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 0603562N *I Submarine Tactical Warfare Sys*							
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	115.727	10.293	14.059	10.917	-	10.917	12.706	12.587	12.406	12.574	Continuing	Continuing
0770: *Adv Sub Supp Equip Prog*	34.122	4.634	4.736	3.835	-	3.835	5.414	5.203	4.892	4.944	Continuing	Continuing
1739: *Submarine Arctic W/F Development*	81.605	5.659	9.323	7.082	-	7.082	7.292	7.384	7.514	7.630	Continuing	Continuing

A. Mission Description and Budget Item Justification

This Program Element (PE) addresses advanced submarine technology areas in support of the Navy's strategic objective of Assured Access and Combat Credibility. All projects funded in this PE are non-Acquisition Category (ACAT) programs.

PROJECT 0770 - The Advanced Submarine Support Equipment Program (ASSEP) objective is to improve submarine operational effectiveness through the implementation of advanced Research and Development (R&D). In order to provide improved operational effectiveness, R&D efforts are focused on advanced Imaging and Electronic Warfare (EW) support development. 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 include improved antennas, tethered buoy, 360-degree imaging systems, and electro-optic infra-red (EO/IR) vulnerability signature reduction technologies.

PROJECT 1739 - The Submarine Arctic Warfare Development Project is aligned to Commander, Undersea Warfighting Development Center (UWDC), Detachment Arctic Submarine Laboratory (ASL). This Project provides the U.S. Navy Submarine Force (SUBFOR) a cadre of trained Arctic Operation Specialists (AOS) and an inventory of unique Arctic sensors that are installed to optimize submarine safety during under-ice operations. AOS personnel assigned from ASL embark on submarines that deploy to the Arctic, cold water and iceberg regions, and marginal ice zones (MIZ) in northern latitudes of the Atlantic and Pacific Oceans, and are advisers to the Commanding Officer. ASL is a shore facility at Naval Base Point Loma with the infrastructure capable of supporting personnel and equipment to conduct the submarine Arctic Warfare Development mission. Improvements and life-cycle expenditures to the facility and warehousing are made as necessary to support the mission.

The Submarine Arctic Warfare Development Project, via ASL, 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. ASL provides a unique capability that enables the SUBFOR to satisfy the requirements laid out in the Arctic Maritime Homeland Defense Initial Capabilities Document (ICD). ASL and SUBFOR demonstrate existing Arctic Warfare capabilities and operational and tactical proficiency while developing advanced submarine technology in unique cold water environments, in under-ice conditions, and in ice-covered shallow water regions during a biennial Ice Exercise (ICEX). ICEX places an emphasis on submarine operability and mission capability in the world's harshest maritime environment. Efforts include assessment of combat system effectiveness, weapons testing, use of High Frequency (HF) sonars in Arctic regions, testing of ice-capable submarine structures, and development of class-specific Arctic operational guidelines. Tactical Development (TACDEV) ICEXs are conducted biennially and require up front comprehensive planning and work-up training, as well as post exercise analysis and reporting. ICEXs provide the framework for various submarine test and evaluation in Arctic regions and at periodic Ice Camps. This program represents DoD's only drifting ice station capability. Emphasis during ICEX is placed on the areas

of sonar operability, tactical surveillance, weapon utility, and other submarine support missions. These efforts include the assessment of combat system effectiveness, development of Arctic specific improvements for existing sonar and weapons, development of class-specific Arctic operational guidelines, and testing of ice-capable submarine support structures.

A torpedo firing ICEX occurs every four (4) years (FY 2022, FY 2026, etc.) in order to meet minimum Fleet requirements of exercise torpedo (EXTORP) firings in the Arctic. A Torpedo Exercise (TORPEX) requires a significantly higher level of logistics, personnel, and infrastructure to account for the recovery and transportation efforts of the EXTORPs.

B. Program Change Summary ($ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Previous President's Budget	10.481	14.059	0.000	-	0.000
Current President's Budget	10.293	14.059	10.917	-	10.917
Total Adjustments	-0.188	0.000	10.917	-	10.917
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.188	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	-	-	10.917	-	10.917

Change Summary Explanation

The FY 2023 funding request was reduced by $0.951 million to account for the availability of prior year execution balances.

