Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Navy											Date: May 2017	
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 5: *System Development & Demonstration (SDD)*						**R-1 Program Element (Number/Name)** PE 0604562N I *Submarine Tactical Warfare System*						
COST ($ in Millions)	**Prior Years**	**FY 2016**	**FY 2017**	**FY 2018 Base**	**FY 2018 OCO**	**FY 2018 Total**	**FY 2019**	**FY 2020**	**FY 2021**	**FY 2022**	**Cost To Complete**	**Total Cost**
Total Program Element	540.261	51.054	43.160	50.850	-	50.850	62.064	64.991	66.284	67.568	Continuing	Continuing
0236: *SSN Comb Cont Sys Imprvmnt (ENG)*	540.261	41.882	43.160	50.850	-	50.850	62.064	64.991	66.284	67.568	Continuing	Continuing
9999: *Congressional Adds*	0.000	9.172	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	9.172

A. Mission Description and Budget Item Justification

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-688, SSGN, SEAWOLF, SSBN and VIRGINIA (Post Shakedown Availability)). The AN/BYG-1 is the combat control system common across submarine platforms which incorporates tactical control, payload control, and tactical Local Area Network (LAN) functions into a single development program. AN/BYG-1 allows the submarine to rapidly update the ship safety tactical picture, integrate the common tactical picture into the battlegroup, improve torpedo interfaces, and provide Tactical TOMAHAWK (TOMAHAWK Block IV) capability. The hardware upgrades, Technology Insertions (TI) are developed on a biennial basis to provide improved capability and address COTS obsolescence. Funding also accommodates the biennial integration of software Advanced Processing Builds (APB) for both tactical control (APB(T)) and payload control (APB(P)) subsystems. The tactical control integration effort incorporates the integration of other sensor (ESM, sonar, radar, etc.) inputs to provide a common operational picture and improved situational awareness in an information assurance (IA) compliant environment. The Weapon Control development effort described in PB-16 has been renamed Payload Control to account for non-weaponized unmanned vehicles. The payload control development effort provides improvements to the payloads control subsystem based on improvements to missiles and torpedoes as well as development of a modernized Payload Control System (PCS) architecture to support various payload such as, but not limited to, Modular Undersea Heavyweight Vehicle (MUHV), Unmanned Undersea Vehicles, Unmanned Aerial Systems (UAS), torpedoes, and Sub Launched Mobile Mines (SLMM). Provides funding for the development of Payloads Launch System, Multi-tube Weapons System (MTWS), Information Assurance (IA) system, Onboard Team Trainer (OBTT), and Command, Control, Computer and Intelligence Maintenance Tool (C3IMT). FY 18 adds development of a Common Infrastructure Services (CIS) subsystem. This involves integration of Onboard Team Trainer - Master Controller (OBTT - MC) & Command, Control, Computer and Intelligence Maintenance Tool (C3IMT)/Inter-Subsystem Monitoring Tool (ISMT) efforts as well as other common services within SWFTS. CIS will be an independent subsystem with its own software development and testing efforts, requiring additional funding to complete product delivery to platforms.

FY18 also integrates additional Tactical Data Link (TDL) capabilities for Command & Control situational awareness. In FY19, additional R&D effort to develop WCS architecture, support MK48, APB 5+, and APB 6 efforts as well as development of CyberSafe Controls.

Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Navy				Date: May 2017	

Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 5: *System Development & Demonstration (SDD)*			R-1 Program Element (Number/Name) PE 0604562N *I Submarine Tactical Warfare System*		

B. Program Change Summary ($ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Previous President's Budget	52.713	43.160	49.629	-	49.629
Current President's Budget	51.054	43.160	50.850	-	50.850
Total Adjustments	-1.659	0.000	1.221	-	1.221
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-1.659	0.000			
• Program Adjustments	0.000	0.000	1.250	-	1.250
• Rate/Misc Adjustments	0.000	0.000	-0.029	-	-0.029

Congressional Add Details ($ in Millions, and Includes General Reductions)	FY 2016	FY 2017
Project: 9999: *Congressional Adds*		
Congressional Add: *Combat and Weapons Systems Modernization*	9.172	0.000
Congressional Add Subtotals for Project: 9999	9.172	0.000
Congressional Add Totals for all Projects	9.172	0.000

Change Summary Explanation
Added $1.250 million of FY 2018 funding for integration of additional Tactical Data Link (TDL) capabilities for Command & Control situational awareness.

Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy		Date: May 2017

Appropriation/Budget Activity 1319 I 5	R-1 Program Element (Number/Name) PE 0604562N I *Submarine Tactical Warfare System*	Project (Number/Name) 0236 I *SSN Comb Cont Sys Imprvmnt (ENG)*

COST ($ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
0236: *SSN Comb Cont Sys Imprvmnt (ENG)*	540.261	41.882	43.160	50.850	-	50.850	62.064	64.991	66.284	67.568	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

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-688, SSGN, SEAWOLF, SSBN and VIRGINIA (Post Shakedown Availability)). The AN/BYG-1 is the combat control system common across submarine platforms which incorporates tactical control, payload control, and tactical Local Area Network (LAN) functions into a single development program. AN/BYG-1 allows the submarine to rapidly update the ship safety tactical picture, integrate the common tactical picture into the battlegroup, improve torpedo interfaces, and provide Tactical TOMAHAWK (TOMAHAWK Block IV) capability. The hardware upgrades, Technology Insertions (TI) are developed on a biennial basis to provide improved capability and address COTS obsolescence. Funding also accommodates the biennial integration of software Advanced Processing Builds (APB) for both tactical control (APB(T)) and payload control (APB(P)) subsystems. The tactical control integration effort incorporates the integration of other sensor (ESM, sonar, radar, etc.) inputs to provide a common operational picture and improved situational awareness in an information assurance (IA) compliant environment. The Weapon Control development effort described in PB-16 has been renamed Payload Control to account for non-weaponized unmanned vehicles. The payload control development effort provides improvements to the payloads control subsystem based on improvements to missiles and torpedoes as well as development of a modernized Payload Control System (PCS) architecture to support various payload such as, but not limited to, Modular Undersea Heavyweight Vehicle (MUHV), Unmanned Undersea Vehicles, Unmanned Aerial Systems (UAS), torpedoes, and sub launched mobile mines (SLMM). Provides funding for the development of Payloads Launch System, Multi-tube Weapons System (MTWS), Information Assurance (IA) system, Onboard Team Trainer (OBTT), and Command, Control, Computer and Intelligence Maintenance Tool (C3IMT). FY 18 adds development of a Common Infrastructure Services (CIS) subsystem. This involves integration of Onboard Team Trainer - Master Controller (OBTT - MC) & Command, Control, Computer and Intelligence Maintenance Tool (C3IMT)/Inter-Subsystem Monitoring Tool (ISMT) efforts as well as other common services within SWFTS. CIS will be an independent subsystem with its own software development and testing efforts, requiring additional funding to complete product delivery to platforms.

FY18 also integrates additional Tactical Data Link (TDL) capabilities for Command & Control situational awareness. In FY19, additional R&D effort to develop WCS architecture, support MK48, APB 5+, and APB 6 efforts as well as development of CyberSafe Controls.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)

	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Title: Advanced Processing Builds	18.955	15.735	20.945	0.000	20.945
Articles:	-	-	-	-	-
FY 2016 Accomplishments:					

