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<b>Exhibit R-2, RDT&amp;E Budget Item Justification:</b> PB 2014 Navy	<b>DATE:</b> April 2013
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APPROPRIATION/BUDGET ACTIVITY					R-1 ITEM NOMENCLATURE							
1319: <i>Research, Development, Test &amp; Evaluation, Navy</i> BA 4: <i>Advanced Component Development &amp; Prototypes (ACD&amp;P)</i>					PE 0603562N: <i>Submarine Tactical Warfare Sys</i>							
COST (\$ in Millions)	All Prior Years	FY 2012	FY 2013 <sup>#</sup>	FY 2014 Base	FY 2014 OCO <sup>##</sup>	FY 2014 Total	FY 2015	FY 2016	FY 2017	FY 2018	Cost To Complete	Total Cost
Total Program Element	37.871	9.008	9.368	8.764	-	8.764	9.690	9.835	9.993	10.138	Continuing	Continuing
0770: <i>Adv Sub Supp Equip Prog</i>	7.046	3.798	3.989	3.855	-	3.855	4.141	4.194	4.234	4.296	Continuing	Continuing
1739: <i>Submarine Arctic W/F Development</i>	30.825	5.210	5.379	4.909	-	4.909	5.549	5.641	5.759	5.842	Continuing	Continuing

<sup>#</sup> FY 2013 Program is from the FY 2013 President's Budget, submitted February 2012

<sup>##</sup> The FY 2014 OCO Request will be submitted at a later date

**A. Mission Description and Budget Item Justification**

The Submarine Tactical Warfare Systems program element is comprised of the Advanced Submarine Support Equipment Program (ASSEP) and the Submarine Special Operations Support Program. The objective is to improve submarine operational effectiveness through the development and implementation of advanced Research and Development (R&D). In order to provide improved operational effectiveness, R&D efforts are focused on Advanced Imaging Developments and Advanced Electronic Warfare Support (ES) Developments. A continuing need exists to improve these capabilities in view of the advancements in potential imaging counter detection, the need to support specialized missions, and the increasingly dense and sophisticated electronic environment caused by the proliferation of complex radar, communications, and navigation equipment of potential adversaries. Ongoing developments in 360 degree imaging systems and electro-optic infra-red vulnerability signature reduction technologies are supporting these needs.

The Submarine Arctic Warfare Development program responds to the increased threat of naval activity in the Arctic regions while continuously supporting the Navy's strategic objective of Assured Access and Combat Credibility. The U.S. Navy Submarine Force (SUBFOR) demonstrates existing Arctic Warfare capabilities, operational and tactical proficiency while developing advanced submarine research and development technology in unique cold water environments, under-ice conditions, and ice-covered shallow water regions during Ice Exercises (ICEX). ICEX provides the framework for various submarine research and development programs to conduct test and evaluation in Arctic regions or at periodic Ice Camps. Particular emphasis is placed on the areas of sonar operability, tactical surveillance, weapon utility, and other submarine support missions. Efforts include assessment of combat system effectiveness, development of Arctic specific improvements for existing sonar and weapons, development of class specific Arctic operational guidelines, and the testing of ice-capable submarine support structures. This program also provides SUBFOR a cadre of trained Arctic Operation Specialists (AOS) and an inventory of unique Arctic sensors to optimize submarine safety during under-ice operations.

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BA 4: Advanced Component Development & Prototypes (ACD&P)					
B. Program Change Summary (\$ in Millions)	FY 2012	FY 2013	FY 2014 Base	FY 2014 OCO	FY 2014 Total
Previous President's Budget	9.233	9.368	9.492	-	9.492
Current President's Budget	9.008	9.368	8.764	-	8.764
Total Adjustments	-0.225	0.000	-0.728	-	-0.728
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.225	0.000			
• Program Adjustments	0.000	0.000	-0.018	-	-0.018
• Rate/Misc Adjustments	0.000	0.000	-0.710	-	-0.710
Change Summary Explanation					
Schedule: Not applicable.					

