Exhibit R-2, RDT&E Budget Item Justification: PB 2022 Navy											Date: May 2021	
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 2020**	**FY 2021**	**FY 2022 Base**	**FY 2022 OCO**	**FY 2022 Total**	**FY 2023**	**FY 2024**	**FY 2025**	**FY 2026**	**Cost To Complete**	**Total Cost**
Total Program Element	1,370.850	121.122	124.990	177.098	-	177.098	-	-	-	-	-	-
0951: *Joint Warhead Fuze Sustainment Program*	672.145	22.332	16.557	6.733	-	6.733	-	-	-	-	-	-
2021: *Mk4B Shape Stable Nose Tip*	32.128	21.942	9.614	9.653	-	9.653	-	-	-	-	-	-
2228: *Technical Applications Programs*	631.452	31.611	53.333	95.607	-	95.607	-	-	-	-	-	-
3097: *Mk 7 / W-93*	23.908	25.124	31.475	61.695	-	61.695	-	-	-	-	-	-
3158: *Integrated Nuclear Weapons Security Sys Dev*	11.217	2.737	2.011	3.410	-	3.410	-	-	-	-	-	-
9999: *Congressional Adds*	0.000	17.376	12.000	0.000	-	0.000	-	-	-	-	-	-

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 accountable 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 included 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) Mk7/W93 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 MK5/W88 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.

Exhibit R-2, RDT&E Budget Item Justification: PB 2022 Navy	Date: May 2021
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 (FSA's) from legacy carbon composite nose tips to SSNT's. 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 RB's to FSA's 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.

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 FY2030, 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 FY2039. Several D5LE components are obsolete, out of production, and no longer supported by industry. D5LE2 is required to replace D5LE to support later COLUMBIA Class missile inventory starting in FY2039. While the D5LE program simply extended the lifetime of some missile components, D5LE2 will leverage technologies for both the missile and shipboard systems ensuring adaptability and survivability 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.

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.

The Mk7/W93 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 2022 Navy	Date: May 2021
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 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
Previous President's Budget	125.766	173.056	209.776	-	209.776
Current President's Budget	121.122	124.990	177.098	-	177.098
Total Adjustments	-4.644	-48.066	-32.678	-	-32.678
• Congressional General Reductions	-	-2.989			
• Congressional Directed Reductions	-	-57.077			
• Congressional Rescissions	-	-			
• Congressional Adds	-	12.000			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-4.644	0.000			
• Program Adjustments	0.000	0.000	-29.309	-	-29.309
• Rate/Misc Adjustments	0.000	0.000	-3.369	-	-3.369

Congressional Add Details ($ in Millions, and Includes General Reductions)	FY 2020	FY 2021
Project: 9999: *Congressional Adds*		
Congressional Add: *High temperature composite material capacity expansion*	11.584	0.000
Congressional Add: *Next generation strategic inertial measurement unit*	5.792	0.000
Congressional Add: *Next Generation Strategic Inertial Measurement Unit*	0.000	6.000
Congressional Add: *Scalable Very High Temperature Composite Manufacturing Technologies*	0.000	6.000
Congressional Add Subtotals for Project: 9999	17.376	12.000
Congressional Add Totals for all Projects	17.376	12.000

Change Summary Explanation

The FY 2020 funding was reduced by $4.644M for small business innovative research.

Exhibit R-2, RDT&E Budget Item Justification: PB 2022 Navy	Date: May 2021
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*

FY 2022 decrease of $3.369 million due to rate and miscellaneous adjustments.

The net decrease of $29.309M was required to rebaseline D5LE2 and maintain a balanced risk posture. As part of the rebaseline, SSP delayed design milestones. PDR, CDR, and first experimental flight moved one year right, lengthening the development period and depressing the near term ramp. This drove additional risk in production by compressing the production span; PRR and Low-Rate Initial Production also moved one year right. However, Initial Fleet Introduction (IFI) could not move right while maintaining support for COLUMBIA. The PB22 D5LE2 budget reprofile is an executable profile designed to balance risk for the program and ensure sufficient SLBM technology readiness.

Exhibit R-2A, RDT&E Project Justification: PB 2022 Navy											Date: May 2021	
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 2020**	**FY 2021**	**FY 2022 Base**	**FY 2022 OCO**	**FY 2022 Total**	**FY 2023**	**FY 2024**	**FY 2025**	**FY 2026**	**Cost To Complete**	**Total Cost**
0951: *Joint Warhead Fuze Sustainment Program*	672.145	22.332	16.557	6.733	-	6.733	-	-	-	-	-	-
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 MK5/W88 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.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
Title: TRIDENT II	22.332	16.557	6.733	0.000	6.733
Articles:	-	-	-	-	-
Description: Identify, prioritize, develop, proof, and demonstrate advanced technologies that will be leveraged and incorporated into future AF&Fs.					
FY 2021 Plans: - AF&F FPU scheduled for May 2021 - Re-entry body assembly (RBA) FPU scheduled for July 2021 - Completed production engineering to include component failure review - Completed performance assessment of tested designs - Continued system vulnerability analysis - Finalized missile integration of the Mk5A Alt 370 fuze development, and perform pre-flight test and analysis - Finalized design, develop and qualify production tools and processes, testers, gauges, AF&F simulators and trainers - Provided final system Verification Cross-Reference Matrix (VCRM)					
FY 2022 Base Plans: - Complete Weapon Realization Report appendix for the Mk5 Alt 370 - Complete Design Review and Acceptance Group (DRAAG) Review and recommendation for weapon acceptance to the Nuclear Weapons Council - Continue system vulnerability analysis					

Exhibit R-2A, RDT&E Project Justification: PB 2022 Navy		Date: May 2021
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*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
- Support Flight Test integration and data analysis for a Commander Evaluation Test (CET) Development Joint Test Assembly upper-S Band qualification body ***FY 2022 OCO Plans:*** N/A ***FY 2021 to FY 2022 Increase/Decrease Statement:*** The decrease from FY 2021 to FY 2022 is attributable to the program transitioning to production and the completion of efforts associated with missile integration of the Mk5 ALT 370.					
Accomplishments/Planned Programs Subtotals	22.332	16.557	6.733	0.000	6.733

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
• RDTEN/3219: *SBSD Nuclear Technology Development*	114.006	80.085	60.142	-	60.142	-	-	-	-	-	-
• RDTEN/3220: *Advanced Submarine System Development*	403.713	316.396	296.231	-	296.231	-	-	-	-	-	-
• OPN/5358: *SWS Modernization Funds*	258.901	251.683	266.474	-	266.474	-	-	-	-	-	-
• WPN/1250: *TRIDENT II Mods*	1,165.736	1,160.862	1,144.446	-	1,144.446	-	-	-	-	-	-
• SCN/1045: *OHIO Replacement Submarine*	1,820.927	4,122.199	4,646.980	-	4,646.980	-	-	-	-	-	-
• OMN/1D2D: *Fleet Ballistic Missile*	1,410.136	1,411.227	1,476.247	-	1,476.247	-	-	-	-	-	-

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 2022 Navy		Date: May 2021
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*