Exhibit R-2A, **RDT&E Project Justification:** FY 2018 Navy		**Date:** May 2017
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604562N / *Submarine Tactical Warfare System*	**Project (Number/Name)** 0236 / *SSN Comb Cont Sys Imprvmnt (ENG)*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	**FY 2016**	**FY 2017**	**FY 2018 Base**	**FY 2018 OCO**	**FY 2018 Total**
Completed APB-15 development and integration into AN/BYG-1 (TI-14) baseline. Support development of APB-17 into AN/BYG-1 baseline.					
FY 2017 Plans: Continue development of APB-17 into AN/BYG-1 (TI-16) baseline.					
FY 2018 Base Plans: Complete development of APB-17 into AN/BYG-1 (TI-16) baseline. Support development of APB-19 into AN/BYG-1 baseline. Included in the APB effort for FY 18 is the addition of the SSBN software baseline needed for the conversion of the SSBN Combat Control System from legacy to the TI/APB model. FY 18 also adds development of a Common Infrastructure Services (CIS) subsystem. This involves integration of Onboard Team Trainer - Master Controller (OBTT - MC) & Command, Control, Computer and Intelligence Maintenance Tool (C3IMT)/Inter-Subsystem Monitoring Tool (ISMT) efforts as well as other common services within SWFTS. CIS will be an independent subsystem with its own software development and testing efforts, requiring additional funding to complete product delivery to platforms.					
FY 2018 OCO Plans: N/A					
Title: AN/BYG-1 TI-14	4.887	0.000	0.000	0.000	0.000
Articles:	-	-	-	-	-
FY 2016 Accomplishments: Completed development, integration and test of the next generation AN/BYG-1 (TI-14) for SSN 688/VA Class submarines.					
FY 2017 Plans: N/A					
FY 2018 Base Plans: N/A					
FY 2018 OCO Plans: N/A					
Title: AN/BYG-1 TI-18	0.000	4.570	8.178	0.000	8.178

Exhibit R-2A, **RDT&E Project Justification:** FY 2018 Navy		**Date:** May 2017
Appropriation/Budget Activity 1319 *I* 5	**R-1 Program Element (Number/Name)** PE 0604562N *I Submarine Tactical Warfare System*	**Project (Number/Name)** 0236 *I SSN Comb Cont Sys Imprvmnt (ENG)*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	**FY 2016**	**FY 2017**	**FY 2018 Base**	**FY 2018 OCO**	**FY 2018 Total**
Articles:	-	-	-	-	-
FY 2016 Accomplishments: N/A **FY 2017 Plans:** Begin development, integration and test of the next generation AN/BYG-1 (TI-18) for SSN 688/SSGN/SSBN Class submarines. **FY 2018 Base Plans:** Continue development, integration and test of the next generation AN/BYG-1 (TI-18) for SSN 688/SSGN/SSBN Class submarines. **FY 2018 OCO Plans:** N/A					
Title: AN/BYG-1 TI-16	6.508	6.782	3.996	0.000	3.996
Articles:	-	-	-	-	-
FY 2016 Accomplishments: Continued development, integration and test of the next generation AN/BYG-1 (TI-16) for SEAWOLF/SSBN/VA Class submarines. **FY 2017 Plans:** Continue development, integration and test of the next generation AN/BYG-1 (TI-16) for SEAWOLF/SSBN/VA Class submarines. **FY 2018 Base Plans:** Complete development, integration and test of the next generation AN/BYG-1 (TI-16) for SSN SEAWOLF/SSBN/ VA Class submarines. **FY 2018 OCO Plans:** N/A					
Title: Testing	2.900	3.987	3.113	0.000	3.113
Articles:	-	-	-	-	-
FY 2016 Accomplishments:					

Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy		Date: May 2017	
Appropriation/Budget Activity 1319 I 5	**R-1 Program Element (Number/Name)** PE 0604562N I *Submarine Tactical Warfare System*	**Project (Number/Name)** 0236 I *SSN Comb Cont Sys Imprvmnt (ENG)*	

