Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Navy												Date: March 2023
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 7: *Operational Systems Development*					R-1 Program Element (Number/Name) PE 0101221N *I Strategic Sub & Wpns Sys Supt*							
COST ($ in Millions)	**Prior Years**	**FY 2022**	**FY 2023**	**FY 2024 Base**	**FY 2024 OCO**	**FY 2024 Total**	**FY 2025**	**FY 2026**	**FY 2027**	**FY 2028**	**Cost To Complete**	**Total Cost**
Total Program Element	1,613.143	190.928	312.502	321.648	-	321.648	324.458	539.483	658.284	1,088.058	Continuing	Continuing
0951: *Joint Warhead Fuze Sustainment Program*	710.809	6.570	3.087	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	720.466
2021: *Mk4B Shape Stable Nose Tip*	63.446	9.474	7.598	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	80.518
2228: *Technical Applications Programs*	714.722	70.969	173.344	192.003	-	192.003	113.530	115.484	117.284	119.634	Continuing	Continuing
3097: *W-93 / Mk 7*	79.295	69.702	97.089	126.466	-	126.466	207.708	420.717	537.660	965.017	Continuing	Continuing
3158: *Integrated Nuclear Weapons Security Sys Dev*	15.911	3.322	3.384	3.179	-	3.179	3.220	3.282	3.340	3.407	Continuing	Continuing
9999: *Congressional Adds*	28.960	30.891	28.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	87.851

Program MDAP/MAIS Code:
Project MDAP/MAIS Code(s): 178

A. Mission Description and Budget Item Justification

The Strategic Submarine & Weapon Systems Support program element directly supports the Navy's deterrence mission, specifically the Submarine Launched Ballistic Missile (SLBM). The SLBM, accounting for approximately 70 percent of the deployable nuclear inventory, is the most survivable leg of the triad and foundational to the nation's deterrence strategy. Nuclear deterrence underwrites every U.S. military operation and capability on the globe and serves as the backstop for both our national defense and the defense of our allies. The nation's nuclear triad serves as the bedrock of our ability to deter aggression, assure our allies and partners, achieve U.S. objectives should deterrence fail, and hedge against an uncertain future. This program element focuses on the modernization of the nuclear deterrent, and its role as trusted steward of the safety and security of these weapons.

Major projects in the Strategic Submarine & Weapon Systems Support program include: 1) Joint Warhead Fuze Sustainment Program; 2) Mk4B Shape Stable Nose Tip; 3) Technical Applications Programs; 4) W93/Mk7 Reentry Program; and 5) Integrated Nuclear Weapons Security System Development.

The Joint Warhead Fuze Sustainment Program (0951) is an effort to develop advanced components to improve the reliability, safety, and security of Arming, Fuzing, and Firing (AF&F) systems for nuclear reentry systems. The current effort is focused on supporting the alteration of the AF&F system for the W88/MK5 system which will be five years beyond its design life at the scheduled deployment of the AF&F alteration. This effort also supports future utilization of the developed components by the US Air Force and United Kingdom. This project's final year of development is FY 2023.

Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Navy	Date: March 2023
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0101221N *I Strategic Sub & Wpns Sys Supt*

The Mk4B (formerly referred to as Mk4A) Shape Stable Nose Tip (SSNT) (2021) effort will convert reentry body (RB) forward shell assemblies (FSAs) from legacy carbon composite nose tips to SSNTs. This will require ground and flight testing of SSNT Reentry Body Assemblies, updates and modifications to RB documentation (Weapon Specifications, Interface Control Drawings, product drawings, etc.), updated Fire Control software for fleet implementation, conversion of war reserve RBs to FSAs with SSNT, procurement/conversion of surveillance and flight test units, Strategic Weapons Facility (SWF) logistics implementation planning and execution, review and update Mk4B surveillance planning and the DoD share of National Nuclear Security Administration (NNSA) Office of Secure Transportation (OST) for shipping. This project's final year of development is FY 2023.

The Technology Applications Program (2228) consists of three elements: D5 Life Extension 2 (D5LE2), Multi-Star Enhanced Pre-Launch (MEP), and Systems Engineering Modeling and Simulation.

The TRIDENT II modernization, D5 Life Extension 2 (D5LE2), modernizes and replaces the current TRIDENT II D5 Life Extension (D5LE) Strategic Weapons System (SWS). D5LE supports all OHIO Class submarines. At least 12 COLUMBIA Class SSBNs will replace today's 14 OHIO SSBNs beginning in FY 2030, D5LE will also support initial missile load-outs on COLUMBIA through the 8th SSBN. Safety critical D5LE missile electronics begin to exceed their qualification period by FY 2039. Several D5LE components are obsolete, out of production, and no longer supported by industry. D5LE2 is required to replace D5LE to support COLUMBIA Class missile inventory requirements starting in FY 2039. While the D5LE program extended the lifetime of some missile components, D5LE2 will leverage technologies for both the missile and shipboard systems ensuring adaptability and survivability of the weapons system out to the 2080s. The D5LE2 program is a hybrid of pull-through cost-effective technology (e.g. solid rocket motors, ignitors) and redesign candidates (e.g., avionics, guidance, system architecture).

The Multi Star Enhanced Prelaunch (MEP) project delivers enhanced Strategic Weapon System (SWS) resiliency by 1) leveraging the capability of the D5 Life Extension Guidance (Mk6 Mod1) to sight two stars vice one allowing for improved in-flight error correction and 2) updating interfaces to the Fire Control and Navigation subsystems enabling enhanced use of Navigation Sonar System (NSS) data for weapon system error control during Prelaunch. This capability reduces SWS reliance on Global Positioning System (GPS) and Bathymetry data which enables operation in environments where GPS is denied and improves SSBN security during patrol. This capability also has potential for future relief to the strict tolerance requirements of the strategic navigator on the current OHIO Class Submarines and the COLUMBIA class program. This project's final year of development is FY 2022.

The Systems Engineering Modeling and Simulation capability will consist of three elements: Model Based Design, SWS Integrated Modeling and Simulation/Common Architecture & Framework, and SWS Enhancement Ground Test. This effort will provide the capability to comprehensively evaluate and test the integrated SWS within representative operational environments, providing unprecedented visibility across the SWS and system performance characterization equivalent to flight testing. This capability will enable trade space analysis to identify technical margin, subsystem interactions, and lifecycle affordability opportunities to include other services and be able to identify the benefits and risks of commonality to the individual programs, requirements and CONOPs modifications that could facilitate commonality, potential common acquisition strategies between the services, and total life cycle cost implications. This project's final year of development is FY 2023.

The W93/Mk7 warhead project (3097), formerly known as the Interoperable Warhead (IW), will design, develop, and test a future Navy warhead to include a new Navy Aeroshell for a SLBM. Early FYDP efforts will primarily consist of developing programmatic planning and structure to support the continuing study and future program along with further exploration and refinement of the concept studies that resulted from the FY 2019 Navy Feasibility Study.

Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Navy	Date: March 2023
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0101221N *I Strategic Sub & Wpns Sys Supt*

The Integrated Nuclear Weapons Security System (INWSS) (3158) efforts support the Nuclear Weapons Security program and SSBN Escort mission. The policies and requirements regarding the safeguard of nuclear weapons within the Department of Defense is established by DoD S5210.41M. Within the Department of the Navy, nuclear weapons are limited to TRIDENT Fleet Ballistic Missiles (FBM), either deployed aboard TRIDENT submarines or located landside at Naval Submarine Base, Kings Bay, or Naval Submarine Base, Bangor where missiles are assembled/disassembled, tested as well as repaired. This project supports efforts directed at improving the current technological baseline through a series of studies. These efforts aim to improve countermeasure technologies to address detection, delay and denial.

B. Program Change Summary ($ in Millions)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Previous President's Budget	186.998	284.502	327.597	-	327.597
Current President's Budget	190.928	312.502	321.648	-	321.648
Total Adjustments	3.930	28.000	-5.949	-	-5.949
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	28.000			
• Congressional Directed Transfers	-	-			
• Reprogrammings	10.000	0.000			
• SBIR/STTR Transfer	-6.070	0.000			
• Rate/Misc Adjustments	0.000	0.000	-5.949	-	-5.949

Congressional Add Details ($ in Millions, and Includes General Reductions)	FY 2022	FY 2023
Project: 9999: *Congressional Adds*		
Congressional Add: *Next Generation Strategic Inertial Measurement Unit*	5.792	10.000
Congressional Add: *Scalable Very High Temperature Composite Manufacturing Technologies*	5.792	0.000
Congressional Add: *Autonomous fiber optic sensing network*	4.827	0.000
Congressional Add: *Strategic weapons systems shipboard navigation system modernization*	14.480	0.000
Congressional Add: *Multimodal biometric authentication*	0.000	8.000
Congressional Add: *Navigation modernization capabilities*	0.000	10.000
Congressional Add Subtotals for Project: 9999	30.891	28.000
Congressional Add Totals for all Projects	30.891	28.000

Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Navy	Date: March 2023
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0101221N *I Strategic Sub & Wpns Sys Supt*

Change Summary Explanation

The increase in funding from FY 2023 to FY 2024 is due to the required growth for the D5LE2 (2228) and W93/Mk7 (3097) projects. D5LE2 Program's increase in funding will support three major efforts: System Studies and Architecture Development, SLBM technologies, and Strategic Guidance technologies. These efforts are ramped and phased to deliver a System Requirements Review in FY 2025. W93/Mk7 Program's increase is attributed to the increased activities throughout Phase 2 (Feasibility Study and Design Options) and personnel ramping to support schedule, cost, design and development planning to meet defined First Production Unit (FPU) date.

Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy			Date: March 2023
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0101221N / *Strategic Sub & Wpns Sys Supt*	Project (Number/Name) 0951 / *Joint Warhead Fuze Sustainment Program*	

COST ($ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
0951: *Joint Warhead Fuze Sustainment Program*	710.809	6.570	3.087	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	720.466
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

Project MDAP/MAIS Code: 178

A. Mission Description and Budget Item Justification

The Joint Warhead Fuze Sustainment Program is an effort to develop advanced components to improve the reliability, safety, and security of AF&F systems for nuclear reentry systems. The current effort is focused on supporting the alteration of the AF&F system for the W88/MK5 system which will be five years beyond its design life at the scheduled deployment of the AF&F alteration. This effort also supports future utilization of the developed components by the U.S. Air Force and United Kingdom. FY 2023 will be the last year of development for the Joint Warhead Fuze Sustainment Program.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Title: TRIDENT II	6.570	3.087	0.000	0.000	0.000
Articles:	-	-	-	-	-
Description: Identify, prioritize, develop, proof, and demonstrate advanced technologies that will be leveraged and incorporated into future AF&Fs. ***FY 2023 Plans:*** - Complete evaluation of CET-4 telemetry data in association with qualification of Upper S-Band Telemetry for all future flight tests. ***FY 2024 Base Plans:*** N/A ***FY 2024 OCO Plans:*** N/A ***FY 2023 to FY 2024 Increase/Decrease Statement:*** The FY 2023 to FY 2024 decrease is attributed to development activities ramping down as FY 2023 is the final year of development.					
Accomplishments/Planned Programs Subtotals	6.570	3.087	0.000	0.000	0.000

Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy			Date: March 2023
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0101221N / *Strategic Sub & Wpns Sys Supt*	Project (Number/Name) 0951 / *Joint Warhead Fuze Sustainment Program*	

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
• RDTEN/3219: *SBSD Nuclear Technology Development*	60.142	56.707	54.400	-	54.400	44.385	39.173	35.834	36.222	Continuing	Continuing
• RDTEN/3220: *COLUMBIA Class Submarine Development*	287.533	268.996	185.739	-	185.739	121.400	121.994	107.882	134.707	Continuing	Continuing
• OPN/5358: *Strategic Missile Systems Equip*	276.430	279.430	325.318	-	325.318	321.406	435.968	325.448	447.515	Continuing	Continuing
• WPN/1250: *TRIDENT II Mods*	1,120.241	1,125.164	1,284.705	-	1,284.705	1,705.878	2,468.925	2,897.274	3,186.112	4,352.768	30,073.252
• SCN/1045: *COLUMBIA Class Submarine*	4,776.980	5,857.776	5,834.332	-	5,834.332	7,275.820	8,467.564	8,788.208	8,728.802	52,170.081	112,651.052
• OMN/1D2D: *Fleet Ballistic Missile*	1,474.005	1,664.933	1,763.238	-	1,763.238	1,861.325	1,890.125	1,934.921	1,983.564	0.000	12,572.111