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Exhibit R-2A, RDT&E Project Justification: PB 2014 Navy									DATE: April 2013			
APPROPRIATION/BUDGET ACTIVITY 1319: Research, Development, Test & Evaluation, Navy BA 4: Advanced Component Development & Prototypes (ACD&P)					R-1 ITEM NOMENCLATURE PE 0603562N: Submarine Tactical Warfare Sys				PROJECT 0770: Adv Sub Supp Equip Prog			
COST (\$ in Millions)	All Prior Years	FY 2012	FY 2013 <sup>#</sup>	FY 2014 Base	FY 2014 OCO <sup>##</sup>	FY 2014 Total	FY 2015	FY 2016	FY 2017	FY 2018	Cost To Complete	Total Cost
0770: Adv Sub Supp Equip Prog	7.046	3.798	3.989	3.855	-	3.855	4.141	4.194	4.234	4.296	Continuing	Continuing
Quantity of RDT&E Articles	0	0	0	0		0	0	0	0	0		
# FY 2013 Program is from the FY 2013 President's Budget, submitted February 2012												
## The FY 2014 OCO Request will be submitted at a later date												
A. Mission Description and Budget Item Justification												
A continuing need exists to improve Imaging and Electronic Warfare support (EW) capabilities in view of the advancements in potential imaging counter detection and the increasingly dense electromagnetic environment caused by the proliferation of complex radar, communications, and navigation equipment of potential adversaries. Improvements are necessary for submarine EW and Imaging to be operationally effective in the following mission areas: Joint Littoral Warfare, Joint Surveillance, Space and Electronic Warfare, Intelligence Collection, Maritime Protection, and Joint Strike. The program is divided into two project categories: Advanced Imaging Project Development and Advanced Electronic Warfare Support Project Development. Both of these categories will allow for the mitigation of submarine masts, periscopes, and sensors to visual, radar, and infrared detection. Evaluation of state of the art technology to implement periscope/mast improvements via EW electromagnetic and electro-optic sensors resulting in improved capability. Engineering Demonstration Models (EDMs) are developed, evaluated, and validated in the lab and through at-sea testing.												
The Advanced Imaging Project Development projects include the development of: 360 Degree Imaging Affordable Modular Panoramic Photonics Mast (AMPPM); Submarine Panoramic Infra-Red (SPIR) Imaging System; Low Profile Photonics Mast (LPPM); Advanced Head Window Water Shedding; Electro-Optic/Infrared (EO/IR) Vulnerability Signature Reduction; and Mast Signature Reduction; Mast Test Vehicle (MTV) and Imaging Engineering Measurement Program. The Advanced EW Development projects include the development of: Distant ES Support and Remote Log-In; Rapid Reprogramming Threat Libraries; Specific Emitter Identification (SEI) Improvements; Radar Vulnerability Tool; Enhanced DeInterleavers; ES Correlator; Low Probability of Intercept (LPI) Direction Finding (DF); Embedded Built-in Test (BIT); EW on-Board Trainer (OBT); Multi-function Modular Mast (MMM) Payloads and Next Generation EW Systems Algorithms and Applications. OPNAV direction provided for Next Generation EW in reference dated 17 June 12, SER N97/12U144401.												
All programs funded in this project are non Acquisition Category (ACAT) programs. The test articles identified consist of critical components that will be fully developed during Engineering Manufacturing and Development phase into EDMs.												
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)									FY 2012	FY 2013	FY 2014	
Title: Advanced Imaging Project Development									2.536	2.366	1.944	
									0	0	0	
FY 2012 Accomplishments:												
Transitioned Head Window Water Shedding Selection												
UMC Software/Hardware testing												

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Exhibit R-2A, RDT&E Project Justification: PB 2014 Navy		DATE: April 2013		
APPROPRIATION/BUDGET ACTIVITY 1319: Research, Development, Test & Evaluation, Navy BA 4: Advanced Component Development & Prototypes (ACD&P)		R-1 ITEM NOMENCLATURE PE 0603562N: Submarine Tactical Warfare Sys		PROJECT 0770: Adv Sub Supp Equip Prog
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2012	FY 2013	FY 2014
ONR AMPPM Critical Design Review EO/IR Vulnerability Studies <b>FY 2013 Plans:</b> 360 Degree Medium Wave Infrared (MWIR) Lab Demo and Pierside Testing 360 Degree Affordable Modular Panoramic Photonics Mast (AMPPM) Short Wave Infrared (SWIR) camera and Hyperspectral camera Critical Design Reviews (CDR) EO/IR Mast Signature Reduction: Continuation of EO/IR TDA GUI Development Electro-Optic/Infrared Vulnerability Signature Reduction At-Sea Test Universal Mast Controller S/W & H/W Development/Test, EDM# 1 & 2 Delivery LPPM Initial Design Reveiw (IDR), CDR, Lab Test/Sell Off Common electronic hull penetrator and dip-loop Head Window Water Shedding Pierside Testing <b>FY 2014 Plans:</b> 360 Degree Imaging (ONR) Dip Loop Development, AMPPM - Lab Testing SWIR and Hyperspectral Cameras LPPM At-Sea Testing				
Title: Advanced Electronic Warfare Support (EW) Project Development  <b>FY 2012 Accomplishments:</b> Commenced development of the EW Vulnerability Tool / Tactical Decision Aid Distant Support and Remote Log-in Lab Testing Rapid Reprogramming of Threat Libraries Lab Testing ES Server (Correlator) Lab Testing <b>FY 2013 Plans:</b> Distant Support and Remote Log-in At-Sea Testing Rapid Reprogramming of Threat Libraries At-sea Testing ES Server (Correlator) At-Sea Testing ES Server (Valkyrie) Development ES Vulnerability Tool / Tactical Decision Aid Development CDR and Lab Demo Enhanced DeInterleavers Development LPI DF / Localization Development		Articles: 1.262 0	1.623 0	1.911 0

