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**Exhibit R-2, RDT&E Budget Item Justification:** PB 2017 Navy **Date:** February 2016

<b>Appropriation/Budget Activity</b> 1319: <i>Research, Development, Test &amp; Evaluation, Navy / BA 5: System Development &amp; Demonstration (SDD)</i>	<b>R-1 Program Element (Number/Name)</b> PE 0604562N / <i>Submarine Tactical Warfare System</i>
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COST (\$ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
Total Program Element	507.298	37.768	52.713	43.160	-	43.160	49.629	61.484	65.270	66.647	Continuing	Continuing
0236: <i>SSN Comb Cont Sys Imprvmnt (ENG)</i>	507.298	37.768	43.213	43.160	-	43.160	49.629	61.484	65.270	66.647	Continuing	Continuing
9999: <i>Congressional Adds</i>	0.000	0.000	9.500	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	9.500

**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).

<b>B. Program Change Summary (\$ in Millions)</b>	<b>FY 2015</b>	<b>FY 2016</b>	<b>FY 2017 Base</b>	<b>FY 2017 OCO</b>	<b>FY 2017 Total</b>
Previous President's Budget	38.985	48.213	44.721	-	44.721
Current President's Budget	37.768	52.713	43.160	-	43.160
Total Adjustments	-1.217	4.500	-1.561	-	-1.561
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-5.000			
• Congressional Rescissions	-	-			
• Congressional Adds	-	9.500			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-1.217	0.000			
• Program Adjustments	0.000	0.000	-0.555	-	-0.555

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• Rate/Misc Adjustments	0.000	0.000	-1.006	-	-1.006
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**Congressional Add Details (\$ in Millions, and Includes General Reductions)**

**Project:** 9999: *Congressional Adds*

*Congressional Add: Combat and Weapons Systems Modernization*

Congressional Add Subtotals for Project: 9999

Congressional Add Totals for all Projects

	FY 2015	FY 2016
Congressional Add Subtotals for Project: 9999	0.000	9.500
Congressional Add Totals for all Projects	0.000	9.500

**Change Summary Explanation**

Decrease in Submarine Tactical Warfare System RDTEN by \$1.802M as required for the Department of the Navy to comply with the Bipartisan Budget Act of 2015.

The FY 2017 funding request was reduced by \$2.266 million to account for the availability of prior years execution balance.

Increased FY17-FY19 funding due to Unmanned Aerial System (UAS)

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2017 Navy										<b>Date:</b> February 2016		
<b>Appropriation/Budget Activity</b> 1319 / 5					<b>R-1 Program Element (Number/Name)</b> PE 0604562N / <i>Submarine Tactical Warfare System</i>				<b>Project (Number/Name)</b> 0236 / <i>SSN Comb Cont Sys Imprvmnt (ENG)</i>			
<b>COST (\$ in Millions)</b>	<b>Prior Years</b>	<b>FY 2015</b>	<b>FY 2016</b>	<b>FY 2017 Base</b>	<b>FY 2017 OCO</b>	<b>FY 2017 Total</b>	<b>FY 2018</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>	<b>Cost To Complete</b>	<b>Total Cost</b>
0236: <i>SSN Comb Cont Sys Imprvmnt (ENG)</i>	507.298	37.768	43.213	43.160	-	43.160	49.629	61.484	65.270	66.647	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).

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

	<b>FY 2015</b>	<b>FY 2016</b>	<b>FY 2017 Base</b>	<b>FY 2017 OCO</b>	<b>FY 2017 Total</b>
<b>Title:</b> Advanced Processing Builds	13.928	18.955	15.735	0.000	15.735
<b>Articles:</b>	-	-	-	-	-
<b>FY 2015 Accomplishments:</b> Continued development of APB-15 into AN/BYG-1 (TI-14) baseline.					
<b>FY 2016 Plans:</b> Complete APB-15 integration into AN/BYG-1 (TI-14) baseline. Support development of APB-17 into AN/BYG-1 baseline.					
<b>FY 2017 Base Plans:</b>					