Remarks

D. Acquisition Strategy

Contracts will continue to be awarded to those sources who were engaged in the Mk4LE Reentry Body development program and are currently engaged in the production and/or operational support of the deployed Mk4LE Reentry Body on the basis of Other Than Full and Open Competition pursuant to the authority of 10 U.S.C. 2304 (c) (1) and (3) implemented by FAR 6.302.-1, 3, 4

Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy		Date: March 2023
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0101221N / *Strategic Sub & Wpns Sys Supt*	**Project (Number/Name)** 0951 / *Joint Warhead Fuze Sustainment Program*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2022 Cost	FY 2022 Award Date	FY 2023 Cost	FY 2023 Award Date	FY 2024 Base Cost	FY 2024 Base Award Date	FY 2024 OCO Cost	FY 2024 OCO Award Date	FY 2024 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Joint Warhead Fuze Sustainment DOE	MIPR	DOE : NM	572.411	4.090	Nov 2021	0.200	Dec 2022	0.000		-		0.000	0.000	576.701	-
Joint Warhead Fuze Sustainment ITT	SS/CPFF	ITT : VA	27.023	0.000		0.000		0.000		-		0.000	0.000	27.023	-
Joint Warhead Fuze Sustainment LMMS	SS/CPFF	LMMS : CA	78.227	1.100	Nov 2021	0.000		0.000		-		0.000	0.000	79.327	-
Joint Warhead Fuze Sustainment	WR	NSWC Dahlgren : VA	20.639	0.000		0.000		0.000		-		0.000	0.000	20.639	-
Joint Warhead Fuze Sustainment	SS/CPFF	BAE : MD	1.889	0.000		0.000		0.000		-		0.000	0.000	1.889	-
Joint Warhead Fuze Sustainment	SS/CPIF	APL : MD	1.052	0.000		0.000		0.000		-		0.000	0.000	1.052	-
Joint Warhead Fuze Sustainment	WR	CNSW : IN	2.079	0.880	Dec 2021	0.000		0.000		-		0.000	0.000	2.959	-
Joint Warhead Fuze Sustainment	C/BA	PERATON : VA	5.058	0.000		0.000		0.000		-		0.000	0.000	5.058	-
Joint Warhead Fuze Sustainment	C/BA	TOYON : VA	2.431	0.500	Jan 2022	2.000	Feb 2023	0.000		-		0.000	0.000	4.931	-
Joint Warhead Fuze Sustainment	C/CPFF	L3 Harris : CA	0.000	0.000		0.887	Feb 2023	0.000		-		0.000	0.000	0.887	-
		Subtotal	710.809	6.570		3.087		0.000		-		0.000	0.000	720.466	N/A

	Prior Years	FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	710.809	6.570		3.087		0.000		-		0.000	0.000	720.466	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2024 Navy		Date: March 2023
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0101221N / *Strategic Sub & Wpns Sys Supt*	**Project (Number/Name)** 0951 / *Joint Warhead Fuze Sustainment Program*

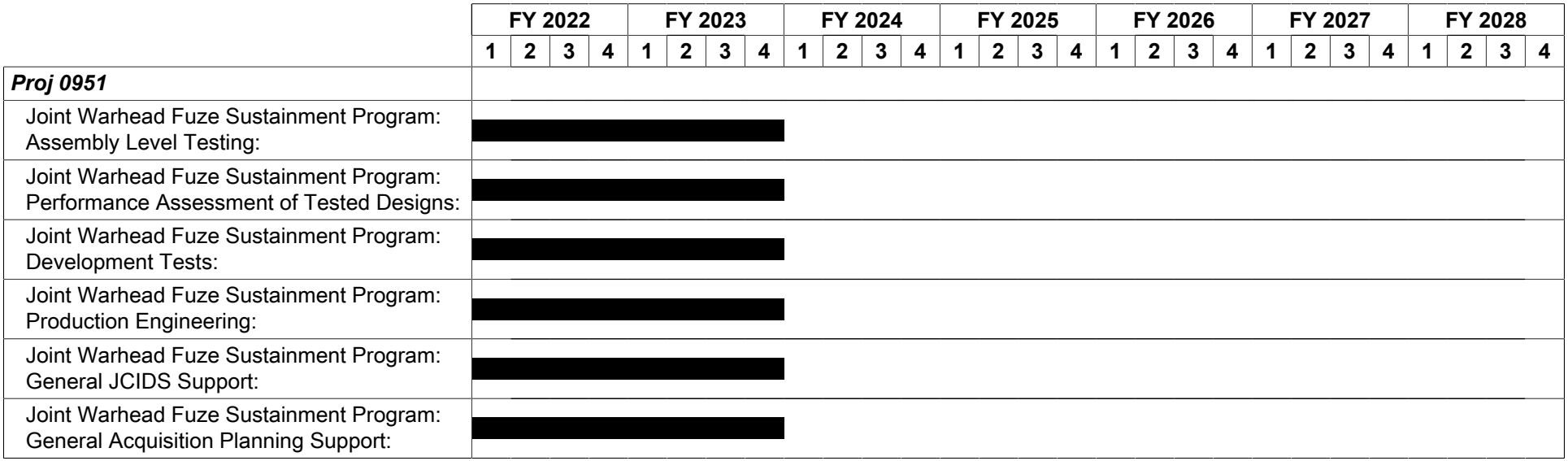

Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy		Date: March 2023
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0101221N / *Strategic Sub & Wpns Sys Supt*	**Project (Number/Name)** 0951 / *Joint Warhead Fuze Sustainment Program*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 0951				
Joint Warhead Fuze Sustainment Program: Assembly Level Testing:	1	2022	4	2023
Joint Warhead Fuze Sustainment Program: Performance Assessment of Tested Designs:	1	2022	4	2023
Joint Warhead Fuze Sustainment Program: Development Tests:	1	2022	4	2023
Joint Warhead Fuze Sustainment Program: Production Engineering:	1	2022	4	2023
Joint Warhead Fuze Sustainment Program: General JCIDS Support:	1	2022	4	2023
Joint Warhead Fuze Sustainment Program: General Acquisition Planning Support:	1	2022	4	2023

Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy			Date: March 2023
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0101221N / *Strategic Sub & Wpns Sys Supt*	Project (Number/Name) 2021 / *Mk4B Shape Stable Nose Tip*	

COST ($ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
2021: *Mk4B Shape Stable Nose Tip*	63.446	9.474	7.598	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	80.518
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Mk4B (formerly referred to as Mk4A) Shape Stable Nose Tip (SSNT) effort will convert reentry body (RB) forward shell assemblies (FSAs) from legacy carbon composite nose tips to SSNTs. This will require ground and flight testing of SSNT RBs, updates and modifications to RB documentation (Weapon Specifications, Interface Control Drawings, product drawings, etc), updated Fire Control software for fleet implementation, conversion of war reserve RBs to FSAs with SSNT, procurement/conversion of surveillance and flight test units, Strategic Weapons Facility (SWF) logistics implementation planning and execution, and review and updates to both the Mk4B surveillance planning and the DoD share of National Nuclear Security Administration (NNSA) Office of Secure Transportation (OST) for shipping. FY 2023 will be the last year of development for the Mk4B program.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Title: Mk4B Shape Stable Nose Tip	9.474	7.598	0.000	0.000	0.000
Articles:	-	-	-	-	-
FY 2023 Plans: - Complete system and component level development testing at DoE and DoD facilities - Assess and update Mk4B aerodynamic model with new flight test data, complete analysis of component and system design in support of requirements verification					
FY 2024 Base Plans: N/A					
FY 2024 OCO Plans: N/A					
FY 2023 to FY 2024 Increase/Decrease Statement: The FY 2023 to FY 2024 decrease is due to FY 2023 being the final year of development before this effort fully transitions to production as shown in Navy WPN budget line item 1250.					
Accomplishments/Planned Programs Subtotals	9.474	7.598	0.000	0.000	0.000

Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy		Date: March 2023
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0101221N / *Strategic Sub & Wpns Sys Supt*	**Project (Number/Name)** 2021 / *Mk4B Shape Stable Nose Tip*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
• WPN/1250: *Trident II Mods*	1,120.241	1,125.164	1,284.705	-	1,284.705	1,705.878	2,468.925	2,897.274	3,186.112	4,352.768	30,073.252

Remarks

D. Acquisition Strategy

Contracts will continue to be awarded to those sources who were engaged in the Mk4LE Reentry Body development program and are currently engaged in the production and/or operational support of the deployed Mk4LE Reentry Body on the basis of Other Than Full and Open Competition pursuant to the authority of 10 U.S.C. 2304 (c) (1) and (3) implemented by FAR 6.302.-1, 3, 4

Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy		Date: March 2023
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0101221N / *Strategic Sub & Wpns Sys Supt*	**Project (Number/Name)** 2021 / *Mk4B Shape Stable Nose Tip*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2022 Cost	FY 2022 Award Date	FY 2023 Cost	FY 2023 Award Date	FY 2024 Base Cost	FY 2024 Base Award Date	FY 2024 OCO Cost	FY 2024 OCO Award Date	FY 2024 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
SSNT LMSS	SS/CPIF	LMSSC : CA	40.710	3.981	Nov 2021	3.378	Jan 2023	0.000		-		0.000	0.000	48.069	-
SSNT DOE/NNSA	MIPR	DOE/NNSA : NM	15.285	4.000	Nov 2021	4.070	Jan 2023	0.000		-		0.000	0.000	23.355	-
SSNT JHU-APL	SS/CPFF	APL : MD	2.615	1.193	Nov 2021	0.000		0.000		-		0.000	0.000	3.808	-
SSNT PERATON	SS/CPFF	PERATON : VA	1.558	0.000		0.000		0.000		-		0.000	0.000	1.558	-
SSNT NSWC	WR	NSWC : VA	1.586	0.100	Oct 2021	0.000		0.000		-		0.000	0.000	1.686	-
SSNT Toyon	SS/CPFF	TOYON : CA	1.042	0.000		0.000		0.000		-		0.000	0.000	1.042	-
SSNT SPA	SS/CPFF	SPA : VA	0.500	0.000		0.000		0.000		-		0.000	0.000	0.500	-
SSNT Draper	SS/CPFF	Draper : MA	0.150	0.200	Nov 2021	0.150	Feb 2023	0.000		-		0.000	0.000	0.500	-
		Subtotal	63.446	9.474		7.598		0.000		-		0.000	0.000	80.518	N/A

	Prior Years	FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	63.446	9.474		7.598		0.000		-		0.000	0.000	80.518	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2024 Navy		Date: March 2023
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0101221N / *Strategic Sub & Wpns Sys Supt*	**Project (Number/Name)** 2021 / *Mk4B Shape Stable Nose Tip*

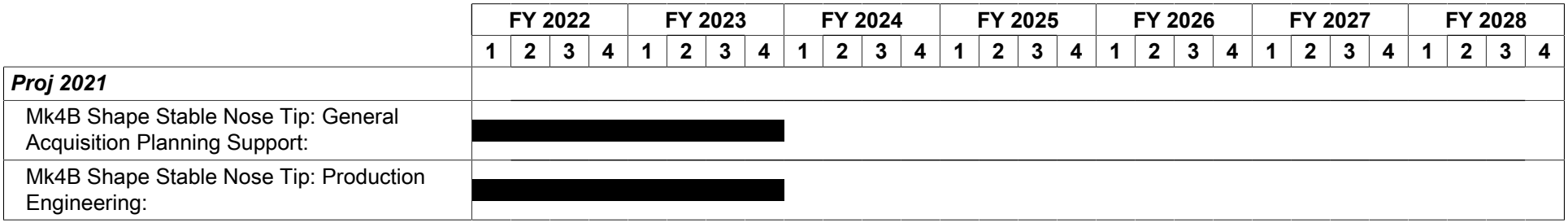

Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy		Date: March 2023
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0101221N / *Strategic Sub & Wpns Sys Supt*	**Project (Number/Name)** 2021 / *Mk4B Shape Stable Nose Tip*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 2021				
Mk4B Shape Stable Nose Tip: General Acquisition Planning Support:	1	2022	4	2023
Mk4B Shape Stable Nose Tip: Production Engineering:	1	2022	4	2023

Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy											Date: March 2023	
Appropriation/Budget Activity 1319 / 7					R-1 Program Element (Number/Name) PE 0101221N / *Strategic Sub & Wpns Sys Supt*				Project (Number/Name) 2228 / *Technical Applications Programs*			
COST ($ in Millions)	**Prior Years**	**FY 2022**	**FY 2023**	**FY 2024 Base**	**FY 2024 OCO**	**FY 2024 Total**	**FY 2025**	**FY 2026**	**FY 2027**	**FY 2028**	**Cost To Complete**	**Total Cost**
2228: *Technical Applications Programs*	714.722	70.969	173.344	192.003	-	192.003	113.530	115.484	117.284	119.634	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Project 2228 consists of three elements: D5 Life Extension 2 (D5LE2), Multi-Start Enhanced Pre-Launch (MEP) (effort completed in FY 2022), and Systems Engineering Modeling and Simulation (effort completes in FY 2023).

