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Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Navy **Date:** February 2020

Appropriation/Budget Activity 1319: <i>Research, Development, Test & Evaluation, Navy / BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 0603553N / <i>Surface ASW</i>
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COST (\$ in Millions)	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
Total Program Element	187.992	1.078	1.137	1.161	-	1.161	1.183	1.209	1.233	1.258	Continuing	Continuing
1704: <i>Undersea Warfare</i>	187.992	1.078	1.137	1.161	-	1.161	1.183	1.209	1.233	1.258	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. The Rest-of-the-World (ROW) continues to produce quieter, more lethal submarine technologies. Adaptable commercial technologies are readily available to the ROW navies. 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 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Previous President's Budget	1.122	1.137	1.157	-	1.157
Current President's Budget	1.078	1.137	1.161	-	1.161
Total Adjustments	-0.044	0.000	0.004	-	0.004
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.044	0.000			
• Rate/Misc Adjustments	0.000	0.000	0.004	-	0.004

Change Summary Explanation

FUNDING CHANGES SINCE PREVIOUS PRESIDENT'S BUDGET:

- FY 2019 decrease of \$-0.044M reflects Small Business Innovative Research (SBIR) transfer.
- FY 2021 increase of \$+0.004M reflects general and Navy Working Capital Fund (NWCF) specific rate adjustments.

FY 2020 TO FY 2021 BUDGET REQUEST INCREASE:

- FY 2020 (\$1.137M) to FY 2021 (\$1.161M) increase (\$+0.024M) is in line with inflation associated with the RDT&EN appropriation.

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy										Date: February 2020		
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0603553N / <i>Surface ASW</i>				Project (Number/Name) 1704 / <i>Undersea Warfare</i>			
COST (\$ in Millions)	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
1704: <i>Undersea Warfare</i>	187.992	1.078	1.137	1.161	-	1.161	1.183	1.209	1.233	1.258	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. The Rest-of-the-World (ROW) continues to produce quieter, more lethal submarine technologies. Adaptable commercial technologies are readily available to the ROW navies. 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 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Title: ASW Concept Development/Studies	1.078	1.137	1.161	0.000	1.161
Articles:	-	-	-	-	-
FY 2020 Plans:					
- Continue development efforts supporting color-map improvements for Torpedo Defense (TD) and Anti-Submarine Warfare (ASW), and development of a statistical model of Continuous Active Sonar (CAS) as compared to Pulsed Active Sonar (PAS) waveform performance to provide testable hypotheses for any data collection.					
- Continue developing Passive Augmented Doppler Matched Active Processing (DMAP), which associates active TD clusters with passive tracks to provide earlier and single-ping classifications.					
- Submit technology to Step 3 for laboratory testing and eventual delivery for operational use via ACB-21 on the AN/SQQ-89A(V)15 Surface Ship Anti-Submarine Warfare (ASW) Combat System.					
FY 2021 Base Plans:					
- Transition development items from FY 2019 and FY 2020 via Advanced Capability Build (ACB)-21 to the AN/SQQ-89A(V)15 Surface Ship ASW Combat System production program for fielding.					
- Award new development contract via Broad Agency Announcement (BAA) solicitation process in support of AN/SQQ-89A(V)15 Surface Ship ASW Combat System Fleet requirements.					
- Continue development of new capabilities focused on ASW and TD improvements.					
FY 2021 OCO Plans:					

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Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603553N / <i>Surface ASW</i>	Project (Number/Name) 1704 / <i>Undersea Warfare</i>
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B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
N/A					
<i>FY 2020 to FY 2021 Increase/Decrease Statement:</i>					
The increase from FY 2020 to FY 2021 (\$+0.024M) is in line with inflation associated with the RDT&EN appropriation.					
Accomplishments/Planned Programs Subtotals	1.078	1.137	1.161	0.000	1.161

C. Other Program Funding Summary (\$ in Millions)											
<u>Line Item</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021 Base</u>	<u>FY 2021 OCO</u>	<u>FY 2021 Total</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Cost To Complete</u>	<u>Total Cost</u>
• RDTEN/0205620N/1916: <i>Surface ASW System Improvement</i>	25.478	29.572	29.348	-	29.348	29.849	30.441	31.046	31.666	Continuing	Continuing
• OPN/2136: <i>AN/SQQ-89 Surf ASW Cmbt Sys</i>	114.344	121.966	128.664	-	128.664	135.722	138.306	139.602	141.452	Continuing	Continuing

Remarks

D. Acquisition Strategy

- Use competitively awarded contracts from Broad Agency Announcement (BAA) solicitations. 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, etc.).

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Navy **Date:** February 2020

Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603553N / <i>Surface ASW</i>	Project (Number/Name) 1704 / <i>Undersea Warfare</i>
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Product Development (\$ in Millions)				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
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	1.150	0.301	Dec 2018	0.307	Jan 2020	0.313	Dec 2020	-		0.313	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	-

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Product Development (\$ in Millions)				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
ASW Concept Development/Studies	WR	NUWC/Newport : RI	44.870	0.045	Jan 2019	0.045	Jan 2020	0.046	Nov 2020	-		0.046	Continuing	Continuing	Continuing
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*	33.671	0.232	Dec 2018	0.275	Jan 2020	0.282	Dec 2020	-		0.282	Continuing	Continuing	Continuing
Subtotal			168.065	0.578		0.627		0.641		-		0.641	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)				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
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.

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Management Services (\$ in Millions)				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
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	0.741	0.500	Dec 2018	0.510	Jan 2020	0.000		-		0.000	0.000	1.751	-
Program Management Support - Systems Engineering and Technical Assistance (SETA)	C/CPFF	TBD (CGI Federal Follow On) : TBD	0.000	0.000		0.000		0.520	Dec 2020	-		0.520	Continuing	Continuing	Continuing
Program Office Travel	Allot	NAVSEA PEO IWS 5 : DC	0.350	0.000		0.000		0.000		-		0.000	0.000	0.350	-
Subtotal			7.965	0.500		0.510		0.520		-		0.520	Continuing	Continuing	N/A

Remarks
 *In addition to program office support, CGI Federal provides technical planning, systems engineering, and test support. CGI Federal 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 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	187.992	1.078	1.137	1.161	-	1.161	Continuing	Continuing	N/A

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2021 Navy **Date:** February 2020

Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603553N / <i>Surface ASW</i>	Project (Number/Name) 1704 / <i>Undersea Warfare</i>
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Project 1704	FY 2019				FY 2020				FY 2021				FY 2022				FY 2023				FY 2024				FY 2025							
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4				
Broad Agency Announcement (BAA) Awards		▲ BAA Award								△ BAA Award																				△ BAA Award		
Technology Development and Analysis	Technology Development and Analysis																															

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Exhibit R-4A, RDT&E Schedule Details: PB 2021 Navy **Date:** February 2020

Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603553N / <i>Surface ASW</i>	Project (Number/Name) 1704 / <i>Undersea Warfare</i>
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Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>Proj 1704.L24</i>				
Broad Agency Announcement (BAA) Awards: BAA Award - 2019	2	2019	2	2019
Broad Agency Announcement (BAA) Awards: BAA Award - 2021	2	2021	2	2021
Broad Agency Announcement (BAA) Awards: BAA Award - 2023	2	2023	2	2023
Broad Agency Announcement (BAA) Awards: BAA Award - 2025	2	2025	2	2025
Technology Development and Analysis: Technology Development and Analysis	1	2019	4	2025