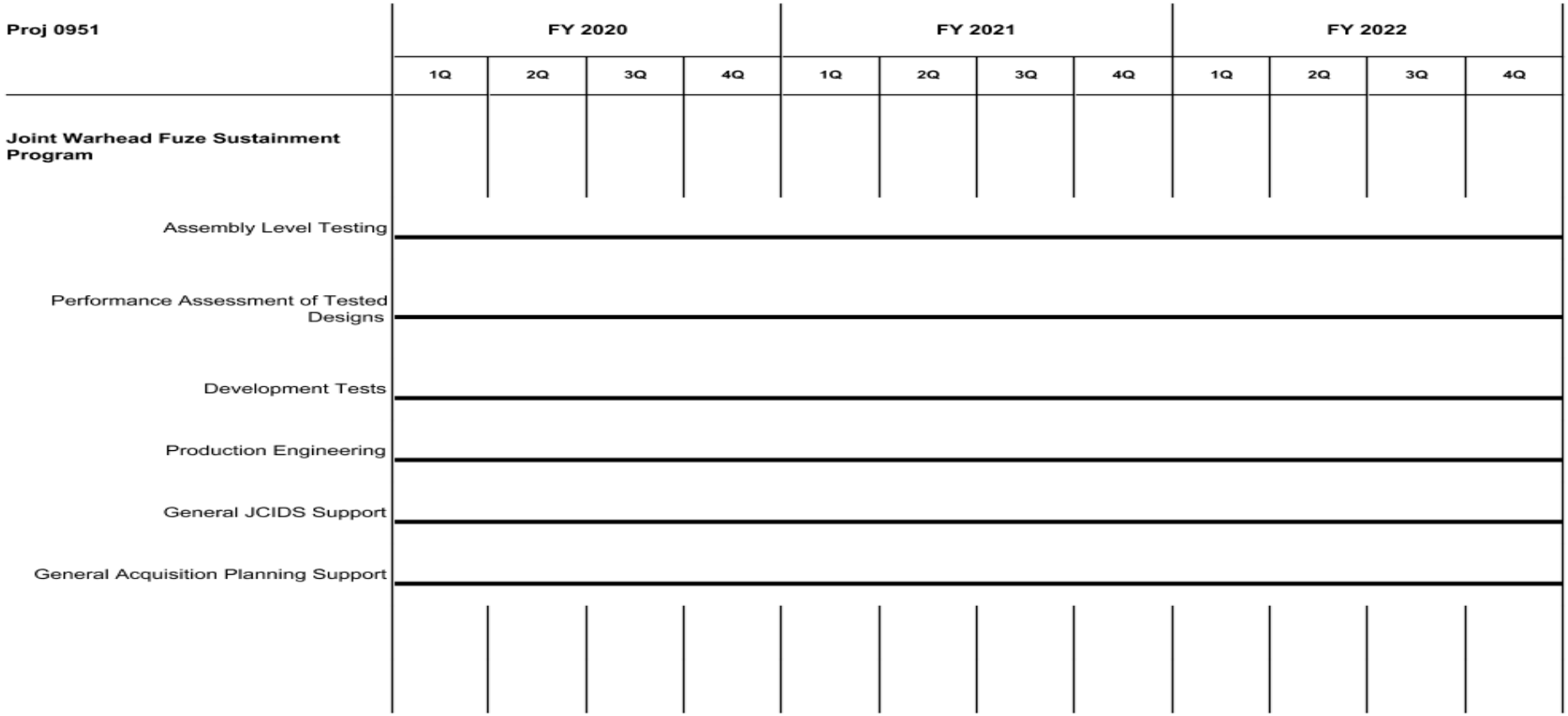
Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Joint Warhead Fuze Sustainment DOE	MIPR	DOE : NM	554.784	9.466	Jan 2020	8.386	Nov 2020	2.633	Nov 2021	-		2.633	-	-	-
Joint Warhead Fuze Sustainment ITT	SS/CPFF	ITT : VA	27.023	0.000		0.000		0.000		-		0.000	-	-	-
Joint Warhead Fuze Sustainment LMMS	SS/CPFF	LMMS : CA	66.541	6.082	Nov 2019	5.604	Nov 2020	4.100	Nov 2021	-		4.100	-	-	-
Joint Warhead Fuze Sustainment	WR	NSWC Dahlgren : VA	19.475	1.041	Nov 2019	0.123	Mar 2021	0.000		-		0.000	-	-	-
Joint Warhead Fuze Sustainment	SS/CPFF	BAE : MD	1.889	0.000		0.000		0.000		-		0.000	-	-	-
Joint Warhead Fuze Sustainment	SS/CPIF	APL : MD	1.002	0.000		0.050	Dec 2020	0.000		-		0.000	-	-	-
Joint Warhead Fuze Sustainment	WR	CNSW : ID	0.639	0.440	Oct 2019	1.000	Oct 2020	0.000		-		0.000	-	-	-
Joint Warhead Fuze Sustainment	C/BA	PERATON : VA	0.000	4.207	Nov 2019	0.851	Nov 2020	0.000		-		0.000	-	-	-
Joint Warhead Fuze Sustainment	C/BA	TOYON : VA	0.792	1.096	Nov 2019	0.543	Oct 2020	0.000		-		0.000	-	-	-
		Subtotal	672.145	22.332		16.557		6.733		-		6.733	-	-	N/A

	Prior Years	FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	672.145	22.332		16.557		6.733		-		6.733	-	-	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Navy		Date: May 2021
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*



2022PB - 0101221N - 0951

Exhibit R-4A, RDT&E Schedule Details: PB 2022 Navy		Date: May 2021
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	2020	4	2022
Joint Warhead Fuze Sustainment Program: Performance Assessment of Tested Designs:	1	2020	4	2022
Joint Warhead Fuze Sustainment Program: Development Tests:	1	2020	4	2022
Joint Warhead Fuze Sustainment Program: Production Engineering:	1	2020	4	2022
Joint Warhead Fuze Sustainment Program: General JCIDS Support:	1	2020	4	2022
Joint Warhead Fuze Sustainment Program: General Acquisition Planning Support:	1	2020	4	2022

Exhibit R-2A, RDT&E Project Justification: PB 2022 Navy			Date: May 2021
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 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
2021: *Mk4B Shape Stable Nose Tip*	32.128	21.942	9.614	9.653	-	9.653	-	-	-	-	-	-
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 (FSA's) from legacy carbon composite nose tips to SSNT's. This will require ground and flight testing of SSNT RBA's, 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 RB's to FSA's 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.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
Title: Mk4B Shape Stable Nose Tip	21.942	9.614	9.653	0.000	9.653
Articles:	-	-	-	-	-
FY 2021 Plans: - Complete Mk4B Flight System Preliminary Design Review (PDR) - Complete Mk4B Nose Assembly design and drawings, produce development Mk4B Nose Assemblies to be used for system and component level test, mature production process in preparation for the start of tactical Mk4B Nose Assembly hardware production in FY22 - Continue refinement of the reentry body aerodynamics model and associated fire control flight parameters - Continuing engineering support for both development and qualification testing (ground and flight) - Conduct Mk4B Strategic Weapon System (SWS) Preliminary Design review (PDR)					
FY 2022 Base Plans: - Conduct Mk4A SSNT Enhanced Inert Head (EIH) and Mk4A SSNT ENTB flight test - Conduct Mk4B flight system Critical Design Review (CDR) - Complete reentry body cable testing - Conduct Aft-on Light Initiated High Explosive Test in support of system qualification - Begin system Dynamic Characterization test in support of system qualification - Conduct Strategic Weapon System (SWS) Mk4B Critical Design Review (CDR)					

Exhibit R-2A, RDT&E Project Justification: PB 2022 Navy		Date: May 2021
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*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
- Finalize design documentation in support of Mk4B SSNT assembly PRR ***FY 2022 OCO Plans:*** N/A ***FY 2021 to FY 2022 Increase/Decrease Statement:*** The FY 2021 to FY 2022 decrease is attributable to the program continuing to transition to production as shown in Navy WPN budget line item 1250.					
Accomplishments/Planned Programs Subtotals	21.942	9.614	9.653	0.000	9.653

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
• WPN/1250: *Trident II Mods*	1,165.736	1,160.862	1,144.446	-	1,144.446	-	-	-	-	-	-

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 2022 Navy		Date: May 2021
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*