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2014 Navy		<b>DATE:</b> April 2013	
<b>APPROPRIATION/BUDGET ACTIVITY</b> 1319: <i>Research, Development, Test &amp; Evaluation, Navy</i> BA 4: <i>Advanced Component Development &amp; Prototypes (ACD&amp;P)</i>		<b>R-1 ITEM NOMENCLATURE</b> PE 0603562N: <i>Submarine Tactical Warfare Sys</i>	<b>PROJECT</b> 0770: <i>Adv Sub Supp Equip Prog</i>
<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>		<b>FY 2012</b>	<b>FY 2013</b>
Embedded Built-in Test (BIT) Development			
<b>FY 2014 Plans:</b> ES Vulnerability Tool / Tactical Decision Aid At-Sea Test ES Server (Valkyrie) CDR Enhanced DeInterleavers Development/CDR LPI DF / Localization Development/CDR Embedded Built-in Test (BIT) Development/CDR			
<b>Accomplishments/Planned Programs Subtotals</b>		3.798	3.989
<b>C. Other Program Funding Summary (\$ in Millions)</b> N/A			
<b>Remarks</b>			
<b>D. Acquisition Strategy</b> This project optimizes technology insertion using a build-test-build approach to support EW and Imaging operational needs. Operational needs have been based on the tactical requirements identified in CNO letters, Serial N77/3U629212, dated 04 Sep 03, CNO Ltr Ser N772/5U936037 dtd 13 JUN 2005, CNO Ltr Ser N776/4U786103 dtd 1 APR 2004, COMSUBLANT/ COMSUBPAC, Virginia Class SSN Operational Requirements Documentation objectives, ORD for Photonics (ORD #365-87-94) [dtd JUL 1994], Operational Requirements Document (ORD) for ES (ORD # 570-77-00) [dtd 20 DEC 2000], ORD for ISIS (ORD #663-77-05) [dtd MAR 2005], Capability Development Document (CDD) for Submarine EW Systems (Ver-DRAFT), Common Submarine Imaging System (CSIS) (CDD# 849-87-11) dtd 22 Dec 2011 for Submarine Imaging Systems and JOINT COMMAND SUBMARINE FORCE/COMMANDER SUBMARINE FORCE Ltr Ser# NOO/00621 dtd 24 Oct 2011. Project efforts develop submarine unique improvements to mast, periscope, and EW electromagnetic spectrum and electro-optic sensors based on emerging technologies that are available from DoD Exploratory Development Programs, industry Independent Research and Development, and other sources. Engineering Demonstration Models (EDMs) will be developed to provide a realistic method of evaluating the improvements, including deployment on submarines for testing.			
<b>E. Performance Metrics</b> The RDD program goal is to respond to urgent operational needs within 30 days and provide for rapid development and fielding of prototype solutions within 270 days.			

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2014 Navy												DATE: April 2013			
APPROPRIATION/BUDGET ACTIVITY						R-1 ITEM NOMENCLATURE				PROJECT					
1319: Research, Development, Test & Evaluation, Navy BA 4: Advanced Component Development & Prototypes (ACD&P)						PE 0603562N: Submarine Tactical Warfare Sys				0770: Adv Sub Supp Equip Prog					
Product Development (\$ in Millions)				FY 2012		FY 2013		FY 2014 Base		FY 2014 OCO		FY 2014 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	All Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Systems Engineering	WR	NUWC:RI	5.014	1.949	Nov 2011	3.074	Nov 2012	3.332	Nov 2013	-		3.332	Continuing	Continuing	Continuing
Primary Hardware Development	SS/CPIF	NSWCCD Det Bethesda:MD	0.000	0.083	Jan 2012	0.000		0.000		-		0.000	0.000	0.083	
Systems Engineering	SS/FFP	JHU/ARL:MD	0.318	0.300	Mar 2012	0.300	Jul 2013	0.300	Jul 2014	-		0.300	Continuing	Continuing	Continuing
Primary Hardware Development	WR	NSWC Philadelphia:PA	0.000	0.000	Jan 2012	0.367	Apr 2013	0.000		-		0.000	0.000	0.367	
Primary Hardware Development	C/CPFF	3 Phoenix:VA	0.451	1.190	Jan 2012	0.000	Mar 2013	0.000		-		0.000	0.000	1.641	
Subtotal			5.783	3.522		3.741		3.632		0.000		3.632			
Support (\$ in Millions)				FY 2012		FY 2013		FY 2014 Base		FY 2014 OCO		FY 2014 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	All Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Engineering Technical Services	C/CPAF	AT&T GSI:Vienna, VA	1.115	0.240	Feb 2012	0.000		0.000		-		0.000	0.000	1.355	1.585
Engineering Technical Services	C/CPAF	Booz Allen & Hamilton:McLean, VA	0.000	0.000		0.216	Feb 2013	0.194	Feb 2014	-		0.194	Continuing	Continuing	Continuing
Subtotal			1.115	0.240		0.216		0.194		0.000		0.194			
Management Services (\$ in Millions)				FY 2012		FY 2013		FY 2014 Base		FY 2014 OCO		FY 2014 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	All 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:WNY	0.148	0.036	Oct 2011	0.032	Oct 2012	0.029	Oct 2013	-		0.029	Continuing	Continuing	Continuing
Subtotal			0.148	0.036		0.032		0.029		0.000		0.029			

