CLASSIFICATION:

					DATE:	
					February 20	06
			R-1 ITEM NOMEN	CLATURE		
BA-5			Submarine Tactica	l Warfare System/	0604562N	
FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
46.389	46.024	51.656	53.578	54.681	55.945	57.081
45.455	40.074	51.656	53.578	54.681	55.945	57.081
0.934						
	5.950					
	FY 2005 46.389 45.455	FY 2005 FY 2006 46.389 46.024 45.455 40.074 0.934	BA-5 FY 2005 FY 2006 FY 2007 46.389 46.024 51.656 45.455 40.074 51.656	BA-5 Submarine Tactica FY 2005 FY 2006 FY 2007 FY 2008 46.389 46.024 51.656 53.578 45.455 40.074 51.656 53.578 0.934 0.934 0.934	R-1 ITEM NOMENCLATURE Submarine Tactical Warfare System/s FY 2005 FY 2006 FY 2007 FY 2008 FY 2009 46.389 46.024 51.656 53.578 54.681 45.455 40.074 51.656 53.578 54.681	R-1 ITEM NOMENCLATURE Submarine Tactical Warfare System/0604562N FY 2005 FY 2006 FY 2007 FY 2008 FY 2009 FY 2010 46.389 46.024 51.656 53.578 54.681 55.945 45.455 40.074 51.656 53.578 54.681 55.945 0.934

Defense Emergency Response Funds (DERF) Funds: Not Applicable

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 multiple submarine Classes (SSN688, 688I, SSGN, SEAWOLF, and VIRGINIA (Post Shakedown Availability)). 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 accommodates 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.

This program also develops and tests a Common Weapon Launcher (CWL), a COTS-based software weapons launch capability for all SSN688/688I and Virginia Class submarines. This upgrade provides a more reliable capability for launching missiles and torpedos from submarines while providing the architecture to support the introduction of the next generation of payloads and sensors.

Funding was provided in Fiscal Year 2005 to explore the feasibility of an alternative concept to the current process for submarine maintenance, training and logistics infrastructure for the AN/BYG-1 system. A submarine maintenance free operating period would minimize the need for maintenance support products, maintenance training/trainers and maintenance and logistics infrastructures by developing a highly available submarine combat system. At-sea maintenance would be by keyboard action only and Original Equipment Manufacturers would provide pier-side maintenance and supply support. This would allow operators to focus on system employment versus system maintenance, while harnessing commercial processes and infrastructure for maintenance training and supply support.

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification			DATE:
			February 2006
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND N	AME
RDT&E, N /BA-5	0604562N/SUBMARINE TACTICAL WARFARE SYSTEM	0236/SSN COMB CONT SY	S IMP (ENG)
	<u> </u>		

B. Accomplishments/Planned Program (Cont.)

AN/BYG-1 TI00/02	FY 05	FY 06	FY 07
Accomplishments/Effort/Subtotal Cost	3.000	0.000	0.000
RDT&E Articles Quantity			

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

AN/BYG-1 TI04	FY 05	FY 06	FY 07
Accomplishments/Effort/Subtotal Cost	16.500	6.100	0.500
RDT&E Articles Quantity			

- FY05: Continued development, integration and test of the next generation AN/BYG-1 (Tl04) for SSN 688I/SSN 21 Class submarines scheduled for delivery in FY05.
- FY06: Continue development, integration and test of the next generation AN/BYG-1 (TI04) for SSN 688 Class/ SSGN submarines scheduled for delivery in FY06.
- FY07: Complete development, integration and test of the next generation AN/BYG-1 (Tl04) for 688 Class/SSGN submarines scheduled for delivery in FY07.

AN/BYG-1 TI06	FY 05	FY 06	FY 07
Accomplishments/Effort/Subtotal Cost	4.083	11.233	11.188
RDT&E Articles Quantity			

- FY05: Began engineering development process for selection and protyping of new technologies for TI06.
- FY06: Continue development, integration and test of the next generation AN/BYG-1 (TI06) for 688/688I Class submarines scheduled for delivery in FY07.
- FY07: Continue development, integration and test of the next generation AN/BYG-1 (TI06) for 688/688I Class submarines scheduled for delivery in FY07.