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2017 Navy		<b>Date:</b> February 2016
<b>Appropriation/Budget Activity</b> 1319 / 5	<b>R-1 Program Element (Number/Name)</b> PE 0604562N / <i>Submarine Tactical Warfare System</i>	<b>Project (Number/Name)</b> 0236 / <i>SSN Comb Cont Sys Imprvmnt (ENG)</i>

<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>	<b>FY 2015</b>	<b>FY 2016</b>	<b>FY 2017 Base</b>	<b>FY 2017 OCO</b>	<b>FY 2017 Total</b>
Continue development of APB-17 into AN/BYG-1 (TI-16) baseline. <b>FY 2017 OCO Plans:</b> N/A					
<b>Title:</b> AN/BYG-1 TI-14  <b>FY 2015 Accomplishments:</b> Continued development, integration and test of the next generation AN/BYG-1 (TI-14) for SSN 688/SSGN/VA Class submarines. <b>FY 2016 Plans:</b> Complete development, integration and test of the next generation AN/BYG-1 (TI-14) for SSN 688/SSGN/VA Class submarines. <b>FY 2017 Base Plans:</b> N/A <b>FY 2017 OCO Plans:</b> N/A	6.734 <i>Articles:</i> -	4.887 -	0.000 -	0.000 -	0.000 -
<b>Title:</b> AN/BYG-1 TI-16  <b>FY 2015 Accomplishments:</b> Begin development, integration and test of the next generation AN/BYG-1 (TI-16) for SSN 688/SSGN/SSBN/VA Class submarines. <b>FY 2016 Plans:</b> Continue development, integration and test of the next generation AN/BYG-1 (TI-16) for SSN 688/SSGN/SSBN/VA Class submarines. <b>FY 2017 Base Plans:</b> Continue development, integration and test of the next generation AN/BYG-1 (TI-16) for SSN 688/SSGN/SSBN/VA Class submarines. <b>FY 2017 OCO Plans:</b>	4.254 <i>Articles:</i> -	6.508 -	6.782 -	0.000 -	6.782 -

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<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>	<b>FY 2015</b>	<b>FY 2016</b>	<b>FY 2017 Base</b>	<b>FY 2017 OCO</b>	<b>FY 2017 Total</b>
N/A					
<b>Title:</b> AN/BYG-1 TI-18  <b>Articles:</b>  <b>FY 2015 Accomplishments:</b> N/A  <b>FY 2016 Plans:</b> N/A  <b>FY 2017 Base Plans:</b> Begin development, integration and test of the next generation AN/BYG-1 (TI-18) for SSN 688/SSGN/SSBN/VA Class submarines.  <b>FY 2017 OCO Plans:</b> N/A	0.000 -	0.000 -	4.070 -	0.000 -	4.070 -
<b>Title:</b> Payload Control System Upgrade  <b>Articles:</b>  <b>FY 2015 Accomplishments:</b> Begin development process to modernize the Payload Control System architecture to support various payloads.  <b>FY 2016 Plans:</b> Continue development process to modernize the Payload Control System architecture to support various payloads.  <b>FY 2017 Base Plans:</b> Continue development process to modernize the Payload Control System architecture to support various payloads.  <b>FY 2017 OCO Plans:</b> N/A	3.500 -	5.100 -	5.300 -	0.000 -	5.300 -
<b>Title:</b> Testing  <b>Articles:</b>  <b>FY 2015 Accomplishments:</b>	4.597 -	2.899 -	3.987 -	0.000 -	3.987 -