Trident II D5 Modernization (D5LE2):
The Submarine Launched Ballistic Missile (SLBM) is the most survivable leg of the triad and foundational to the nation's deterrence strategy. The heart of the SLBM capability is the D5LE Strategic Weapon System (SWS) currently hosted aboard the OHIO platform throughout its remaining service life. D5LE is planned to be the initial SWS on the COLUMBIA platform but cannot support the platform throughout its predicted service life (through 2084) due to age, attrition, and obsolescence of critical components within the system. Aging components (such as flight electronics and guidance) fall below requirements as early as the late 2030s and non-aging components are reduced by flight tests and spares consumption and fall below requirements shortly thereafter. As the D5LE missile inventory cannot be extended further, the D5LE SWS will require a significant modernization - D5LE2 - which is required to support COLUMBIA missile inventory and loadouts.

The nation's Strategic Systems must be more adaptable and resilient in the face of adversaries who are increasingly showing the ability to quickly deploy capabilities that threaten the effectiveness of the existing strategic deterrent. Adaptability and resiliency will be required for the D5LE2 system in order to meet established STRATCOM requirements for the life of the COLUMBIA Class. The D5LE2 weapon system modernization and these attributes will address the COLUMBIA Class service life requirement by delivering the range and accuracy of the current system, and address the threat of near peer adversaries' improved defensive capabilities by maintaining a credible and survivable strategic deterrent.

Meeting these new and evolving challenges will require that the D5LE2 architecture be designed so that it can address evolving threats and defensive capabilities in a timely manner. Being able to adapt at the speed of relevance will require an architecture based on modular interfaces that maximize margin unlocked via critical technologies.

D5LE2's schedule is directly analogous to the previous life extension's (D5LE) executed schedule which began concept studies in the late 1990s, began design in 2004, completed design in 2011, and deployed in 2017. D5LE2 encompasses significantly more scope than D5LE on a similar timeline. Funding is required in the pre-SPALT (Strategic Systems Programs Alterations) development phase of the program to mature enabling technologies for D5LE2 in anticipation of long lead material procurements starting in 2030; therefore, significant technology investments must be continued in 2024 to support execution of the program of record. To ensure that key technologies have reached appropriate maturation and been tested in a relevant environment prior to the Preliminary Design Review (PDR) in FY 2028, funding to improve Technology and Manufacturing Readiness Levels (TRL/MRL) by commodity is phased according to complexity and need.

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D5LE2 is focused on maturation of critical technologies required to modernize the Navy's SWS. The technology investments are architecture agnostic (i.e. they must be developed regardless of the design of the architecture) and represent the fundamental building blocks for the SWS. The ability to rapidly mature these technologies represents the single greatest risk mitigation to the program. D5LE2 strategic modernization efforts will focus on critical technologies such as:

- Post Boost Control System (PBCS) Technologies utilizing high refractory metal
- Next Generation Low - Size Weight and Power (SWaP) Guidance Inertial Instruments and Components
- Strategic Radiation Hardened Electronics
- Modernized Structural Components (e.g. Nose Fairing and Equipment Section)

D5LE2 Technology Development targets replacements for legacy D5 and D5LE technologies now obsolete with manufacturing lines shutdown that are required regardless of architecture chosen (e.g. radiation hardened parts) and/or have long lead maturity and development timelines. Technology advancements and improved system architecture concepts will unlock existing system capability, and add adaptability, manufacturability, SWS operations, and sustainability - while at the same time reconstituting an industrial base that has not performed SLBM development for decades.

In order to support STRATCOM requirements without gapping capability, in FY 2020 D5LE2 began critical architecture agnostic technology maturation efforts on key strategic technologies and studies to explore potential modern System Level Architectures. FY 2020 efforts have focused on filling requirements voids in the areas of threat effectiveness, cyber vulnerabilities, evaluating the SWS contribution to platform survivability, developing the military utility curves by which concepts will be evaluated and limited technology development on certain key technologies. Efforts also focused on limited technology development on certain key technologies. FY 2021 concluded with preliminary architecture concepts that enabled key architecture decisions in FY 2022, followed by performance allocations to requirements in FY 2023. The program also funded efforts for advanced technology development and maturation of critical SWS D5LE2 components in the areas of high refractory metal PBCS Valve Assemblies, alternative batteries, nuclear safe out-of-line blocking elements, large Missile Structures, and RADHARD parts & shielding. Additionally, efforts funded included Strategic Guidance activities to include the development of technologies and components for strategic sensors to support the next generation of inertial sensors, instruments, rotary components and high performance processing electronics to address the need for advanced sensor data processing and low SWaP modular solutions.

FY 2022 accomplishments included preliminary functional and physical system architecture concept (to include lifecycle concepts and performance evaluation), evaluation and prototyping of materials and critical components for technology maturation, fabrication and evaluation of SLBM and strategic guidance subsystem parts for advanced development and to support prototyping and radiation testing.
-FY 2022 System Studies and Architecture Development efforts focused on refining previous studies, key architecture defining decisions, development of mission effectiveness and threat mitigation boundaries, refinement of digital engineering, CONOPS development activities associated with system operations that potentially lead to opportunities for affordability improvements, and activities to define core SWS architecture elements.
-FY 2022 SLBM technologies concentrated on advanced technology development and maturation of critical SWS D5LE2 components in the areas of high refractory metal PBCS and Valve Assemblies, batteries, large Missile Structures. FY 2022 efforts focused on continuation of activities critical to establishing the supply chain.
-FY 2022 Strategic Guidance efforts included the development of technologies and components to support the next generation of inertial sensors, rotary mechanical components and rad-hard electronics to address the need for high performing low SWaP modular solutions.

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FY 2023 plans continue critical D5LE2 efforts in the area of Systems Studies for Performance Allocations, Requirements and Architecture, SLBM technology investment and maturation efforts and Strategic Guidance efforts - all of which are based on historical timelines and execution for developing new technologies in this challenging environment to support the proposed D5LE2 and COLUMBIA class schedules.
-FY 2023 System Studies and Architecture Development efforts include continuing and completing prior year studies and architecture decisions.
-FY 2023 SLBM technologies concentrates on Common Parts ID, Battery Small Scale Tests, Radiation Hardened Testing start, Data Bus CONOPS, Additive Manufacturing Surveys, PBCS Thruster Valve cold gas tests, and Nose Fairing Element level tests.
-FY 2023 Strategic Guidance efforts include Algorithm simulation, fabrication and prototyping.

FY 2024 plans continue critical D5LE2 efforts in the area of Systems Studies for Performance Allocations, Requirements and Architecture, and SLBM technology investment and maturation efforts and Strategic Guidance efforts.
-FY 2024 SLBM technology investment areas will continue the maturation of the Common Parts Database, Flight System Batteries, Development of Radiation Hardened Test Capability, Maturation of a Nuclear Safe Data Bus, continued evaluation of Additive Manufacturing for high reliability space applications, continued maturation of Post Boost Control System (PBCS), Nose Faring, and Equipment Section Designs.
-FY 2024 Strategic Guidance efforts encompass Radiation Hardened Parts Concepts Evaluation to include candidate vendor allocations and technology down select fabrication, accelerometers, gyroscopes, stellar components, high fidelity lab/simulation testing, and mechanical packaging studies, Low Space Weight and Power solid state inertial sensor prototyping, Advanced imaging technology prototyping, Inertial Measurement Unit electro-mechanical component prototyping, Prototype Avionics developmental testing, Guidance Navigation and Control Software and Algorithm Studies, and Inertial Measurement Unit single axis testing and evaluation.
-FY 2024 System Level Studies and Architecture Development efforts culminate in an iterative update to the D5LE2 concept baseline to conduct a System Studies Concept Review (SCR), generating a sufficiently refined system architecture and requirements to support a System Readiness Review (SRR) in FY 2025. The FY 2025 SRR supports developing modernized commodities, requalifying pull-through commodities, iterative model maturation, integration, and ground testing with the first flight test in FY 2033. Completion of first flight test will lead to early production to support the loadout of an entire boat with qualified missiles in FY 2039.

Multi Star Enhanced Pre-Launch:
The Multi Star Enhanced Prelaunch (MEP) project delivers enhanced SWS resiliency by 1) leveraging the capability of the D5 Life Extension Guidance (Mk6 Mod1) to sight two stars vice one allowing for improved in-flight error correction and 2) updating interfaces to the Fire Control and Navigation subsystems enabling enhanced use of Navigation Sonar System (NSS) data for weapon system error control during Prelaunch. This capability reduces SWS reliance on Global Positioning System (GPS) and Bathymetry data which enables operation in environments where GPS is denied and improves SSBN security during patrol. This capability also has potential for future relief to the strict tolerance requirements of the strategic navigator on the current OHIO Class Submarines and the COLUMBIA class program. FY 2022 was the final year of development for the MEP project.

Systems Engineering Modeling and Simulation:
The Systems Engineering Modeling and Simulation capability will consist of three elements: Model Based Design, SWS Integrated Modeling and Simulation/Common Architecture & Framework, and SWS Enhancement Ground Test. This effort will provide the capability to comprehensively evaluate and test the integrated SWS within representative operational environments, providing unprecedented visibility across the SWS and system performance characterization equivalent to flight testing. This

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capability will enable trade space analysis to identify technical margin, subsystem interactions, and lifecycle affordability opportunities to include other services and be able to identify the benefits and risks of commonality to the individual programs, requirements and CONOPs modifications that could facilitate commonality, potential common acquisition strategies between the services, and total life cycle cost implications. FY 2023 is the final year of development for this effort.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Title: D5LE2	56.012	156.974	192.003	0.000	192.003
Articles:	-	-	-	-	-
FY 2023 Plans: System Studies: FY 2023 activities build upon the FY 2022 completion of the system requirements specification. Specifically, efforts focus on the System Architecture Concept Refinement and Allocated Systems Requirement Specification, which divides the architecture agnostic systems' requirements to the subsystems and is required prior to both the system and subsystem SRRs. FY 2023 System Studies include ones of significantly increased complexity from those performed in FY 2020-2022. Continued and Expanded: - Lifecycle concepts - Cyber Response Concept Development - Missile Handling and Recertification - Performance Allocations - Reliability Allocation - Reconfiguration Time Initiated: - Allocated capability requirements - Allocated performance requirements - System Navigation Solution - Inter-subsystem data requirements - Allocated environments specification - Identification of induced survivability environments - Allocated safety and surety architecture and design guidelines - Reconfiguration time performance allocations - Accuracy Allocations to subsystems - Electronics and Guidance interfaces					

Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy		Date: March 2023
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B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
- Flexible payload interfaces Technology Investments: FY 2023 technology investments efforts continue and include a significant increase in the scope of both the expanded and initiated major missile and guidance technologies to inform potential down selection and prototyping of scale design concepts. Continued and Expanded: - Radiation Hardened Parts Concepts Evaluation to include candidate vendor allocations and technology down select fabrication - Radiation Hardened Survivable Field Programmable Gate Array Evaluation - PBCS Technologies (proportional valve) Concepts and Evaluation, detailed studies - Battery Concepts and Evaluations including additive manufacturing local shield and enclosure shield and batteries - Nose Fairing and Equipment Section Materials evaluation - Connectors/Cables Concepts and evaluation - Guidance Concepts and Sensors including accelerometers, gyroscopes, stellar components, high fidelity lab/ simulation testing, and mechanical packaging studies Initiated: - Radiation Hardened Parts Solid State Switch (RHSSS) for safety/surety - Radiation Hardened Addressable Electric Foil Initiator Firing unit feasibility evaluation - Additive Manufacturing Shielding studies - PBCS proportional valve material candidates and test - PBCS alternative manufacturing planning and evaluation - Batteries small scale tests following battery cell-level tests - Nose Fairing alternate materials evaluation - Equipment Section materials studies, candidate evaluation, and test - Missile Health monitoring concepts - Missile Common Parts Identification process initiation - Data Bus CONOPS - Additive Manufacturing technology surveys - Connectors/fiber/Cables testing					

Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy		Date: March 2023
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B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
- Avionics testbed development in support of Hardware in the Loop and enhanced ground testing - Guidance accelerometer and gyroscope lab characterization testing and critical component testing - Low Space Weight and Power solid state inertial sensor prototyping - Advanced imaging prototyping - Inertial Measurement Unit electro-mechanical component prototyping - Inertial Measurement Unit single axis testbed development					
FY 2024 Base Plans: System Studies: FY 2024 System level studies will define the system concept and system architecture and culminate with a System Concept Review. Following the review, updates to the system functional baseline will be made leading to the System Requirements Review (SRR) in FY 2025. Several data products will be developed and baseline in FY 2024 in support of the SRR. The Allocated System Requirements Specification (ASRS) Revision that formally establishes subsystem allocated requirements will be delivered. Subsystem Interfaces and interface constraints will be captured in the system descriptive model. Performance (Accuracy and Reliability) requirements will be allocated and baselined. Continued, Expanded, and Baselined for SRR: - Lifecycle concepts - Cyber Response Concept Development - Missile Handling and Recertification - Performance Allocations - Reliability Allocation - Reconfiguration Time - Allocated capability requirements - Allocated performance requirements - System Navigation Solution - Inter-subsystem data requirements - Allocated environments specification - Identification of induced survivability environments - Allocated safety and surety architecture and design guidelines - Reconfiguration time performance allocations - Accuracy Allocations to subsystems					

Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy		Date: March 2023
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B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
- Electronics and Guidance interfaces - Flexible payload interfaces Technology Investments: FY 2024 technology investments efforts continue and include a significant increase in the scope of both the expanded and initiated major missile and guidance technologies to inform potential down selection and prototyping of scale design concepts. Continued and Expanded: - Radiation Hardened Parts Solid State Switch (RHSSS) for safety/surety testing - Radiation Hardened by Design (RHBD) test boards fabrication - Additive Manufacturing Shielding design rules and sample material analysis - PBCS Technologies Thruster valve cold gas testing and analysis following cold gas hardware fabrication - PBCS Technologies Thruster Valve performance models and hot gas demonstration - Batteries large scale design, fabrication and testing to create and evaluate a large scale battery of approximate form/fit/function - Nose Fairing component level trade studies to include tooling and processing strategies to refine component models with structural details and configurations and material characterization - Equipment Section materials element level tests of advanced materials to refine material model performance, thermal, stress/structural analysis, and material characterization - Common Parts, Materials, and Processes (PMP) initial lab testing and electrical performance evaluation, along with environmental testing and a manufacturability and cost assessment - Missile Common Parts database and Common PMP Trades Model Based Engineering (MBE) models for selected components - Down selection of Data Bus selected technologies from suppliers and Data Bus vendor design - Linear Accelerator (LINAC) Critical Design Review (CDR) and fabrication start - Radiation Hardened Parts Concepts Evaluation to include candidate vendor allocations and technology down select fabrication - Guidance Concepts and Sensors including accelerometers, gyroscopes, stellar components, high fidelity lab/ simulation testing, and mechanical packaging studies - Guidance accelerometer and gyroscope lab characterization testing and critical component testing - Low Space Weight and Power solid state inertial sensor prototyping - Advanced imaging technology prototyping					

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B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
- Inertial Measurement Unit electro-mechanical component prototyping Initiated: - Prototype Avionics developmental testing of Hardware in the Loop environment - Guidance Navigation and Control Software and Algorithm Studies - Inertial Measurement Unit single axis testing and evaluation ***FY 2024 OCO Plans:*** N/A ***FY 2023 to FY 2024 Increase/Decrease Statement:*** The D5LE2 Program's FY 2023 to FY 2024 increase in funding supports three major efforts: SLBM technologies, Strategic Guidance technologies, and System Studies and Architecture Development. These efforts are ramped and phased to, just-in-time, deliver a System Requirements Review in FY 2025 and ensure that architecture agnostic technologies that will support the modernized portions of the TRIDENT II system are of sufficient maturity to support the transfer to redesign and engineering for D5LE2 in the mid-2020s. FY 2024 technology investments efforts continue maturation and include a significant increase in the scope of both the expanded and initiated major missile and guidance technologies to inform potential down selection and prototyping of scale design concepts. FY 2024 System Level Studies and Architecture Development efforts culminate in an iterative update to the D5LE2 concept baseline to conduct a System Studies Concept Review (SCR), generating sufficiently refined system architecture and requirements. FY 2024 efforts across these areas are critical to continue and complete development activities that will foster TRL maturation, enable successful completion of the Systems Requirement Review (SRR) in FY 2025, and secure the uninterrupted sustainment of the Trident SWS while meeting requirements for adaptability and survivability.					
Title: Multi-Star Enhanced Prelaunch (MEP) ***Articles:*** ***FY 2023 Plans:***	4.405 -	0.000 -	0.000 -	0.000 -	0.000 -

Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy		Date: March 2023
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B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
N/A ***FY 2024 Base Plans:*** N/A ***FY 2024 OCO Plans:*** N/A					
Title: System Engineering Modeling and Simulation	10.552	16.370	0.000	0.000	0.000
Articles:	-	-	-	-	-
FY 2023 Plans: - Continue development of physical model based tools/virtual reality for training and planning. - Complete the expansion of initially planned sites for the secure computing infrastructure at the Secret level. - Expand the secure computing infrastructure at the Top Secret level. In FY 2023 there are 3 locations selected for connectivity: NSWC Crane, NSWC Dahlgren, and Waterton. - Continue developing SE Governance Process and Documentation including (but not limited to) System Modeling Ontology, System Modeling Profiles, and Configuration Management Plan for the Digital Engineering Environment. - Draft the Tailored Object Oriented Systems Engineering Modeling Approach. - Update the following documents: Integrate Modeling and Simulation: Simulation Standards & Guidelines for Model Development and Software Coding & Real-Time Hardware-in-the Loop. - Select and purchase Digital Engineering tools and licenses for the initial baseline of the secure computing infrastructure Government Reference Architecture (GRA). ***FY 2024 Base Plans:*** N/A ***FY 2024 OCO Plans:*** N/A ***FY 2023 to FY 2024 Increase/Decrease Statement:*** The decrease from FY 2023 to FY 2024 is attributed to the System Engineering Modeling and Simulation sub-project ending in FY 2023.					
Accomplishments/Planned Programs Subtotals	70.969	173.344	192.003	0.000	192.003

Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy		Date: March 2023
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C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

D5LE2 will modernize D5LE under the TRIDENT II D5 existing acquisition program and remain an ACAT IC Major Defense Acquisition Program (MDAP). The Assistant Secretary of the Navy, for Research Development & Acquisition (ASN RDA) will continue as the Milestone Decision Authority (MDA) maintaining effective oversight for the proven, highly successful TRIDENT II D5 program to continue achieving desired cost, schedule, and performance outcomes. This acquisition approach minimizes technical and programmatic risk, ensuring on-time delivery of the performance needed to sustain the nation's sea-based strategic deterrent.

D5LE2 will be procured as a Strategic Systems Programs (SSP) Alteration (SPALT). SPALTs are an SSP process to insert new technologies into, extend the life of, or otherwise alter components of the Strategic Weapons System. SSP has performed many SPALTs over decades, from minor modifications to major component modernization (e.g. the first D5 Life Extension). SPALTs are executed under the TRIDENT II program to allow for seamless execution while maintaining the intent and rigor of acquisition oversight

Contracts will continue to be awarded to those sources who were engaged in program and are currently engaged in the production and/or operational support on the basis of Other Than Full and Open Competition pursuant to the authority of 10 U.S.C. 2304 (c) (1) and (3) implemented by FAR 6.302.-1, 3, 4

Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy			Date: March 2023
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Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2022 Cost	FY 2022 Award Date	FY 2023 Cost	FY 2023 Award Date	FY 2024 Base Cost	FY 2024 Base Award Date	FY 2024 OCO Cost	FY 2024 OCO Award Date	FY 2024 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Technical Applications LMSS	SS/CPIF	LMSS : CA	194.683	23.509	Oct 2021	68.260	Nov 2022	91.477	Oct 2023	-		91.477	Continuing	Continuing	Continuing
Technical Applications DRAPER	SS/CPFF	Draper : MA	369.300	18.474	Nov 2021	53.736	Nov 2022	42.204	Oct 2023	-		42.204	Continuing	Continuing	Continuing
Technical Applications APL	SS/CPFF	APL : MD	13.386	9.023	Nov 2021	13.685	Nov 2022	9.380	Oct 2023	-		9.380	Continuing	Continuing	Continuing
Technical Applications VAR	Various	Various : Various	29.577	2.394	Nov 2021	9.672	Nov 2022	7.224	Oct 2023	-		7.224	Continuing	Continuing	Continuing
Technical Applications CRANE	SS/CPFF	NSWC Crane : IN	2.908	8.247	Oct 2021	12.485	Nov 2022	22.363	Oct 2023	-		22.363	Continuing	Continuing	Continuing
Technical Applications Dahlgren	WR	Dahlgren : VA	99.342	2.188	Nov 2021	1.866	Nov 2022	1.706	Oct 2023	-		1.706	Continuing	Continuing	Continuing
Technical Applications GDMS	SS/CPFF	GDMS : MA	3.310	2.321	Feb 2022	3.971	Nov 2022	1.713	Dec 2023	-		1.713	Continuing	Continuing	Continuing
Technical Applications NGMS	SS/CPFF	NGMS : CA	0.000	0.000		0.681	Feb 2023	0.425	Oct 2023	-		0.425	Continuing	Continuing	Continuing
Technical Applications PSU ARL	SS/CPFF	ARL : PA	1.000	0.200	May 2022	0.731	Dec 2022	0.493	Dec 2023	-		0.493	Continuing	Continuing	Continuing
Technical Applications SPA	SS/CPFF	SPA : VA	0.303	1.200	Nov 2021	1.516	Nov 2022	1.356	Nov 2023	-		1.356	Continuing	Continuing	Continuing
Technical Applications BAE	SS/CPFF	BAE : VA	0.913	2.224	Nov 2021	2.004	Nov 2022	0.510	Oct 2023	-		0.510	Continuing	Continuing	Continuing
Technical Applications LMRMS	SS/CPIF	LMRMS : NY	0.000	0.475	Nov 2021	0.539	Jan 2023	0.599	Oct 2023	-		0.599	Continuing	Continuing	Continuing
Technical Applications China Lake	WR	China Lake : CA	0.000	0.634	Nov 2021	0.088	Nov 2022	0.088	Oct 2023	-		0.088	Continuing	Continuing	Continuing
Technical Applications Carderock	WR	Carderock : MD	0.000	0.000		0.074	Feb 2023	0.074	Oct 2023	-		0.074	Continuing	Continuing	Continuing
Technical Applications Peraton	SS/CPFF	Peraton : VA	0.000	0.000		0.673	Feb 2023	1.413	Oct 2023	-		1.413	Continuing	Continuing	Continuing
Technical Applications Battelle	SS/CPFF	Battelle : OH	0.000	0.000		0.379	Feb 2023	0.796	Nov 2023	-		0.796	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy		Date: March 2023
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Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2022 Cost	FY 2022 Award Date	FY 2023 Cost	FY 2023 Award Date	FY 2024 Base Cost	FY 2024 Base Award Date	FY 2024 OCO Cost	FY 2024 OCO Award Date	FY 2024 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Technical Applications EMCUBE	SS/CPFF	EMCUBE : VA	0.000	0.000		0.165	Feb 2023	0.269	Nov 2023	-		0.269	Continuing	Continuing	Continuing
Technical Applications MARC	SS/CPFF	MARC : VA	0.000	0.000		0.097	Feb 2023	0.196	Nov 2023	-		0.196	Continuing	Continuing	Continuing
Technical Applications DEVCOM	MIPR	ARMY DEVCOM : MD	0.000	0.080	Nov 2021	2.722	Feb 2023	9.717	Nov 2023	-		9.717	0.000	12.519	-
		Subtotal	714.722	70.969		173.344		192.003		-		192.003	Continuing	Continuing	N/A

