS obsolescence. Funding also accommodates the annual integration of software Advanced Processing Builds (APBs) for 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 improved 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 torpedoes. 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.

This program also develops and tests a Common Weapon Launcher, a COTS-based software weapons launch capability for Virginia Class submarines. This upgrade provides a more reliable capability for launching missiles and torpedoes from submarines while providing the architecture to support the introduction of the next generation of payloads and sensors. This new design will also reduce the recurring costs of VA Class submarine weapon launch systems.

Project Units 9999 is comprised of FY08 & FY09 congressional adds for Automated Submarine Command and Control Center, Submarine Maintenance Automation and Communication System, Advanced Tactical Control System, Submarine Maintenance Automation and Communication System, Water Space Management Navigation Decision Aid and Submarine Environment for Evaluation and Development.

CLASSIFICATION:**UNCLASSIFIED****EXHIBIT R-2, RDT&E BUDGET ITEM JUSTIFICATION (CONTINUATION)**

DATE

May 2009

APPROPRIATION/BUDGET ACTIVITY

RDTEN/BA 5

R-1 ITEM NOMENCLATURE

0604562N/SUBMARINE TACTICAL WARFARE SYSTEM

B. PROGRAM CHANGE SUMMARY:

Funding:	FY 2008	FY 2009	FY 2010
FY09 President's Budget	55.728	58.592	55.902
FY10 President's Budget	55.128	66.364	59.703
Total Adjustments	-0.600	7.772	3.801
(U) Summary of Adjustments			
Congressional Rescissions	0.000	0.000	0.000
Congressional Adjustments	0.001	-0.180	0.000
SBIR/STTR/FTT Assessment	-0.533	0.000	0.000
Program Adjustments	-0.068	7.990	4.753
Rate/Misc Adjustments	0.000	-0.038	-0.952
Total	-0.600	7.772	3.801

C. OTHER PROGRAM FUNDING SUMMARY:

Related RDT&E:

PE 0204229N (Tomahawk & Tomahawk Mission Planning Center)

PE 0205632N (MK 48 ADCAP)

PE 0603561N (Advanced Submarine Systems Development)

PE 0604503N (SSN-688 and Trident Modernization)

PE 0604558N (New Design SSN)

Line Item No. and Name	FY 2008	FY 2009	FY 2010						Total Cost
OPN/BA-4 5420	100.871	86.872	105.299						293.042

D. ACQUISITION STRATEGY:

- This budget integrates APBs developed by the advanced development community.
- This program has been tailored in accordance with the new DoD5000 directive to incorporate annual MDA production reviews.
- Competitive contracts awarded in Dec 02 started the development of a combat control system which segregates tactical control from weapons control system.
- Advanced Processing Builds (APB) products associated with AN/BYG-1 Release-To- Fleet 4Q 2003, 3Q 2004, 3Q 2006, 3Q 2007, 3Q 2008, 3Q 2009 and 3Q 2010.
- Follow-On contracts for both tactical and weapons control subsystems are planned for award in FY2009.

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EXHIBIT R-2, RDT&E BUDGET ITEM JUSTIFICATION (CONTINUATION)		DATE May 2009
APPROPRIATION/BUDGET ACTIVITY RDTEN/BA 5	R-1 ITEM NOMENCLATURE 0604562N/SUBMARINE TACTICAL WARFARE SYSTEM	
<p>E. 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 subsystem - December 2002. NUWC Newport, RI - Government Engineering Progeny Systems, Manassas, VA - Common Weapon Launcher development</p>		

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EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION				DATE May 2009
APPROPRIATION/BUDGET ACTIVITY RD TEN/BA 5	PROGRAM ELEMENT NUMBER AND NAME 0604562N/SUBMARINE TACTICAL WARFARE SYSTEM			PROJECT NUMBER AND NAME 0236/SSN Comb Cont Sys Imprvmt (ENG)
COST (In Millions)	FY 2008	FY 2009	FY 2010	
Project Cost	55.128	66.364	59.703	
RDT&E Articles Qty	0	0	0	
A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:				
<p>Project Unit 0236: This program develops Commercial-Off-The-Shelf (COTS) based software and hardware upgrades to integrate improved tactical and weapons control capabilities for multiple submarine Classes (SSN 688I, SSGN, SEAWOLF, and VIRGINIA (Post Shakedown Availability)). The AN/BYG-1 is the combat control system common across submarine platforms which incorporates tactical control, weapon control and tactical Local Area Network (LAN) functions into a single development program. The hardware upgrades (technology insertions (TI's) are developed on a biennial basis to provide improved capability and address COTS obsolescence. Funding also accommodates the annual integration of software Advanced Processing Builds (APBs) for 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 improved 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 torpedoes. 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.</p> <p>This program also develops and tests a Common Weapon Launcher, a COTS-based software weapons launch capability for Virginia Class submarines. This upgrade provides a more reliable capability for launching missiles and torpedoes from submarines while providing the architecture to support the introduction of the next generation of payloads and sensors. This new design will also reduce the recurring costs of VA Class submarine weapon launch systems.</p>				

