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Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Navy **Date:** March 2019

Appropriation/Budget Activity 1319: <i>Research, Development, Test & Evaluation, Navy / BA 5: System Development & Demonstration (SDD)</i>	R-1 Program Element (Number/Name) PE 0604261N / <i>Acoustic Search Sensors</i>
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COST (\$ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
Total Program Element	515.845	36.310	42.485	47.013	-	47.013	47.883	48.843	49.802	50.797	Continuing	Continuing
0480: <i>ASW Sensors & Proc</i>	398.306	32.686	38.599	43.045	-	43.045	43.837	44.717	45.594	46.505	Continuing	Continuing
3224: <i>High Altitude ASW</i>	117.539	3.624	3.886	3.968	-	3.968	4.046	4.126	4.208	4.292	Continuing	Continuing

A. Mission Description and Budget Item Justification

Includes RDT&E funds for engineering development and operational test and evaluation of acoustic search sensors/systems and complementary equipment for Anti-Submarine Warfare (ASW) aircraft.

JUSTIFICATION FOR BUDGET ACTIVITY: This program is funded under SYSTEM DEVELOPMENT AND DEMONSTRATION because it includes those projects that have passed Milestone B approval and are conducting engineering and manufacturing development tasks aimed at meeting validated requirement prior to full-rate production decision.

B. Program Change Summary (\$ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Previous President's Budget	37.167	42.485	47.083	-	47.083
Current President's Budget	36.310	42.485	47.013	-	47.013
Total Adjustments	-0.857	0.000	-0.070	-	-0.070
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.857	0.000			
• Rate/Misc Adjustments	0.000	0.000	-0.070	-	-0.070

Change Summary Explanation

Funding: Funds Multi-Static Active Coherent Enhancements (MAC-E) development.

Technical: Not applicable.

Schedule:

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Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Navy		Date: March 2019
Appropriation/Budget Activity 1319: Research, Development, Test & Evaluation, Navy / BA 5: System Development & Demonstration (SDD)	R-1 Program Element (Number/Name) PE 0604261N / Acoustic Search Sensors	
<p>0480 Schedule 1. The updated schedule adds more detail to the system development category to depict the test, analyze, fix, test relationship between data collection, software development and integration activities for MAC-E and Next Gen MAC-E. Next Gen MAC-E data collection and analysis and initial software development activities moved left from FY2022 into FY2021.</p> <p>0480 Schedule 2. Not applicable.</p> <p>0480 Schedule 3. Not applicable.</p> <p>3224 Schedule. Not applicable.</p>		

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy										Date: March 2019		
Appropriation/Budget Activity 1319 / 5					R-1 Program Element (Number/Name) PE 0604261N / <i>Acoustic Search Sensors</i>				Project (Number/Name) 0480 / <i>ASW Sensors & Proc</i>			
COST (\$ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
0480: <i>ASW Sensors & Proc</i>	398.306	32.686	38.599	43.045	-	43.045	43.837	44.717	45.594	46.505	Continuing	Continuing
Quantity of RDT&E Articles		75	100	125	-	125	-	-	-	-		

A. Mission Description and Budget Item Justification

The Anti-Submarine Warfare (ASW) Sensors and Processing project provides the tools and methods necessary to maintain naval superiority by preventing threat submarines from disrupting the U.S. Navy's ability to control the sea lines of communication and completing their hostile missions. This project encompasses the Engineering & Manufacturing Development phase and the follow on Production and Deployment Phase of sensor systems to improve the mission effectiveness of airborne ASW platforms in cueing, searching, localizing, tracking, and attacking subsurface targets. Smaller and quieter threat submarines drive the requirement for continued advancement in ASW sensor capabilities for both blue water and littoral environments. The littoral regions of the world create an additional ASW challenge to overcome the increase in background clutter caused by the shallow water depth, high volume of shipping, and commercial radio frequency interference. Project 0480 provides funding to the passive and active ASW family of systems for the engineering development of solutions that detect, classify, and track threat submarines. The Multi-Static Active Coherent (MAC) program encompasses modifications to the active coherent (electronic) source sonobuoy and the Air Deployable Active Receiver sonobuoy and development, integration, and test of aircraft software. It also provides upgrades to the Multi-static mission planning tool, the tactical crew trainers and the tactical ground replay system. This program includes MAC Enhancements (MAC-E) that will shorten the ASW kill chain by enabling the warfighter to search larger areas in less time with more precision.