CLASSIFICATION:

AN/BYG-1 TI08

RDT&E Articles Quantity

Accomplishments/Effort/Subtotal Cost

EXHIBIT R-2a, RDT&E Project Justification			DATE:
			February 2006
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND I	NAME
RDT&E, N /BA-5	0604562N/SUBMARINE TACTICAL WARFARE SYSTEM	0236/SSN COMB CONT SY	/S IMP (ENG)
B. Accomplishments/Planned Program (Cont.)			

FY 05

0.000

FY 06

0.000

FY 07

4.957

FY07: Begin engineering development process for selection and protyping of new technologies for TI08 for 688/VA Class/SSGN/SSN 21 Class submarines.

Advanced Processor Builds	FY 05	FY 06	FY 07
Accomplishments/Effort/Subtotal Cost	15.872	15.189	16.871
RDT&E Articles Quantity			

FY05: Began integration of APB(T)-05 and APB(W)-04 into BYG-1. Completed APB-04 integration into AN/BYG-1 baseline.

FY06: Begin integration of APB(T)-06 and APB(W)-05/06 into BYG-1. Complete APB-05 integration into AN/BYG-1 baseline.

FY07: Begin integration of APB(T)-07 and APB(W)-07 into BYG-1. Complete APB-06 integration into AN/BYG-1 baseline.

Testing	FY 05	FY 06	FY 07
Accomplishments/Effort/Subtotal Cost	6.000	3.500	4.300
RDT&E Articles Quantity			

FY05: Planned and began conduct of Development Testing of AN/BYG-1 TI04 on 688I/SSN 21 Class submarines.

FY06: Continue FOT&E for AN/BYG-1 TI04 on SSN 688I Class/SSGN/SSN 21 Class submarines. Complete FOT&E on 688I Class submarines.

FY07: Complete FOT&E for AN/BYG-1 APB-05 on 688 Class/SSGN/SSN 21 Class submarines. Complete FOT&E on SSN 21 and SSGN Class submarines.

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justifica	ition			DATE: February 2006	
PPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAM	//E PR	OJECT NUMBER AND N		
DT&E, N /BA-5	0604562N/SUBMARINE TACTICAL WARF	ARE SYSTEM 02	36/SSN COMB CONT SY	'S IMP (ENG)	
. Accomplishments/Planned Program (Cont.)					
Common Weapon Launcher	FY	05	FY 06	FY 07	
Accomplishments/Effort/Subtotal Cost RDT&E Articles Quantity	0.0	000	4.052	13.840	
RDT&E Articles Quantity					
FY06-FY07: Develop, integrate and to	est Common Weapon Launcher (CWL).				
	• • • • • • • • • • • • • • • • • • • •				
	FY	05	FY 06	FY 07	
Accomplishments/Effort/Subtotal Cost					
RDT&E Articles Quantity					
	FY	05	FY 06	FY 07	
Accomplishments/Effort/Subtotal Cost	1.1	05	1 1 00	1101	
RDT&E Articles Quantity					
		,		1	

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification		DATE: February 2006
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND NAME
RDT&E, N / BA-5	0604562N/SUBMARINE TACTICAL WARFARE SYSTE	M 0236/SSN COMB CONT SYS IMP (ENG)
C. PROGRAM CHANGE SUMMARY:		
Funding: FY2006 President Budget FY2007 President Budget Total Adjustments	47.497 40 45.455 40	8006 FY 2007 690 55.089 .074 51.656 .616 -3.433
Summary of Adjustments: Programmatic/Other Adjustments Execution Realignments Inflation Fuel Rates Pay Rates Rescissions/Reductions TOTAL:	-1.042 -1.000	-0.670 0.245 0.055 0.035 616 -3.098 616 -3.433
Schedule: - None		
Technical: - None		
	D. 4 OLIOPPINO LIGT. III. N	

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project	Justification		DATE:
			February 2006
APPROPRIATION/BUDGET ACTIVIT	Υ	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND NAME
RDT&E, N /	BA-5	0604562N/SUBMARINE TACTICAL WARFAF	E SYSTEM 0236/SSN COMB CONT SYS IMP (ENG)
	· ·		

D. OTHER PROGRAM FUNDING SUMMARY:

To Total FY 2005 FY 2006 FY 2007 FY 2008 FY 2009 FY 2010 FY 2011 Complete Cost Line Item No. & Name OPN/BA-4 5420 105.309 CONT. 111.226 132.072 86.876 98.046 106.799 113.303 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 began 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.
- A competitive Phase 3 Small Business & Innovative Research (SBIR) contract was awarded for the CWL development.