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EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION				DATE May 2009
APPROPRIATION/BUDGET ACTIVITY RDTEN/BA 5	PROGRAM ELEMENT NUMBER AND NAME 0604562N/SUBMARINE TACTICAL WARFARE SYSTEM	PROJECT NUMBER AND NAME 0236/SSN Comb Cont Sys Imprvmt (ENG)		
B. ACCOMPLISHMENTS/PLANNED PROGRAM:				
	FY 2008	FY 2009	FY 2010	
Advanced Processor Builds	22.189	29.395	25.030	
RDT&E Articles Quantity	0	0	0	
FY08: Support development of APB-09 into AN/BYG-1. Continue APB-07 integration into AN/BYG-1 baseline.				
FY09: Begin integration of APB-09 into AN/BYG-1. Complete APB-07 integration into AN/BYG-1 baseline. One capability for delivery will be the ability to operate the TOMAHAWK Weapon System at the SECRET level, while maintaining the ability to operate at the TOP SECRET level if the need arises.				
FY10: Support development of APB-11 into AN/BYG-1. Complete APB-09 integration into AN/BYG-1 baseline.				
	FY 2008	FY 2009	FY 2010	
AN/BYG-1 TI-06	3.081	0.000	0.000	
RDT&E Articles Quantity	0	0	0	
FY08: Complete development, integration and test of the next generation AN/BYG-1 (TI06) for SSN 688 Class submarines scheduled for delivery in FY08.				
	FY 2008	FY 2009	FY 2010	
AN/BYG-1 TI-08	14.221	13.919	3.183	
RDT&E Articles Quantity	0	0	0	
FY08: Continue development, integration and test of the next generation AN/BYG-1 (TI08) for SSN 688/Seawolf/Virginia Class submarines scheduled for initial delivery in FY09.				
FY09: Continue development, integration and test of the next generation AN/BYG-1 (TI08) for SSN 688/Seawolf/Virginia Class submarines scheduled for initial delivery in FY09.				
FY10: Complete development, integration and test of the next generation AN/BYG-1 (TI08) for SSN 688/Seawolf/Virginia Class submarines scheduled for final delivery in FY10.				
	FY 2008	FY 2009	FY 2010	
AN/BYG-1 TI-10	2.637	8.572	13.730	
RDT&E Articles Quantity	0	0	0	
FY08: Began engineering development process for selection and prototyping of new technologies for TI10.				
FY09: Continue development, integration and test of the next generation AN/BYG-1 (TI10) for SSN 688/SSGN/VA Class submarines. One capability for delivery will include hardware improvements to provide the Officer of the Deck improved situational awareness, particularly in the area of navigation and contact management.				
FY10: Continue development, integration and test of the next generation AN/BYG-1 (TI10) for SSN 688/SSGN/VA Class submarines.				
	FY 2008	FY 2009	FY 2010	
AN/BYG-1 TI-12	0.000	0.000	2.660	
RDT&E Articles Quantity	0	0	0	
FY10: Begin engineering development process for selection and prototyping of new technologies.				
	FY 2008	FY 2009	FY 2010	
Testing	4.000	7.000	4.000	