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Began DT/OT for AN/BYG-1 APB-15 on SSN 688/SEAWOLF/SSBN/VA Class submarines. ***FY 2017 Plans:*** Complete DT/OT for AN/BYG-1 APB-15 on SSN 688/SEAWOLF/SSBN/VA Class submarines. ***FY 2018 Base Plans:*** Begin DT/OT for AN/BYG-1 APB-17 on SSN 688/SEAWOLF/SSBN/SSGN/VA Class submarines. ***FY 2018 OCO Plans:*** N/A					
Title: Payload Control System Upgrade	5.100	5.911	7.806	0.000	7.806
Articles:	-	-	-	-	-
FY 2016 Accomplishments: Continued development process to modernize the Payload Control System architecture to support various payloads. ***FY 2017 Plans:*** Continue development process to modernize the Payload Control System architecture to support various payloads. ***FY 2018 Base Plans:*** Complete development to modernize the Payload Control System architecture to support various payloads. FY18 is a ramp up in effort to modernize the Payload Control System Architecture and contains additional efforts to integrate new payloads and integrate of a common UxV interface. ***FY 2018 OCO Plans:*** N/A					
Title: Information Assurance (IA)	3.532	3.603	4.190	0.000	4.190
Articles:	-	-	-	-	-
FY 2016 Accomplishments: Developed integration of IA Toolkit and continue IA Certification Testing on BYG-1 TI-16 ***FY 2017 Plans:***					

Exhibit R-2A, **RDT&E Project Justification:** FY 2018 Navy		**Date:** May 2017
Appropriation/Budget Activity 1319 *I* 5	**R-1 Program Element (Number/Name)** PE 0604562N *I Submarine Tactical Warfare System*	**Project (Number/Name)** 0236 *I SSN Comb Cont Sys Imprvmnt (ENG)*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	**FY 2016**	**FY 2017**	**FY 2018 Base**	**FY 2018 OCO**	**FY 2018 Total**
Complete integration of IA Toolkit and continue IA Certification Testing on BYG-1 TI-16 ***FY 2018 Base Plans:*** Develop integration of IA Toolkit and continue IA Certification Testing on BYG-1 TI-18. FY18 growth is a result of implementation of additional cyber security requirements and initiatives from the implementation of CYBERSAFE including the development of Cyber Conditions of Readiness (X, Y, Z), the implementation of Risk Management Framework (RMF), the execution of Cybersecurity Vulnerability Assessments and the addition of new of SPAWAR IT/IA standards (host level protection, boundary protection, security information &, event management and more). ***FY 2018 OCO Plans:*** N/A					
Title: Unmanned Aerial System (UAS) **Articles:**	0.000 -	2.572 -	2.622 -	0.000 -	2.622 -
FY 2016 Accomplishments: N/A ***FY 2017 Plans:*** Begin Unmanned Aerial System (UAS) development and integration efforts. ***FY 2018 Base Plans:*** Continue Unmanned Aerial System (UAS) development and integration efforts. ***FY 2018 OCO Plans:*** N/A					
Accomplishments/Planned Programs Subtotals	41.882	43.160	50.850	0.000	50.850

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
• OPN/5420: *SSN Combat Control Systems*	96.040	144.715	129.972	-	129.972	150.750	177.643	259.455	239.264	Continuing	Continuing

Exhibit R-2A, **RDT&E Project Justification:** FY 2018 Navy		**Date:** May 2017
Appropriation/Budget Activity 1319 *I* 5	**R-1 Program Element (Number/Name)** PE 0604562N *I Submarine Tactical Warfare System*	**Project (Number/Name)** 0236 *I SSN Comb Cont Sys Imprvmnt (ENG)*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost

Remarks
 OPN BA4 Ordinance Support & Equipment. BLI 5420 SSN Combat Control Systems

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.
 Advanced Processing Builds (APB) products associated with AN/BYG-1 Release-To-Fleet 3Q 2017, 3Q 2019 and 3Q 2021.

E. Performance Metrics
 AN/BYG-1 Submarine Combat and Payload Control System performance metrics for each Advanced Processor Build (APB) and Technology Insertion (TI) cycle are
 contained in the classified Capability Production Document (CPD) annex to the overarching system requirements as laid out in the Capabilities Development Document
 (CDD). Each APB cycle receives an updated CPD based on fleet required capabilities.