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

Progeny Systems, VA - CWL, Information Assurance (IA) and Multi-tube Weapon Simulator (MTWS) Developer

CLASSIFICATION:

Multi-Tube Weapon Simulator AN/BYG-1 Tech Insertion AN/BYG-1 Tech Insertion Government Engineering		PROGRAM E 0604562N/SU Performing Activity & Location Progeny	BMARINE TACTI Total PY s			PROJECT NU	JMBER AND N	Februar NAME	y 2006			
RDT&E, N / BA-5 Cost Categories Multi-Tube Weapon Simulator AN/BYG-1 Tech Insertion AN/BYG-1 Tech Insertion Government Engineering	Contract Method & Type SBIR CPIF/CPAF	0604562N/SU Performing Activity & Location	BMARINE TACTI Total PY s				JMBER AND N	IAME				
Cost Categories Multi-Tube Weapon Simulator AN/BYG-1 Tech Insertion AN/BYG-1 Tech Insertion Government Engineering	Method & Type SBIR CPIF/CPAF	Performing Activity & Location	Total PY s									
Multi-Tube Weapon Simulator AN/BYG-1 Tech Insertion AN/BYG-1 Tech Insertion Government Engineering	Method & Type SBIR CPIF/CPAF	Activity & Location	PY s			0236/SSN CC	MB CONT SY FY 06		FY 07	1	T	ı
Multi-Tube Weapon Simulator AN/BYG-1 Tech Insertion AN/BYG-1 Tech Insertion Government Engineering	& Type SBIR CPIF/CPAF	Location		FY 05	FY 05 Award	FY 06	Award		Award	Cost to	Total	Target Value
Multi-Tube Weapon Simulator AN/BYG-1 Tech Insertion AN/BYG-1 Tech Insertion Government Engineering	SBIR CPIF/CPAF	Progeny	Cost		Date	Cost	Date	Cost	Date	Complete	Cost	of Contract
AN/BYG-1 Tech Insertion Government Engineering			2.635							0.000	2.635	
Government Engineering	CPIF/CPAF	Raytheon Portsmouth, RI	5.333	9.306	10/04	8.347	10/05	8.028	10/06	CONT.	CONT.	
0 0		General Dynamics (GD AIS)	5.202	8.969	10/04	7.992	10/05	6.304	10/06	CONT.	CONT.	
AN/BYG-1 Tech Insertion	WR	NUWC Newport, RI	57.236	2.531	Various	0.869	Various	2.213	Various	CONT.	CONT.	
	FFRDC	MITRE	1.502	0.475	10/04	0.125	02/06	0.100	10/06	CONT.	CONT.	
AN/BYG-1 Tech Insertion	CPIF/CPAF	ANTEON	4.000	2.000							6.000	
Common Weapon Launcher	CPAF	Progeny				4.052	01/06	13.840			17.892	
COTS Hardware & Software	CPFF	DDL Omni	8.500								8.500	
											0.000	
Subtotal Product Development			112.313	23.281		21.385		30.485		0.000	187.464	
Development Support Equipment											0.000	
	CPIF/CPAF	Raytheon Portsmouth, RI	4.970	6.428	10/04	6.152	10/05	6.833	10/06	CONT.	0.000 24.383	
APB Software Integration	CPIF/CPAF CPIF/CPAF	Raytheon Portsmouth, RI General Dynamics (GD AIS)	4.970 4.847	6.428 6.270	10/04 10/04	6.152 6.001		6.833 6.664	10/06 10/06	CONT. CONT.		
APB Software Integration APB Software Integration		- '					10/05				24.383	
APB Software Integration APB Software Integration	CPIF/CPAF	General Dynamics (GD AIS)	4.847	6.270	10/04	6.001	10/05	6.664	10/06	CONT.	24.383 23.782	
APB Software Integration APB Software Integration APB Software Integration	CPIF/CPAF	General Dynamics (GD AIS)	4.847	6.270	10/04	6.001	10/05	6.664	10/06	CONT.	24.383 23.782 12.038	
APB Software Integration APB Software Integration APB Software Integration	CPIF/CPAF WR	General Dynamics (GD AIS) NUWC Newport, RI	4.847 2.454	6.270	10/04	6.001	10/05	6.664	10/06	CONT.	24.383 23.782 12.038 0.000	