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EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION (CONTINUATION)				DATE May 2009
APPROPRIATION/BUDGET ACTIVITY RDTEN/BA 5	PROGRAM ELEMENT NUMBER AND NAME 0604562N/SUBMARINE TACTICAL WARFARE SYSTEM	PROJECT NUMBER AND NAME 0236/SSN Comb Cont Sys Imprmnt (ENG)		
RDT&E Articles Quantity		0	0	0
FY08: Complete OT for AN/BYG-1 TI06 and APB-06 and begin planning for OT for AN/BYG-1 TI-08 and APB-07 on SSN 688 Class/Seawolf/VA Class submarines.				
FY09: Begin OT for AN/BYG-1 TI08 and APB-07 on 688 Class/SSGN/Seawolf/VA Class submarines.				
FY10: Complete OT for AN/BYG-1 TI08 and APB-07 on 688 Class/SSGN/Seawolf/VA Class submarines. Begin OT for AN/BYG-1 APB-09 on 688 Class/SSGN/VA Class submarines.				
		FY 2008	FY 2009	FY 2010
Information Assurance (IA)		0.000	0.000	6.100
RDT&E Articles Quantity		0	0	0
FY10: Develop and Integrate IA Toolkit and conduct IA Certification Testing on BYG-1 TI-10.				
		FY 2008	FY 2009	FY 2010
Common Weapon Launcher (CWL)		9.000	7.478	5.000
RDT&E Articles Quantity		0	0	0
FY08: Continue integration of CWL with AN/BYG-1 TI-10 on VA Class submarines.				
FY09: Continue integration of CWL with AN/BYG-1 TI-10 on VA Class submarines.				
FY10: Complete integration of CWL with AN/BYG-1 TI-10 on VA Class submarines.				

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EXHIBIT R-3, RDT&E PROJECT COST ANALYSIS									DATE May 2009		
APPROPRIATION/BUDGET ACTIVITY RDTEN/BA 5		PROGRAM ELEMENT NUMBER AND NAME 0604562N/SUBMARINE TACTICAL WARFARE SYSTEM					PROJECT NUMBER AND NAME 0236/SSN Comb Cont Sys Imprvmt (ENG)				
Cost Categories	Contract Method & Type	Performing Activity & Location	Total PY Cost (\$000)	FY 2009 Cost (\$000)	FY 2009 Award Date	FY 2010 Cost (\$000)	FY 2010 Award Date				
Multi-Tube Weapon Simulator	SBIR	Progeny	2.635	0.000		0.000					
AN/BYG-1 Tech Insertion	CPIF/CPAF	Raytheon Portsmouth, RI	38.113	10.201	OCT-08	9.503	OCT-09				
AN/BYG-1 Tech Insertion	CPIF/CPAF	General Dynamics (GDAIS)	34.269	7.241	OCT-08	7.640	OCT-09				
Government Engineering	WX	NUWC Newport, RI	66.221	2.255	OCT-08	2.430	OCT-09				
AN/BYG-1 Tech Insertion	FFRDC	MITRE	2.429	0.000		0.000					
AN/BYG-1 Tech Insertion	CPIF/CPAF	ANTEON	6.000	0.000		0.000					
COTS Hardware & Software	CPFF	DDL Omni	8.500	0.000		0.000					
Common Weapon Launcher	CPAF	Progeny	26.892	6.500	JAN-09	5.000	JAN-10				
Information Assurance	CPAF	Progeny	0.000	0.000		6.100	JAN-10				
Subtotal Product Development			185.059	26.197		30.673					
Remarks:											
APB Software Integration	CPIF/CPAF	Raytheon Portsmouth, RI	31.553	11.460	OCT-08	10.844	OCT-09				
APB Software Integration	CPIF/CPAF	General Dynamics (GDAIS)	30.147	9.088	OCT-08	8.596	OCT-09				
APB Software Integration	WX	NUWC Newport, RI	18.541	5.847	OCT-08	5.590	OCT-09				
Software Development	Various	Various	36.679	0.000		0.000					
Subtotal Support Costs			116.920	26.395		25.030					
Remarks:											
Developmental Test & Evaluation	WX	NUWC	20.312	3.500	OCT-08	2.300	OCT-09				
Operational Test & Evaluation	WX	COMOPTEVFOR	14.469	2.500	OCT-08	1.700	OCT-09				
Test & Evaluation	Various	Various	1.295	0.000		0.000					
Subtotal Test and Evaluation			36.076	6.000		4.000					
Remarks:											
Program Management Support	CPFF	EG&G Arlington, VA	9.330	0.000		0.000					
Travel	PD	NAVSEA Arlington, VA	0.370	0.000		0.000					
Subtotal Management Services			9.700	0.000		0.000					
Remarks:											

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Cost Categories	Contract Method & Type	Performing Activity & Location	Total PY Cost (\$000)	FY 2009 Cost (\$000)	FY 2009 Award Date	FY 2010 Cost (\$000)	FY 2010 Award Date				
Total Cost			347.755	58.592		59.703					