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Navy													Date: May 2017	
Appropriation/Budget Activity 1319 / 5						R-1 Program Element (Number/Name) PE 0604562N / Submarine Tactical Warfare System						Project (Number/Name) 0236 / SSN Comb Cont Sys Imprvmnt (ENG)		

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
				Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
AN/BYG-1 TECH INSERTION	C/CPIF	GENERAL DYNAMICS (GDAIS) : FAIR LAKES, VA	90.221	5.147	Oct 2015	5.250	Oct 2016	6.645	Oct 2017	-		6.645	Continuing	Continuing	Continuing
AN/BYG-1 TECH INSERTION	C/CPIF	GENERAL DYNAMICS (GDAIS) : PITTSFIELD, MA	38.100	3.233	Oct 2015	0.661	Oct 2016	0.200	Oct 2017	-		0.200	Continuing	Continuing	Continuing
AN/BYG-1 TECH INSERTION	C/CPIF	PROGENY (PCS) : MANASSAS, VA	0.000	1.616	Oct 2015	2.164	Oct 2016	6.537	Oct 2017	-		6.537	Continuing	Continuing	Continuing
GOVERNMENT ENGINEERING	WR	NUWC : NEWPORT, RI	82.152	1.399	Oct 2015	1.427	Oct 2016	1.812	Oct 2017	-		1.812	Continuing	Continuing	Continuing
INFORMATION ASSURANCE	C/CPAF	PROGENY : MANASSAS, VA	33.723	3.532	Oct 2015	3.603	Oct 2016	4.190	Oct 2017	-		4.190	Continuing	Continuing	Continuing
UNMANNED AERIAL SYSTEM	C/CPIF	GENERAL DYNAMICS : FAIR LAKES, VA	0.000	0.000		1.087	Oct 2016	0.432	Oct 2017	-		0.432	Continuing	Continuing	Continuing
UNMANNED AERIAL SYSTEM	WR	NUWC : NEWPORT, RI	0.000	0.000		1.061	Oct 2016	1.082	Oct 2017	-		1.082	Continuing	Continuing	Continuing
UNMANNED AERIAL SYSEM	C/CPIF	PROGENY (PCS) : MANASSAS, VA	0.000	0.000		0.424	Oct 2016	1.108	Oct 2017	-		1.108	Continuing	Continuing	Continuing
		Subtotal	244.196	14.927		15.677		22.006		-		22.006	-	-	-

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
				Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
APB SOFTWARE INTEGRATION	C/CPIF	GENERAL DYNAMICS (GDAIS) : FAIRLAKES, VA	74.256	7.157	Oct 2015	7.300	Oct 2016	7.446	Oct 2017	-		7.446	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Navy											**Date:** May 2017		
Appropriation/Budget Activity 1319 I 5					**R-1 Program Element (Number/Name)** PE 0604562N I *Submarine Tactical Warfare System*						**Project (Number/Name)** 0236 I *SSN Comb Cont Sys Imprvmnt (ENG)*		

Support ($ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total			
Cost Category Item	**Contract Method & Type**	**Performing Activity & Location**	**Prior Years**	**Cost**	**Award Date**	**Cost**	**Award Date**	**Cost**	**Award Date**	**Cost**	**Award Date**	**Cost**	**Cost To Complete**	**Total Cost**	**Target Value of Contract**
APB SOFTWARE INTEGRATION	C/CPIF	GENERAL DYNAMICS : PITTSFIELD, MA	22.195	5.055	Oct 2015	0.600	Oct 2016	0.272	Oct 2017	-		0.272	Continuing	Continuing	Continuing
APB SOFTWARE INTEGRATION	WR	NUWC : NEWPORT, RI	49.327	4.835	Oct 2015	4.672	Oct 2016	4.765	Oct 2017	-		4.765	Continuing	Continuing	Continuing
APB SOFTWARE INTEGRATION	C/CPAF	LOCKHEED MARTIN (LM-MSS) : MANASSAS, VA	12.280	2.400	Oct 2015	3.600	Oct 2016	3.672	Oct 2017	-		3.672	Continuing	Continuing	Continuing
APB SOFTWARE INTEGRATION	C/CPFF	PROGENY (PCS) : MANASSAS, VA	0.000	0.870	Oct 2015	4.208	Oct 2016	4.705	Oct 2017	-		4.705	Continuing	Continuing	Continuing
SOFTWARE DEVELOPMENT	Various	VARIOUS : VARIOUS:Not Specified	49.973	1.902	Oct 2015	2.283	Oct 2016	2.329	Oct 2017	-		2.329	Continuing	Continuing	Continuing
		Subtotal	208.031	22.219		22.663		23.189		-		23.189	-	-	-