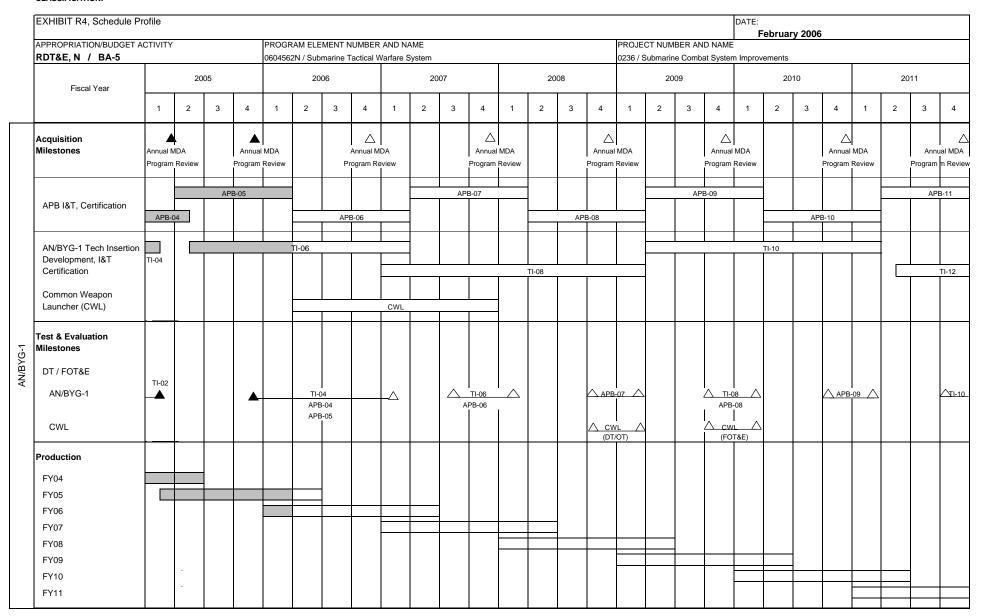
CLASSIFICATION:

										DATE:					
Exhibit R-3 Cost Analysis (pag	e 2)										uary 2000	6			
APPROPRIATION/BUDGET ACTIVI	TY		PROGRAM E	LEMENT				PROJECT	NUMBER ANI	D NAME					
RDT&E, N / BA-5			0604562N/SU	JBMARIN	E TAC	TICAL WARF		И 0236/SSN (SYS IMP (EN					
Cost Categories	Contract	Performing		Total			FY 05		FY 06		FY 07				
	Method	Activity &		PY s		FY 05	Award	FY 06	Award	FY 07	Award		Cost to	Total	Target Value
	& Type	Location		Cost		Cost	Date	Cost	Date	Cost	Date		Complete	Cost	of Contract
Developmental Test & Evaluation	Various	Various			9.212	3.750		2.3				/06	CONT.	CONT.	
Operational Test & Evaluation	Various	Various			7.769	2.250	10/04	1.1	50 10/05	1.	.600 10	/06	CONT.	CONT.	
Test & Evaluation	Various	Various			1.295									1.295	
														0.000	
														0.000	
														0.000	
														0.000	
Subtotal T&E					18.276	6.000		3.5	00	4	.300		0.000	32.076	
Contractor Engineering Support														0.000	
Government Engineering Support														0.000	
Program Management Support	CPFF	EG&G Arlingto	n, VA		8.731	0.302	10/04	0.0	00	0	.000		CONT.	CONT.	
Travel	PD	NAVSEA Arling	gton, VA		0.350								CONT.	0.350	
Labor (Research Personnel)														0.000	
SBIR Assessment														0.000	
Subtotal Management					9.081	0.302		0.0	00	0	.000		0.000	9.383	
Remarks:															
Total Cost				18	38.620	45.455		40.0	74	51	.656		0.000	325.804	
Remarks:															

