Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Navy	Date: April 2022
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 0603553N *I Surface ASW*

COST ($ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
Total Program Element	190.168	1.113	1.144	1.180	-	1.180	1.197	1.195	1.213	1.222	Continuing	Continuing
1704: *Undersea Warfare*	190.168	1.113	1.144	1.180	-	1.180	1.197	1.195	1.213	1.222	Continuing	Continuing

A. Mission Description and Budget Item Justification

The objective of this Program Element (PE) is to pursue the development of technologies with the goal of improving Anti-Submarine Warfare (ASW) effectiveness to the point of rendering the enemy submarine irrelevant against U.S. and coalition forces. U.S. adversaries continue to develop asymmetric capabilities and capacities to deter, disrupt, or delay the entry of U.S. and allied naval forces, and pose a constant challenge as we implement the Maritime Strategy. These trends increase the threats to U.S. surface combatants, thus requiring a focused effort to identify the most promising ASW technologies through a process of discovery, assessment, experimentation, and analysis. Studies, experiments, and/or technology developments under this PE will seek to improve the ability of surface combatants to detect, classify, localize, and track submerged contacts and detect and defend against modern torpedoes. To achieve these objectives, it is essential to develop new ASW technologies. The products from these efforts will be provided to the Advanced Capability Build (ACB) program supporting the continuing improvement of the AN/SQQ-89A(V)15 Surface Ship ASW Combat System.

B. Program Change Summary ($ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Previous President's Budget	1.156	1.144	0.000	-	0.000
Current President's Budget	1.113	1.144	1.180	-	1.180
Total Adjustments	-0.043	0.000	1.180	-	1.180
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.043	0.000			
• Program Adjustments	0.000	0.000	0.000	-	0.000
• Rate/Misc Adjustments	0.000	0.000	0.000	-	0.000
• Adjustments to Budget Year	-	-	1.180	-	1.180

Change Summary Explanation

FUNDING CHANGES SINCE PREVIOUS PRESIDENT'S BUDGET:
- FY 2021 decrease of $-0.043M reflects the Small Business Innovative Research (SBIR) transfer.

FY 2022 TO FY 2023 BUDGET REQUEST INCREASE:

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Navy	Date: April 2022
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 0603553N *I Surface ASW*

- FY 2022 ($1.144M) to FY 2023 ($1.180M) increase ($+0.036M) is in line with the inflation expected with the RDT&EN appropriation.

FY 2023 funding increase reflects the fact that the FY 2022 President’s Budget request did not include out-year funding.

Exhibit R-2A, RDT&E Project Justification: PB 2023 Navy			Date: April 2022
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603553N / *Surface ASW*	Project (Number/Name) 1704 / *Undersea Warfare*	

COST ($ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
1704: *Undersea Warfare*	190.168	1.113	1.144	1.180	-	1.180	1.197	1.195	1.213	1.222	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The objective of this Project is to pursue the development of technologies with the goal of improving Anti-Submarine Warfare (ASW) effectiveness to the point of rendering the enemy submarine irrelevant against U.S. and coalition forces. U.S. adversaries continue to develop asymmetric capabilities and capacities to deter, disrupt, or delay the entry of U.S. and allied naval forces, and pose a constant challenge as we implement the Maritime Strategy. These trends increase the threats to U.S. surface combatants, thus requiring a focused effort to identify the most promising ASW technologies through a process of discovery, assessment, experimentation, and analysis. Studies, experiments, and/or technology developments under this PE will seek to improve the ability of surface combatants to detect, classify, localize, and track submerged contacts and detect and defend against modern torpedoes. To achieve these objectives, it is essential to develop new ASW technologies. The products from these efforts will be provided to the Advanced Capability Build (ACB) program supporting the continuing improvement of the AN/SQQ-89A(V)15 Surface Ship ASW Combat System.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Title: ASW Concept Development/Studies	1.113	1.144	1.180	0.000	1.180
Articles:	-	-	-	-	-
FY 2022 Plans: - Integrate Joint Passive and Active Localization (JPAL) algorithm into the Torpedo Defense (TD) Functional Segment for inclusion in ACB-23. - Develop Passive Coherent Processor (PCP) algorithms which are designed to provide passive alerting and state estimation of torpedo kinematics using advanced coherent multi-path/multi-array correlation processing technology. - Evaluate data collected from new sea trials and data collected using programmable waveforms to understand its benefits and advantages for TD. - Extend the Doppler Matched Active Processing (DMAP) for ASW capability to towed arrays. - Investigate concepts of employment to be used by the Fleet to determine optimal waveforms. - Update ping jitter sequencing with the goal of reducing blanking regions and ambiguous range tracking. - Award option under Broad Agency Announcement (BAA) development contract in support of AN/SQQ-89A(V)15 Surface Ship ASW Combat System Fleet requirements.					
FY 2023 Base Plans: - Continue to develop capabilities for eventual transition via ACB Step-3 land-based testing.					