FUNDING CHANGES SINCE THE PREVIOUS PRESIDENT'S BUDGET AT THE OVERALL PE LEVEL:
- FY 2021 decrease of $-0.188M reflects the Small Business Innovative Research (SBIR) transfer.

PROJECT 0770 - FY 2022 TO FY 2023 BUDGET REQUEST DECREASE:
- FY 2022 ($4.736M) to FY 2023 ($3.835M) decrease ($-0.901M) was driven by the application of an under-execution reduction to the FY 2023 budget control.

PROJECT 1739 - FY 2022 TO FY 2023 BUDGET REQUEST DECREASE:
- FY 2022 ($9.323M) to FY 2023 ($7.082M) decrease ($-2.241M) is driven by FY 2023 being an Ice Exercise (ICEX) planning year (no major ICEX/Ice Camp scheduled in FY 2023 as it was in FY 2022). FY 2023 will focus on the planning for the major FY 2024 ICEX/Ice Camp.

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 0603562N *I Submarine Tactical Warfare Sys*

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 0603562N / *Submarine Tactical Warfare Sys*	Project (Number/Name) 0770 / *Adv Sub Supp Equip Prog*	

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
0770: *Adv Sub Supp Equip Prog*	34.122	4.634	4.736	3.835	-	3.835	5.414	5.203	4.892	4.944	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

A continuing need exists to improve Imaging and Electronic Warfare (EW) support 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. This project, previously divided into two project categories, Advanced Imaging Project Development and Advanced Electronic Warfare Support Project Development, is now operating under a single category titled Imaging and Electronic Warfare (EW) Support Capabilities, going forward the project will concurrently consider both domains as improved mast systems are designed. The evaluation of state-of-the-art technology to implement periscope/mast improvements via EW electromagnetic and electro-optic sensors results in improved capability. Engineering Development Models (EDMs) are developed, evaluated, and validated in the lab and through at-sea testing.

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. Software-based capabilities in Imaging and/or EW domains that will process inputs from improved masts may be integrated and tested within this project.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Title: Imaging and Electronic Warfare (EW) Support Capabilities	4.634	4.736	3.835	0.000	3.835
Articles:	-	-	-	-	-
FY 2022 Plans: - Continue development of the advanced imaging and EW sensor configuration for submarine periscopes. - Conduct lab testing of new sensors under consideration as part of design process to verify performance meets operational needs. - Initiate sensor stack prototype to support testing in lab and in representative at-sea environment to validate approach before transitioning to PEO SUB production program for integration into submarine masts. - Continue Imaging and EW tethered buoy development with focus on laboratory demonstration of the body and payload. - Integrate RADAR Vulnerability Assessment Tool (RVAT), Detection Finding (DF), and other EW capabilities into AN/BQQ-10 prototype system.					
FY 2023 Base Plans:					

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 0603562N / *Submarine Tactical Warfare Sys*	**Project (Number/Name)** 0770 / *Adv Sub Supp Equip Prog*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
- Continue development of the advanced Imaging and EW sensor configuration for submarine periscopes. - Conduct at-sea testing of tethered buoy to verify performance meets operational needs. - Continue sensor stack prototype and conduct testing to validate approach before transitioning to PEO SUB production program for integration into submarine masts. - Complete RVAT, DF, and Low Probability of Intercept (LPI) development and integration and transition to PEO SUB production program. ***FY 2023 OCO Plans:*** N/A ***FY 2022 to FY 2023 Increase/Decrease Statement:*** - FY 2022 ($4.736M) to FY 2023 ($3.835M) decrease ($-0.901M) was driven by the application of an under-execution reduction to the FY 2023 budget control.					
Accomplishments/Planned Programs Subtotals	4.634	4.736	3.835	0.000	3.835