Test and Evaluation ($ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total			
Cost Category Item	**Contract Method & Type**	**Performing Activity & Location**	**Prior Years**	**Cost**	**Award Date**	**Cost**	**Award Date**	**Cost**	**Award Date**	**Cost**	**Award Date**	**Cost**	**Cost To Complete**	**Total Cost**	**Target Value of Contract**
DEVELOPMENT TEST & EVALUATION	WR	NUWC : NEWPORT, RI	36.181	0.932	Oct 2015	0.949	Oct 2016	0.968	Oct 2017	-		0.968	Continuing	Continuing	Continuing
TEST & EVALUATION	C/CPIF	GENERAL DYNAMICS : FAIRLAKES, VA	8.697	0.711	Oct 2015	0.724	Oct 2016	0.739	Oct 2017	-		0.739	Continuing	Continuing	Continuing
TEST & EVALUATION	C/CPIF	GENERAL DYNAMICS : PITTSFIELD, MA	2.801	0.711	Oct 2015	0.724	Oct 2016	0.739	Oct 2017	-		0.739	Continuing	Continuing	Continuing
TEST & EVALUATION	C/CPAF	PROGENY : MANASSAS, VA	1.373	0.466	Oct 2015	0.474	Oct 2016	0.483	Oct 2017	-		0.483	Continuing	Continuing	Continuing
OPERATIONAL TEST & EVALUATION	WR	COMOPTEVFOR : NORFOLK, VA	16.753	0.079	Oct 2015	0.080	Oct 2016	0.820	Oct 2017	-		0.820	Continuing	Continuing	Continuing
		Subtotal	65.805	2.899		2.951		3.749		-		3.749	-	-	-

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Navy														**Date:** May 2017		

Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604562N / *Submarine Tactical Warfare System*	Project (Number/Name) 0236 / *SSN Comb Cont Sys Imprvmnt (ENG)*

Management Services ($ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
PROGRAM MANAGEMENT SUPPORT	C/CPFF	VARIOUS : VARIOUS:Not Specified	22.229	1.837	Oct 2015	1.869	Oct 2016	1.906	Oct 2017	-		1.906	Continuing	Continuing	Continuing
		Subtotal	22.229	1.837		1.869		1.906		-		1.906	-	-	-

	Prior Years	FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	540.261	41.882		43.160		50.850		-		50.850	-	-	-