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EXHIBIT R-4, SCHEDULE PROFILE

DATE

May 2009

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 Imprmnt (ENG)

Fiscal Year	2008				2009				2010			
	1	2	3	4	1	2	3	4	1	2	3	4
Acquisition Milestones				▲ Annual MDA Program Review				▲ Annual MDA Program Review				▲ Annual MDA Program
APB I&T, Certification				APB-07				APB-09				APB-11
Development, I&T Certification				TI-08				TI-10				TI-12
Common Weapon Launcher (CWL)				CWL								
Test & Evaluation Milestones												
DT / FOT&E												
AN/BYG-1	▲	TI-06 APB-06 (DT/OT)		▲				▲	TI-08 APB-07 (DT/OT)		▲	▲ APB-09 (DT/OT)
Production												
		▲	Contract Award					▲	First Delivery			
					▲	Contract Award					▲	First Delivery
											▲	Contract Award

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EXHIBIT R-4a, SCHEDULE DETAIL						DATE May 2009		
APPROPRIATION/BUDGET ACTIVITY RD TEN/BA 5		PROGRAM ELEMENT NUMBER AND NAME 0604562N/SUBMARINE TACTICAL WARFARE SYSTEM			PROJECT NUMBER AND NAME 0236/SSN Comb Cont Sys Imprvmt (ENG)			
Schedule Profile		FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014
Common Weapon Launcher - Development		1Q-4Q	1Q-4Q	1Q-4Q				
AN/BYG-1 APB07 Integration & Test, Certification		1Q-4Q	1Q					
AN/BYG-1 APB06/TI06 DT/OT		1Q-2Q						
AN/BYG-1 TI08 - Development		1Q-4Q	1Q-3Q					
AN/BYG-1 APB07/TI08 DT/OT			4Q	1Q				
AN/BYG-1 APB09 Integration & Test, Certification		4Q	1Q-4Q	1Q-3Q				
AN/BYG-1 APB09 MDA Review			4Q					
AN/BYG-1 TI10 Development		4Q	1Q-4Q	1Q-4Q				
AN/BYG-1 APB11 Integration & Test, Certification				4Q				
AN/BYG-1 APB09 DT/OT				4Q				
AN/BYG-1 TI12 Development				4Q				

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B. ACCOMPLISHMENTS/PLANNED PROGRAM:			
	FY 2008	FY 2009	FY 2010
9850A Automated Sub Command and Control Center	1.543	0.000	0.000
RDT&E Articles Quantity	0	0	0
The congressional add will be used to support the insertion of knowledge management and automation technologies into the AN/BYG-1 combat system modernization efforts. This additional technology will allow for a reduced number of crew members to safely perform the actions required in the submarine attack center.			
	FY 2008	FY 2009	FY 2010
9D85A Advanced Tactical Control System	0.000	1.596	0.000
RDT&E Articles Quantity	0	0	0
The congressional add automatically fuses contact data to provide the commanding officer and crew a clear and accurate tactical picture. This will enable the submarine commanding officer and crew to make better, faster tactical decision while at sea.			
	FY 2008	FY 2009	FY 2010
9D86A Submarine Environment for Evaluation and Development	0.000	2.393	0.000
RDT&E Articles Quantity	0	0	0
The congressional add will provide a low-cost test bed for industry and academia to create and evaluate innovative ideas and to integrate their products into currently deployed and conceptual systems.			
	FY 2008	FY 2009	FY 2010
9D87A Water Space Management Navigation Decision Aid	0.000	2.393	0.000
RDT&E Articles Quantity	0	0	0
The congressional add will provide a navigational decision aide and message editor that automatically drafts standard US Navy submarine planning and asset assignment messages (e.g., SUBNOTES, OPSKDS, MODUS) for transmission, and also converts these messages into 2-dimensional and 3-dimensional graphic renderings of an asset's waterspace for enhanced navigational awareness and contact avoidance.			
	FY 2008	FY 2009	FY 2010
9A50A Sub Maintenance Automation and Communication	1.543	1.596	0.000
RDT&E Articles Quantity	0	0	0
The congressional add will be used to expand the Submarine Maintenance Free Operating Period (MFOP) effort, designed to automate scheduled preventive maintenance events, potentially reducing the weekly allocation of man-hours dedicated to maintenance.			