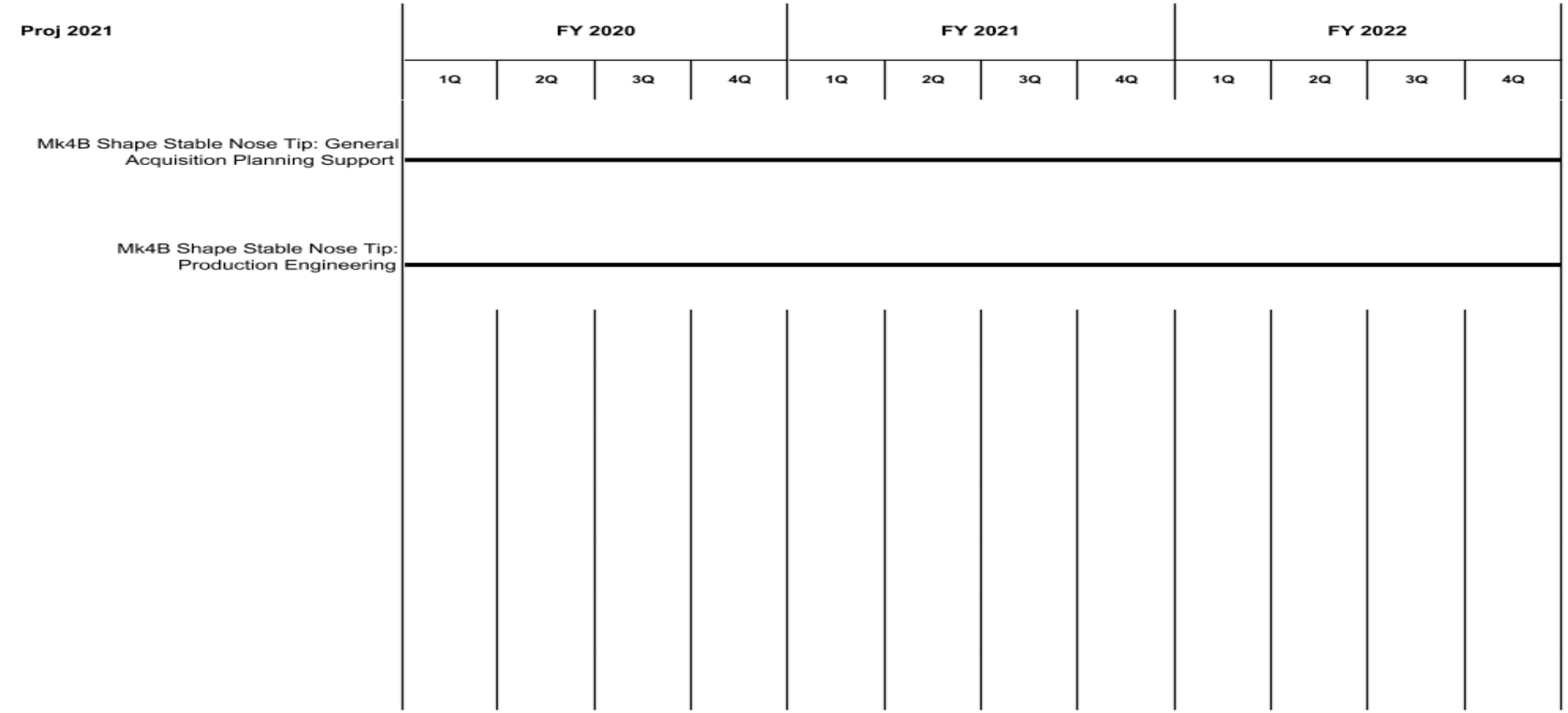
Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
SSNT LMSS	SS/CPIF	LMSSC : CA	24.118	13.018	Nov 2019	3.574	Nov 2020	4.076	Oct 2021	-		4.076	-	-	-
SSNT DOE/NNSA	MIPR	DOE/NNSA : NM	5.209	4.960	Feb 2020	5.354	Oct 2020	4.355	Jan 2022	-		4.355	-	-	-
SSNT JHU-APL	SS/CPFF	APL : MD	1.000	1.615	May 2020	0.000		1.222	Dec 2021	-		1.222	-	-	-
SSNT PERATON	SS/CPFF	PERATON : VA	0.515	0.507	Nov 2019	0.536	Oct 2020	0.000		-		0.000	-	-	-
SSNT NSWC	WR	NSWC : VA	1.286	0.150	Dec 2019	0.150	Oct 2020	0.000		-		0.000	-	-	-
SSNT Toyon	SS/CPFF	TOYON : CA	0.000	1.042	Feb 2020	0.000		0.000		-		0.000	-	-	-
SSNT SPA	SS/CPFF	SPA : VA	0.000	0.500	Nov 2019	0.000		0.000		-		0.000	-	-	-
SSNT Draper	SS/CPFF	Draper : MA	0.000	0.150	Apr 2021	0.000		0.000		-		0.000	-	-	-
		Subtotal	32.128	21.942		9.614		9.653		-		9.653	-	-	N/A

	Prior Years	FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	32.128	21.942		9.614		9.653		-		9.653	-	-	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Navy		Date: May 2021
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*



2022PB - 0101221N - 2021

Exhibit R-4A, RDT&E Schedule Details: PB 2022 Navy		Date: May 2021
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: Schedule Detail	1	2020	4	2022
Mk4B Shape Stable Nose Tip: Production Engineering: Schedule Detail	1	2020	4	2022

Exhibit R-2A, RDT&E Project Justification: PB 2022 Navy											Date: May 2021	
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 2020**	**FY 2021**	**FY 2022 Base**	**FY 2022 OCO**	**FY 2022 Total**	**FY 2023**	**FY 2024**	**FY 2025**	**FY 2026**	**Cost To Complete**	**Total Cost**
2228: *Technical Applications Programs*	631.452	31.611	53.333	95.607	-	95.607	-	-	-	-	-	-
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), and Systems Engineering Modeling and Simulation.

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. The D5LE is also 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 2018 Nuclear Posture Review identified the need for the nation's Strategic Systems to be more flexible and adaptable in the face of adversaries who are increasingly showing the ability to quickly deploy enhanced capabilities to the range of the existing system. Flexibility and adaptability 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 not only address the COLUMBIA service life requirement by delivering the range and accuracy of the current system, but also address the threat of near peer adversaries' improved defensive capabilities to maintain 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 in a timely manner. Being able to adapt at the speed of relevance will require an architecture which will be based on modular interfaces which enables flexibility and adaptability. Leveraging technologies inherent in modern designs will enable the system to be flexible and adaptable. The flexibility and adaptability inherent in modern avionics architecture will allow the program to meet its existing SWS requirements and remain credible, reliable, and survivable.

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 early development phase of the program to enable technologies for D5LE2 in anticipation of long lead material procurements starting in 2030; therefore, significant technology investments must be made in 2022 to support execution of the program of record.

Exhibit R-2A, RDT&E Project Justification: PB 2022 Navy		Date: May 2021
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*

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.

D5LE2 program is focused on maturation of key strategic 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 high priority technologies such as:

- Post Boost Control System (PBCS) Technologies utilizing high refractory metals
- Next Generation Low - Size Weight and Power (SWaP) Guidance Instruments
- Strategic Rad Hard Electronics
- Advanced Battery Technologies
- Resilient Cyber Security frameworks

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 flexibility/adaptability, manufacturability, SWS operations, and sustainability - while at the same time reconstituting an industrial base that has not directly benefited from S&T funding or performed SLBM development for decades.

In order to support STRATCOM requirements without gapping capability, SSP began critical architecture agnostic technology maturation on key strategic technologies in FY 2020 and initiated studies to explore potential modern System Level Architectures. Congressional reductions in FY 2020 reduced scope to only those areas most critical to the System Concepts Baseline Refinement (SCR) on the critical path to System Requirements Review (SRR) in FY 2025. FY 2020 focused on filling requirements voids in the areas of threat effectiveness, cyber vulnerabilities, evaluating the SWS contribution to platform survivability, and developing the utility curves by which concepts will be evaluated. The FY 2020 reduction also limited technology development on certain key technologies.

FY 2021 focused on the continuation of Systems Studies and Systems Architecture as the FY 2021 reduction limited development of strategic guidance and missile technologies. FY 2021 Systems Engineering efforts focused on key architecture defining decisions, the development of mission effectiveness and threat mitigation requirements, CONOPS development activities associated with system operations that would potentially lead to opportunities for affordability improvements, and the start of new activities to define core SWS architecture elements. FY 2021 builds on the work started in FY 2020 with key architecture decisions to enable the preliminary system architecture concept to be defined in FY 2022. The program utilized its remaining funding to concentrate on advanced technology development and maturation of critical SWS D5LE2 components in the areas of high refractory metal PBCS and Valve Assemblies, long stand time batteries, nuclear safe out-of-line blocking elements, large Missile Structures, and parts & shielding. FY 2021 Strategic Guidance efforts included the development of technologies and components for strategic sensors to support the next generation of inertial sensors, components and rad-hard electronics to address the need for higher performing lower SWaP solutions.

The FY 2022 plans are based on historical timelines and execution for developing new technologies in this challenging environment to support the proposed D5LE2 and COLUMBIA schedules. FY 2022 efforts include preliminary functional and physical system architecture concept (to include lifecycle concepts and performance

evaluation), evaluation and prototyping of materials to begin the down select of key 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 commencing in FY 2022. These key efforts are phased to support an iterative update to the D5LE2 concept baseline culminating in sufficiently refined system architecture and requirements to support an 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 2032. 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.