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<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>	<b>FY 2015</b>	<b>FY 2016</b>	<b>FY 2017 Base</b>	<b>FY 2017 OCO</b>	<b>FY 2017 Total</b>
<p>Completed DT/OT for AN/BYG-1 APB-13 on SSN 688/SSGN/Seawolf/VA Class submarines.</p> <p><b>FY 2016 Plans:</b> Begin DT/OT for AN/BYG-1 APB-15 on SSN 688/SSGN/Seawolf/VA Class submarines.</p> <p><b>FY 2017 Base Plans:</b> Complete DT/OT for AN/BYG-1 APB-15 on SSN 688/SSGN/Seawolf/VA Class submarines.</p> <p><b>FY 2017 OCO Plans:</b> N/A</p>					
<p><b>Title:</b> Information Assurance (IA)</p> <p align="right"><b>Articles:</b></p> <p><b>FY 2015 Accomplishments:</b> Completed integration of IA Toolkit and continue IA Certification Testing on BYG-1 TI-14</p> <p><b>FY 2016 Plans:</b> Develop integration of IA Toolkit and continue IA Certification Testing on BYG-1 TI-16</p> <p><b>FY 2017 Base Plans:</b> Complete integration of IA Toolkit and continue IA Certification Testing on BYG-1 TI-16</p> <p><b>FY 2017 OCO Plans:</b> N/A</p>	4.755 -	4.864 -	4.714 -	0.000 -	4.714 -
<p><b>Title:</b> Unmanned Aerial System (UAS)</p> <p align="right"><b>Articles:</b></p> <p><b>FY 2015 Accomplishments:</b> N/A</p> <p><b>FY 2016 Plans:</b> N/A</p> <p><b>FY 2017 Base Plans:</b> Begin Unmanned Aerial System (UAS) development and integration efforts.</p> <p><b>FY 2017 OCO Plans:</b></p>	0.000 -	0.000 -	2.572 -	0.000 -	2.572 -

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<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>	<b>FY 2015</b>	<b>FY 2016</b>	<b>FY 2017 Base</b>	<b>FY 2017 OCO</b>	<b>FY 2017 Total</b>
N/A					
<b>Accomplishments/Planned Programs Subtotals</b>	37.768	43.213	43.160	0.000	43.160

**C. Other Program Funding Summary (\$ in Millions)**

N/A

**Remarks**

**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 2015, 3Q 2017 and 3Q 2019.

**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.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy												Date: February 2016			
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)				FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 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
AN/BYG-1 TECH INSERTION	C/CPIF	GENERAL DYNAMICS (GDAIS) : FAIR LAKES, VA	85.098	5.123	Oct 2014	5.147	Oct 2015	5.736	Oct 2016	-		5.736	Continuing	Continuing	Continuing
AN/BYG-1 TECH INSERTION	C/CPIF	GENERAL DYNAMICS (GDAIS) : PITTSFIELD, MA	34.854	3.246	Oct 2014	3.233	Oct 2015	0.661	Oct 2016	-		0.661	Continuing	Continuing	Continuing
GOVERNMENT ENGINEERING	WR	NUWC : NEWPORT, RI	80.704	1.448	Oct 2014	1.399	Oct 2015	1.531	Oct 2016	-		1.531	Continuing	Continuing	Continuing
INFORMATION ASSURANCE	C/CPAF	PROGENY : MANASSAS, VA	28.968	4.755	Oct 2014	4.864	Oct 2015	4.108	Oct 2016	-		4.108	Continuing	Continuing	Continuing
AN/BYG-1 Tech Insertion	C/CPAF	Lockheed Martin (LM-MSS) : Manassas, VA	3.634	1.171	Oct 2014	1.616	Oct 2015	1.069	Oct 2016	-		1.069	Continuing	Continuing	Continuing
UNMANNED AERIAL SYSTEM	C/CPIF	GENERAL DYNAMIC (PCS) : PITTSFIELD, MA	0.000	0.000		0.000		1.087	Oct 2016	-		1.087	Continuing	Continuing	Continuing
UNMANNED AERIAL SYSTEM	WR	NUWC : NEWPORT, RI	0.000	0.000		0.000		1.061	Oct 2016	-		1.061	Continuing	Continuing	Continuing
UNMANNED AERIAL SYSEM	WR	NRL : WASHINGTON, DC	0.000	0.000		0.000		0.424	Oct 2016	-		0.424	Continuing	Continuing	Continuing
<b>Subtotal</b>			233.258	15.743		16.259		15.677		-		15.677	-	-	-
Support (\$ in Millions)				FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 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 (GDAIS) : FAIRLAKES, VA	69.096	5.160	Oct 2014	7.157	Oct 2015	8.548	Oct 2016	-		8.548	Continuing	Continuing	Continuing