Exhibit R-2A, RDT&E Project Justification: PB 2023 Navy		Date: April 2022
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603553N / *Surface ASW*	**Project (Number/Name)** 1704 / *Undersea Warfare*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
- Continue transition of technologies to the AN/SQQ-89A(V)15 Surface Ship ASW Combat System production program for fielding. - Continue to extend the DMAP for ASW capability to towed arrays. - Initiate implementation of optimal waveforms. - Initiate studies and development of Synthetic Training for Torpedo Classification. ***FY 2023 OCO Plans:*** N/A ***FY 2022 to FY 2023 Increase/Decrease Statement:*** The FY 2022 ($1.144M) to FY 2023 ($1.180M) increase ($+0.036M) is in line with the inflation expected with the RDT&EN appropriation.					
Accomplishments/Planned Programs Subtotals	1.113	1.144	1.180	0.000	1.180

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
• RDTEN/0205620N/1916: *Surface ASW System Improvement*	28.085	28.804	28.999	-	28.999	30.086	29.955	30.400	30.666	Continuing	Continuing
• OPN/2136: *AN/SQQ-89 Surf ASW Cmbt Sys*	128.664	131.829	141.591	-	141.591	143.258	145.000	146.803	149.597	Continuing	Continuing

Remarks

D. Acquisition Strategy

- Use competitively awarded contracts from Broad Agency Announcement (BAA) solicitations and Other Transaction Authority (OTA). Successful technologies are transitioned to the AN/SQQ-89A(V)15 Surface Ship Anti-Submarine Warfare (ASW) Combat System Advanced Capability Build (ACB) development program funded under PE 0205620N Project 1916 for integration and test. Technologies are delivered every two years to the AN/SQQ-89A(V)15 Surface Ship ASW Combat System production program via the ACB spiral development process (ACB-19, ACB-21, ACB-23, etc.).