	Prior Years	FY 2022 Cost	FY 2022 Award Date	FY 2023 Cost	FY 2023 Award Date	FY 2024 Base Cost	FY 2024 Base Award Date	FY 2024 OCO Cost	FY 2024 OCO Award Date	FY 2024 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	714.722	70.969		173.344		192.003		-		192.003	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2024 Navy		Date: March 2023
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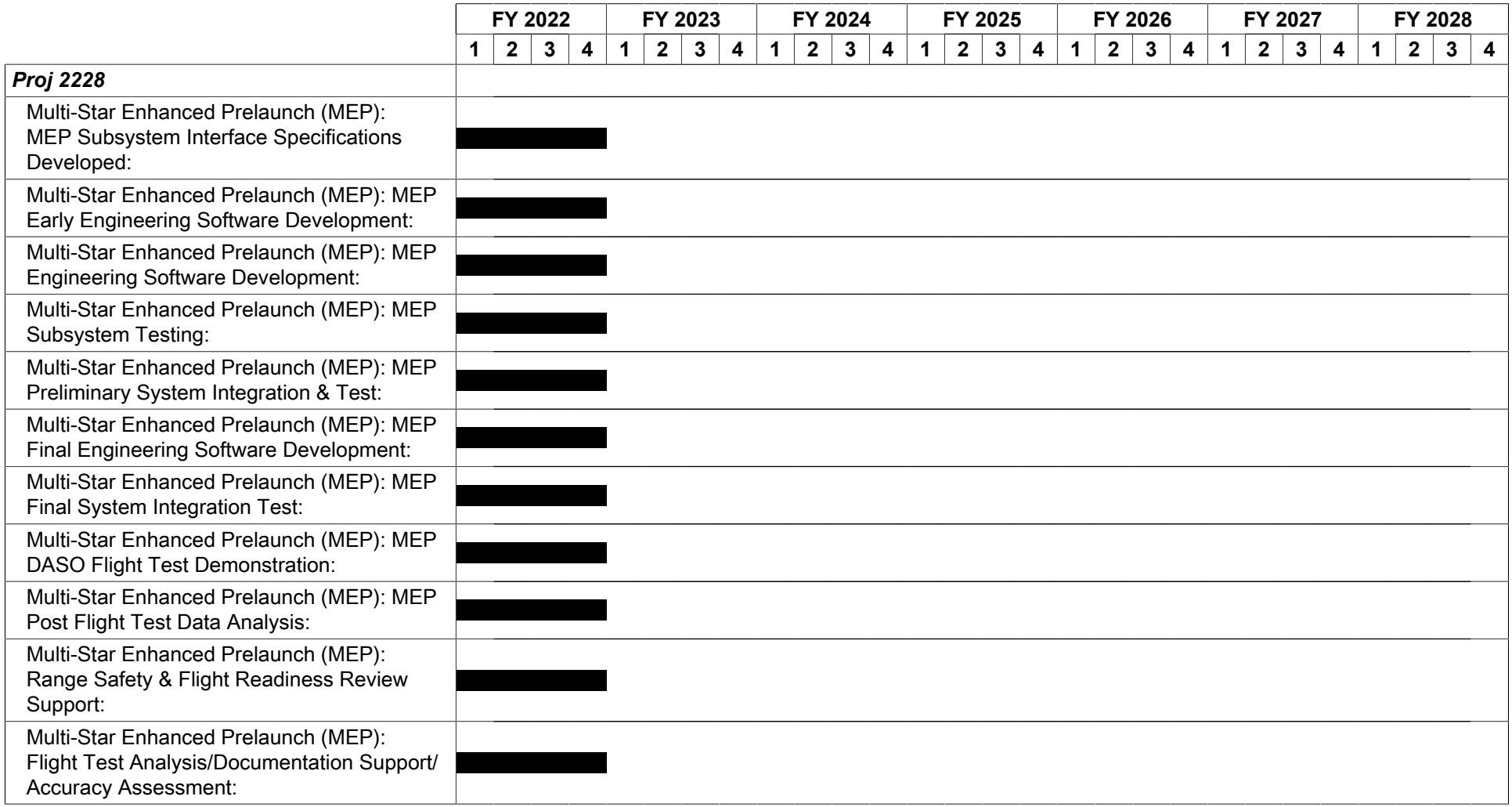

Exhibit R-4, RDT&E Schedule Profile: PB 2024 Navy		Date: March 2023
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0101221N / *Strategic Sub & Wpns Sys Supt*	**Project (Number/Name)** 2228 / *Technical Applications Programs*

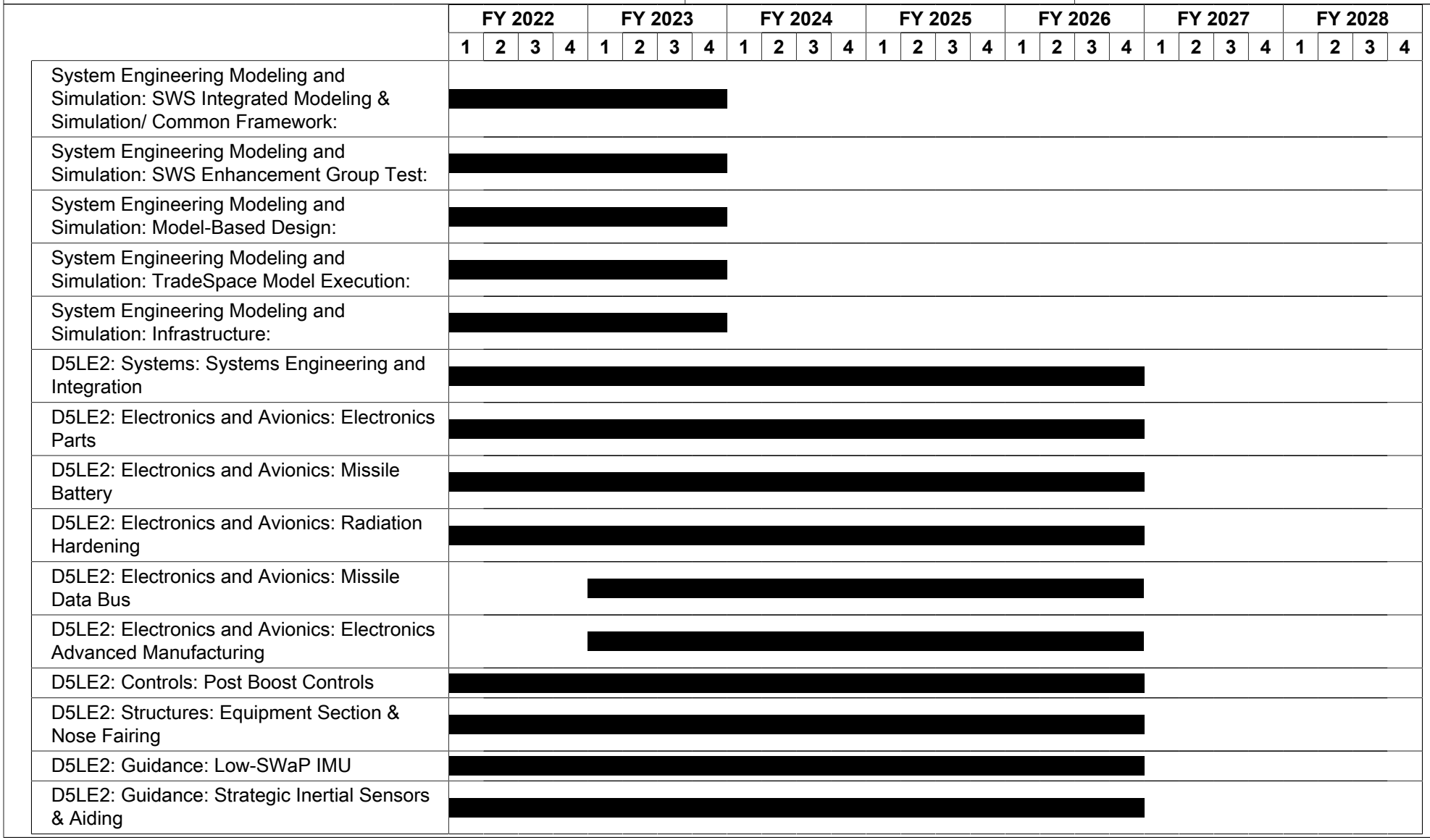

Exhibit R-4, RDT&E Schedule Profile: PB 2024 Navy		Date: March 2023
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0101221N / *Strategic Sub & Wpns Sys Supt*	**Project (Number/Name)** 2228 / *Technical Applications Programs*

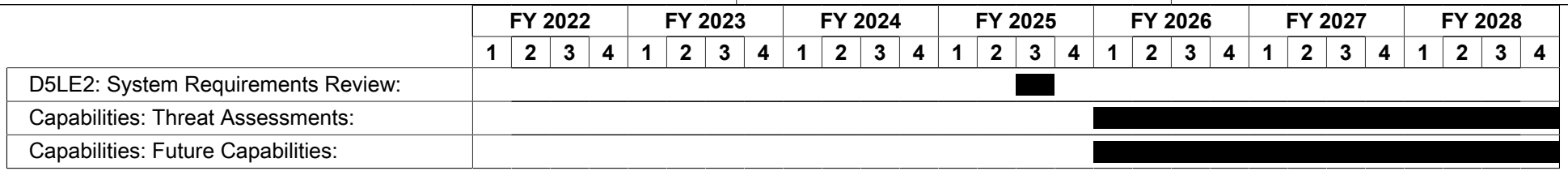

Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy		Date: March 2023
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0101221N / *Strategic Sub & Wpns Sys Supt*	**Project (Number/Name)** 2228 / *Technical Applications Programs*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 2228				
Multi-Star Enhanced Prelaunch (MEP): MEP Subsystem Interface Specifications Developed:	1	2022	4	2022
Multi-Star Enhanced Prelaunch (MEP): MEP Early Engineering Software Development:	1	2022	4	2022
Multi-Star Enhanced Prelaunch (MEP): MEP Engineering Software Development:	1	2022	4	2022
Multi-Star Enhanced Prelaunch (MEP): MEP Subsystem Testing:	1	2022	4	2022
Multi-Star Enhanced Prelaunch (MEP): MEP Preliminary System Integration & Test:	1	2022	4	2022
Multi-Star Enhanced Prelaunch (MEP): MEP Final Engineering Software Development:	1	2022	4	2022
Multi-Star Enhanced Prelaunch (MEP): MEP Final System Integration Test:	1	2022	4	2022
Multi-Star Enhanced Prelaunch (MEP): MEP DASO Flight Test Demonstration:	1	2022	4	2022
Multi-Star Enhanced Prelaunch (MEP): MEP Post Flight Test Data Analysis:	1	2022	4	2022
Multi-Star Enhanced Prelaunch (MEP): Range Safety & Flight Readiness Review Support:	1	2022	4	2022
Multi-Star Enhanced Prelaunch (MEP): Flight Test Analysis/Documentation Support/ Accuracy Assessment:	1	2022	4	2022
System Engineering Modeling and Simulation: SWS Integrated Modeling & Simulation/ Common Framework:	1	2022	4	2023
System Engineering Modeling and Simulation: SWS Enhancement Group Test:	1	2022	4	2023
System Engineering Modeling and Simulation: Model-Based Design:	1	2022	4	2023
System Engineering Modeling and Simulation: TradeSpace Model Execution:	1	2022	4	2023
System Engineering Modeling and Simulation: Infrastructure:	1	2022	4	2023
D5LE2: Systems: Systems Engineering and Integration	1	2022	4	2026
D5LE2: Electronics and Avionics: Electronics Parts	1	2022	4	2026

Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy		Date: March 2023
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0101221N / *Strategic Sub & Wpns Sys Supt*	**Project (Number/Name)** 2228 / *Technical Applications Programs*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
D5LE2: Electronics and Avionics: Missile Battery	1	2022	4	2026
D5LE2: Electronics and Avionics: Radiation Hardening	1	2022	4	2026
D5LE2: Electronics and Avionics: Missile Data Bus	1	2023	4	2026
D5LE2: Electronics and Avionics: Electronics Advanced Manufacturing	1	2023	4	2026
D5LE2: Controls: Post Boost Controls	1	2022	4	2026
D5LE2: Structures: Equipment Section & Nose Fairing	1	2022	4	2026
D5LE2: Guidance: Low-SWaP IMU	1	2022	4	2026
D5LE2: Guidance: Strategic Inertial Sensors & Aiding	1	2022	4	2026
D5LE2: System Requirements Review:	3	2025	3	2025
Capabilities: Threat Assessments:	1	2026	4	2028
Capabilities: Future Capabilities:	1	2026	4	2028

Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy			Date: March 2023
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0101221N / *Strategic Sub & Wpns Sys Supt*	Project (Number/Name) 3097 / *W-93 / Mk 7*	

COST ($ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
3097: *W-93 / Mk 7*	79.295	69.702	97.089	126.466	-	126.466	207.708	420.717	537.660	965.017	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The 3097 RDTEN project has been designated as the W93/Mk7 warhead, a third variant for the TRIDENT. This project was formerly known as the Interoperative Warhead (IW); the name change to W93/Mk7 is reflected herein. This project will design, develop, and test a future warhead to include a new Navy Aeroshell for a Submarine Launched Ballistic Missile (SLBM). W93/Mk7 will mitigate risk from aging or technical failure by balancing the sea-leg warhead strategic force.