R-1 SHOPPING LIST - Item No. 116

-5.95042 UNCLASSIFIED

CLASSIFICATION:



CLASSIFICATION:

Exhibit R-4a, Schedule Detail						DATE:	
						February 2	2006
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMEN	NT			PROJECT NUME		
RDT&E, N / BA-5	0604562N / Submari	ne Tactical Warfa	re System		0236 / Submarine	e Combat System	Improvements
Schedule Profile	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
AN/BYG-1 (TI04) - Development	1Q						
AN/BYG-1 (TI06/APB05) - MDA Review	4Q						
AN/BYG-1 - APB05 Integration & Test, Certification	2Q - 4Q	1Q					
AN/BYG-1 (TI06) - Development	2Q - 4Q	1Q - 4Q	1Q				
AN/BYG-1 - TIÓ4 DT/OT	4Q	1Q - 4Q	1Q				
AN/BYG-1 (APB06) - MDA Review		4Q					
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			4Q				
AN/BYG-1 - APB07 Integration & Test, Certification			2Q - 4Q	1Q			
AN/BYG-1 - APB06 DT/OT			3Q - 4Q	1Q			
AN/BYG-1 (TI08) - Development			1Q - 4Q	1Q - 4Q	1Q		
AN/BYG-1 - TI06 DT/OT			3Q - 4Q	1Q			
CWL DT/OT				4Q	1Q		
AN/BYG-1 (APB08) - MDA Review				4Q	• • • • • • • • • • • • • • • • • • • •		
AN/BYG-1 - APB08 Integration & Test, Certification				2Q - 4Q	1Q		
AN/BYG-1 (TI10/APB09) - MDA Review				20 10	4Q		
AN/BYG-1 - APB09 Integration & Test, Certification					2Q - 4Q	1Q	1
AN/BYG-1 - APB07 DT/OT				4Q	1Q	100	
AN/BYG-1 (TI10) - Development				100	2Q - 4Q	1Q - 4Q	1Q
AN/BYG-1 - TI08 DT/OT					4Q	1Q	100
CWL FOT&E					4Q	1Q	
AN/BYG-1 (APB10) - MDA Review					1.3	4Q	
AN/BYG-1 - APB10 Integration & Test, Certification						2Q - 4Q	1Q
AN/BYG-1 (TI12/APB11) - MDA Review						2Q 1Q	4Q
AN/BYG-1 - APB11 Integration & Test, Certification							2Q - 4Q
AN/BYG-1 - APB09 DT/OT					+	4Q	10
AN/BYG-1 (TI12) - Development						74	2Q - 4Q
7.17 Di T (1112) Dovolopinone					+		24 74
							
							
							
					+		

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification			DATE: February 2006
PROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND N	
T&E, N / BA-5	0604562N/SUBMARINE TACTICAL WARFARE S	YSTEN 9999/Congressional Plus-U	ps : VARIOUS
CONGRESSIONAL PLUS-UPS:			
	FY 06		
1950C			
Submarine Open Architecture Technology Insertion	2.500		
FY06: Re-engineer and migrate unique military stand	dandara and a factor of a section of a few and a section of a section		and the street and the book and a street and the street
		'	ronic subsystems.
	T EV 06	, 	T
9850N	FY 06		
9850N Automated Submarine Command and Control Cente	1.750		
	n 1.750 d to accelerate hardware and software production, i		
Automated Submarine Command and Control Cente Transition weapons launch technology efforts require	r 1.750 ed to accelerate hardware and software production, i Submarines.		
Automated Submarine Command and Control Cente Transition weapons launch technology efforts require Improvements for both Virginia Class and In-Service	n 1.750 d to accelerate hardware and software production, i		
Automated Submarine Command and Control Cente Transition weapons launch technology efforts require	r 1.750 ed to accelerate hardware and software production, i Submarines.		