Project 0480 also provides funding for the Advanced Product Build (APB) program which integrates Office of Naval Research (ONR) Future Naval Capabilities (FNCs), Small Business Innovation Research (SBIR), University Affiliated Research Center (UARC) and other mature technologies into the processing baseline. Efforts incorporate clutter reduction, automation, improved displays and controls, as well as improved communication links resulting in reduced operator workload, increased target detection opportunities, and improved classification techniques. APB also includes an Air ASW Engineering Measurement Program (AEMP) that collects ASW operational system performance data and identifies areas where beneficial improvements can be incorporated across all Air ASW platforms. APB will deliver a new software build nominally in two year increments following MAC-E. The sonobuoy test articles in FY18-FY24 will support software and hardware integration flight tests and Technical Evaluation/Follow-On Test & Evaluation for the MAC program.

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

	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Title: APB System Qualification Test/Fleet Release for P-3C. Rapid Capability Insertion (RCI)/Fleet Release for P-8A	10.686	11.391	12.807	0.000	12.807
Articles:	-	-	-	-	-
FY 2019 Plans: Continue software development/EMP for P-8A RCI (2). Continue MAC FITs for P-8A squadrons.					
FY 2020 Base Plans:					

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy								Date: March 2019				
Appropriation/Budget Activity 1319 / 5				R-1 Program Element (Number/Name) PE 0604261N / <i>Acoustic Search Sensors</i>				Project (Number/Name) 0480 / <i>ASW Sensors & Proc</i>				
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)								FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Continue software development/EMP for P-8A RCI (2). Continue MAC FITs for P-8A squadrons. FY 2020 OCO Plans: N/A FY 2019 to FY 2020 Increase/Decrease Statement: The FY20 increase funds the continued software development/EMP.												
Title: Multi-static Active Coherent (MAC) Articles:								22.000 75	27.208 100	30.238 125	0.000 -	30.238 125
FY 2019 Plans: Continue MAC-E software development. Deliver SSQ-125A PRM units. Conduct SSQ-125A/MAC-E development test. FY 2020 Base Plans: Continue MAC-E software development/integration into the P-8A ECP-7 aircraft software. MAC-E software includes, but is not limited to: MAC-E/ADAR Controller, Likelihood Ratio Tracker, Atlantis, and Active System Performance Estimate Computer Tool. Conduct MAC-E/SSQ-125A development tests. FY 2020 OCO Plans: N/A FY 2019 to FY 2020 Increase/Decrease Statement: The FY20 increase funds the ramp-up of INC 3 MAC-E acoustics development/integration efforts and MAC-E test and evaluation.												
Accomplishments/Planned Programs Subtotals								32.686	38.599	43.045	0.000	43.045
C. Other Program Funding Summary (\$ in Millions)												
Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost	
• OPN/4048: <i>Sonobuoys</i>	41.752	70.363	77.882	0.943	78.825	85.045	82.601	87.084	87.104	Continuing	Continuing	
- AN/SSQ-125 (<i>Multistatic Coherent Source</i>)												
Remarks												

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy		Date: March 2019
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604261N / <i>Acoustic Search Sensors</i>	Project (Number/Name) 0480 / <i>ASW Sensors & Proc</i>
D. Acquisition Strategy The Multistatic Active Coherent (MAC) ASW system and associated sonobuoys are fully integrated on the P-3C and P-8A ASW platforms. MAC Enhancements (MAC-E) is a development program associated with P-8A increment 3 that will significantly increase the wide area search capability through Engineering Change Proposals (ECPs) to the sonobuoys, aircraft software modifications to reduce clutter and improve processing, and OMI improvements to reduce operator workload. S&T and early R&D ASW improvement programs are matured through the APB process for periodic Fleet software releases.		
E. Performance Metrics High level operational system requirements are documented in the MAC Capability Production Document (CPD). Cost, schedule, and performance metrics are tracked throughout the development phase of the program to ensure the operational requirements will be met or exceeded during an extensive DT/OT cycle.		