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 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.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
Title: D5LE2	18.274	38.922	80.116	0.000	80.116
Articles:	-	-	-	-	-
FY 2021 Plans: System Studies: FY 2021 activities built upon the activities that began in FY 2020. The system concept baseline continued its refinement while key architecture decisions began to be made based on the more mature requirements set. Detailed looks into Lifecycle concepts began across the SWS and initial performance allocations were evaluated. Continued & Expanded: - SWS Functional and Behavior Modeling Development					

Exhibit R-2A, RDT&E Project Justification: PB 2022 Navy		Date: May 2021
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*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
- Refined Integrated Test Concepts - Ballistic Missile Defense Impacts Study - Assessment of Mission Performance Requirements Study - Platform Security and Survivability Impacts Study - Hostile Cyber Environment System Impact Study Initiated: - Evaluation of mission and system level requirements - Key function and physical architecture (Avionics, Radiation hardening, Data, Communication) - Lifecycle concepts (Safety, Design for Test & Sustainment) - Performance Allocations (all of which support future systems studies and inform future technology investments) Technology Investments: Continued & Expanded: Radiation Hardened Parts Concepts and Evaluation - Radiation Hardened Parts development of key components - Development of radiation hardness approach - Refine Radiation Hardness Assurance Plan to include testing/verification facilities needed based on environments Guidance Concepts and Sensors - Evaluations of concepts informed by systems studies and expands into concepts that were lower priority in FY 2020 - TRL/MRL evaluation of sensors - Mechanical component evaluation and mechanical prototype component evaluation and environmental testing Initiated: Radiation Hardened Parts Concepts and Evaluation including - Database tool selection - Initial draft of electronics parts procurement plan - Collected parts data - Evaluation of additive shielding					

Exhibit R-2A, RDT&E Project Justification: PB 2022 Navy		Date: May 2021
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*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
Post Boost Control System Technologies Concepts and Evaluation - Technology evaluation with Thermal/Structural analysis and material characterization - Initial thruster concepts - Prototype design - Cold gas test planning and execution - Alternate manufacturing process development begins Battery Concepts and Evaluation - Initial key concepts - Analytic study/detailed trades of battery chemistry - Feasibility assessments of various battery approaches to include submarine/man safety evaluation PBCS Manufacturing Concepts - Alternate manufacturing process evaluation - Structural analysis and material characterization - Long lead prototype material procurement - Process model developed - Weld reduction targets evaluated - Chemical composition testing Nose Fairing and Equipment Section Materials - Researched candidate technologies and additive manufacturing capabilities - Space claim and layout configuration models - Established initial subsystem model interfaces - First order material and layout configuration assessments for stress, thermal and mass properties - Coupon level fabrication and testing for initial characterization - Acquired limited tooling Connectors/Cables - Evaluation to refine producible or alternate cable technologies for weight, bandwidth, radiation survivability, and other features					

Exhibit R-2A, RDT&E Project Justification: PB 2022 Navy		Date: May 2021
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*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
Guidance Concepts and Sensors - Simulation/HWIL for high risk items - Accelerometer and Gyroscope high fidelity lab/simulation testing - Next Generation IMU Component Development					
FY 2022 Base Plans: System Studies: FY 2022 activities build upon the FY 2021 activities. Key architecture decisions made in FY 2021 enable definition of preliminary system architecture concept in FY 2022. Continued and Expanded: - Lifecycle concepts (Cyber Response Concept Development, Missile Handling and Recertification) - Performance Allocations (Methods to Reduce Contribution to Engagement Timeline, Launch interval, Interface, Ship to Missile Interface to include flexible payload interface) Initiated: - Preliminary functional/physical architecture concept for the following: - System Navigation Solution - Missile to Missile Selection - Shipboard Computing Architecture - Timing Architecture Technology Investments: FY 2022 technology investments efforts continue and include a significant increase of major missile and guidance technologies to evaluate multiple materials, concepts, and design strategies in advance of down selecting and prototyping scale design concepts slated to begin in FY 2023 to support SRR in FY 2025. Continued and Expanded: - Radiation Hardened Parts Concepts design and Evaluation - PBCS Technologies Manufacturing Concepts and Evaluation - Battery Concepts and Evaluations including additive manufacturing local shield and enclosure shield and batteries - Nose Fairing and Equipment Section Materials evaluation					

Exhibit R-2A, RDT&E Project Justification: PB 2022 Navy		Date: May 2021
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*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
- Connectors/Cables Concepts and evaluation - Guidance Concepts and Sensors including accelerometer and Gyroscope high fidelity lab/simulation testing Initiated: - Radiation Hardened Parts Concepts and Evaluation for radiation hard EFI and EFI firing unit - Guidance Concepts and Sensors including Prototype Radiation testing and Mechanical Manufacturing evaluation ***FY 2022 OCO Plans:*** N/A ***FY 2021 to FY 2022 Increase/Decrease Statement:*** The D5LE2 Program's FY 2021 to FY 2022 increase in funding supports three major efforts: System Studies and Architecture Development, SLBM technologies, and Strategic Guidance technologies. FY 2022 System Studies and Architecture Development efforts focus heavily on key architecture defining decisions, the development of mission effectiveness and threat mitigation requirements, CONOPS development activities associated with system operations that would potentially lead to opportunities for affordability improvements, and the activities to define core SWS architecture elements. FY 2022 SLBM technologies concentrate on advanced technology development and maturation of critical SWS D5LE2 components in the areas of high refractory metal PBCS and Valve Assemblies, Hardened Data-bus and Health monitoring, long stand time batteries, nuclear safe out-of-line blocking elements, large Missile Structures, and parts & shielding. FY 2022 Strategic Guidance efforts include the development of technologies and components for strategic sensors to support the next generation of inertial sensors, components and rad-hard electronics to address the need for higher performing lower SWaP solutions. FY 2022 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), and secure the uninterrupted sustainment of the Trident SWS while meeting NPR requirements for flexibility and adaptability.					
Title: Multi-Star Enhanced Prelaunch (MEP)	7.290	5.508	4.563	0.000	4.563

Exhibit R-2A, RDT&E Project Justification: PB 2022 Navy		Date: May 2021
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*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
Articles:	-	-	-	-	-
FY 2021 Plans: - Complete DASO 30 flight test analysis, accuracy assessment, and final report. - Complete assessment of MEP-enabled weapon system performance against modeled predictions and accuracy metrics. - Complete majority of trade studies and risk reduction activities to define deployed system configuration and down-select a "design ready" solution. ***FY 2022 Base Plans:*** - Complete trade studies and risk reduction activities for deployed configuration. - Finalize EP configuration, Multi-Star selection algorithms, and CONOPS deployment method for SWS flexibility and MEP capability use cases. - Update missile performance models to support revisions to fire-control targeting software. - Complete draft and final versions of IFI tech baseline. - Develop Systems Engineering Plan (algorithms SEP). - Conduct System Concept Review to define MEP IFI system of interest (SOI) concept and design-ready solution. ***FY 2022 OCO Plans:*** N/A ***FY 2021 to FY 2022 Increase/Decrease Statement:*** The FY 2021 to FY 2022 increase is due to various miscellaneous rate adjustments and inflation.					
Title: System Engineering Modeling and Simulation	6.047	8.903	10.928	0.000	10.928
Articles:	-	-	-	-	-
FY 2021 Plans: - Begin SE Governance Process and Documentation. - Begin Infrastructure for Methods, Procedures, and Policies for handling Models. - Begin development of secure computing infrastructure at Top Secret level. - Begin development of physical model based tools/virtual reality for training and planning. - Continue development of model based design integration plan. - Continue modeling and simulation gap analysis. - Continue System Behavioral Model process and methods Development.					