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy												Date: February 2016			
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)							
Support (\$ in Millions)				FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 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	19.427	2.768	Oct 2014	5.055	Oct 2015	3.825	Oct 2016	-		3.825	Continuing	Continuing	Continuing
APB SOFTWARE INTEGRATION	WR	NUWC : NEWPORT, RI	47.661	1.666	Oct 2014	4.835	Oct 2015	4.672	Oct 2016	-		4.672	Continuing	Continuing	Continuing
APB SOFTWARE INTEGRATION	C/CPAF	LOCKHEED MARTIN (LM-MSS) : MANASSAS, VA	8.387	3.893	Oct 2014	3.270	Oct 2015	3.335	Oct 2016	-		3.335	Continuing	Continuing	Continuing
SOFTWARE DEVELOPMENT	Various	VARIOUS : VARIOUS:Not Specified	48.071	1.902	Oct 2014	1.902	Oct 2015	2.283	Oct 2016	-		2.283	Continuing	Continuing	Continuing
<b>Subtotal</b>			192.642	15.389		22.219		22.663		-		22.663	-	-	-
Test and Evaluation (\$ in Millions)				FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 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	34.683	1.498	Oct 2014	0.932	Oct 2015	0.949	Oct 2016	-		0.949	Continuing	Continuing	Continuing
TEST & EVALUATION	C/CPIF	GENERAL DYNAMICS : FAIRLAKES, VA	7.420	1.277	Oct 2014	0.711	Oct 2015	0.724	Oct 2016	-		0.724	Continuing	Continuing	Continuing
TEST & EVALUATION	C/CPIF	GENERAL DYNAMICS : PITTSFIELD, MA	1.524	1.277	Oct 2014	0.711	Oct 2015	0.724	Oct 2016	-		0.724	Continuing	Continuing	Continuing
TEST & EVALUATION	C/CPAF	PROGENY : MANASSAS, VA	0.907	0.466	Oct 2014	0.466	Oct 2015	0.474	Oct 2016	-		0.474	Continuing	Continuing	Continuing
OPERATIONAL TEST & EVALUATION	WR	COMOPTEVFOR : NORFOLK, VA	16.674	0.079	Oct 2014	0.079	Oct 2015	0.080	Oct 2016	-		0.080	Continuing	Continuing	Continuing
<b>Subtotal</b>			61.208	4.597		2.899		2.951		-		2.951	-	-	-



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<b>Exhibit R-4, RDT&amp;E Schedule Profile: PB 2017 Navy</b>		<b>Date:</b> February 2016
<b>Appropriation/Budget Activity</b> 1319 / 5	<b>R-1 Program Element (Number/Name)</b> PE 0604562N / <i>Submarine Tactical Warfare System</i>	<b>Project (Number/Name)</b> 0236 / <i>SSN Comb Cont Sys Imprvmnt (ENG)</i>

Phase/Year	2015				2016				2017				2018				2019				2020				2021				
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	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 Review				△ Annual MDA Program Review				△ Annual MDA Program Review				△ Annual MDA Program Review				△ Annual MDA Program Review	
Alt 1a1 and Certification	Alt-15							Alt-17								Alt-19								Alt-21					
Development, Test, and Certification	E-14											E-18								E-20								E-22	
ANSDC-1 Test & Evaluation Milestones	APE-13 (OTOT)							APE-15 (OTOT)								APE-17 (OTOT)								APE-19 (OTOT)					

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<b>Exhibit R-4A, RDT&amp;E Schedule Details: PB 2017 Navy</b>		<b>Date:</b> February 2016
<b>Appropriation/Budget Activity</b> 1319 / 5	<b>R-1 Program Element (Number/Name)</b> PE 0604562N / <i>Submarine Tactical Warfare System</i>	<b>Project (Number/Name)</b> 0236 / <i>SSN Comb Cont Sys Imprvmnt (ENG)</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<b>Page 1</b>				
Acq Milestones: Annual MDA Program Review - FY15	4	2015	4	2015
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
APB I&T, Certification: APB-15: APB-15	1	2015	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
Development, I&T Certification: TI-14: TI-14	1	2015	4	2016
Development, I&T Certification: TI-16: TI-16	1	2015	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-13 DT/OT	1	2015	1	2015
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	4	2021