Remarks

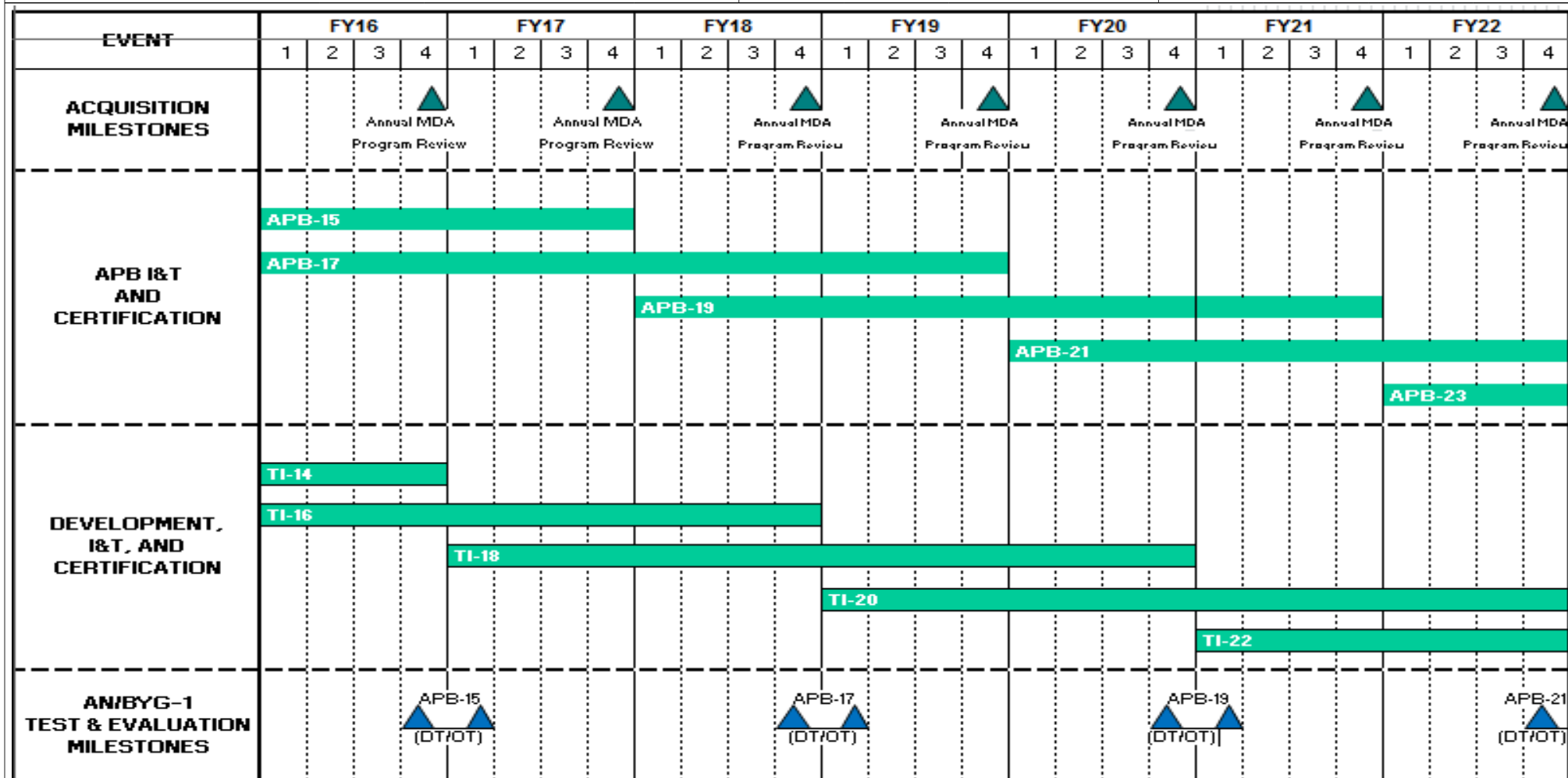| Exhibit R-4, RDT&E Schedule Profile: FY 2018 Navy		Date: May 2017
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604562N / Submarine Tactical Warfare System	**Project (Number/Name)** 0236 / SSN Comb Cont Sys Imprvmnt (ENG)

Exhibit R-4A, RDT&E Schedule Details: FY 2018 Navy		Date: May 2017
Appropriation/Budget Activity 1319 I 5	**R-1 Program Element (Number/Name)** PE 0604562N I *Submarine Tactical Warfare System*	**Project (Number/Name)** 0236 I *SSN Comb Cont Sys Imprvmnt (ENG)*