The U.S. has not delivered an integrated ballistic reentry system since the 1980s. Critical early investments are required for development of critical skills and recapitalization of the atrophied industrial base. The program will align to the President's priority of strengthening our Nation's manufacturing and defense industrial base while improving supply chain resiliency and reducing reliance on foreign countries by making critical investments in the aeroshell industrial base. In order to maintain a credible sea-based deterrent capable of the flexibility and adaptability necessary to meet future adversarial threats, the Department of Defense (DoD) and Department of Energy (DOE) / National Nuclear Security Administration (NNSA) have initiated a joint DoD-DOE/NNSA Nuclear Weapons Life-Cycle Process.

Progress and activity (Phase 1 - 2/2A):

- Early efforts primarily consist of developing programmatic planning and structure to support the future program along with further exploration and refinement of the concept studies that resulted from the Feasibility Management Team Study, which was directed in the 2018 Nuclear Posture Review (NPR). Following the results of the Feasibility Management Team Study, refinement of the concept study will be accomplished through system trade studies and drafting initial high level requirements documents in order to support the program entering a Phase 2 (Feasibility Study and Design Options) / 2A (Design Definition and Cost Study).
- As part of the Phase 1 analysis, U.S. Navy Strategic Systems Programs and the NNSA have identified ways to reduce the overall burden on the Nation's weapons complex and nuclear enterprise facilities through innovative design and logistics planning. These changes to legacy planning factors will result in significant cost reduction to the program's sustainment and lifecycle costs.
- Development and submission of Executive Report to Nuclear Weapons Council (NWC) outlines analysis and findings from Phase 1 which will serve as the baseline for further analysis of refined and matured concept designs in Phase 2.
- Identify necessary investments and align OSD stakeholders on planned investments within the nuclear enterprise.
- Develop draft military characteristics, stockpile to target sequence and identified interdependencies between requirement drivers of DoD and DOE.
- Develop initial nuclear enterprise assurance and supply chain protection considerations.
- Draft threat and vulnerability assessments as well as safety, security, and use control architectures.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Title: W93 / Mk7	69.702	97.089	126.466	0.000	126.466

Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy		Date: March 2023
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0101221N / *Strategic Sub & Wpns Sys Supt*	**Project (Number/Name)** 3097 / *W-93 / Mk 7*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Articles:	-	-	-	-	-
FY 2023 Plans: - Conduct Flight Systems System Requirements Review. - Analyze ability to meet system requirements, define production quantities, which includes Surveillance and War Reserve quantities. - Begin in-depth analysis of each design option. - Begin an in-depth review of planned support equipment, facility upgrades and technical publications. - Update requirements documents (Military Characteristics, Stockpile-to-Target Sequence, and Interface Control Drawings). - Review/update readiness levels for technologies and manufacturing (TRLs and MRLs) and associated risk analysis and constraints. - Purchase of capital equipment to support aeroshell industrial base recapitalization effort; creates efficiency and reduces operational/maintenance risk. - Analyze carbonization and heat shield capacity in support of TPS/Aeroshell requirements. - Analyze research and development (R&D) and production requirements and capabilities, including identifying long-lead items and production constraints. - Begin development of qualification and certification requirements. - Analyze research and development, production, life-cycle maintenance, and logistics scope. - Identify and certify manufacturing processes and supply chains for new-builds of substrates, heatshield material from new rayon source, antenna windows, and other non-nuclear components critical to the thermal protection system. - Development of instrumentation for thermomechanical and aerothermal testing to certify components for flight test and system qualification.					
FY 2024 Base Plans: - Conduct Thermal Protection System (TPS) System Requirements Review. - Conduct Development-1Flight Test Body Critical Design Review. - Continue analysis of each design option. - Continue analysis of ability to meet system requirements, define production quantities, which includes Surveillance and War Reserve quantities. - Continue review of planned support equipment, facility upgrades and technical publications. - Continue to refine requirements documents (Military Characteristics, Stockpile-to-Target Sequence, and Interface Control Drawings).					

Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy		Date: March 2023
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0101221N / *Strategic Sub & Wpns Sys Supt*	**Project (Number/Name)** 3097 / *W-93 / Mk 7*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
- Continue development of qualification and certification requirements. - Identify and certify manufacturing processes and supply chains for new-builds of substrates, heatshield material from new rayon source, antenna windows, and other non-nuclear components critical to the thermal protection system. - Continue development of instrumentation for thermomechanical and aerothermal testing to certify components for flight test and system qualification. - Continue purchase of capital equipment to support aeroshell industrial base recapitalization effort; creates efficiency and reduces operational/maintenance risk. - Continue analysis of carbonization and heat shield capacity in support of TPS/Aeroshell requirements. - Conduct microstructure analysis of legacy substrate material. - Procure and conduct analysis of new substrate material to be used in future aeroshell production. - Begin to define project scope and design definition in preparation for Phase 2A. - Begin development of integrated project requirements management plan and project schedule. ***FY 2024 OCO Plans:*** N/A ***FY 2023 to FY 2024 Increase/Decrease Statement:*** From FY 2023 to FY 2024 Phase 2 efforts of the program will continue to require personnel ramping to support schedule, cost, design and development planning to meet defined First Production Unit (FPU) date. The results of the Phase 2 study, including the DoD evaluation of design options, will be captured in the Joint Integrated Program Plan (JIPP) and shall be independently reviewed for cost.					
Accomplishments/Planned Programs Subtotals	69.702	97.089	126.466	0.000	126.466

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

Contracts will be awarded to those sources who were engaged in the ALT 370 program and are currently engaged in the production and/or operational support of the deployed W78/88-1 Systems on the basis of Other Than Full and Open Competition pursuant to the authority of 10 U.S.C. 2304 (c) (1) and (3) implemented by FAR 6.302.-1, 3, 4

Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy		Date: March 2023
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0101221N / *Strategic Sub & Wpns Sys Supt*	**Project (Number/Name)** 3097 / *W-93 / Mk 7*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2022 Cost	FY 2022 Award Date	FY 2023 Cost	FY 2023 Award Date	FY 2024 Base Cost	FY 2024 Base Award Date	FY 2024 OCO Cost	FY 2024 OCO Award Date	FY 2024 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
W93/Mk7	SS/CPIF	LMS : PA	47.099	36.391	Nov 2021	41.699	Nov 2022	57.384	Nov 2023	-		57.384	Continuing	Continuing	Continuing
W93/Mk7	MIPR	DOE : NM	14.367	10.241	Nov 2021	26.127	Oct 2022	34.500	Nov 2023	-		34.500	Continuing	Continuing	Continuing
W93/Mk7	SS/CPFF	ARCFIELD : VA	6.188	2.414	Jan 2022	3.700	Mar 2023	5.000	Nov 2023	-		5.000	Continuing	Continuing	Continuing
W93/Mk7	SS/CPFF	APL : MD	8.238	7.072	Nov 2021	4.671	Mar 2023	7.000	Nov 2023	-		7.000	Continuing	Continuing	Continuing
W93/Mk7	SS/CPFF	Various : Various	1.943	1.850	Dec 2021	2.233	Dec 2022	3.490	Nov 2023	-		3.490	Continuing	Continuing	Continuing
W93/Mk7	SS/CPFF	BAE : MD	0.000	0.800	Nov 2021	0.988	Dec 2022	0.987	Dec 2023	-		0.987	Continuing	Continuing	Continuing
W93/Mk7	SS/CPFF	NSWC RSO : MD	0.273	7.064	Nov 2021	13.552	Feb 2023	13.835	Nov 2023	-		13.835	Continuing	Continuing	Continuing
W93/Mk7	C/CPFF	SPA : VA	0.054	0.500	Jan 2022	0.510	Feb 2023	0.520	Jan 2024	-		0.520	Continuing	Continuing	Continuing
W93/Mk7	SS/CPFF	TOYON : CA	1.133	3.370	Nov 2021	1.354	Oct 2022	1.450	Nov 2023	-		1.450	Continuing	Continuing	Continuing
W93/Mk7	WR	CNSW : IN	0.000	0.000		2.000	Feb 2023	2.040	Nov 2023	-		2.040	Continuing	Continuing	Continuing
W93/Mk7	SS/CPFF	EMCUBE : VA	0.000	0.000		0.255	Mar 2023	0.260	Nov 2023	-		0.260	Continuing	Continuing	Continuing
		Subtotal	79.295	69.702		97.089		126.466		-		126.466	Continuing	Continuing	N/A

	Prior Years	FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	79.295	69.702		97.089		126.466		-		126.466	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2024 Navy		Date: March 2023
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0101221N / *Strategic Sub & Wpns Sys Supt*	**Project (Number/Name)** 3097 / *W-93 / Mk 7*

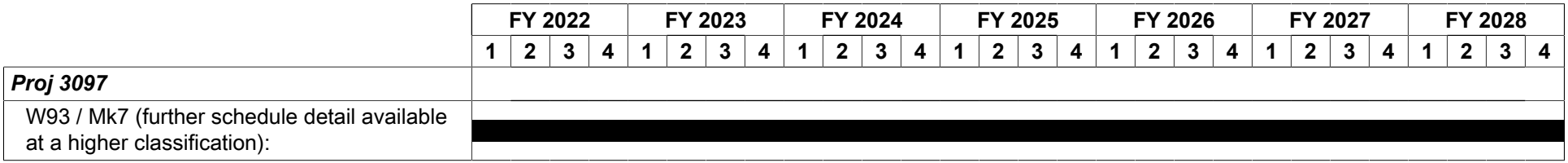

Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy		Date: March 2023
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0101221N / *Strategic Sub & Wpns Sys Supt*	**Project (Number/Name)** 3097 / *W-93 / Mk 7*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 3097				
W93 / Mk7 (further schedule detail available at a higher classification):	1	2022	4	2028

Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy			Date: March 2023
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0101221N / *Strategic Sub & Wpns Sys Supt*	Project (Number/Name) 3158 / *Integrated Nuclear Weapons Security Sys Dev*	

COST ($ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
3158: *Integrated Nuclear Weapons Security Sys Dev*	15.911	3.322	3.384	3.179	-	3.179	3.220	3.282	3.340	3.407	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Enhanced Special Weapons effort supports the Nuclear Weapons Security (NWS) program and SSBN Escort mission. The policies and requirements regarding the safeguard of nuclear weapons within the Department of Defense is established by DoD S5210.41M. Within the Department of the Navy, nuclear weapons are limited to TRIDENT Fleet Ballistic Missiles (FBM), either deployed aboard TRIDENT submarines or located landside at Naval Submarine Base, Kings Bay or Naval Submarine Base, Bangor where missiles are assembled/disassembled, tested as well as repaired. The CNO has assigned SSP, the FBM program manager, with mission responsibility for the safeguard of FBM nuclear assets. More specifically, the mission includes landside and pier operations as well as transits to and from the dive point, each of which present challenges to personnel as well as existing technologies. This budget supports efforts directed at improving the current security technological baseline through a series of technology developments, tests, and studies focusing on land and in transit security requirements. Collectively, these efforts will improve countermeasure technologies addressing detection, delay, denial, and defeat.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Title: Integrated Nuclear Weapons Security Sys Dev	3.322	3.384	3.179	0.000	3.179
Articles:	-	-	-	-	-
FY 2023 Plans: Identify, develop, and test technologies needed for aerial and underwater surveillance, for detection and defeat (passive and active) of unmanned aircraft systems and unmanned underwater vehicles. Investment into technologies that aide in mitigating risks posed by cyber-security threats, assess susceptibility and vulnerability to malicious activities, and to strengthen against unauthorized access to electronic security systems.					
FY 2024 Base Plans: Continue to identify, develop, and test technologies needed for aerial and underwater surveillance, for detection and defeat (passive and active) of unmanned aircraft systems and unmanned underwater vehicles. Continue investing in technologies that aide in mitigating risks posed by cyber-security threats, assess susceptibility and vulnerability to malicious activities, and strengthen against unauthorized access to electronic security systems.					
FY 2024 OCO Plans:					

Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy		Date: March 2023
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0101221N / *Strategic Sub & Wpns Sys Supt*	**Project (Number/Name)** 3158 / *Integrated Nuclear Weapons Security Sys Dev*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
N/A ***FY 2023 to FY 2024 Increase/Decrease Statement:*** The decrease from FY 2023 to FY 2024 is due to miscellaneous rate adjustments.					
Accomplishments/Planned Programs Subtotals	3.322	3.384	3.179	0.000	3.179