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/0603561N/0223: *Combat System Improvement (ADV)*	53.536	55.442	57.691	-	57.691	58.487	58.546	59.499	60.214	Continuing	Continuing

Remarks

D. Acquisition Strategy

- This project is a non-Acquisition Category (ACAT) program.
- 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 the Common Submarine Imaging System (CSIS) (CDD# 849-87-11) dated 22 Dec 2011, with an updated Capability Development Document (CDD) approved on 15 Mar 2018, for Submarine Imaging Systems, and the Common Submarine Electronic Warfare System (CSEWS) (CDD# 907-97-16) dated 27 Sep 2016 for the Electronic Warfare Systems. 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 Development Models (EDMs) will be developed to provide a realistic method of evaluating the improvements, including deployment on submarines for testing.

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 0603562N / *Submarine Tactical Warfare Sys*	**Project (Number/Name)** 0770 / *Adv Sub Supp Equip Prog*

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
Imaging and EW Support Capability Development	C/CPFF	JHU/APL : MD	2.478	0.000		0.000		0.000		-		0.000	0.000	2.478	-
Imaging and EW Support Capability Development	C/CPFF	Lockheed Martin : VA	0.000	0.000		1.775	Nov 2021	1.395	Dec 2022	-		1.395	Continuing	Continuing	Continuing
Imaging and EW Support Capability Development	MIPR	MIT/LL : MA	0.690	0.864	Jan 2021	1.444	Feb 2022	1.135	Dec 2022	-		1.135	Continuing	Continuing	Continuing
Imaging and EW Support Capability Development	WR	NUWC : RI	29.348	1.410	Nov 2020	0.225	Oct 2021	0.215	Nov 2022	-		0.215	Continuing	Continuing	Continuing
Imaging and EW Support Capability Development	C/FFP	PSU/ARL : PA	0.000	0.975	Nov 2020	0.515	Jan 2022	0.450	Dec 2022	-		0.450	Continuing	Continuing	Continuing
Imaging and EW Support Capability Development	C/FFP	Toyon Research Corp : CA	0.000	0.500	Jan 2021	0.000		0.000		-		0.000	0.000	0.500	-
Imaging and EW Support Capability Development	C/FFP	VAR : VAR*	1.180	0.218	Mar 2021	0.112	Dec 2021	0.075	Dec 2022	-		0.075	Continuing	Continuing	Continuing
		Subtotal	33.696	3.967		4.071		3.270		-		3.270	Continuing	Continuing	N/A

Remarks

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

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 Office Travel	WR	NAVSEA : DC	0.426	0.027	Apr 2021	0.025	Oct 2021	0.025	Oct 2022	-		0.025	Continuing	Continuing	Continuing
Program Management	C/FFP	KMS Solutions* : VA	0.000	0.640	Mar 2021	0.640	Mar 2022	0.540	Dec 2022	-		0.540	Continuing	Continuing	Continuing
		Subtotal	0.426	0.667		0.665		0.565		-		0.565	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) for technical Peer Review Working Groups and Integrated Product Teams (IPTs) in support Electronic Warfare capability development.

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 0603562N / *Submarine Tactical Warfare Sys*	Project (Number/Name) 0770 / *Adv Sub Supp Equip Prog*	

	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	34.122	4.634		4.736		3.835		-		3.835	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 0603562N / *Submarine Tactical Warfare Sys*	**Project (Number/Name)** 0770 / *Adv Sub Supp Equip Prog*