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<b>Appropriation/Budget Activity</b> 1319 / 5	<b>R-1 Program Element (Number/Name)</b> PE 0604562N / <i>Submarine Tactical Warfare System</i>	<b>Project (Number/Name)</b> 9999 / <i>Congressional Adds</i>
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COST (\$ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
9999: <i>Congressional Adds</i>	0.000	0.000	9.500	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	9.500
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)**

<b><i>Congressional Add:</i></b> Combat and Weapons Systems Modernization	<b>FY 2015</b>	<b>FY 2016</b>
	0.000	9.500

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2017 Navy	<b>Date:</b> February 2016
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<b>Appropriation/Budget Activity</b> 1319 / 5	<b>R-1 Program Element (Number/Name)</b> PE 0604562N / <i>Submarine Tactical Warfare System</i>	<b>Project (Number/Name)</b> 9999 / <i>Congressional Adds</i>
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<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>	<b>FY 2015</b>	<b>FY 2016</b>
<i>FY 2015 Accomplishments:</i> N/A		
<i>FY 2016 Plans:</i> N/A		
<b>Congressional Adds Subtotals</b>	0.000	9.500

**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 2015, 3Q 2017 and 3Q 2019.

**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.

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**Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy** **Date:** February 2016

<b>Appropriation/Budget Activity</b> 1319 / 5	<b>R-1 Program Element (Number/Name)</b> PE 0604562N / <i>Submarine Tactical Warfare System</i>	<b>Project (Number/Name)</b> 9999 / <i>Congressional Adds</i>
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<b>Product Development (\$ in Millions)</b>				FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Attack in a Minute	C/CPIF	General Dynamics : Pittsfield, MA	0.000	0.000		1.500	Oct 2015	0.000		-		0.000	0.000	1.500	-
Cyber Security	C/CPAF	Progeny : Manassas, VA	0.000	0.000		2.000	Oct 2015	0.000		-		0.000	0.000	2.000	-
WCS Code Modernization	C/CPIF	General Dynamics : Pittsfield, MA	0.000	0.000		1.540	Oct 2015	0.000		-		0.000	0.000	1.540	-
APB5+	C/CPIF	General Dynamics : Pittsfield, MA	0.000	0.000		0.460	Oct 2015	0.000		-		0.000	0.000	0.460	-
Common Infrastructure Services	C/CPIF	General Dynamics : Fairlakes, VA	0.000	0.000		1.800	Oct 2015	0.000		-		0.000	0.000	1.800	-
Government Engineering	WR	NUWC : Newport, RI	0.000	0.000		0.200	Oct 2015	0.000		-		0.000	0.000	0.200	-
Combat System of the Future (CSOF)	Various	Various (Not specified) : Not Specified	0.000	0.000		2.000	Oct 2015	0.000		-		0.000	0.000	2.000	-
<b>Subtotal</b>			0.000	0.000		9.500		0.000		-		0.000	0.000	9.500	-

**Remarks**  
 Combat System of the Future (CSOF) effort will leverage existing SBIR Contracts (Rite Solutions, MIKEL and ASSETT) to accelerate virtualization and open architecture.

	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	Cost To Complete	Total Cost	Target Value of Contract
<b>Project Cost Totals</b>	0.000	0.000	9.500	0.000	-	0.000	0.000	9.500	-

**Remarks**



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<b>Exhibit R-4A, RDT&amp;E Schedule Details:</b> PB 2017 Navy		<b>Date:</b> February 2016
<b>Appropriation/Budget Activity</b> 1319 / 5	<b>R-1 Program Element (Number/Name)</b> PE 0604562N / <i>Submarine Tactical Warfare System</i>	<b>Project (Number/Name)</b> 9999 / <i>Congressional Adds</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<b>Page 1</b>				
Acquisition Milestones: Annual MDA Program Review - FY16	4	2016	4	2016
Acquisition Milestones: Annual MDA Program Review - FY17	4	2017	4	2017
APB I&T, Certification: APB-17: APB-17	1	2016	4	2019
Test and Evaluation Milestones: AN/BYG-1: APB-17 DT/OT	4	2018	1	2019

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