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Navy													Date: March 2019		
Appropriation/Budget Activity 1319 / 5						R-1 Program Element (Number/Name) PE 0604261N / <i>Acoustic Search Sensors</i>				Project (Number/Name) 0480 / <i>ASW Sensors & Proc</i>					
Product Development (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 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
Primary Hdw Development	SS/CPIF	ERAPSCO : FT. WAYNE IN	21.208	3.592	Dec 2017	2.047	Dec 2018	0.000		-		0.000	17.500	44.347	44.347
Prior year Prod Dev no longer funded in the FYDP	Various	VARIOUS :	19.905	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Software Development	C/CPIF	Boeing : Huntington Beach, CA	0.000	0.000		11.008	Dec 2018	14.452	Dec 2019	-		14.452	0.000	25.460	25.460
Software Development	WR	NAWCAD : PATUXENT RIVER, MD	30.740	6.068	Dec 2017	5.553	Dec 2018	6.036	Dec 2019	-		6.036	Continuing	Continuing	Continuing
Software Development	SS/CPIF	LOCKHEED MARTIN : MANASSAS VA	11.702	1.870	Dec 2017	1.750	Dec 2018	2.500	Dec 2019	-		2.500	3.727	21.549	21.549
Software Development	Various	VARIOUS :	21.442	7.753	Dec 2017	6.750	Dec 2018	7.330	Dec 2019	-		7.330	Continuing	Continuing	Continuing
Subtotal			104.997	19.283		27.108		30.318		-		30.318	Continuing	Continuing	N/A
Remarks															
The FY20 increase funds the ramp-up of INC 3 MAC-E acoustics development/integration efforts.															
Support (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 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
Studies & Analysis	WR	NAWCAD : PATUXENT RIVER, MD	20.073	2.070	Dec 2017	1.979	Dec 2018	2.156	Dec 2019	-		2.156	Continuing	Continuing	Continuing
Technical Data	WR	NAWCAD : PATUXENT RIVER, MD	16.374	0.337	Dec 2017	0.350	Dec 2018	0.431	Dec 2019	-		0.431	Continuing	Continuing	Continuing
Training	WR	NAWCAD : PATUXENT RIVER, MD	4.209	2.360	Dec 2017	2.528	Dec 2018	2.587	Dec 2019	-		2.587	Continuing	Continuing	Continuing
Subtotal			40.656	4.767		4.857		5.174		-		5.174	Continuing	Continuing	N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Navy												Date: March 2019			
Appropriation/Budget Activity 1319 / 5						R-1 Program Element (Number/Name) PE 0604261N / <i>Acoustic Search Sensors</i>				Project (Number/Name) 0480 / <i>ASW Sensors & Proc</i>					
Test and Evaluation (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 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
Test & Eval	WR	NAWCAD : PATUXENT RIVER, MD	32.303	3.689	Dec 2017	3.050	Dec 2018	3.506	Dec 2019	-		3.506	Continuing	Continuing	Continuing
Subtotal			32.303	3.689		3.050		3.506		-		3.506	Continuing	Continuing	N/A
Management Services (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 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
Contractor Eng Spt	Various	VARIOUS : VARIOUS	44.609	2.050	Dec 2017	1.275	Dec 2018	1.293	Dec 2019	-		1.293	Continuing	Continuing	Continuing
Contractor Eng Spt	C/CPFF	NAVMAR APPLIED SCIENCES CORP : WARMINSTER, PA	7.579	1.011	Dec 2017	1.000	Dec 2018	1.173	Dec 2019	-		1.173	2.810	13.573	13.573
Government Eng Spt	WR	NAWCAD : PATUXENT RIVER, MD	98.482	0.386	Dec 2017	0.300	Dec 2018	0.380	Dec 2019	-		0.380	Continuing	Continuing	Continuing
Eng & Tech Spt Srvc (NON-FFRDC)	Various	VARIOUS : VARIOUS	58.794	1.500	Dec 2017	1.009	Dec 2018	1.201	Dec 2019	-		1.201	Continuing	Continuing	Continuing
Mgt & Prof SptT Srvc (FFRDC)	Various	VARIOUS : VARIOUS	10.018	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Prior Years Mgmt Svcs no longer funded in the FYDP	Various	VARIOUS : VARIOUS	0.868	0.000		0.000		0.000		-		0.000	0.000	0.868	0.868
Subtotal			220.350	4.947		3.584		4.047		-		4.047	Continuing	Continuing	N/A
			Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			398.306	32.686		38.599		43.045		-		43.045	Continuing	Continuing	N/A
Remarks															