Advanced Submarine Support Equipment Program

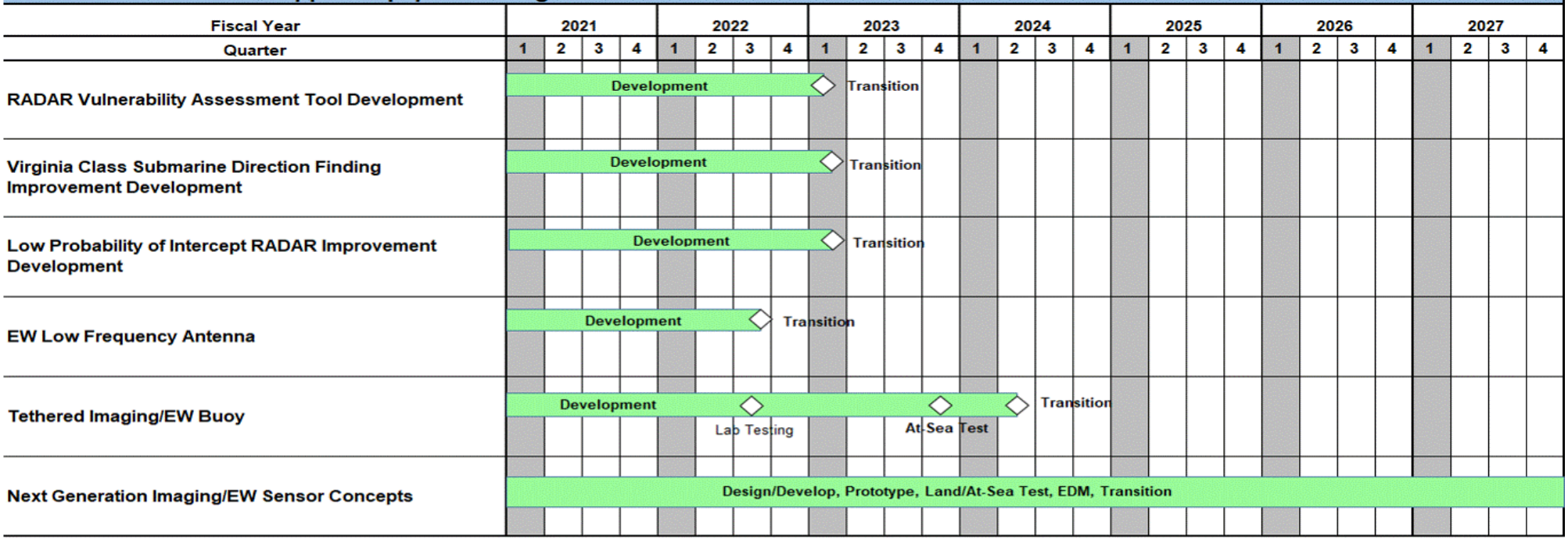

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Navy		Date: April 2022
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603562N / *Submarine Tactical Warfare Sys*	**Project (Number/Name)** 0770 / *Adv Sub Supp Equip Prog*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Imaging and Electronic Warfare Support Capabilties				
RADAR Vulnerability Assessment Tool - Development	1	2021	1	2023
RADAR Vulnerability Assessment Tool - Transition to PEO SUB Production Program	1	2023	1	2023
Virginia Class Submarine Direction Finding Improvement - Development	1	2021	1	2023
Virginia Class Submarine Direction Finding Improvement - Transition to PEO SUB Production Program	1	2023	1	2023
Low Probability of Intercept RADAR Improvement - Development	1	2021	1	2023
Low Probability of Intercept RADAR Improvement Test - Transition to PEO SUB Production Program	1	2023	1	2023
Electronic Warfare Low Frequency Antenna - Development	1	2021	3	2022
Electronic Warfare Low Frequency Antenna - Transition to PEO SUB Production Program	3	2022	3	2022
Tethered Imaging/Electronic Warfare Buoy - Development	1	2021	2	2024
Tethered Imaging/Electronic Warfare Buoy - Lab Test	3	2022	3	2022
Tethered Imaging/Electronic Warfare Buoy - At-Sea Test	4	2023	4	2023
Tethered Imaging/Electronic Warfare Buoy - Transition to PEO SUB Production Program	2	2024	2	2024
Next Generation Imaging/Electronic Warfare Sensor Development	1	2021	4	2027

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 0603562N / *Submarine Tactical Warfare Sys*	Project (Number/Name) 1739 / *Submarine Arctic W/F Development*	

