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Exhibit R-2, RDT&E Budget Item Justification: PB 2016 Navy **Date:** February 2015

Appropriation/Budget Activity 1319: <i>Research, Development, Test & Evaluation, Navy I BA 7: Operational Systems Development</i>					R-1 Program Element (Number/Name) PE 0101226N I <i>Submarine Acoustic War Dev</i>							
COST (\$ in Millions)	Prior Years	FY 2014	FY 2015	FY 2016 Base	FY 2016 OCO	FY 2016 Total	FY 2017	FY 2018	FY 2019	FY 2020	Cost To Complete	Total Cost
Total Program Element	32.275	1.430	4.509	3.900	-	3.900	5.969	6.005	7.364	7.571	Continuing	Continuing
1265: <i>Sub Defensive Warfare</i>	32.275	1.430	4.509	3.900	-	3.900	5.969	6.005	7.364	7.571	Continuing	Continuing

A. Mission Description and Budget Item Justification

This project supports the Submarine Acoustic Warfare System (SAWS) program to maintain and improve the survivability of all U.S. Submarine classes in response to torpedo attack. This program funds:

1. The Next Generation Countermeasure (NGCM) program, (ACAT III) currently in Engineering and Manufacturing Development (E&MD). The key new capabilities NGCM brings are: adaptive countermeasure (ACM) technology with full duplex capability and mobility packaged in a three inch diameter body. Milestone C is nominally 2020.
2. The Torpedo Defense Working Group (TDWG). A working group comprised of fleet, resource sponsor, and acquisition community representatives to assess countermeasure effectiveness against fleet threats, both known and projected, with associated studies, models, and simulations.
3. The Technical Direction Agent and In-Service Engineering Agent hardware and software development support for Acoustic Devices Countermeasure (ADC) (ADC MK 2, 3 & 4, NAE Beacon) as well as Countermeasures Set, Acoustic (CSA) MK 2, MK 3, MK 4 systems and Acoustic Augmentation Support Systems (AASS) in the Acoustic Augmentation Support Program (AASP), including component level technical insertion.
4. Research and development of new technologies and capabilities developed under the Future Naval Capabilities (FNC), Small Business and Innovative Research (SBIR), and other Research, Development, Test & Evaluation (RDT&E) initiatives. New and emerging hardware and software are evaluated in representative acoustic environments, against projected threats through both digital and hardware-in-the-loop simulations, to determine their effectiveness and how that improves submarine survivability. The technology is then incorporated into the appropriate countermeasure.

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Appropriation/Budget Activity		R-1 Program Element (Number/Name)			
1319: Research, Development, Test & Evaluation, Navy I BA 7: Operational Systems Development		PE 0101226N I Submarine Acoustic War Dev			
B. Program Change Summary (\$ in Millions)	FY 2014	FY 2015	FY 2016 Base	FY 2016 OCO	FY 2016 Total
Previous President's Budget	1.464	4.509	3.925	-	3.925
Current President's Budget	1.430	4.509	3.900	-	3.900
Total Adjustments	-0.034	-	-0.025	-	-0.025
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.034	-			
• Program Adjustments	-	-	-	-	-
• Rate/Misc Adjustments	-	-	-0.025	-	-0.025
Change Summary Explanation					
Technical: Not applicable.					
Schedule: The NGCM program restructure occurred in FY14. The Navy has made the decision to let the two existing development contracts expire. A single new development contract resulting in both fully functional EDM and LRIP quantities will be awarded in FY17. The developmental effort in FY15 and FY16 will include Modeling and Simulation (M&S), Torpedo Threat Integration for high fidelity NGCM countermeasure logic, Concepts Of Operations (CONOPS) for fleet tactics, Test and Evaluation Master Plan (TEMP), Tactical Decision Aid (TACDA) start, Program Life-Cycle Cost Estimate (PLCCE) and acquisition documentation including the RFP for the new developmental contract. The TDWG and Weapons Analysis Facility (WAF) efforts were increased to restore efforts to provide more valid and current submarine survivability assessments.					
Financial: Miscellaneous rate adjustments.					