Exhibit R-2A, RDT&E Project Justification: PB 2022 Navy		Date: May 2021
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*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
- Continue deployment of secure computing infrastructure at Secret level. ***FY 2022 Base Plans:*** - Continue SE Governance Process and Documentation. - Continue Infrastructure for Methods, Procedures, and Policies for handling Models. - Continue development of secure computing infrastructure at Top Secret level. - Continue development of physical model based tools/virtual reality for training and planning. - Continue development of model based design integration plan. - Continue modeling and simulation gap analysis. - Continue System Behavioral Model process and methods Development. - Continue deployment of secure computing infrastructure at Secret level. ***FY 2022 OCO Plans:*** N/A ***FY 2021 to FY 2022 Increase/Decrease Statement:*** The FY 2021 to FY 2022 increase is due to SWS modeling development and Digital Engineering processes and methodologies needed to support system engineering milestones reviews. These efforts include the Profile Development Phase 1 Release, development of the Verification & Validation Management Plan, implementation of the Interface Management Policy, and two program reviews in Q1 and Q3.					
Accomplishments/Planned Programs Subtotals	31.611	53.333	95.607	0.000	95.607

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

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 2022 Navy			Date: May 2021
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*	

Product Development ($ in Millions)

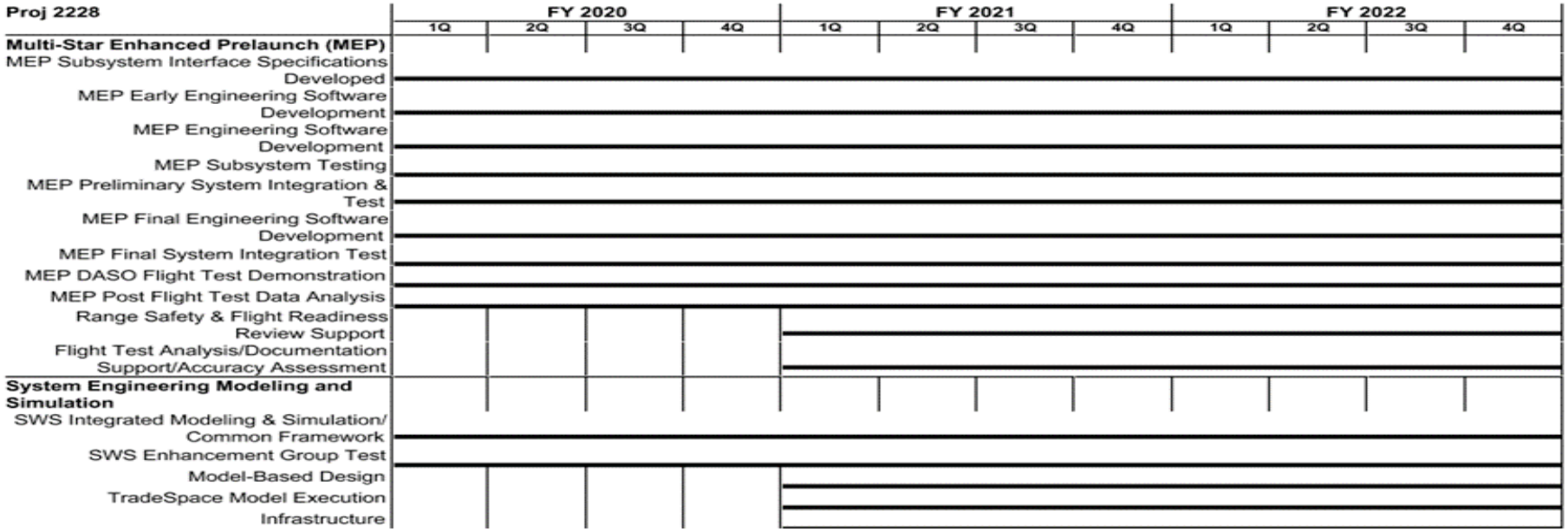
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Technical Applications LMSS	SS/CPIF	LMSS : CA	167.072	8.444	Jan 2020	20.387	Nov 2020	35.926	Oct 2021	-		35.926	-	-	-
Technical Applications DRAPER	SS/CPFF	Draper : MA	348.848	7.202	Nov 2019	13.442	Nov 2020	30.391	Oct 2021	-		30.391	-	-	-
Technical Applications APL	SS/CPFF	APL : MD	0.000	6.286	Dec 2019	6.758	Oct 2020	10.755	Dec 2021	-		10.755	-	-	-
Technical Applications CRANE	SS/CPFF	NSWC Crane : IN	0.000	0.000		2.994	Nov 2020	9.295	Oct 2021	-		9.295	-	-	-
Technical Applications Dahlgren	WR	Dahlgren : VA	94.970	3.107	Nov 2019	0.959	Nov 2020	2.892	Oct 2021	-		2.892	-	-	-
Technical Applications BAE	SS/CPFF	BAE : VA	0.000	0.000		0.913	Nov 2020	1.002	Oct 2021	-		1.002	-	-	-
Technical Applications GDMS	SS/CPFF	GDMS : MA	0.900	0.853	Jan 2020	1.919	Oct 2020	2.298	Dec 2021	-		2.298	-	-	-
Technical Applications NGMS	SS/CPFF	NGMS : CA	0.000	0.000		0.000	Oct 2020	0.444	Oct 2021	-		0.444	-	-	-
Technical Applications PSU ARL	SS/CPFF	ARL : PA	0.000	0.000		0.901	Nov 2020	0.697	Dec 2021	-		0.697	-	-	-
Technical Applications SPA	SS/CPFF	SPA : VA	0.000	0.000		0.913	Dec 2020	0.790	Oct 2021	-		0.790	-	-	-
Technical Applications China Lake	WR	China Lake : CA	0.000	0.000		0.000		0.000	Oct 2021	-		0.000	-	-	-
Technical Applications Carderock	WR	Carderock : MD	0.000	0.000		0.000		0.000	Oct 2021	-		0.000	-	-	-
Technical Applications LMRMS	SS/CPIF	LMRMS : NY	0.000	0.000		0.000		1.117	Oct 2021	-		1.117	-	-	-
Technical Applications VAR	Various	Various : Various	19.662	5.719	Nov 2019	4.147	Nov 2020	0.000		-		0.000	-	-	-
		Subtotal	631.452	31.611		53.333		95.607		-		95.607	-	-	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Navy			Date: May 2021
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*	

	Prior Years	FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	631.452	31.611		53.333		95.607		-		95.607	-	-	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Navy		Date: May 2021
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*



2022PB - 0101221N - 2228

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Navy		Date: May 2021
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*

Project 2228 - D5LE2 Schedule

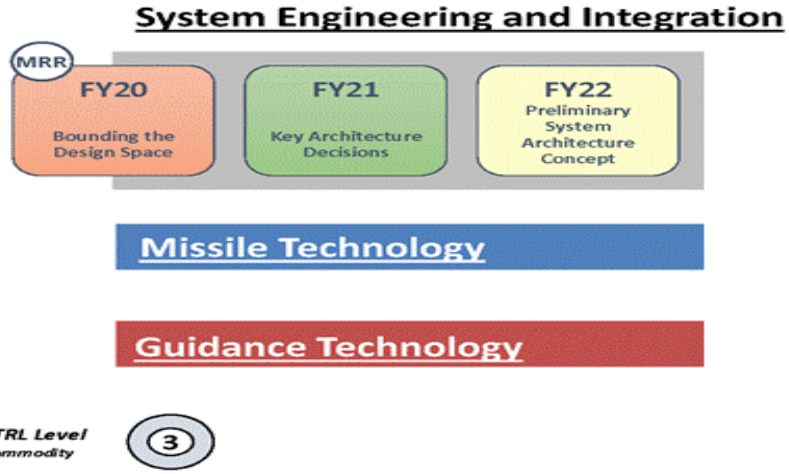


Exhibit R-4A, RDT&E Schedule Details: PB 2022 Navy		Date: May 2021
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0101221N / *Strategic Sub & Wpns Sys Supt*	**Project (Number/Name)** 2228 / *Technical Applications Programs*