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			All Prior Years	FY 2012		FY 2013		FY 2014 Base		FY 2014 OCO		FY 2014 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			7.046	3.798		3.989		3.855		0.000		3.855			

Remarks

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Exhibit R-4, RDT&amp;E Schedule Profile: PB 2014 Navy

DATE: April 2013

## APPROPRIATION/BUDGET ACTIVITY

1319: Research, Development, Test & Evaluation, Navy  
BA 4: Advanced Component Development & Prototypes (ACD&P)

## R-1 ITEM NOMENCLATURE

PE 0603562N: Submarine Tactical Warfare  
Sys

## PROJECT

0770: Adv Sub Supp Equip Prog

Fiscal Year	2012				2013				2014				2015				2016				2017				2018			
Quarter	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
ASSEP																												
Imaging Advanced Development																												
360 Degree Imaging (ONR 360 MWIR)				Lab Demo				Pierside Phase I																				
360 Degree Imaging (ONR AMPPM unit FY15, ASSEP MT-22 FY16-FY21)		AMPPM CDR		SWIR CDR		Hyperspectral CDR				Lab Testing SWIR Hyper Spectral Cameras		Diploop/EHP Development		FNC Demo		FNC Pierside Testing		Diploop/EHP 1st Article Testing		Updated FNC Testing		TEMPALT/At-Sea-Test		AMPPM TDP				
Head Window Water Shedding			Pierside Testing		Pierside Testing					Transition to Imaging At-Sea Test																		
Electro-Optic/Infrared Vulnerability Signature Reduction		Update TDA		IR/EO TDA GUI																								
Low Profile Photonics Mast				IDR CDR		CDR		Lab Test Self-Conf																				
Universal Mast Controller		S/W Lab Test		H/W Lab Test		EDM #1	EDM #2			Transition to Imaging																		
Electronic Warfare Advanced Development																												
Tech Insertions (TI14) Distant Support and Remote Login, Rapid Reprogram threat Library and ES Server (Correlator)		Lab Test				At-Sea Test				Transition to EW																		
Tech Insertions (TI16) ES Server (Valkyrie)						Transition Develop				CDR				Lab Demo		At-Sea Test				Transition to EW								
Tech Insertions (TI16) EW Vulnerability Tool / Tactical Decision Aid		Develop				CDR				Lab Demo				At-Sea Test														
Tech Insertions (TI16) Embedded BIT						Develop				CDR				Lab Demo		At-Sea Test				Transition to EW								
Tech Insertions (TI20) LPI DF / Localization and Enhanced Deinterleavers						Develop				CDR				Lab Demo		At-Sea Test												
Tech Insertions (TI18) ES On-Board Trainer (OBT)														Develop						CDR				Lab Test		At-Sea Test		Transition to EW
Tech Insertions (TI20) Next Generation EW System														Develop						CDR				Lab Test		At-Sea Test		Transition to EW
Tech Insertions (TI20) MMM Payload																				Develop				CDR				Lab Test
Tech Insertions (APB21/23) Next Gen EW APB (x2)																											Develop	

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<b>Exhibit R-4A, RDT&amp;E Schedule Details:</b> PB 2014 Navy			<b>DATE:</b> April 2013
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## Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<b>Proj 0770</b>				
Imaging Advanced Development: 360 Degree Imaging (ONR 360 MWIR) - Lab Testing	1	2013	1	2013
Imaging Advanced Development: 360 Degree Imaging (ONR 360 MWIR) - Pierside Testing	2	2013	2	2013
Imaging Advanced Development: 360 Degree Imaging (ONR) - AMPPM - System CDR	4	2012	4	2012
Imaging Advanced Development: 360 Degree Imaging (ONR) - AMPPM - SWIR CDR	1	2013	1	2013
Imaging Advanced Development: 360 Degree Imaging (ONR) - AMPPM - Hyperspectral CDR	2	2013	2	2013
Imaging Advanced Development: 360 Degree Imaging (ONR) - AMPPM - Lab Demo Components	2	2014	2	2014
Imaging Advanced Development: 360 Degree Imaging (ONR) - AMPPM - Diploop / EHP Development	4	2014	4	2014
Imaging Advanced Development: 360 Degree Imaging (ONR) - AMPPM - FNC Lab Demo	2	2015	2	2015
Imaging Advanced Development: 360 Degree Imaging (ONR) - AMPPM - FNC Pierside Testing	4	2015	4	2015
Imaging Advanced Development: 360 Degree Imaging (ONR) - AMPPM - Diploop / EHP 1st Article Testing	3	2016	3	2016
Imaging Advanced Development: 360 Degree Imaging (ONR) - AMPPM - Updated FNC Testing	1	2017	1	2017
Imaging Advanced Development: 360 Degree Imaging (ONR) - AMPPM - TEMPALT/ At-Sea Testing	2	2017	2	2017
Imaging Advanced Development: 360 Degree Imaging (ONR) - AMPPM - AMPPM TDP	4	2017	4	2017
Imaging Advanced Development: Head Window Watershedding - Pierside Testing #1	2	2012	2	2012