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PE 0604261N: *Acoustic Search Sensors*
Navy

R-1 Line #109

Appropriation/Budget Activity 1319 / 5												R-1 Program Element (Number/Name) PE 0604261N / Acoustic Search Sensors												Project (Number/Name) 0480 / ASW Sensors & Proc																
Proj: 0480 ASW Sensors & Processors - Multistatic Active Coherent												FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023				FY 2024				
												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	
Acquistion Milestones																																								
Reviews and Milestones																MAC-E CDR ▲																						MAC-E IOC ▲		
System Development																																								
Capability Development and Integration												MAC-E Data Collection & Analysis																												
																								Next Gen MAC-E Data Collection & Analysis																
												MAC-E System of Systems S/W Dev																												
																								Next Gen MAC-E System of Systems S/W Dev																
												MAC-E Acoustic A/C S/W Integration																												
																								Next Gen MAC-E Acoustic A/C S/W Integration																
Test & Evaluation																																								
Technical Evaluation												MAC-E Dev Test																												
Development Test												MAC-E IT & OT																												
Operational Test																																								
Production Milestones																																								
Contract Awards												SSQ-125A PRM ●				Sonobuoy Production Contract Award ●																								Next Gen MAC-E Contract Award ●

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Exhibit R-4, RDT&E Schedule Profile: PB 2020 Navy																								Date: March 2019					
Appropriation/Budget Activity 1319 / 5												R-1 Program Element (Number/Name) PE 0604261N / <i>Acoustic Search Sensors</i>								Project (Number/Name) 0480 / <i>ASW Sensors & Proc</i>									
Proj: 0480 ASW Sensors & Processors - Advanced Product Builds (APB)		FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023				FY 2024			
		1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q				
Acquisition Milestones																													
Milestones									RCI (2) Flt Rel ▼																				
System Development																													
Software Development		System Development/Engineering Measurement																											
Test & Evaluation																													
Technical Evaluation																													
Fleet Introduction Training																													
		Fleet Intro Trng																											
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Exhibit R-4A, RDT&E Schedule Details: PB 2020 Navy

Date: March 2019

Appropriation/Budget Activity

1319 / 5

R-1 Program Element (Number/Name)

PE 0604261N / Acoustic Search Sensors

Project (Number/Name)