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Navy			Date: April 2022
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603553N / *Surface ASW*	Project (Number/Name) 1704 / *Undersea Warfare*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
ASW Concept Development/Studies	C/CPFF	AAC : NY	2.201	0.000		0.000		0.000		-		0.000	0.000	2.201	-
ASW Concept Development/Studies	C/CPFF	Adaptive Methods : VA	3.788	0.000		0.000		0.000		-		0.000	0.000	3.788	-
ASW Concept Development/Studies	C/CPFF	Alion Sciences : VA	8.749	0.000		0.000		0.000		-		0.000	0.000	8.749	-
ASW Concept Development/Studies	C/CPFF	Applied Physical Sciences : CT	1.758	0.675	Feb 2021	0.675	Jan 2022	0.725	Jan 2023	-		0.725	Continuing	Continuing	Continuing
ASW Concept Development/Studies	C/CPFF	In-Depth Engineering : VA	3.635	0.000		0.000		0.000		-		0.000	0.000	3.635	-
ASW Concept Development/Studies	C/CPFF	JHU/APL : MD	28.068	0.000		0.000		0.000		-		0.000	0.000	28.068	-
ASW Concept Development/Studies	C/CPFF	L-3 Communications : VA	3.000	0.000		0.000		0.000		-		0.000	0.000	3.000	-
ASW Concept Development/Studies	C/CPFF	Lockheed Martin - ISS : NY	7.110	0.000		0.000		0.000		-		0.000	0.000	7.110	-
ASW Concept Development/Studies	WR	NAVWAR : CA	0.277	0.000		0.000		0.000		-		0.000	0.000	0.277	-
ASW Concept Development/Studies	WR	NAWC/Pax River : MD	2.400	0.000		0.000		0.000		-		0.000	0.000	2.400	-
ASW Concept Development/Studies	WR	NFESC/PH : CA	5.350	0.000		0.000		0.000		-		0.000	0.000	5.350	-
ASW Concept Development/Studies	C/CPFF	Northrop Grumman : VA	4.684	0.000		0.000		0.000		-		0.000	0.000	4.684	-
ASW Concept Development/Studies	WR	NRL : DC	3.037	0.000		0.000		0.000		-		0.000	0.000	3.037	-
ASW Concept Development/Studies	WR	NSMA : VA	0.907	0.000		0.000		0.000		-		0.000	0.000	0.907	-
ASW Concept Development/Studies	WR	NSWC/Carderock : MD	4.373	0.000		0.000		0.000		-		0.000	0.000	4.373	-
ASW Concept Development/Studies	WR	NUWC/Keyport : WA	0.790	0.000		0.000		0.000		-		0.000	0.000	0.790	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Navy			Date: April 2022
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603553N / *Surface ASW*	Project (Number/Name) 1704 / *Undersea Warfare*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
ASW Concept Development/Studies	WR	NUWC/Newport : RI	44.915	0.000		0.000		0.000		-		0.000	0.000	44.915	-
ASW Concept Development/Studies	MIPR	SSGC : MS	3.253	0.000		0.000		0.000		-		0.000	0.000	3.253	-
ASW Concept Development/Studies	C/CPFF	UT/ARL : TX	6.752	0.000		0.000		0.000		-		0.000	0.000	6.752	-
ASW Concept Development/Studies	C/CPFF	VAR : VAR*	34.184	0.338	Feb 2021	0.369	Dec 2021	0.355	Dec 2022	-		0.355	Continuing	Continuing	Continuing
		Subtotal	169.231	1.013		1.044		1.080		-		1.080	Continuing	Continuing	N/A

Remarks

*Consists of multiple performing activities with funding for each not greater than $1M per year.

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
ASW Concept Development/Studies - At-Sea Test/Experiment	WR	ONR : VA	5.500	0.000		0.000		0.000		-		0.000	0.000	5.500	-
ASW Concept Development/Studies - Enhanced Data Collection	C/CPFF	JHU/APL : MD	4.462	0.000		0.000		0.000		-		0.000	0.000	4.462	-
ASW Concept Development/Studies - Enhanced Data Collection	C/CPFF	UT/ARL : TX	2.000	0.000		0.000		0.000		-		0.000	0.000	2.000	-
		Subtotal	11.962	0.000		0.000		0.000		-		0.000	0.000	11.962	N/A

Remarks

*Consists of multiple performing activities with funding for each not greater than $1M per year.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Navy		Date: April 2022
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603553N / *Surface ASW*	**Project (Number/Name)** 1704 / *Undersea Warfare*