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Exhibit R-2A, RDT&E Project Justification: PB 2016 Navy									Date: February 2015			
Appropriation/Budget Activity 1319 / 7					R-1 Program Element (Number/Name) PE 0101226N / Submarine Acoustic War Dev				Project (Number/Name) 1265 / Sub Defensive Warfare			
COST (\$ in Millions)	Prior Years	FY 2014	FY 2015	FY 2016 Base	FY 2016 OCO	FY 2016 Total	FY 2017	FY 2018	FY 2019	FY 2020	Cost To Complete	Total Cost
1265: Sub Defensive Warfare	32.275	1.430	4.509	3.900	-	3.900	5.969	6.005	7.364	7.571	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		
A. Mission Description and Budget Item Justification												
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2. The Torpedo Defense Working Group (TDWG). A working group comprised of fleet, resource sponsor, and acquisition community representatives to assess countermeasure effectiveness against fleet threats, both known and projected, with associated studies, models, and simulations.												
3. The Technical Direction Agent and In-Service Engineering Agent hardware and software development support for Acoustic Devices Countermeasure (ADC) (ADC MK 2, 3 & 4, NAE Beacon) as well as Countermeasures Set, Acoustic (CSA) MK 2, MK 3, MK 4 systems and Acoustic Augmentation Support Systems (AASS) in the Acoustic Augmentation Support Program (AASP), including component level technical insertion.												
4. Research and development of new technologies and capabilities developed under the Future Naval Capabilities (FNC), Small Business and Innovative Research (SBIR), and other Research, Development, Test & Evaluation (RDT&E) initiatives. New and emerging hardware and software are evaluated in representative acoustic environments, against projected threats through both digital and hardware-in-the-loop simulations, to determine their effectiveness and how that improves submarine survivability. The technology is then incorporated into the appropriate countermeasure.												
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)								FY 2014	FY 2015	FY 2016 Base	FY 2016 OCO	FY 2016 Total
Title: Sub Acoustic Warfare								1.430	4.509	3.900	-	3.900
								Articles:				
FY 2014 Accomplishments:												
- Continued contractor testing of NGCM subsystems.												
- Continued NGCM restructure.												
- Conducted TDWG review and started vulnerability assessment process.												
FY 2015 Plans:												

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B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2014	FY 2015	FY 2016 Base	FY 2016 OCO	FY 2016 Total
<ul style="list-style-type: none"> - Prepare for the NGCM developmental contract solicitation. - Start NGCM TEMP. - Start Modeling and Simulation development /assessment for known Torpedo Threats. - Continue NGCM TEMP, SAMP, PLCCE, and acquisition documentation. - Begin development of Concept of Operation and Tactical Decision Aid for Fleet Tactics. - Begin SABOT development for External Launch. - Conduct assessment of threat by TDWG and WAF with updated vulnerability assessment. <p>FY 2016 Base Plans:</p> <ul style="list-style-type: none"> - Continue NGCM TEMP - Continue preparing for the NGCM developmental contract. - Continued Modeling and Simulation for known Torpedo Threats - Continued development of Required Program Documentation - Continued development of Concept of Operations and Tactical Decision Aid for Fleet Tactics - Continued SABOT development for External Launch - Conduct review TDWG and WAF with updated reliability assessment. <p>FY 2016 OCO Plans: N/A</p>					
Accomplishments/Planned Programs Subtotals	1.430	4.509	3.900	-	3.900

C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2014	FY 2015	FY 2016 Base	FY 2016 OCO	FY 2016 Total	FY 2017	FY 2018	FY 2019	FY 2020	Cost To Complete	Total Cost
• OPN/221000/221005: <i>Submarine Acoustic Warfare</i>	20.937	24.221	21.234	-	21.234	21.534	20.646	22.137	23.931	Continuing	Continuing
Remarks											
D. Acquisition Strategy											
<p>Submarine Acoustic Warfare System (SAWS) develops Undersea Defensive Warfare technologies to improve the survivability of all U.S. Submarine classes. The integration of technology into the Next Generation Countermeasure (NGCM) and the NGCM-Capable CSA MK 3/4 system will continue through FY22. The NGCM development will be awarded 1st quarter FY17, through a full and open competition for a Cost Plus Fixed Fee (CPFF), System Development Demonstration (SDD), Engineering Development Models (EDM), Technical Data Package (TDP) and Low Rate Initial Production (LRIP) contract. NGCM contractor's subsystem testing will</p>											

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<p>occur in FY18 through FY19 and Navy Development Testing (DT) will be in FY18-20, with Operational Testing (OT) in FY20-21. Milestone C is nominally in 2020, IOC nominally in 2022, and the production contract nominally in FY22.</p> <p><u>E. Performance Metrics</u></p> <p>Progress Reviews Execution Reporting and Reviews Milestone Reviews</p>		