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Exhibit R-4A, RDT&E Schedule Details: PB 2014 Navy			DATE: April 2013	
APPROPRIATION/BUDGET ACTIVITY 1319: Research, Development, Test & Evaluation, Navy BA 4: Advanced Component Development & Prototypes (ACD&P)		R-1 ITEM NOMENCLATURE PE 0603562N: Submarine Tactical Warfare Sys		PROJECT 0770: Adv Sub Supp Equip Prog
		Start		End
Events by Sub Project		Quarter	Year	Quarter Year
Imaging Advanced Development: Head Window Watershedding - Pierside Testing #2		3	2013	3 2013
Imaging Advanced Development: Head Window Watershedding (Transistion to Imaging)		4	2013	4 2013
Imaging Advanced Development: Electro-Optic/Infrared (EO/IR) Vulnerability Signature Reduction - Update TDA		2	2012	2 2012
Imaging Advanced Development: EO/IR Vulnerability Signature Reduction - TDA GUI		4	2012	4 2012
Imaging Advanced Development: EO/IR Vulnerability Signature Reduction - At-Sea Test		4	2013	4 2013
Imaging Advanced Development: EO/IR Vulnerability Signature Reduction - Transistion to Imaging		3	2014	3 2014
Imaging Advanced Development: Universal Mast Controller (UMC) Software Lab Test		2	2012	2 2012
Imaging Advanced Development: Low Profile Photonics Mast - IDR		1	2013	1 2013
Imaging Advanced Development: Low Profile Photonics Mast - FDR		2	2013	2 2013
Imaging Advanced Development: Low Profile Photonics Mast - Lab Testing/Sell-off		4	2013	4 2013
Imaging Advanced Development: Low Profile Photonics Mast - TEMPALT/At-Sea Test		2	2014	2 2014
Imaging Advanced Development: UMC Hardware Lab Test		3	2012	3 2012
Imaging Advanced Development: UMC EDM #1 Delivery		1	2013	1 2013
Imaging Advanced Development: UMC EDM #2 Delivery		2	2013	2 2013
Imaging Advanced Development: UMC Transition to Imaging		3	2013	3 2013
Electronic Warfare Advance Development: TI-14 - Lab Test		3	2012	3 2012
Electronic Warfare Advance Development: TI-14 - At-Sea Test		2	2013	2 2013
Electronic Warfare Advance Development: TI-14 - Transition to EW		3	2013	3 2013
Electronic Warfare Advance Development: TI-16 ES Server (Valkyrie) - Develop		1	2013	1 2013
Electronic Warfare Advance Development: TI-16 ES Server (Valkyrie) - CDR		1	2014	1 2014
Electronic Warfare Advance Development: TI-16 ES Server (Valkyrie) - Lab Demo		2	2015	2 2015
Electronic Warfare Advance Development: TI-16 ES Server (Valkyrie) - At-Sea Test		4	2015	4 2015