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
1739: *Submarine Arctic W/F Development*	81.605	5.659	9.323	7.082	-	7.082	7.292	7.384	7.514	7.630	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Submarine Arctic Warfare Development Project is aligned to Commander, Undersea Warfighting Development Center (UWDC), Detachment Arctic Submarine Laboratory (ASL). This Project provides the U.S. Navy Submarine Force (SUBFOR) a cadre of trained Arctic Operation Specialists (AOS) and an inventory of unique Arctic sensors that are installed to optimize submarine safety during under-ice operations. AOS personnel assigned from ASL embark on submarines that deploy to the Arctic, cold water and iceberg regions, and marginal ice zones in northern latitudes of the Atlantic and Pacific Oceans, and are advisers to the Commanding Officer. ASL is a shore facility at Naval Base Point Loma with the infrastructure capable of supporting personnel and equipment to conduct the submarine Arctic Warfare Development mission. Improvements and life-cycle expenditures to the facility and warehousing are made as necessary to support the mission.

The Submarine Arctic Warfare Development Project, via ASL, 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. ASL provides a unique capability that enables the submarine force to satisfy the requirements laid out in the Arctic Maritime Homeland Defense Initial Capabilities Document (ICD). ASL and SUBFOR demonstrate existing Arctic Warfare capabilities and operational and tactical proficiency while developing advanced submarine technology in unique cold water environments, in under-ice conditions, and in ice-covered shallow water regions during a biennial Ice Exercise (ICEX). ICEX places an emphasis on submarine operability and mission capability in the world's harshest maritime environment. Efforts include assessment of combat system effectiveness, weapons testing, use of High Frequency (HF) sonars in Arctic regions, testing of ice-capable submarine structures, and development of class-specific Arctic operational guidelines. Tactical Development (TACDEV) ICEXs are conducted biennially and require up front comprehensive planning and work-up training, as well as post exercise analysis and reporting. ICEXs provide the framework for various submarine test and evaluation in Arctic regions and at periodic Ice Camps. This program represents DoD's only drifting ice station capability. Emphasis during ICEX is placed on the areas of sonar operability, tactical surveillance, weapon utility, and other submarine support missions. These efforts include the assessment of combat system effectiveness, development of Arctic specific improvements for existing sonar and weapons, development of class-specific Arctic operational guidelines, and testing of ice-capable submarine support structures. Torpedo ICEXs, occurring every four (4) years (FY 2022, FY 2026, etc.) include a Fleet requirement to conduct exercise torpedo (EXTORP) firings in the Arctic. A Torpedo Exercise (TORPEX) requires a significantly higher level of logistics, personnel, and infrastructure to account for the recovery and transportation efforts of the EXTORPs.

All programs funded in this project are non-Acquisition Category (ACAT) programs.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Title: Conduct ICEX and Arctic Transit Mission, ICEX Workup and Training, Ice Camps	5.659	9.323	7.082	0.000	7.082
Articles:	-	-	-	-	-

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 0603562N / *Submarine Tactical Warfare Sys*	**Project (Number/Name)** 1739 / *Submarine Arctic W/F Development*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
FY 2022 Plans: - Conduct Arctic work-up training, ICEX mission 2022 with Ice Camp 2022. - Conduct ICEX 2022 as a TACDEV and TORPEX event. Operate a submarine tracking range for approximately 14 days, conduct complex and coordinated operations from a drifting ice station. Logistically and operationally support submarine and camp operations from a drifting ice station that will be re-supplied via contracted commercial rotary and fixed-wing aviation services, via US Transportation Command (USTRANSCOM), from temporary infrastructure and services on the North Slope of Alaska. - Support Arctic deployments, including inter-Fleet transfers, as required by the SUBFOR 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. - Conduct Arctic operations to support ice camp equipment evaluation, systems development and extreme cold weather training, and to also perform drifting sea ice analysis required to improve drifting sea ice camp Arctic operations. ***FY 2023 Base Plans:*** - Conduct Arctic work-up training. - Support Arctic deployments, including inter-Fleet transfers, as required by the SUBFOR Commanders. - Investigate, research, develop, and deploy new systems for Arctic submarine support. - Conduct Arctic operations to support ice camp equipment evaluation, systems development, extreme cold weather training, and perform drifting sea ice analysis required to improve drifting sea ice camp Arctic operations. - Support testing and tactical development required to improve submarine Arctic operability and warfighting. - Initiate planning, logistics support, procurement, and preparation for ICEX mission 2024 and Ice Camp 2024 ***FY 2023 OCO Plans:*** N/A ***FY 2022 to FY 2023 Increase/Decrease Statement:*** The FY 2022 ($9.323M) to FY 2023 ($7.082M) decrease ($-2.241M) is driven by FY 2023 being an Ice Exercise (ICEX) planning year (no major ICEX/Ice Camp scheduled in FY 2023 as it was in FY 2022). FY 2023 will focus on the planning for the major FY 2024 ICEX/Ice Camp.					
Accomplishments/Planned Programs Subtotals	5.659	9.323	7.082	0.000	7.082