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	2020	4	2022
Multi-Star Enhanced Prelaunch (MEP): MEP Early Engineering Software Development:	1	2020	4	2022
Multi-Star Enhanced Prelaunch (MEP): MEP Engineering Software Development:	1	2020	4	2022
Multi-Star Enhanced Prelaunch (MEP): MEP Subsystem Testing:	1	2020	4	2022
Multi-Star Enhanced Prelaunch (MEP): MEP Preliminary System Integration & Test:	1	2020	4	2022
Multi-Star Enhanced Prelaunch (MEP): MEP Final Engineering Software Development:	1	2020	4	2022
Multi-Star Enhanced Prelaunch (MEP): MEP Final System Integration Test:	1	2020	4	2022
Multi-Star Enhanced Prelaunch (MEP): MEP DASO Flight Test Demonstration:	1	2020	4	2022
Multi-Star Enhanced Prelaunch (MEP): MEP Post Flight Test Data Analysis:	1	2020	4	2022
Multi-Star Enhanced Prelaunch (MEP): Range Safety & Flight Readiness Review Support:	1	2021	4	2022
Multi-Star Enhanced Prelaunch (MEP): Flight Test Analysis/Documentation Support/ Accuracy Assessment:	1	2021	4	2022
System Engineering Modeling and Simulation: SWS Integrated Modeling & Simulation/ Common Framework:	1	2020	4	2022
System Engineering Modeling and Simulation: SWS Enhancement Group Test:	1	2020	4	2022
System Engineering Modeling and Simulation: Model-Based Design:	1	2021	4	2022
System Engineering Modeling and Simulation: TradeSpace Model Execution:	1	2021	4	2022
System Engineering Modeling and Simulation: Infrastructure:	1	2021	4	2022
D5LE2: System Studies and Trades: Schedule Detail	1	2020	4	2022
D5LE2: Key Architecture Decisions: Schedule Detail	1	2021	4	2021

Exhibit R-4A, RDT&E Schedule Details: PB 2022 Navy		Date: May 2021
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: System Architecture Concept Refinement: Schedule Detail	1	2022	4	2022

Exhibit R-2A, RDT&E Project Justification: PB 2022 Navy			Date: May 2021
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0101221N / *Strategic Sub & Wpns Sys Supt*	Project (Number/Name) 3097 / *Mk 7 / W-93*	

COST ($ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
3097: *Mk 7 / W-93*	23.908	25.124	31.475	61.695	-	61.695	-	-	-	-	-	-
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The 3097 RDTEN project has been designated as the Mk7/W93 warhead, a third variant for the Trident. This project was formerly known as the Interoperative Warhead (IW); the name change to Mk7/W93 is reflected herein. This project will design, develop, and test a future Navy warhead to include a new Navy Aeroshell for a Submarine Launched Ballistic Missile (SLBM). Early 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. Programmatic efforts will consist of program planning and development of cross-agency plans (risk and opportunity, decision documentation and communication). Following the results of the Navy Feasibility 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) effort in FY 2024.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
Title: Mk7 / W93 (formerly W78/88-1 Life Extension Program)	25.124	31.475	61.695	0.000	61.695
Articles:	-	-	-	-	-
FY 2021 Plans: - Programmatic planning and structure to support the continuing study and future warhead concepts. - Validation of concept study external requirements. - Exploration and refinement of the concept studies. - Conducted system level peer review of trade studies. - Continue drafting and refinement of high level requirements documents to include Phase 1 Plan and drafts of Phase 2 study plan, Systems Engineering Program Plan (SEMP), stockpile CONOPs, development test planning, system qualification, preliminary reliability and safety assessment, Integrated Master Plan/Integrated Master Schedule, and Safety Program Plan. - Continue systems integration and development/qualification planning. - Continue requirements definition and preparation for Systems Requirements Review. - Begin aeroshell design options trade study. - Begin aeroshell Thermal Protection System (TPS) material development. - Begin material modeling and analysis including vulnerability, accuracy, reliability, and flight performance predictions and assessments.					
FY 2022 Base Plans:					

Exhibit R-2A, RDT&E Project Justification: PB 2022 Navy		Date: May 2021
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0101221N / *Strategic Sub & Wpns Sys Supt*	**Project (Number/Name)** 3097 / *Mk 7 / W-93*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
- Continue exploration and refinement of the concept studies. - Continue requirements definition and preparation for Systems Requirements Review (SRR). - Conduct Strategic Weapons System SRR. - Continue systems architecture development. - Begin initial data analysis for fire control software support for W93. - Begin aeroshell material development and conduct ground testing. ***FY 2022 OCO Plans:*** N/A ***FY 2021 to FY 2022 Increase/Decrease Statement:*** The increase from FY 2021 to FY 2022 is attributable to the start of aeroshell material development, increased system architecture development, and the conclusion of Phase 1 efforts which culminate in a recommendation to the Nuclear Weapons Council (NWC) and progression to Phase 2.					
Accomplishments/Planned Programs Subtotals	25.124	31.475	61.695	0.000	61.695

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 2022 Navy		Date: May 2021
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0101221N / *Strategic Sub & Wpns Sys Supt*	**Project (Number/Name)** 3097 / *Mk 7 / W-93*

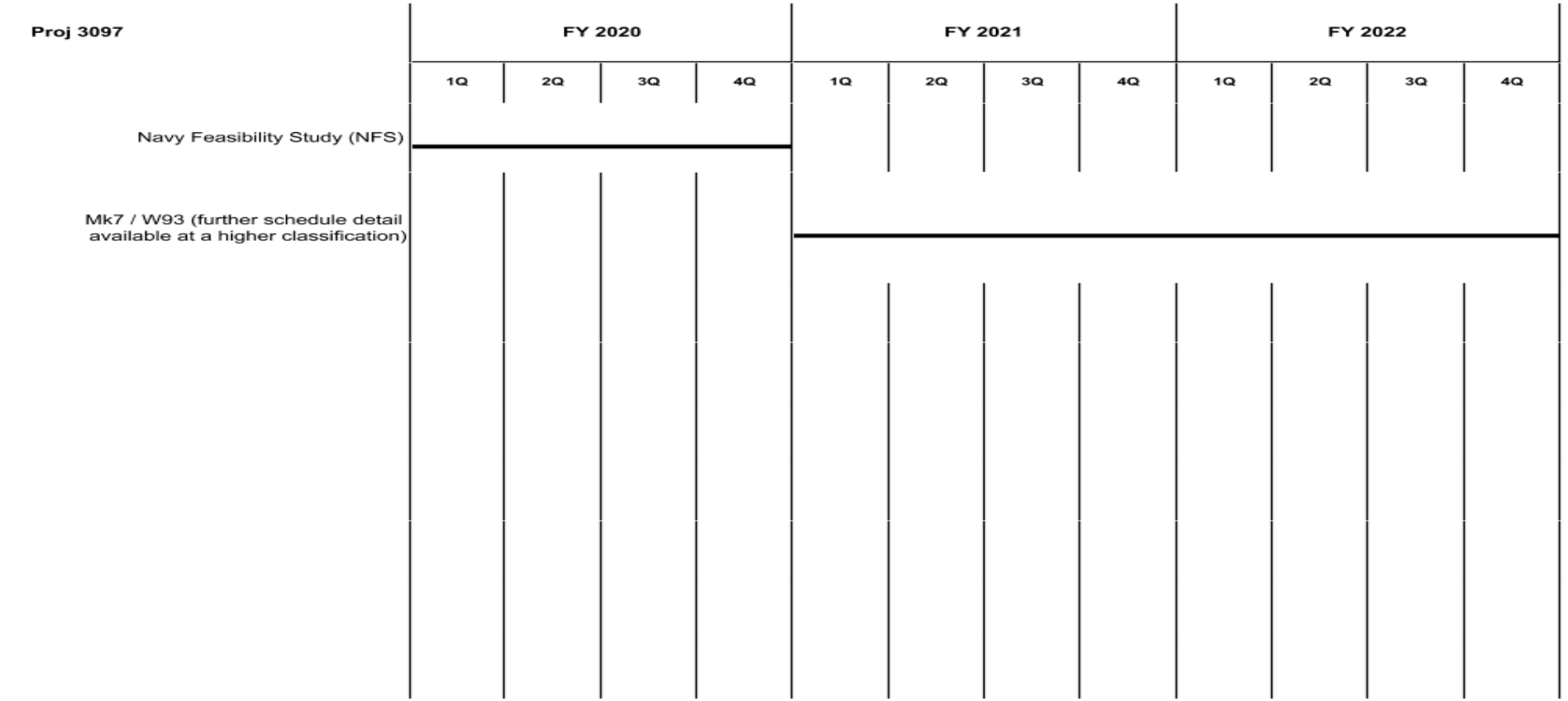
Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Mk7/W93	SS/CPIF	LMS : CA	16.908	16.190	Feb 2020	15.213	Nov 2020	39.619	Nov 2021	-		39.619	-	-	-
Mk7/W93	MIPR	DOE : NM	4.000	5.000	Dec 2019	6.500	Oct 2020	9.226	Nov 2021	-		9.226	-	-	-
Mk7/W93	SS/CPFF	PERATON : VA	3.000	1.594	Nov 2019	1.594	Oct 2020	5.272	Nov 2021	-		5.272	-	-	-
Mk7/W93	SS/CPFF	APL : MD	0.000	1.495	Nov 2019	6.743	Oct 2020	5.272	Nov 2021	-		5.272	-	-	-
Mk7/W93	SS/CPFF	Various : Various	0.000	0.845	Mar 2020	1.425	Nov 2020	1.806	Nov 2021	-		1.806	-	-	-
Mk7/W93	SS/CPFF	BAE : MD	0.000	0.000		0.000		0.500	Dec 2021	-		0.500	-	-	-
		Subtotal	23.908	25.124		31.475		61.695		-		61.695	-	-	N/A