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APPROPRIATION/BUDGET ACTIVITY 1319: Research, Development, Test & Evaluation, Navy BA 4: Advanced Component Development & Prototypes (ACD&P)		R-1 ITEM NOMENCLATURE PE 0603562N: Submarine Tactical Warfare Sys		PROJECT 0770: Adv Sub Supp Equip Prog	
		Start		End	
Events by Sub Project		Quarter	Year	Quarter	Year
Electronic Warfare Advance Development: TI-16 ES Server (Valkyrie) - Transition to EW		1	2016	1	2016
Electronic Warfare Advance Development: TI-16 Radar Vulnerability Tool/Tactical Decision Aid - Develop		1	2012	1	2012
Electronic Warfare Advance Development: TI-16 Radar Vulnerability Tool/Tactical Decision Aid - CDR		1	2013	1	2013
Electronic Warfare Advance Development: TI-16 Radar Vulnerability Tool/Tactical Decision Aid - Lab Demo #1		4	2013	4	2013
Electronic Warfare Advance Development: TI-16 Radar Vulnerability Tool/Tactical Decision Aid - At-Sea Test #1		2	2014	2	2014
Electronic Warfare Advance Development: TI-16 Radar Vulnerability Tool/Tactical Decision Aid - Lab Demo #2		2	2015	2	2015
Electronic Warfare Advance Development: TI-16 Radar Vulnerability Tool/Tactical Decision Aid - At-Sea Test #2		4	2015	4	2015
Electronic Warfare Advance Development: TI-16 Embedded BIT - Develop		2	2013	2	2013
Electronic Warfare Advance Development: TI-16 Embedded BIT - CDR		2	2014	2	2014
Electronic Warfare Advance Development: TI-16 Embedded BIT - Lab Demo		2	2015	2	2015
Electronic Warfare Advance Development: TI-16 Embedded BIT - At-Sea Test		4	2015	4	2015
Electronic Warfare Advance Development: TI-16 Embedded BIT - Transition to EW		1	2016	1	2016
Electronic Warfare Advance Development: TI-18 LPI DF/Localization; Enhanced DeInterleavers - Develop		2	2013	2	2013
Electronic Warfare Advance Development: TI-18 LPI DF/Localization; Enhanced DeInterleavers - CDR		2	2014	2	2014
Electronic Warfare Advance Development: TI-18 LPI DF/Localization; Enhanced DeInterleavers - Lab Demo		2	2015	2	2015
Electronic Warfare Advance Development: TI-18 LPI DF/Localization; Enhanced DeInterleavers - At-Sea Test		4	2015	4	2015
Electronic Warfare Advance Development: TI-18 ES On-Board Trainer - Develop		2	2015	2	2015

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APPROPRIATION/BUDGET ACTIVITY 1319: Research, Development, Test & Evaluation, Navy BA 4: Advanced Component Development & Prototypes (ACD&P)		R-1 ITEM NOMENCLATURE PE 0603562N: Submarine Tactical Warfare Sys		PROJECT 0770: Adv Sub Supp Equip Prog
		Start		End
Events by Sub Project	Quarter	Year	Quarter	Year
Electronic Warfare Advance Development: TI-18 ES On-Board Trainer - CDR	2	2016	2	2016
Electronic Warfare Advance Development: TI-18 ES On-Board Trainer - Lab Test	2	2017	2	2017
Electronic Warfare Advance Development: TI-18 ES On-Board Trainer - At-Sea Test	4	2017	4	2017
Electronic Warfare Advance Development: TI-18 ES On-Board Trainer - Transition to EW	1	2018	1	2018
Electronic Warfare Advance Development: TI 20 Next Generation EW System-Development	2	2015	2	2015
Electronic Warfare Advance Development: TI 20 Next Generation EW System - CDR	2	2016	2	2016
Electronic Warfare Advance Development: TI 20 Next Generation EW System - Lab Test	2	2017	2	2017
Electronic Warfare Advance Development: TI 20 Next Generation EW System - At-Sea Test	4	2017	4	2017
Electronic Warfare Advance Development: TI 20 MMM Payload - Development	2	2016	2	2016
Electronic Warfare Advance Development: TI 20 MMM Payload - CDR	2	2017	2	2017
Electronic Warfare Advance Development: TI 20 MMM Payload - Lap Test	2	2018	2	2018
Electronic Warfare Advance Development: TI 20 MMM Payload - At-Sea Test	4	2018	4	2018
Electronic Warfare Advance Development: APB 21/23 Algorithm - Develop	1	2018	1	2018
Electronic Warfare Advance Development: APB 21/23 New Application - Develop	2	2018	2	2018