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 0603562N / *Submarine Tactical Warfare Sys*	**Project (Number/Name)** 1739 / *Submarine Arctic W/F Development*

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

- This project is a non-Acquisition Category (ACAT) program.
- Use Naval Undersea Warfare Center (NUWC) to provide technical assistance awarded through NAVSEA Reimbursable Work Order for submarine tracking and TORPEX capability.
- Use sole source and competitively awarded contracts through the U.S. Army Corps of Engineers (USACE) Alaska regional office for ICEX Ice Camp logistics, engineering, and operations support.
- Use sole source and competitively awarded contracts through the Fleet Logistics Center (FLC) regional contracting office and Defense Logistics Agency (DLA) for equipment procurement and technical services.
- Use sole source and competitively awarded contracts through the U.S. Transportation Command (USTRANSCOM) for ICEX aviation support.

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 0603562N / *Submarine Tactical Warfare Sys*	**Project (Number/Name)** 1739 / *Submarine Arctic W/F Development*

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
Conduct ICEX and Arctic Transit Mission, ICEX Workup and Training, Ice Camps	WR	COMSUBLANT : VA	15.104	3.107	Oct 2020	4.157	Oct 2021	4.238	Oct 2022	-		4.238	Continuing	Continuing	Continuing
Conduct ICEX and Arctic Transit Mission, ICEX Workup and Training, Ice Camps	WR	COMSUBPAC : CA	36.101	0.000		0.000		0.000		-		0.000	0.000	36.101	-
Conduct ICEX and Arctic Transit Mission, ICEX Workup and Training, Ice Camps	WR	NUWC/Keyport : WA	0.992	0.949	Oct 2020	0.000		0.100	Nov 2022	-		0.100	Continuing	Continuing	Continuing
Conduct ICEX and Arctic Transit Mission, ICEX Workup and Training, Ice Camps	WR	NUWC/Newport : RI	1.916	0.258	Nov 2020	1.465	Oct 2021	0.119	Nov 2022	-		0.119	Continuing	Continuing	Continuing
Conduct ICEX and Arctic Transit Mission, ICEX Workup and Training, Ice Camps	MIPR	USACE : AK	4.621	1.150	Nov 2020	1.234	Dec 2021	2.373	Dec 2022	-		2.373	Continuing	Continuing	Continuing
Conduct ICEX and Arctic Transit Mission, ICEX Workup and Training, Ice Camps	MIPR	USTRANSCOM : IL	3.170	0.000		2.107	Jan 2022	0.070	Dec 2022	-		0.070	Continuing	Continuing	Continuing
Conduct ICEX and Arctic Transit Mission, ICEX Workup and Training, Ice Camps	C/CPFF	UT/ARL : TX	1.444	0.000		0.000		0.000		-		0.000	0.000	1.444	Continuing
Conduct ICEX and Arctic Transit Mission, ICEX Workup and Training, Ice Camps	C/CPFF	UW/APL : WA	15.827	0.000		0.000		0.000		-		0.000	0.000	15.827	Continuing
Conduct ICEX and Arctic Transit Mission, ICEX	C/CPFF	VAR* : VAR	0.339	0.000		0.000		0.000		-		0.000	0.000	0.339	-