	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	23.908	25.124		31.475		61.695		-		61.695	-	-	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Navy		Date: May 2021
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0101221N / *Strategic Sub & Wpns Sys Supt*	**Project (Number/Name)** 3097 / *Mk 7 / W-93*



2022PB - 0101221N - 3097

Exhibit R-4A, RDT&E Schedule Details: PB 2022 Navy		Date: May 2021
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0101221N / *Strategic Sub & Wpns Sys Supt*	**Project (Number/Name)** 3097 / *Mk 7 / W-93*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 3097				
Navy Feasibility Study (NFS):	1	2020	4	2020
Mk7 / W93 (further schedule detail available at a higher classification): Schedule Detail	1	2021	4	2022

Exhibit R-2A, RDT&E Project Justification: PB 2022 Navy			Date: May 2021
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 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
3158: *Integrated Nuclear Weapons Security Sys Dev*	11.217	2.737	2.011	3.410	-	3.410	-	-	-	-	-	-
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 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
Title: Integrated Nuclear Weapons Security Sys Dev	2.737	2.011	3.410	0.000	3.410
Articles:	-	-	-	-	-
FY 2021 Plans: Investment into technologies that improve the operational performance of security escort vessels during surface transit, providing increased adversary denial capability and enhanced sailor safety. Identify, develop, and test technologies needed for aerial surveillance, air-based sensors, and detection and defeat (passive and active) of unmanned aircraft systems. 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 2022 Base 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.					

Exhibit R-2A, RDT&E Project Justification: PB 2022 Navy		Date: May 2021
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 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
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 2022 OCO Plans:*** N/A ***FY 2021 to FY 2022 Increase/Decrease Statement:*** The increase fromm FY 2021 to FY 2022 supports the initiation of hardware and software development for an electronic security system, waterside security system user evaluation and development and integration testing for C-UAS sensors and common hardware.					
Accomplishments/Planned Programs Subtotals	2.737	2.011	3.410	0.000	3.410

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
• OPN/Various-2: *OPN (Nuclear Weapons Security)*	42.023	37.619	33.970	-	33.970	-	-	-	-	-	-
• OMN/11D2D-3: *Fleet Ballistic Missile (Nuclear Weapons Security)*	82.569	95.015	103.772	-	103.772	-	-	-	-	-	-
• OMN/11D2D-5: *Fleet Ballistic Missile (Transit/Escort)*	122.033	104.192	104.888	-	104.888	-	-	-	-	-	-

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 2022 Navy			Date: May 2021
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)

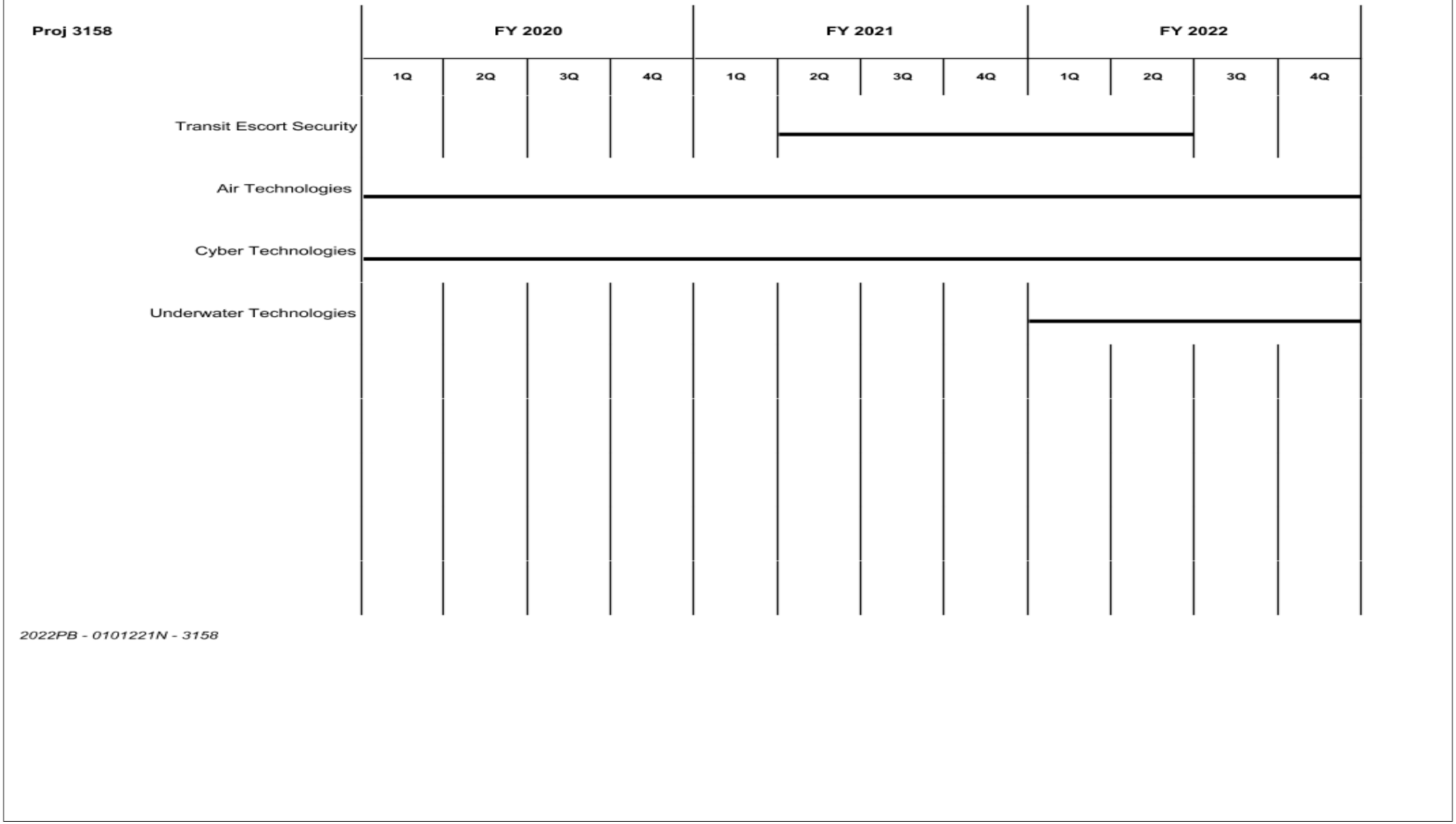
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Integrated Nuclear Weapons Security Sys Dev	SS/CPFF	APL : MD	4.369	0.000		0.000		0.000		-		0.000	-	-	-
Integrated Nuclear Weapons Security Sys Dev	SS/CPFF	JRC : VA	3.529	0.343	Mar 2020	0.000		0.000		-		0.000	-	-	-
Integrated Nuclear Weapons Security Sys Dev	C/BA	DRAPER : MA	0.556	0.000		0.000		0.000		-		0.000	-	-	-
Integrated Nuclear Weapons Security Sys Dev	WR	CNWS : ID	1.865	0.880	Mar 2020	0.392	Nov 2020	1.619	Nov 2021	-		1.619	-	-	-
Integrated Nuclear Weapons Security Sys	C/CPFF	GDMS : MA	0.898	0.538	Mar 2020	0.401	Nov 2020	0.407	Nov 2021	-		0.407	-	-	-
Integrated Nuclear Weapons Security Sys	C/CPFF	ARL : TX	0.000	0.000		0.000		0.339	Dec 2021	-		0.339	-	-	-
Integrated Nuclear Weapons Security Sys	C/CPFF	SPA : VA	0.000	0.425	Mar 2020	0.120	Mar 2021	0.403	Nov 2021	-		0.403	-	-	-
Integrated Nuclear Weapons Security Sys	C/CPFF	EMCUBE : VA	0.000	0.158	Mar 2020	0.223	Mar 2021	0.342	Nov 2021	-		0.342	-	-	-
Integrated Nuclear Weapons Security Sys	C/CPFF	ASC : CA	0.000	0.000		0.800	Mar 2021	0.000		-		0.000	-	-	-
Integrated Nuclear Weapons Security Sys	WR	DAHLGREN : VA	0.000	0.000		0.075	Mar 2021	0.000		-		0.000	-	-	-
Integrated Nuclear Weapons Security Sys	WR	KEYPORT : VA	0.000	0.000		0.000		0.300	Nov 2021	-		0.300	-	-	-
Integrated Nuclear Weapons Security Sys	Various	various : various	0.000	0.393	Mar 2020	0.000		0.000		-		0.000	-	-	-
		Subtotal	11.217	2.737		2.011		3.410		-		3.410	-	-	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Navy			Date: May 2021
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 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	11.217	2.737		2.011		3.410		-		3.410	-	-	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Navy		Date: May 2021
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*