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Exhibit R-2A, RDT&E Project Justification: PB 2014 Navy										DATE: April 2013		
APPROPRIATION/BUDGET ACTIVITY 1319: Research, Development, Test & Evaluation, Navy BA 4: Advanced Component Development & Prototypes (ACD&P)					R-1 ITEM NOMENCLATURE PE 0603562N: Submarine Tactical Warfare Sys				PROJECT 1739: Submarine Arctic W/F Development			
COST (\$ in Millions)	All Prior Years	FY 2012	FY 2013 <sup>#</sup>	FY 2014 Base	FY 2014 OCO <sup>##</sup>	FY 2014 Total	FY 2015	FY 2016	FY 2017	FY 2018	Cost To Complete	Total Cost
1739: Submarine Arctic W/F Development	30.825	5.210	5.379	4.909	-	4.909	5.549	5.641	5.759	5.842	Continuing	Continuing
Quantity of RDT&E Articles	0	0	0	0		0	0	0	0	0		
# FY 2013 Program is from the FY 2013 President's Budget, submitted February 2012												
## The FY 2014 OCO Request will be submitted at a later date												
A. Mission Description and Budget Item Justification												
The Submarine Arctic Warfare Development project responds to the increased threat of submarine and surface ship activity in Arctic regions of the world through the development of advanced submarine concepts. It places particular emphasis on submarine operability and mission support in unique, cold, ice-covered, environments. Efforts include assessment of combat system effectiveness, weapons testing, use of high frequency sonars in Arctic regions, testing of ice-capable submarine structures, and development of class-specific Arctic operational guidelines. This project also provides the framework for various research and development programs to conduct test and evaluation in shallow water and Arctic regions.												
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)										FY 2012	FY 2013	FY 2014
Title: Conduct ICEX and Arctic Transit Mission, ICEX Workup and Training, Ice Camp										5.210	5.379	4.909
										Articles: 0	0	0
FY 2012 Accomplishments: Provided planning and support for the upcoming ICEX mission 1-2013. Supported Arctic deployments, including inter-Fleet transfers, as required by the Submarine Force Commanders. Investigated, researched, developed and deployed new systems for Arctic submarine support. Supported testing and tactical development required to improve submarine Arctic operability and warfighting. Converted SSN 688I and SSN 21 Class Arctic TEMPALTs from study design to mission/tactical grade. Completed Fleet demonstration efforts on new Edgetech 2200 Side Scan system.												
FY 2013 Plans: Conduct ICEX mission 1-2013. Continue planning and support for a 2014 ICEX mission and Ice Camp 1-2014. Support Arctic deployments, including inter-Fleet transfers, as required by the Submarine Force Commanders. Investigate, research, develop and deploy new systems for Arctic submarine support. Support testing and tactical development required to improve submarine Arctic operability and warfighting. Install and test mission/tactical grade equipment on a SSN 688I and SSN 21 Class platform. Convert SSN 774 Class Submarine Arctic TEMPALTs from study design to mission/tactical grade. Develop a High Frequency Active (HFA) under-ice Sonar training product. Evaluate Under-Ice HFA training product during Arctic training sessions. Procure												

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2014 Navy		<b>DATE:</b> April 2013		
<b>APPROPRIATION/BUDGET ACTIVITY</b> 1319: <i>Research, Development, Test &amp; Evaluation, Navy</i> BA 4: <i>Advanced Component Development &amp; Prototypes (ACD&amp;P)</i>	<b>R-1 ITEM NOMENCLATURE</b> PE 0603562N: <i>Submarine Tactical Warfare Sys</i>	<b>PROJECT</b> 1739: <i>Submarine Arctic W/F Development</i>		
<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b> two additional EdgeTech 220 Side Scan systems to support SSN 688I/774 Class Submarines. Develop and test new display software for the Commercial Off The Shelf (COTS) SEABIRD Conductivity, Temperature, and Depth (CTD) probes.  <b><i>FY 2014 Plans:</i></b> Conduct Arctic work-up training and ICEX mission 1-2014. Evaluate new display software for the COTS SEABIRD CTD probes. Support Arctic deployments, including inter-Fleet transfers, as required by the Submarine Force Commanders. Investigate, research, develop and deploy new systems for Arctic submarine support. Support testing and tactical development required to improve submarine Arctic operability and warfighting. Evaluate SSN 774 Class Submarine Arctic Mission/Tactical grade TEMPALTs.		<b>FY 2012</b>	<b>FY 2013</b>	<b>FY 2014</b>
<b>Accomplishments/Planned Programs Subtotals</b>		5.210	5.379	4.909
<b>C. Other Program Funding Summary (\$ in Millions)</b> N/A  <b>Remarks</b>  <b>D. Acquisition Strategy</b> Use sole source and competitively awarded contracts through the Fleet Logistics Center (FLC) regional contracting office for equipment and technical services. The NAVSEA University Affiliated Research Center (UARC) omnibus contract is used for procurement of logistics support for Ice Camps and Conductivity, Temperature, and Depth (CTD) probe display software development.  <b>E. Performance Metrics</b> - Conduct work-up and ICEX 1-2013. - Evaluate a PC-based High Frequency Active (HFA) sonar training tool. - Demonstrate the new software interface for Conductivity, Temperature, and Depth (CTD) probe displays.				