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2016 Navy												Date: February 2015			
Appropriation/Budget Activity 1319 / 7						R-1 Program Element (Number/Name) PE 0101226N / Submarine Acoustic War Dev				Project (Number/Name) 1265 / Sub Defensive Warfare					
Product Development (\$ in Millions)				FY 2014		FY 2015		FY 2016 Base		FY 2016 OCO		FY 2016 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
WAF ANALYSIS TDWG	WR	NUWC : NEWPORT, RI	11.241	0.151	Feb 2014	0.259	Dec 2014	0.275	Dec 2015	-		0.275	Continuing	Continuing	Continuing
NGCM SYSYTEM ENGINEERING	WR	NUWC : NEWPORT, RI	8.121	0.253	Feb 2014	0.150	Dec 2014	0.600	Dec 2015	-		0.600	Continuing	Continuing	Continuing
NGCM DEVELOPMENT 1	C/CPAF	Argon ST : Fairfax, VA	5.357	0.400	Jan 2014	1.900	Jan 2015	-		-		-	Continuing	Continuing	Continuing
NGCM DEVELOPMENT 2	C/CPAF	Ultra : Braintree, MA	5.084	0.400	Jan 2014	1.900	Jan 2015	-		-		-	Continuing	Continuing	Continuing
CSA MK5 SYSTEM ENGINEERING	WR	NUWC : KEYPORT, WA	0.935	0.096	Dec 2014	-		0.500	Dec 2015	-		0.500	Continuing	Continuing	Continuing
Modeling And Simulation	WR	NUWC : NEWPORT, RI	0.000	-		-		1.225	Dec 2015	-		1.225	-	1.225	-
Tactical Decision Aid	WR	NUWC : NEWPORT, RI	0.000	-		-		0.600	Dec 2015	-		0.600	-	0.600	-
Sabot Development	WR	NUWC : NEWPORT, RI	0.000	-		-		0.400	Dec 2015	-		0.400	-	0.400	-
Subtotal			30.738	1.300		4.209		3.600		-		3.600	-	-	-
Management Services (\$ in Millions)				FY 2014		FY 2015		FY 2016 Base		FY 2016 OCO		FY 2016 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
TRAVEL	WR	NAVSEA : Washington, DC	0.516	0.030	Oct 2013	0.010	Oct 2014	0.040	Oct 2015	-		0.040	Continuing	Continuing	Continuing
PROGRAM MANAGEMENT SUPPORT	C/CPAF	TECH MARINE : Washington, DC	0.900	-		-		-		-		-	-	0.900	-
PROGRAM MANAGEMENT SUPPORT	C/CPAF	BOOZ ALLEN : Washington, DC	0.121	0.100	Dec 2013	0.290	Dec 2014	0.260	Dec 2015	-		0.260	Continuing	Continuing	Continuing
Subtotal			1.537	0.130		0.300		0.300		-		0.300	-	-	-

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2016 Navy										Date: February 2015				
Appropriation/Budget Activity 1319 / 7					R-1 Program Element (Number/Name) PE 0101226N / Submarine Acoustic War Dev					Project (Number/Name) 1265 / Sub Defensive Warfare				
		Prior Years	FY 2014		FY 2015		FY 2016 Base		FY 2016 OCO		FY 2016 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals		32.275	1.430		4.509		3.900		-		3.900	-	-	-
Remarks														

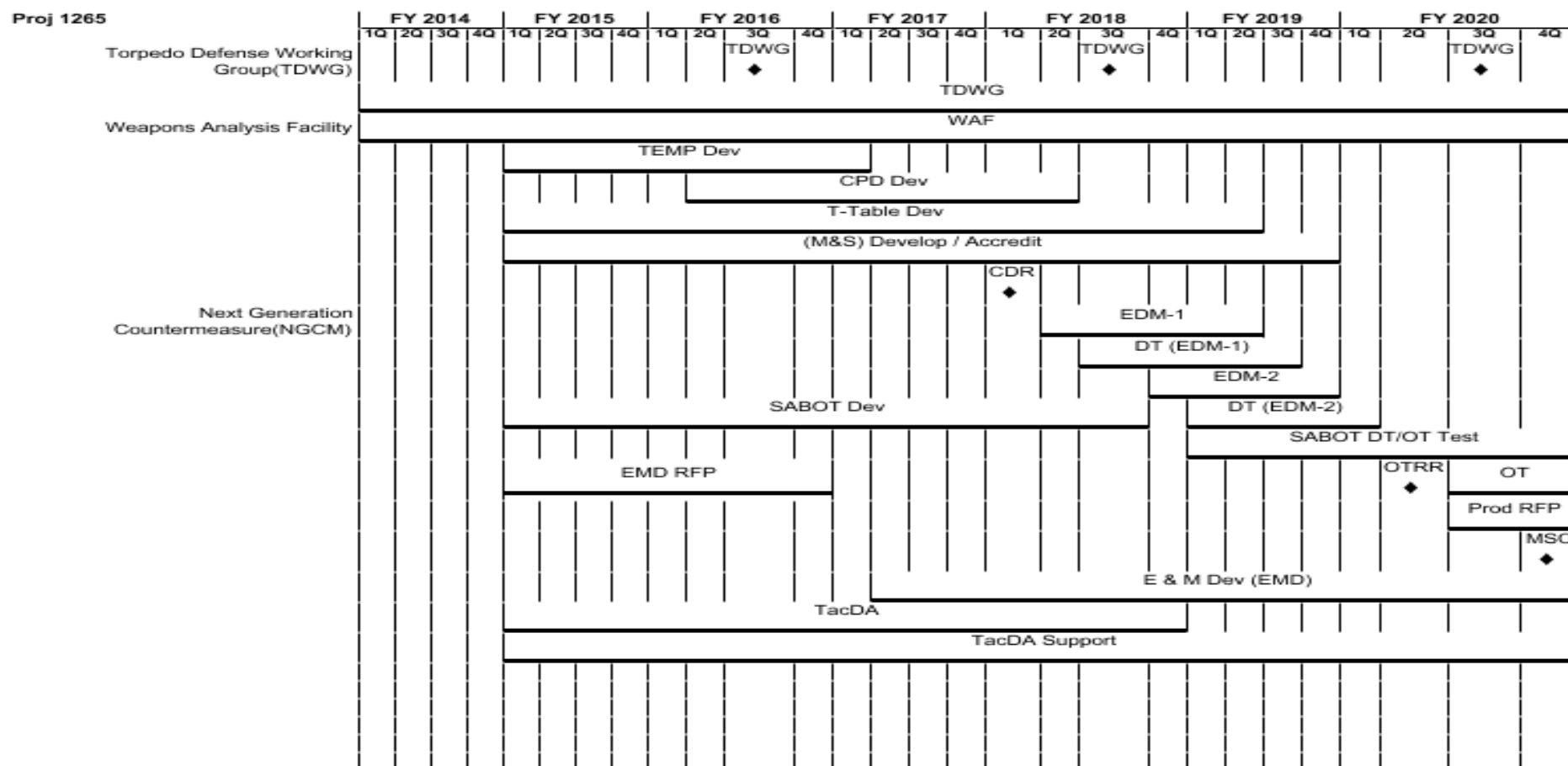
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PE 0101226N: *Submarine Acoustic War Dev*
Navy