0480 / ASW Sensors & Proc

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Proj: 0480 ASW Sensors & Processors - Multistatic Active Coherent				
Acquisition Milestones: Reviews and Milestones: Critical Design Review	1	2019	1	2019
Acquisition Milestones: Reviews and Milestones: Initial Operational Capability	4	2024	4	2024
System Development: Capability Development and Integration: MAC-E Data Collection & Analysis	1	2018	1	2021
System Development: Next Gen MAC-E Data Collection & Analysis	2	2021	4	2024
System Development: MAC-E System of Systems Software Development	1	2018	2	2021
System Development: Next Gen MAC-E System of Systems Software Development	3	2021	4	2024
System Development: MAC-E Acoustic Aircraft Software Integration	1	2018	3	2021
System Development: Next Gen MAC-E Acoustic Aircraft Software Integration	3	2022	4	2024
Test & Evaluation: Development Test: MAC-E Development Test	3	2018	4	2022
Test & Evaluation: Operational Test: MAC-E Operational Test	1	2023	2	2024
Production Milestones: Contract Awards: SSQ-125A PRM	2	2018	2	2018
Production Milestones: Contract Awards: Sonobuoy Production Contract Award	1	2019	1	2019
Production Milestones: Contract Awards: Next Gen MAC-E Contract Award	2	2022	2	2022
Proj: 0480 ASW Sensors & Processors - Advanced Product Builds (APB)				
Acquisition Milestones: Milestones: RCI (2) Fleet Release	4	2019	4	2019
Acquisition Milestones: Milestones: RCI (3) Fleet Release	2	2021	2	2021
System Development: Software Development: System Development/Engineering Measurement	1	2018	4	2024
Test & Evaluation: Technical Evaluation: RCI (2) SQT	3	2018	3	2018
Test & Evaluation: Technical Evaluation: RCI (3) SQT	3	2020	3	2020
Fleet Introduction Training: Fleet Introduction Training	1	2018	4	2024

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy										Date: March 2019		
Appropriation/Budget Activity 1319 / 5					R-1 Program Element (Number/Name) PE 0604261N / <i>Acoustic Search Sensors</i>				Project (Number/Name) 3224 / <i>High Altitude ASW</i>			
COST (\$ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
3224: <i>High Altitude ASW</i>	117.539	3.624	3.886	3.968	-	3.968	4.046	4.126	4.208	4.292	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The High Altitude Anti-Submarine Warfare (HAASW) program increases P-8A operational flexibility and effectiveness throughout the kill chain at higher than traditional ASW altitudes. FY10-FY16 activities included Sonobuoy Technology Development (TD), P-8A Aircraft integration, Training, Test & Evaluation, and Initial Operational Capability. TD includes hardware modifications to current production sonobuoys and software development for the aircraft. Global Positioning System (GPS) integration will provide precise sonobuoy location regardless of aircraft altitude/location to enhance wide area ASW search, localization, track and targeting. The digital telemetry will improve sonobuoy communication performance in high Radio Frequency Interference environments, increase Air Deployable Active Receiver (SSQ-101) channel availability, and provide NATO compatibility. FY18 activities include the integration of an algorithm that will adjust sonobuoy release/drop points for more accurate sonobuoy placement. FY18-FY24 activities include the integration of encryption protections.

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

	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Title: High Altitude Enablers	3.624	3.886	3.968	0.000	3.968
Articles:	-	-	-	-	-
FY 2019 Plans: Continue ECP 3 FOT&E. Continue digital telemetry/encryption requirements analysis. Continue digital telemetry integration.					
FY 2020 Base Plans: Continue ECP 3 FOT&E. Continue digital telemetry/encryption requirements analysis. Continue digital telemetry integration.					
FY 2020 OCO Plans: N/A					
FY 2019 to FY 2020 Increase/Decrease Statement: The FY20 increase funds digital telemetry/encryption efforts.					
Accomplishments/Planned Programs Subtotals	3.624	3.886	3.968	0.000	3.968

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

Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
• OPN/4048: <i>Sonobuoys - All Types</i>	173.616	237.347	260.644	2.910	263.554	264.028	271.538	275.378	279.228	Continuing	Continuing

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy			Date: March 2019
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604261N / <i>Acoustic Search Sensors</i>	Project (Number/Name) 3224 / <i>High Altitude ASW</i>	

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

<u>Line Item</u>	<u>FY 2018</u>	<u>FY 2019</u>	<u>FY 2020</u> <u>Base</u>	<u>FY 2020</u> <u>OCO</u>	<u>FY 2020</u> <u>Total</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
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Remarks

D. Acquisition Strategy

A 15 March 12 Acquisition Decision Memorandum (ADM) from PEO(A) (Milestone Decision Authority) approved the transition from a planned Acquisition Category (ACAT) Program to a series of Engineering Change Proposal (ECP) modifications to the AN/SSQ-53, AN/SSQ-62 and AN/SSQ-101 sonobuoys. Affordability deferred the digital telemetry requirement in the SSQ-53, SSQ-62 and SSQ-125 sonobuoys to FY18-FY24. All major contracts (ERAPSCO & Boeing) to meet P-8A Inc 2 ECP 2 and ECP 3 requirements have been awarded. Integrate cyber security protections.