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<b>Exhibit R-3, RDT&amp;E Project Cost Analysis: PB 2014 Navy</b>												<b>DATE:</b> April 2013			
<b>APPROPRIATION/BUDGET ACTIVITY</b> 1319: Research, Development, Test & Evaluation, Navy BA 4: Advanced Component Development & Prototypes (ACD&P)						<b>R-1 ITEM NOMENCLATURE</b> PE 0603562N: Submarine Tactical Warfare Sys						<b>PROJECT</b> 1739: Submarine Arctic W/F Development			
<b>Test and Evaluation (\$ in Millions)</b>				<b>FY 2012</b>		<b>FY 2013</b>		<b>FY 2014 Base</b>		<b>FY 2014 OCO</b>		<b>FY 2014 Total</b>			
<b>Cost Category Item</b>	<b>Contract Method &amp; Type</b>	<b>Performing Activity &amp; Location</b>	<b>All Prior Years</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Cost To Complete</b>	<b>Total Cost</b>	<b>Target Value of Contract</b>
Developmental Test & Evaluation	WR	COMSUBPAC:CA	22.627	5.106	Dec 2011	3.004	Nov 2012	4.044	Nov 2013	-		4.044	Continuing	Continuing	Continuing
Developmental Test & Evaluation	WR	NUWC/Newport:RI	0.235	0.000		0.000		0.000		-		0.000	0.000	0.235	0.235
Developmental Test & Evaluation	C/CPFF	UT/ARL:TX	0.000	0.000		0.300	Jan 2013	0.000		-		0.000	0.000	0.300	
Developmental Test & Evaluation	C/CPFF	UW/APL:WA	6.828	0.000		2.000	Dec 2012	0.800	Dec 2013	-		0.800	Continuing	Continuing	Continuing
<b>Subtotal</b>			29.690	5.106		5.304		4.844		0.000		4.844			
<b>Management Services (\$ in Millions)</b>				<b>FY 2012</b>		<b>FY 2013</b>		<b>FY 2014 Base</b>		<b>FY 2014 OCO</b>		<b>FY 2014 Total</b>			
<b>Cost Category Item</b>	<b>Contract Method &amp; Type</b>	<b>Performing Activity &amp; Location</b>	<b>All Prior Years</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Cost To Complete</b>	<b>Total Cost</b>	<b>Target Value of Contract</b>
Program Management Support	C/CPAF	EG&G:VA	0.311	0.000		0.000		0.000		-		0.000	0.000	0.311	0.311
Program Management Support	C/CPAF	BAE SYSTEMS:MD	0.784	0.104	Feb 2012	0.075	Dec 2012	0.065	Dec 2013	-		0.065	Continuing	Continuing	Continuing
Travel	Allot	NAVSEA PEO IWS 5:Washington, DC	0.040	0.000		0.000		0.000		-		0.000	0.000	0.040	Continuing
<b>Subtotal</b>			1.135	0.104		0.075		0.065		0.000		0.065			
<b>Project Cost Totals</b>			30.825	5.210		5.379		4.909		0.000		4.909			
<b>Remarks</b>															

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Exhibit R-4, RDT&E Schedule Profile: PB 2014 Navy

DATE: April 2013

## APPROPRIATION/BUDGET ACTIVITY

1319: Research, Development, Test & Evaluation, Navy  
BA 4: Advanced Component Development & Prototypes (ACD&P)

## R-1 ITEM NOMENCLATURE

PE 0603562N: Submarine Tactical Warfare Sys

## PROJECT

1739: Submarine Arctic W/F Development

Proj 1739	FY 2012				FY 2013				FY 2014				FY 2015				FY 2016				FY 2017				FY 2018			
	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q
Arctic Deployment (at Sea)																												
	Arctic Deployment																											
ICEX Mission (at Sea)																												
					ICEX 2013				ICEX 2014								ICEX 2016											
Arctic Transit Mission (at Sea)																												
	Arctic Transit Mission																											
Arctic Workup (at Sea)																												
	Arctic Workup																											
Arctic Training																												
	Arctic Training																											
Ice Camp (Arctic Ocean)																												
									Ice Camp 2014								Ice Camp 2016											

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<b>Exhibit R-4A, RDT&amp;E Schedule Details:</b> PB 2014 Navy			<b>DATE:</b> April 2013
<b>APPROPRIATION/BUDGET ACTIVITY</b> 1319: <i>Research, Development, Test &amp; Evaluation, Navy</i> BA 4: <i>Advanced Component Development &amp; Prototypes (ACD&amp;P)</i>	<b>R-1 ITEM NOMENCLATURE</b> PE 0603562N: <i>Submarine Tactical Warfare Sys</i>	<b>PROJECT</b> 1739: <i>Submarine Arctic W/F Development</i>	

**Schedule Details**

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<b>Proj 1739</b>				
Arctic Deployment (at Sea): Submarine Deployment as required by the Submarine Type Commander	1	2012	4	2018
ICEX Mission (at Sea): ICEX Mission (at Sea) 2013	1	2013	4	2013
ICEX Mission (at Sea): ICEX Mission (at Sea) 2014	1	2014	4	2014
ICEX Mission (at Sea): ICEX Mission (at Sea) 2016	1	2016	4	2016
Arctic Transit Mission (at Sea): Arctic Transit Mission (at Sea)	1	2012	4	2018
Arctic Workup (at Sea): Arctic Workup (at Sea)	1	2012	4	2018
Arctic Training: Arctic Training	1	2012	4	2018
Ice Camp (Arctic Ocean): Ice Camp (Arctic Ocean) 2014	1	2014	4	2014
Ice Camp (Arctic Ocean): Ice Camp (Arctic Ocean) 2016	1	2016	4	2016