Schedule Details

Events by Sub Project	Start		End	
	Quarter	**Year**	**Quarter**	**Year**
Page 1				
Acq Milestones: Annual MDA Program Review - FY16	4	2016	4	2016
Acq Milestones: Annual MDA Program Review - FY17	4	2017	4	2017
Acq Milestones: Annual MDA Program Review - FY18	4	2018	4	2018
Acq Milestones: Annual MDA Program Review - FY19	4	2019	4	2019
Acq Milestones: Annual MDA Program Review - FY20	4	2020	4	2020
Acq Milestones: Annual MDA Program Review - FY21	4	2021	4	2021
Acq Milestones: Annual MDA Program Review - FY22	4	2022	4	2022
APB I&T, Certification: APB-15: APB-15	1	2016	4	2017
APB I&T, Certification: APB-17: APB-17	1	2016	4	2019
APB I&T, Certification: APB-19: APB-19	1	2018	4	2021
APB I&T, Certification: APB-21: APB-21	1	2020	4	2021
APB I&T, Certification: APB-23: APB-23	4	2022	4	2022
Development, I&T Certification: TI-14: TI-14	1	2016	4	2016
Development, I&T Certification: TI-16: TI-16	1	2016	4	2018
Development, I&T Certification: TI-18: TI-18	1	2017	4	2020
Development, I&T Certification: TI-20: TI-20	1	2019	4	2021
Development, I&T Certification: T-22: TI-22	1	2021	4	2021
Test & Evaluation Milestones: AN/BYG-1: APB-15 DT/OT	4	2016	1	2017
Test & Evaluation Milestones: AN/BYG-1: APB-17 DT/OT	4	2018	1	2019
Test & Evaluation Milestones: AN/BYG-1: APB-19 DT/OT	4	2020	1	2021
Test & Evaluation Milestones: AN/BYG-1: APB-21 DT/OT	4	2022	4	2022

Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy											Date: May 2017	

Appropriation/Budget Activity 1319 / 5				R-1 Program Element (Number/Name) PE 0604562N / *Submarine Tactical Warfare System*						Project (Number/Name) 9999 / *Congressional Adds*		

COST ($ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
9999: *Congressional Adds*	0.000	9.172	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	9.172
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Project Unit 9999:

This congressional add provides funding to modernize Combat and Weapons Systems in the efforts below.

Attack in a Minute (AIM): Continue development of this Fleet desired capability for APB17. Complete algorithm development. Update new display with inputs from Fleet. Execute demonstrations to ensure the updates meet the Fleet needs.

Cyber Security: Complete Vulnerability Assessment and manage results. Develop corrections for Account Management. Accelerate CYBERSAFE Control Point hardening and Tactics, Techniques and Procedures (TTP) development. Resolve training issues with Type Commanders.

Weapon Control Advanced Message Queuing Protocol (AMQP) transitions: Common Object Request Broker Architecture (CORBA) middleware will become unsupported in 2020. There is a SWFTS roadmap planning all system middleware transitions. This effort modernizes portions of the WC middleware to AMQP, the latest standard.

WCS Code Modernization with The Software Revolution, Inc. (TSRI): The effort will select additional WC code portions and translate them from ADA to C++.

APB5+: Effort accelerates software updates to support the new PMS404 torpedo.

Common Infrastructure Services (CIS): Design network updates so common functions are more readily available to systems using them. Virtualize some applications which will reside in the CIS footprint.

Combat System of the Future (CSOF): Accelerate ongoing efforts to virtualize BYG-1 and improve open architecture.

B. Accomplishments/Planned Programs ($ in Millions)

	FY 2016	FY 2017
Congressional Add: Combat and Weapons Systems Modernization	9.172	0.000

Exhibit R-2A, **RDT&E Project Justification:** FY 2018 Navy		**Date:** May 2017
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604562N / *Submarine Tactical Warfare System*	**Project (Number/Name)** 9999 / *Congressional Adds*

B. Accomplishments/Planned Programs ($ in Millions)	**FY 2016**	**FY 2017**
FY 2016 Accomplishments: N/A		
FY 2017 Plans: N/A		
Congressional Adds Subtotals	9.172	0.000

C. Other Program Funding Summary ($ in Millions)
 N/A
Remarks

D. Acquisition Strategy
 Once developed, these modernization upgrades will be part of the TI/APB software baselines, utilizing the same Acquisition Strategy as the Tactical Warfare System.
 The program 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.
 Advanced Processing Builds (APB) products associated with AN/BYG-1 Release-To-Fleet 3Q 2017, 3Q 2019 and 3Q 2021.

E. Performance Metrics
 AN/BYG-1 Submarine Combat and Payload Control System performance metrics for each Advanced Processor Build (APB) and Technology Insertion (TI) cycle are
 contained in the classified Capability Production Document (CPD) annex to the overarching system requirements as laid out in the Capabilities Development Document
 (CDD). Each APB cycle receives an updated CPD based on Fleet required capabilities.