E. Performance Metrics

Schedule and cost variances are used to track sonobuoy development. Should Cost methodology has also been employed to manage the development and production costs of the HAASW capable sonobuoys.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Navy												Date: March 2019			
Appropriation/Budget Activity 1319 / 5						R-1 Program Element (Number/Name) PE 0604261N / <i>Acoustic Search Sensors</i>				Project (Number/Name) 3224 / <i>High Altitude ASW</i>					
Product Development (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 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
Primary Hdw Development	C/CPFF	VARIOUS : VARIOUS	1.900	0.850	Nov 2017	1.000	Nov 2018	1.031	Nov 2019	-		1.031	2.600	7.381	7.381
Prior year Prod Dev no longer funded in the FYDP	Various	VARIOUS : VARIOUS	44.280	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
INC 3 A/C Software Integration	C/CPFF	BOEING : SEATTLE WA	0.000	1.500	Nov 2017	1.368	Nov 2018	1.388	Nov 2019	-		1.388	0.000	4.256	4.256
Subtotal			46.180	2.350		2.368		2.419		-		2.419	Continuing	Continuing	N/A
Support (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 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
Prior year Support cost no longer funded in the FYDP	Various	VARIOUS : VARIOUS	35.380	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Subtotal			35.380	0.000		0.000		0.000		-		0.000	Continuing	Continuing	N/A
Test and Evaluation (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 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
Test & Eval	Various	VARIOUS : VARIOUS	5.503	0.644	Nov 2017	0.750	Nov 2018	0.754	Nov 2019	-		0.754	Continuing	Continuing	Continuing
Subtotal			5.503	0.644		0.750		0.754		-		0.754	Continuing	Continuing	N/A
Management Services (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 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
Contractor Eng Spt	Various	VARIOUS : VARIOUS	3.322	0.152	Nov 2017	0.200	Nov 2018	0.199	Nov 2019	-		0.199	Continuing	Continuing	Continuing