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 0603562N / *Submarine Tactical Warfare Sys*	Project (Number/Name) 1739 / *Submarine Arctic W/F Development*	

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
Workup and Training, Ice Camps															
		Subtotal	79.514	5.464		8.963		6.900		-		6.900	Continuing	Continuing	N/A

Remarks

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

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	0.311	0.000		0.000		0.000		-		0.000	0.000	0.311	-
Program Management Support - Acquisition, Business & Finance	C/CPAF	BAE SYSTEMS : MD	1.088	0.000		0.000		0.000		-		0.000	0.000	1.088	-
Program Management Support - Acquisition, Business & Finance	C/CPIF	TMB : DC	0.426	0.125	Mar 2021	0.110	Feb 2022	0.110	Dec 2022	-		0.110	Continuing	Continuing	Continuing
Program Office Travel	Allot	NAVSEA PEO IWS 5 : DC	0.040	0.000		0.000		0.000		-		0.000	0.000	0.040	-
ICEX Event Travel*	Allot	NAVSEA PEO IWS 5 : DC	0.226	0.070	Oct 2021	0.250	Oct 2021	0.072	Oct 2022	-		0.072	Continuing	Continuing	Continuing
		Subtotal	2.091	0.195		0.360		0.182		-		0.182	Continuing	Continuing	N/A

Remarks

* ICEX Event Travel category reflects travel for the Arctic Submarine Lab personnel in support of ICEX, but is managed by NAVSEA PEO IWS 5 via the Defense Travel System (DTS) Cross-Organization process.

	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
Project Cost Totals	81.605	5.659		9.323		7.082		-		7.082	Continuing	Continuing	N/A

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 0603562N / *Submarine Tactical Warfare Sys*	Project (Number/Name) 1739 / *Submarine Arctic W/F Development*	

	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract

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 0603562N / *Submarine Tactical Warfare Sys*	**Project (Number/Name)** 1739 / *Submarine Arctic W/F Development*