2022PB - 0101221N - 3158

Exhibit R-4A, RDT&E Schedule Details: PB 2022 Navy		Date: May 2021
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: Schedule Detail	2	2021	2	2022
Air Technologies: Schedule Detail	1	2020	4	2022
Cyber Technologies: Schedule Detail	1	2020	4	2022
Underwater Technologies: Schedule Detail	1	2022	4	2022

Exhibit R-2A, RDT&E Project Justification: PB 2022 Navy			Date: May 2021
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 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
9999: *Congressional Adds*	0.000	17.376	12.000	0.000	-	0.000	-	-	-	-	-	-
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This funding is a congressional add to support High temperature composite material capacity expansion and Next Generation Strategic Inertial Measurement Unit.

High Temperature Composite Material expansion 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.

Funding for 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.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021
Congressional Add: High temperature composite material capacity expansion ***FY 2020 Accomplishments:*** N/A ***FY 2021 Plans:*** N/A	11.584	0.000
Congressional Add: Next generation strategic inertial measurement unit ***FY 2020 Accomplishments:*** N/A ***FY 2021 Plans:*** N/A	5.792	0.000
Congressional Add: Next Generation Strategic Inertial Measurement Unit ***FY 2020 Accomplishments:*** N/A ***FY 2021 Plans:*** Research and develop new and alternate Guidance, Navigation, and Control (GN&C) technologies and concepts to support Strategic Systems Programs (SSP) Missions. FY21 planned scope includes: - Research, develop and demonstrate radiation-hardened navigation technologies for reentry specific applications, strategic grade inertial instruments, software, electromechanical components and algorithms	0.000	6.000

Exhibit R-2A, RDT&E Project Justification: PB 2022 Navy		Date: May 2021
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0101221N / *Strategic Sub & Wpns Sys Supt*	**Project (Number/Name)** 9999 / *Congressional Adds*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021
- Perform technical trade studies to deliver a navigation solution that optimizes the system for size, weight, and power 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.		
Congressional Add: Scalable Very High Temperature Composite Manufacturing Technologies ***FY 2020 Accomplishments:*** N/A ***FY 2021 Plans:*** Funds provided 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.	0.000	6.000
Congressional Adds Subtotals	17.376	12.000

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

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 2022 Navy		Date: May 2021
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0101221N / *Strategic Sub & Wpns Sys Supt*	**Project (Number/Name)** 9999 / *Congressional Adds*

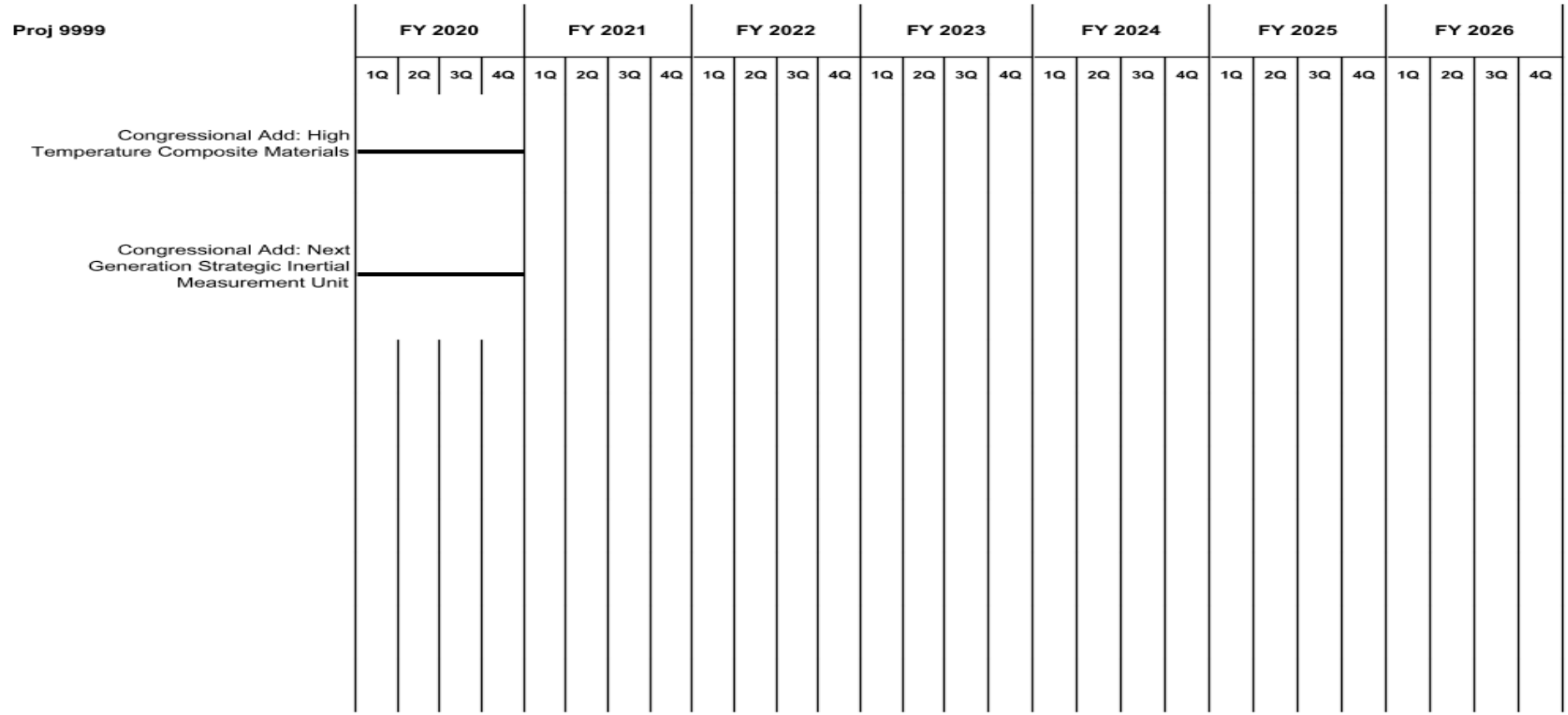
Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Next Generation SIMU	SS/CPFF	Draper Labs : Cambridge, MA	0.000	5.792	Mar 2020	6.000	Apr 2021	0.000		-		0.000	-	-	-
High Temperature Composite Expansion	SS/CPFF	FMI/Intermat : Biddeford, ME	0.000	11.584	Sep 2020	0.000		0.000		-		0.000	-	-	-
High Temperature Composite Expansion	C/BA	NSWC Crane : Bloomington, IN	0.000	0.000		6.000	Aug 2021	0.000		-		0.000	-	-	-
		Subtotal	0.000	17.376		12.000		0.000		-		0.000	-	-	N/A

	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	17.376		12.000		0.000		-		0.000	-	-	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Navy		Date: May 2021
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0101221N / *Strategic Sub & Wpns Sys Supt*	**Project (Number/Name)** 9999 / *Congressional Adds*



2022DON - 0101221N - 9999

Exhibit R-4A, RDT&E Schedule Details: PB 2022 Navy		Date: May 2021
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0101221N / *Strategic Sub & Wpns Sys Supt*	**Project (Number/Name)** 9999 / *Congressional Adds*

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	2020	4	2020
Congressional Add: Next Generation Strategic Inertial Measurement Unit: Next Generation Strategic Inertial Measurement Unit	1	2020	4	2020