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
• OPN/Various-2: *OPN (Nuclear Weapons Security)*	33.970	39.837	37.749	-	37.749	38.460	39.335	40.086	40.886	Continuing	Continuing
• OMN/11D2D-3: *Fleet Ballistic Missile (Nuclear Weapons Security)*	103.772	103.468	110.641	-	110.641	103.515	106.022	107.706	110.137	Continuing	Continuing
• OMN/11D2D-5: *Fleet Ballistic Missile (Transit/Escort)*	104.888	117.906	119.321	-	119.321	120.924	123.251	125.736	128.251	Continuing	Continuing

Remarks

D. Acquisition Strategy

Procurements are being executed through a combination of private contractors (large and small business), government Centers of Excellence (COEs), other government agencies and the Naval Submarine Bases, Kitsap and Kings Bay. Contract awards are based upon "best value" determinations, and where practical will be performance based or include incentive provisions.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy			Date: March 2023
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0101221N / *Strategic Sub & Wpns Sys Supt*	Project (Number/Name) 3158 / *Integrated Nuclear Weapons Security Sys Dev*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2022 Cost	FY 2022 Award Date	FY 2023 Cost	FY 2023 Award Date	FY 2024 Base Cost	FY 2024 Base Award Date	FY 2024 OCO Cost	FY 2024 OCO Award Date	FY 2024 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Integrated Nuclear Weapons Security Sys Dev	SS/CPFF	APL : MD	4.369	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Integrated Nuclear Weapons Security Sys Dev	SS/CPFF	JRC : VA	3.872	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Integrated Nuclear Weapons Security Sys Dev	C/BA	DRAPER : MA	0.556	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Integrated Nuclear Weapons Security Sys Dev	WR	CNWS : ID	3.083	2.016	Oct 2021	2.091	Feb 2023	1.135	Nov 2023	-		1.135	Continuing	Continuing	Continuing
Integrated Nuclear Weapons Security Sys	C/CPFF	GDMS : MA	1.837	0.416	Nov 2021	0.398	Feb 2023	0.000	Nov 2023	-		0.000	Continuing	Continuing	Continuing
Integrated Nuclear Weapons Security Sys	C/CPFF	ARL : TX	0.000	0.000		0.330	Feb 2023	0.489	Oct 2023	-		0.489	Continuing	Continuing	Continuing
Integrated Nuclear Weapons Security Sys	C/CPFF	SPA : VA	0.545	0.325	Nov 2021	0.461	Feb 2023	0.467	Nov 2023	-		0.467	Continuing	Continuing	Continuing
Integrated Nuclear Weapons Security Sys	C/CPFF	EMCUBE : VA	0.381	0.000		0.104	Feb 2023	0.101	Dec 2023	-		0.101	Continuing	Continuing	Continuing
Integrated Nuclear Weapons Security Sys	C/CPFF	ASC : CA	0.800	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Integrated Nuclear Weapons Security Sys	WR	DAHLGREN : VA	0.075	0.250	Apr 2022	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Integrated Nuclear Weapons Security Sys	WR	KEYPORT : VA	0.000	0.315	Feb 2022	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Integrated Nuclear Weapons Security Sys	Various	various : various	0.393	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Integrated Nuclear Weapons Security Sys	WR	NIWC Pacific : CA	0.000	0.000		0.000		0.987	Nov 2023	-		0.987	0.000	0.987	-
		Subtotal	15.911	3.322		3.384		3.179		-		3.179	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy			Date: March 2023
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0101221N / *Strategic Sub & Wpns Sys Supt*	Project (Number/Name) 3158 / *Integrated Nuclear Weapons Security Sys Dev*	

	Prior Years	FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	15.911	3.322		3.384		3.179		-		3.179	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2024 Navy		Date: March 2023
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0101221N / *Strategic Sub & Wpns Sys Supt*	**Project (Number/Name)** 3158 / *Integrated Nuclear Weapons Security Sys Dev*

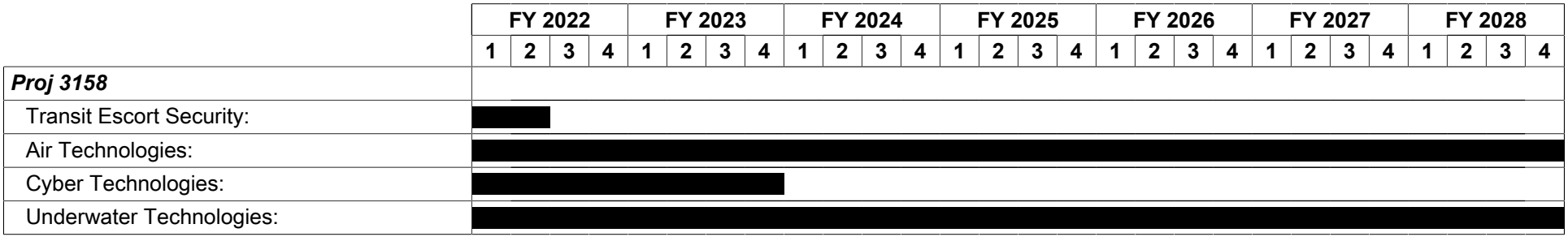

Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy		Date: March 2023
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0101221N / *Strategic Sub & Wpns Sys Supt*	**Project (Number/Name)** 3158 / *Integrated Nuclear Weapons Security Sys Dev*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 3158				
Transit Escort Security:	1	2022	2	2022
Air Technologies:	1	2022	4	2028
Cyber Technologies:	1	2022	4	2023
Underwater Technologies:	1	2022	4	2028

Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy											Date: March 2023	
Appropriation/Budget Activity 1319 / 7					R-1 Program Element (Number/Name) PE 0101221N / *Strategic Sub & Wpns Sys Supt*				Project (Number/Name) 9999 / *Congressional Adds*			
COST ($ in Millions)	**Prior Years**	**FY 2022**	**FY 2023**	**FY 2024 Base**	**FY 2024 OCO**	**FY 2024 Total**	**FY 2025**	**FY 2026**	**FY 2027**	**FY 2028**	**Cost To Complete**	**Total Cost**
9999: *Congressional Adds*	28.960	30.891	28.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	87.851
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Congressional adds to support:

- Next Generation Strategic Inertial Measurement Unit will research, develop and demonstrate radiation-hardened navigation technologies for reentry specific applications, strategic grade inertial instruments, software, electromechanical components and algorithms that exercise strategic skills and are applicable to the long-term viability of the nation's strategic grade guidance systems.

- Scalable Very High Temperature Composite Manufacturing Technologies supports development and production effort for three dimensionally reinforced carbon/carbon SSNTs and further high temperature composite material in support of SSNT and future Navy reentry systems.

- Autonomous fiber optic sensing network will develop advanced sensor systems for counterterrorism and antiterrorism operations to meet rigorous performance metrics necessary for nuclear facility, material, and weapons protection.

- Strategic weapons systems shipboard navigation system modernization will conduct improvement backlog assessment, estimation, and prioritization; evaluation on the sustainability of all Navigation Subsystem Auxiliary Systems and incorporate cyber resilient methods and strategies into the build and production process for targeted Navigation Software Configuration Items (SWCIs).

- Multimodal biometric authentication supports the investigation and development of biometric technology.

B. Accomplishments/Planned Programs ($ in Millions)	**FY 2022**	**FY 2023**
Congressional Add: Next Generation Strategic Inertial Measurement Unit	5.792	10.000
FY 2022 Accomplishments: Research and develop new and alternate Guidance, Navigation, and Control (GN&C) technologies and concepts to support Strategic Systems Programs (SSP) Missions. FY 2022 planned scope includes: - Research, develop and demonstrate radiation-hardened navigation technologies for reentry specific applications, strategic grade inertial instruments, software, electromechanical components and algorithms - Perform technical trade studies to deliver a navigation solution that optimizes the system for size, weight, and power		

Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy		Date: March 2023
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B. Accomplishments/Planned Programs ($ in Millions)	FY 2022	FY 2023
while maintaining the flight test accuracy requirements Develop and deliver an IMU specification defining all system level requirements necessary for deployment on Navy flight test systems - Analyze, design, deliver, and test iterations of a small navigation grade IMU and other non-inertial navigation aids. - Develop requirement definitions and program planning - Conduct trade study/cost-benefit analysis to determine the best value hardware solution for processing and input/output hardware design. - Perform System and Component Engineering of Navigation and avionics systems - Demonstrate navigation system capability and development progress by conducting design reviews. - Conduct Test and Evaluation (T&E) activities to include test development, procedure review, conducting tests, review and analysis of test data, and documentation of test results. - Monitor and assess maintaining accuracy of the existing hypersonic flight systems through analysis, simulation and test of design options. - Assess guidance options including improved/alternate correlation algorithms for reference generation and validation of selected sensors while considering impact on current components. ***FY 2023 Plans:*** Build and test Quantity 3 HyperFlite Engineering Development Unit (EDU) IMUs; including detailed calibration, thermal excursions and ground based environmental test cells Further reduce Size Weight and Power for hypersonic and strategic platforms Integrate HyperFlite EDU IMU flight test data into a model, including updates to modeled parameters where applicable Develop HyperFlite IMU based avionics architecture and concept designs, assuming an optimized HyperFlite design Execute a minimum of one flight test with a HyperFlite EDU IMU, to support progression of TRL		
Congressional Add: Scalable Very High Temperature Composite Manufacturing Technologies ***FY 2022 Accomplishments:*** Funds continued to support heatshield material testing and future capability development. Funds also support recapitalization of US manufacturing capabilities. Specific activities include ground testing and development of machining procedures. ***FY 2023 Plans:*** N/A	5.792	0.000
Congressional Add: Autonomous fiber optic sensing network ***FY 2022 Accomplishments:*** Develop a fiber optic acoustic sensor system that will detect, track, and classify unmanned underwater vehicles. It will be installed and developed with a focus on reduction of technical and	4.827	0.000

Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy		Date: March 2023
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B. Accomplishments/Planned Programs ($ in Millions)	FY 2022	FY 2023
integration risks in an operational environment. This effort will enable a future transition into the Waterside Security System as part of the Electronic Harbor Security System. ***FY 2023 Plans:*** N/A		
Congressional Add: Strategic weapons systems shipboard navigation system modernization ***FY 2022 Accomplishments:*** - Provide support for and collaboration with the SWS Shipboard Modernization Program Working Groups. - Provide support for and collaboration with Shipboard partners to include development of Navigation Modernization concepts, technologies, and designs compatible with Shipboard Architecture Modernization Objectives, establishment of a Navigation Development Roadmap integrated with the Shipboard Modernization Program, and execution of trade studies in support of Program Increment Objectives. - Provide support for and collaboration with Navigation Future Capabilities Working Groups. - Conduct Navigation improvement backlog assessment, estimation, and prioritization. - Conduct evaluation on the sustainability of all Navigation Subsystem Auxiliary Systems, to include the estimated remaining life cycle of each auxiliary system, and provide recommendations for upgrading, replacing, consolidation, and/or retirement of these auxiliary systems. - Conduct pilot projects for incorporation of cyber resilient methods and strategies into the build and production process for targeted Navigation Software Configuration Items (SWCIs). ***FY 2023 Plans:*** N/A	14.480	0.000
Congressional Add: Multimodal biometric authentication ***FY 2022 Accomplishments:*** N/A ***FY 2023 Plans:*** Funding provides for investigation/development of multimodal biometric authentication. Goal is to achieve a method or methods of applying biometric techniques to supplement Columbia's Identity Access Management (IDAM) solution to enhance the security of highly sensitive information.	0.000	8.000
Congressional Add: Navigation modernization capabilities ***FY 2022 Accomplishments:*** N/A ***FY 2023 Plans:*** - Conduct and support Broad Band Navigation Sonar (BBNS) Future Navigation Capability (FNC) development and test activities including develop software architecture and design to support BBNS FNC, develop BBNS FNC test plans and procedures for testing in Ashore Navigation Center (ANC) and Sea Navigation Center (SNC), Implement software and integrate GFI software components, Conduct test, validation	0.000	10.000

Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy		Date: March 2023
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B. Accomplishments/Planned Programs ($ in Millions)	FY 2022	FY 2023
and data analysis per approved Test Plans, Support BBNS FNC meetings, product reviews, and Technical Interchange Meetings - Using the artifacts (e.g., software, test procedures, etc) developed for the BBNS FNC demonstration develop and submit BBNS FNC SWT Plan and Procedures for onboard SSBN testing, Conduct onboard SWT and data analysis per the approved Test Plan, - Evaluate and assess potential BBNS functionalities and develop design that allows incorporation of potential BBNS functionalities into the tactical baseline. The assessment should include an analysis of alternatives concerning determination of areas of overlap and uniqueness between NSS and BBNS; assessment of existing tactical and prototype software code with respect to cyclomatic complexity, modularity, and other software quality metrics. - Support and collaborate with the SWS Shipboard Modernization Program Working Groups. - Provide support for and collaboration with Shipboard partners to include development of Navigation Modernization concepts, technologies, and designs compatible with Shipboard Architecture Modernization Objectives, establishment of a Navigation Development Roadmap integrated with the Shipboard Modernization Program, and execution of trade studies in support of Program Increment Objectives. - Provide support for and collaboration with Navigation Future Capabilities Working Groups. - Investigate development of the system design to enhance the current bathymetric fix capability to a broader ocean environment - support prototype development of a Navigation MBSE Descriptive System Model (DSM) in support of the DoD Digital Engineering Strategy, digital transformation, and migration of legacy requirements and design information - Support investigation and definition of the evolution of the current NAV architecture in terms of system logical / functional, physical, and interfaces - support development and tactical incorporation of the system design to modernize filter and monitor functions in the Navigation Subsystem in support of Enhanced Pre-launch development activities - support a trade study for implementing encryption/decryption of the U.S. Naval Oceanographic Office (NAVO) provided-Navigation Map Data Reference Disk (NMRD) bathymetric and gravity disc for use on SSBN patrols		
Congressional Adds Subtotals	30.891	28.000

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy		Date: March 2023
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D. Acquisition Strategy

Where possible RDTEN Congressional Adds shall be competitively awarded, or provided to programs that have received competitive awards in the past. Alternatively, contracts will be awarded to those sources who were engaged in program and are currently engaged in the production and/or operational support on the basis of Other Than Full and Open Competition pursuant to the authority of 10 U.S.C. 2304 (c) (1) and (3) implemented by FAR 6.302.-1, 3, 4.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy		Date: March 2023
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Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2022 Cost	FY 2022 Award Date	FY 2023 Cost	FY 2023 Award Date	FY 2024 Base Cost	FY 2024 Base Award Date	FY 2024 OCO Cost	FY 2024 OCO Award Date	FY 2024 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Next Generation SIMU	SS/CPFF	Draper Labs* : Cambridge, MA	11.584	5.792	May 2022	10.000	Mar 2023	0.000		-		0.000	0.000	27.376	-
High Temperature Composite Expansion	C/BA	NSWC Crane : Bloomington, IN	5.792	5.792	Apr 2023	0.000		0.000		-		0.000	0.000	11.584	-
SWS Shipboard Navigation System Modernization	SS/CPFF	LMRMS : Uniondale, NY	0.000	14.480	Jun 2022	10.000	Mar 2023	0.000		-		0.000	0.000	24.480	-
Multimodal Biometric Authentication	C/FFP	Defense Unicorns : Prairie Village, KS	0.000	0.000		8.000	Sep 2023	0.000		-		0.000	0.000	8.000	-
Autonomous Fiber Optic Sensing Network	TBD	Digital Force Technologies : Bangor, WA	0.000	4.827	Sep 2022	0.000		0.000		-		0.000	0.000	4.827	-
High Temperature Composite Expansion	SS/CPFF	FMI/Intermat : Biddeford, ME	11.584	0.000		0.000		0.000		-		0.000	0.000	11.584	-
		Subtotal	28.960	30.891		28.000		0.000		-		0.000	0.000	87.851	N/A

Remarks

*Significant sub-contractor is Moog Inc in East Aurora, NY.

	Prior Years	FY 2022 Cost	FY 2022 Award Date	FY 2023 Cost	FY 2023 Award Date	FY 2024 Base Cost	FY 2024 Base Award Date	FY 2024 OCO Cost	FY 2024 OCO Award Date	FY 2024 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	28.960	30.891		28.000		0.000		-		0.000	0.000	87.851	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2024 Navy		Date: March 2023
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0101221N / *Strategic Sub & Wpns Sys Supt*	**Project (Number/Name)** 9999 / *Congressional Adds*

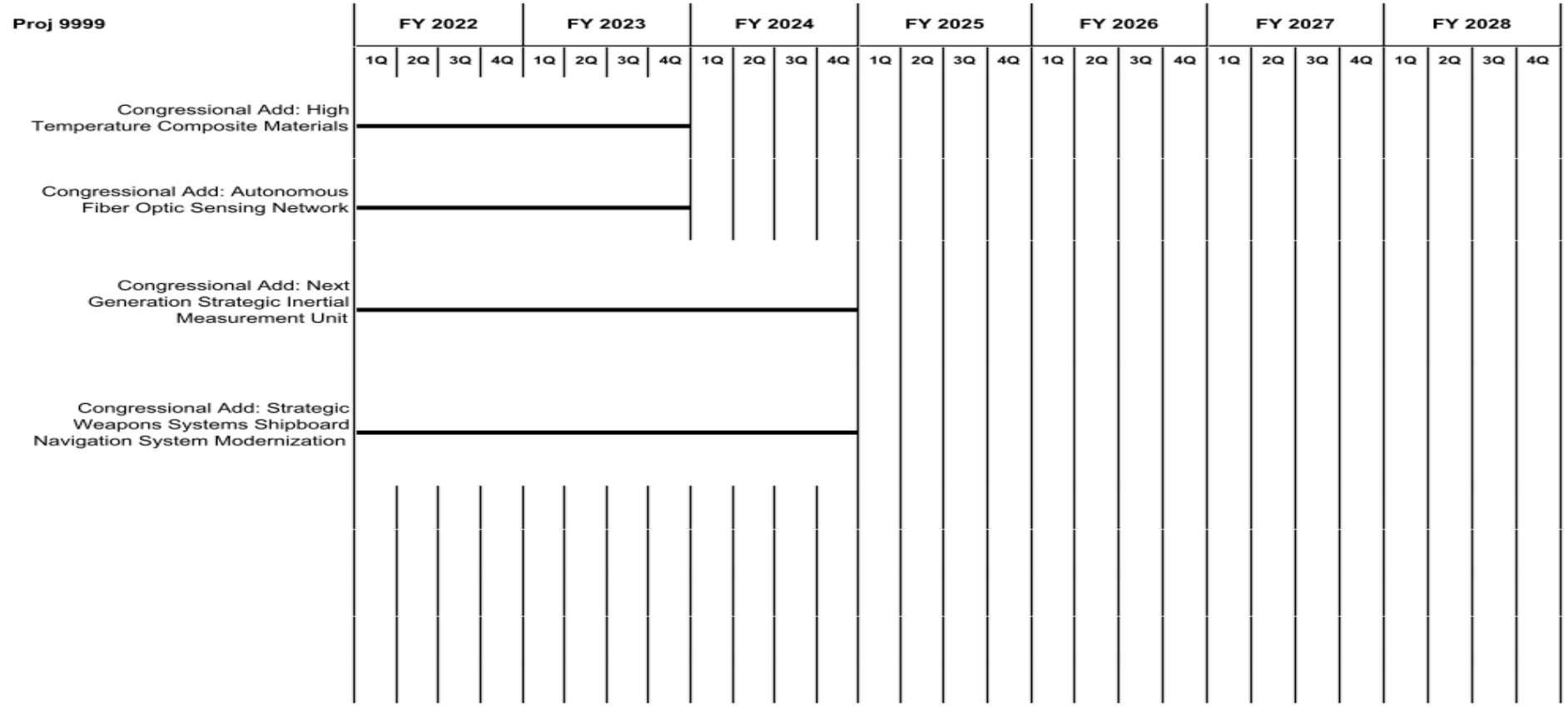

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Navy		Date: March 2023
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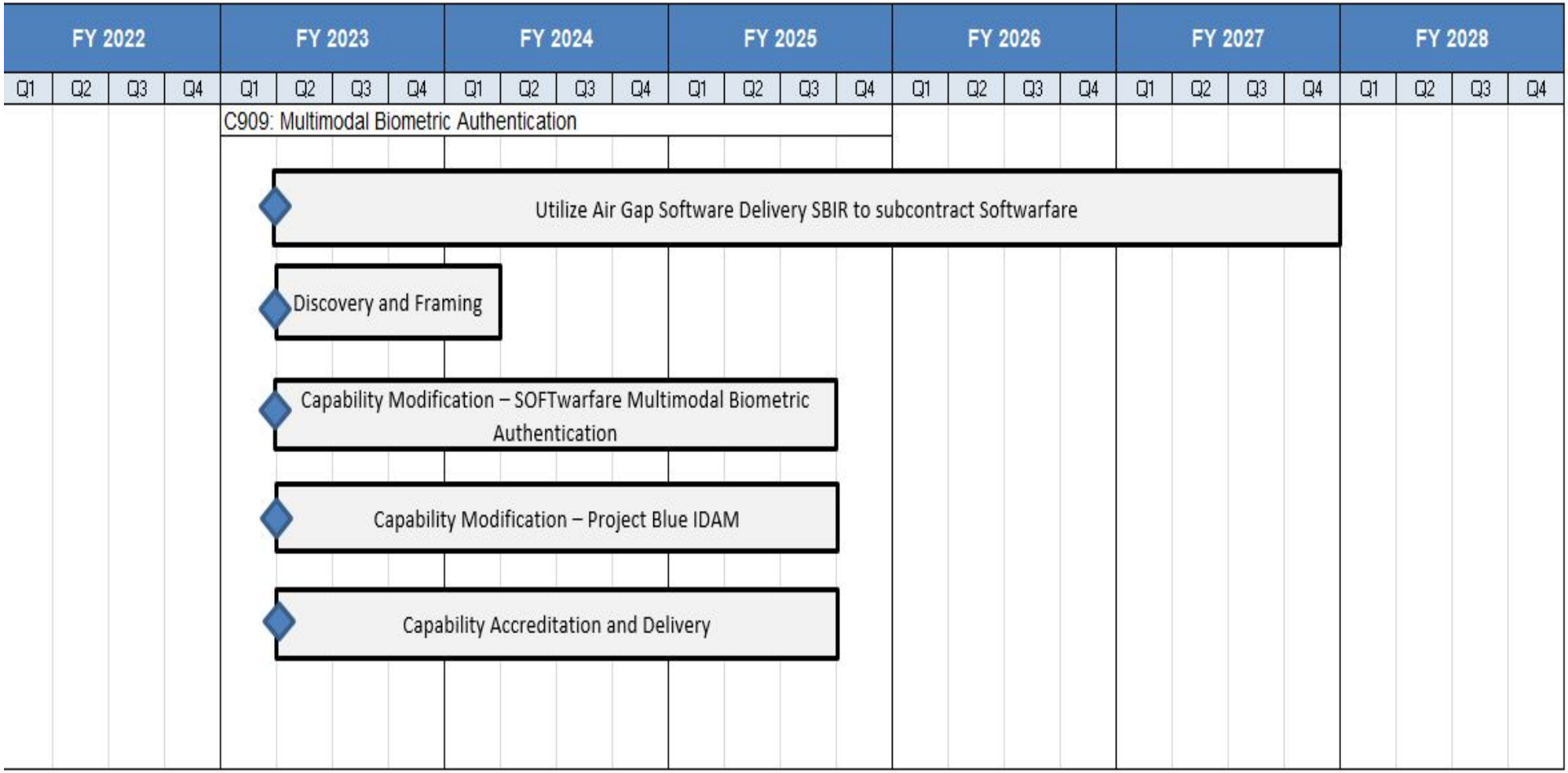

Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy		Date: March 2023
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Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 9999				
Congressional Add: High Temperature Composite Materials: High Temperature Composite Materials	1	2022	4	2023
Congressional Add: Autonomous Fiber Optic Sensing Network: Autonomous Fiber Optic Sensing Network	1	2022	4	2023
Congressional Add: Next Generation Strategic Inertial Measurement Unit: Next Generation Strategic Inertial Measurement Unit	1	2022	4	2024
Congressional Add: Strategic Weapons Systems Shipboard Navigation System Modernization: Strategic Weapons Systems Shipboard Navigation System Modernization	1	2022	4	2024
Congressional Add: Multimodal Biometric Authentication				
Utilize Air Gap Software Delivery SBIR to subcontract Softwarfare	2	2023	3	2027
Discovery and Framing	2	2023	1	2024
Capability Modification - SOFTwarfare Multimodal Biometric Authentication	2	2023	3	2025
Capability Modification - Project Blue IDAM	2	2023	3	2025
Capability Accreditation and Delivery	2	2023	3	2025