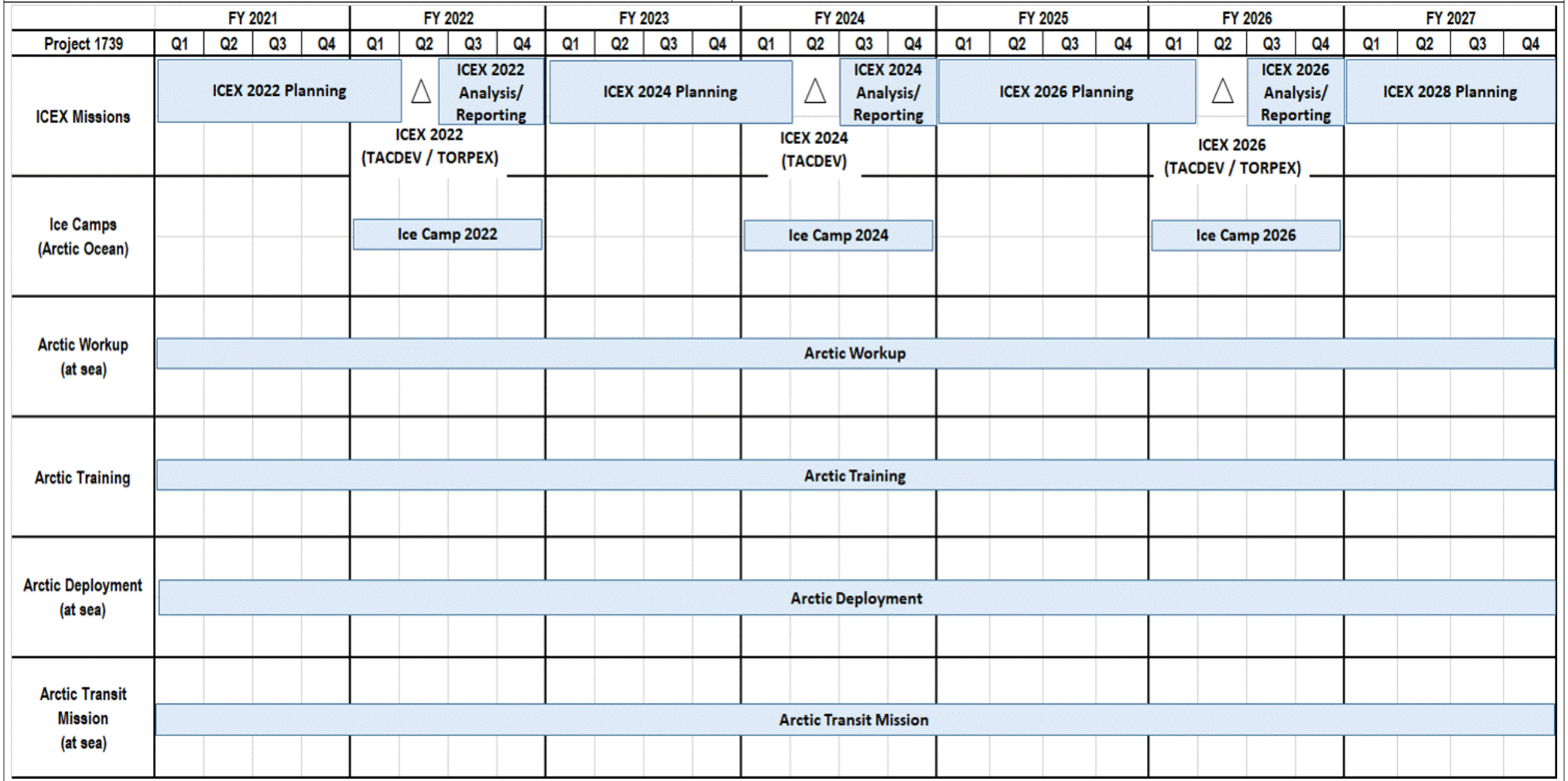

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Navy		Date: April 2022
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603562N / *Submarine Tactical Warfare Sys*	**Project (Number/Name)** 1739 / *Submarine Arctic W/F Development*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 1739				
ICEX Missions: ICEX Mission 2022 (TACDEV / TORPEX) Planning/Logistics	1	2021	1	2022
ICEX Missions: ICEX Mission 2022 (TACDEV / TORPEX)	2	2022	2	2022
ICEX Missions: ICEX Mission 2022 (TACDEV / TORPEX) Post-ICEX Analysis/ Reporting	3	2022	4	2022
ICEX Missions: ICEX Mission 2024 (TACDEV) Planning/Logistics	1	2023	1	2024
ICEX Missions: ICEX Mission 2024 (TACDEV)	2	2024	2	2024
ICEX Missions: ICEX Mission 2024 (TACDEV) Post-ICEX Analysis/Reporting	3	2024	4	2024
ICEX Missions: ICEX Mission 2026 (TACDEV / TORPEX) Planning/Logistics	1	2025	1	2026
ICEX Missions: ICEX Mission 2026 (TACDEV / TORPEX)	2	2026	2	2026
ICEX Missions: ICEX Mission 2026 (TACDEV / TORPEX) Post-ICEX Analysis/ Reporting	3	2026	4	2026
ICEX Missions: ICEX Mission 2028 (TACDEV) Planning/Logistics	1	2027	4	2027
Ice Camps: Ice Camp (Arctic Ocean) 2022	1	2022	4	2022
Ice Camps: Ice Camp (Arctic Ocean) 2024	1	2024	4	2024
Ice Camps: Ice Camp (Arctic Ocean) 2026	1	2026	4	2026
Arctic Workup (At-Sea): Arctic Workup (At Sea)	1	2021	4	2027
Arctic Training: Arctic Training	1	2021	4	2027
Arctic Submarine Deployment as required by the Submarine Type Commander: Arctic Submarine Deployment as required by the Submarine Type Commander	1	2021	4	2027
Arctic Transit Mission (At Sea): Arctic Transit Mission (At Sea)	1	2021	4	2027