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Support - Acquisition, Business & Finance	C/CPAF	EG&G : VA	2.050	0.000		0.000		0.000		-		0.000	0.000	2.050	-
Program Management Support - Acquisition, Business & Finance	C/CPAF	BAE Systems : MD	4.824	0.000		0.000		0.000		-		0.000	0.000	4.824	-
Program Management Support - Systems Engineering and Technical Assistance (SETA)	C/CPFF	CGI Federal : VA	1.751	0.000		0.000		0.000		-		0.000	0.000	1.751	-
Program Management Support - Systems Engineering and Technical Assistance (SETA)	C/CPFF	KMS Solutions* : VA	0.000	0.100	Mar 2021	0.100	Mar 2022	0.100	Dec 2022	-		0.100	Continuing	Continuing	Continuing
Program Ofice Travel	Allot	NAVSEA PEO IWS 5 : DC	0.350	0.000		0.000		0.000		-		0.000	0.000	0.350	-
		Subtotal	8.975	0.100		0.100		0.100		-		0.100	Continuing	Continuing	N/A

Remarks

*In addition to program office support, KMS Solutions provides technical planning, systems engineering, and test support. KMS Solutions also provides Subject Matter Experts (SMEs) as members of AN/SQQ-89 Surface Ship Anti-Submarine Warfare (ASW) Combat System Advanced Capability Build (ACB) technical Peer Review Working Groups and Integrated Product Teams (IPTs) in support of designing and refining candidate technologies for inclusion into ACB deliveries.

	Prior Years	FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	190.168	1.113		1.144		1.180		-		1.180	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Navy			Date: April 2022
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603553N / *Surface ASW*	Project (Number/Name) 1704 / *Undersea Warfare*	

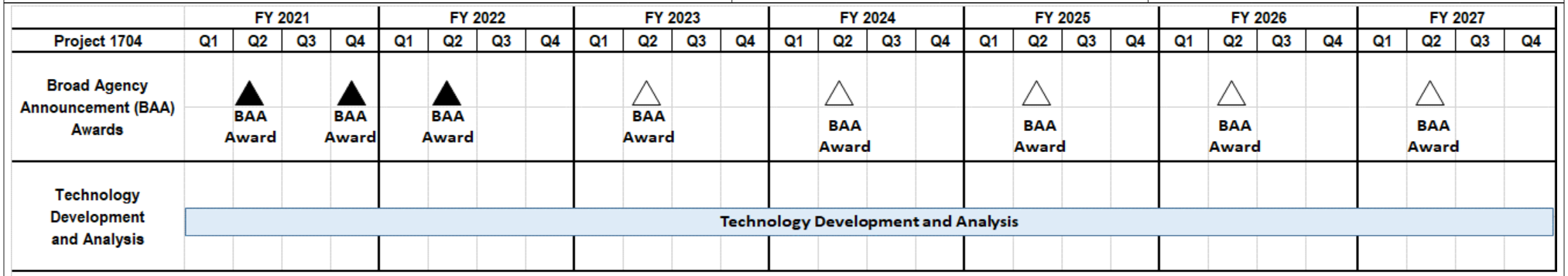

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Navy		Date: April 2022
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603553N / *Surface ASW*	**Project (Number/Name)** 1704 / *Undersea Warfare*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 1704.L24				
Broad Agency Announcement (BAA) Awards: BAA Award - 2021 (1)	2	2021	2	2021
Broad Agency Announcement (BAA) Awards: BAA Award - 2021 (2)	4	2021	4	2021
Broad Agency Announcement (BAA) Awards: BAA Award - 2022	2	2022	2	2022
Broad Agency Announcement (BAA) Awards: BAA Award - 2023	2	2023	2	2023
Broad Agency Announcement (BAA) Awards: BAA Award - 2024	2	2024	2	2024
Broad Agency Announcement (BAA) Awards: BAA Award - 2025	2	2025	2	2025
Broad Agency Announcement (BAA) Awards: BAA Award - 2026	2	2026	2	2026
Broad Agency Announcement (BAA) Awards: BAA Award - 2027	2	2027	2	2027
Technology Development and Analysis: Technology Development and Analysis	1	2021	4	2027