R-1 Line #176

R-1 Program Element (Number/Name)
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Project (Number/Name) 1265 / <i>Sub Defensive Warfare</i>	
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Exhibit R-4A, RDT&E Schedule Details: PB 2016 Navy			Date: February 2015
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0101226N / <i>Submarine Acoustic War Dev</i>	Project (Number/Name) 1265 / <i>Sub Defensive Warfare</i>	

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Proj 1265				
Torpedo Defense Working Group(TDWG): FY16 TDWG	3	2016	3	2016
Torpedo Defense Working Group(TDWG): FY18 TDWG	3	2018	3	2018
Torpedo Defense Working Group(TDWG): FY20 TDWG	3	2020	3	2020
Torpedo Defense Working Group(TDWG): TDWG Modeling & Simulation (M&S)	1	2014	4	2020
Weapons Analysis Facility: COUNTERMEASURE (CM) EFFECTIVENESS/WEAPON ANALYSIS FACILITY (WAF) VULNERABILITY	1	2014	4	2020
Weapons Analysis Facility: TEMP Development	1	2015	1	2017
Weapons Analysis Facility: CPD Development	2	2016	2	2018
Weapons Analysis Facility: T-Table Development	1	2015	2	2019
Weapons Analysis Facility: (M&S) Develop / Accredited	1	2015	4	2019
Weapons Analysis Facility: CDR	1	2018	1	2018
Next Generation Countermeasure(NGCM): EDM-1	2	2018	2	2019
Next Generation Countermeasure(NGCM): DT (EDM-1)	3	2018	3	2019
Next Generation Countermeasure(NGCM): EDM-2	4	2018	4	2019
Next Generation Countermeasure(NGCM): DT (EDM-2)	1	2019	1	2020
Next Generation Countermeasure(NGCM): SABOT Development	1	2015	3	2018
Next Generation Countermeasure(NGCM): SABOT DT/OT Test	1	2019	4	2020
Next Generation Countermeasure(NGCM): OTRR	2	2020	2	2020
Next Generation Countermeasure(NGCM): OT	3	2020	4	2020
Next Generation Countermeasure(NGCM): EMD RFP	1	2015	4	2016
Next Generation Countermeasure(NGCM): Prod RFP	3	2020	4	2020

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Exhibit R-4A, RDT&E Schedule Details: PB 2016 Navy			Date: February 2015		
Appropriation/Budget Activity 1319 / 7		R-1 Program Element (Number/Name) PE 0101226N / Submarine Acoustic War Dev		Project (Number/Name) 1265 / Sub Defensive Warfare	
		Start		End	
Events by Sub Project		Quarter	Year	Quarter	Year
Next Generation Countermeasure(NGCM): MSC		4	2020	4	2020
Next Generation Countermeasure(NGCM): Engineering & Manufacturing Development (EMD)		2	2017	4	2020
Next Generation Countermeasure(NGCM): Tactical Decision Aid (TacDA)		1	2015	4	2018
Next Generation Countermeasure(NGCM): TacDA Support		1	2015	4	2020