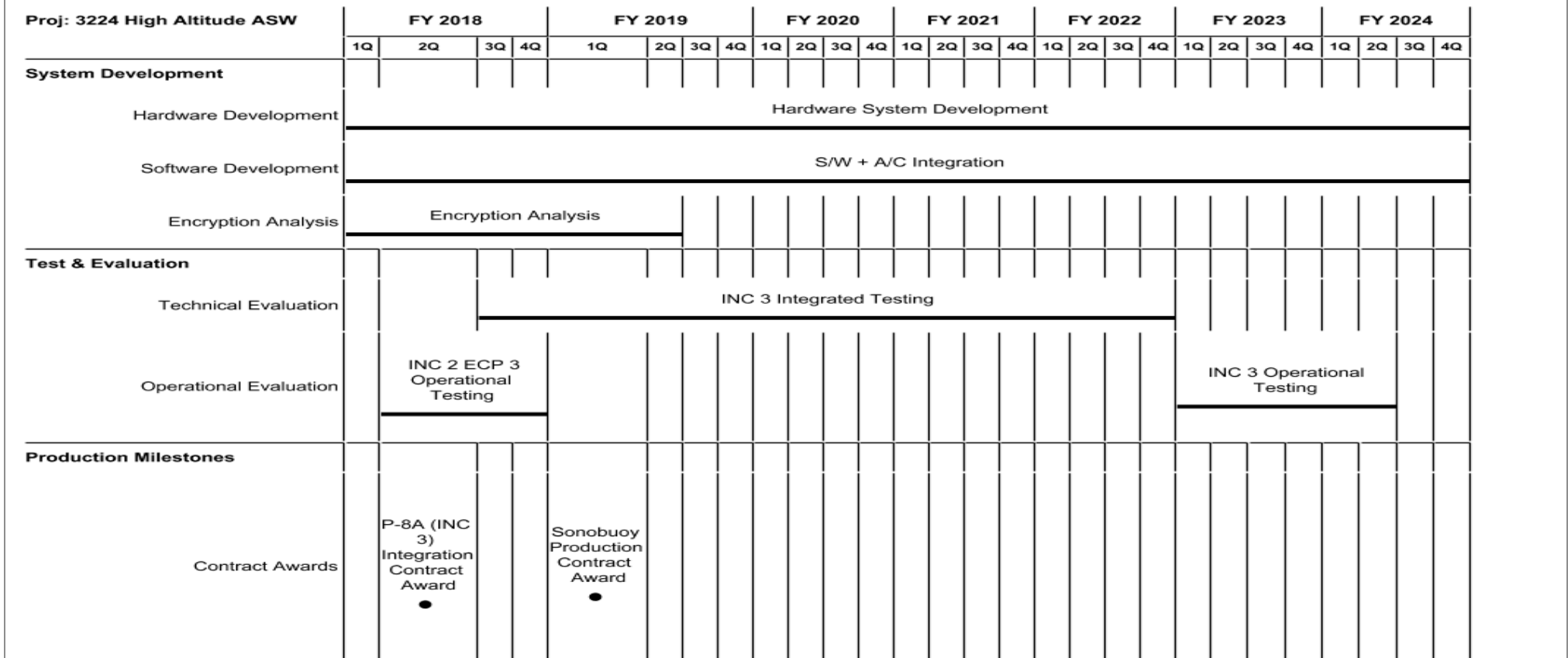
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Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Navy												Date: March 2019			
Appropriation/Budget Activity 1319 / 5						R-1 Program Element (Number/Name) PE 0604261N / <i>Acoustic Search Sensors</i>				Project (Number/Name) 3224 / <i>High Altitude ASW</i>					
Management Services (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 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
Government Eng Spt	WR	NAWCAD : PATUXENT RIVER, MD	23.565	0.478	Nov 2017	0.568	Nov 2018	0.596	Nov 2019	-		0.596	Continuing	Continuing	Continuing
Prior Year Mngmt Svcs no longer funded in the FYDP	Various	VARIOUS : VARIOUS	3.589	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Subtotal			30.476	0.630		0.768		0.795		-		0.795	Continuing	Continuing	N/A
			Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			117.539	3.624		3.886		3.968		-		3.968	Continuing	Continuing	N/A
Remarks															

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Exhibit R-4, RDT&E Schedule Profile: PB 2020 Navy	Date: March 2019
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Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604261N / <i>Acoustic Search Sensors</i>	Project (Number/Name) 3224 / <i>High Altitude ASW</i>
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2020PB - 0604261N - 3224

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Exhibit R-4A, RDT&E Schedule Details: PB 2020 Navy

Date: March 2019

Appropriation/Budget Activity

1319 / 5

R-1 Program Element (Number/Name)

PE 0604261N / Acoustic Search Sensors

Project (Number/Name)

3224 / High Altitude ASW

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Proj: 3224 High Altitude ASW				
System Development: Hardware Development: Hardware System Development	1	2018	4	2024
System Development: Software Development: Aircraft Software Development/ Integration	1	2018	4	2024
System Development: Encryption Analysis: Encryption Analysis	1	2018	2	2019
Test & Evaluation: Technical Evaluation: INC 3 Integrated Testing	3	2018	4	2022
Test & Evaluation: Operational Evaluation: INC 2 ECP 3 Operational Testing	2	2018	4	2018
Test & Evaluation: Operational Evaluation: INC 3 Operational Testing	1	2023	2	2024
Production Milestones: Contract Awards: P-8A (INC 3) Integration Contract Award	2	2018	2	2018
Production Milestones: Contract Awards: Sonobuoy Production Contract Award	1	2019	1	2019