Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Navy											Date: March 2024	
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 4: *Advanced Component Development & Prototypes (ACD&P)*					R-1 Program Element (Number/Name) PE 0603595N *I SSBN New Design*							
COST ($ in Millions)	**Prior Years**	**FY 2023**	**FY 2024**	**FY 2025 Base**	**FY 2025 OCO**	**FY 2025 Total**	**FY 2026**	**FY 2027**	**FY 2028**	**FY 2029**	**Cost To Complete**	**Total Cost**
Total Program Element	4,066.565	334.261	257.076	189.631	-	189.631	211.914	204.645	212.036	174.129	Continuing	Continuing
3220: *COLUMBIA Class Submarine Development*	4,052.094	260.504	185.739	118.333	-	118.333	139.218	130.628	138.419	98.957	Continuing	Continuing
3440: *SBSD Obsolescence*	0.000	19.738	21.655	21.395	-	21.395	21.844	22.218	22.098	22.558	Continuing	Continuing
3441: *SBSD Technology Refresh*	0.000	45.338	49.682	49.903	-	49.903	50.852	51.799	51.519	52.614	Continuing	Continuing
9999: *Congressional Adds*	14.471	8.681	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	23.152
Program MDAP/MAIS Code: **Project MDAP/MAIS Code(s):** 444												

A. Mission Description and Budget Item Justification

This program element supports innovative research and development in submarine Hull, Mechanical and Electrical (HM&E) and combat systems technologies and the subsequent evaluation, demonstration, and validation for submarine platforms over the life cycle of the COLUMBIA Class. It will increase the submarine technology base and provide subsystem design options not currently feasible. The program element also supports programs transitioning from Science and Technology (S&T), Defense Advanced Research Projects Agency (DARPA), Independent Research and Development, and Small Business Innovation Research (SBIR) projects.

The funding applies to the design, systems engineering, prototyping, and vendor qualification activities needed to execute the schedule for Common Missile Compartment (CMC) design, whole ship design, and component technologies development for the next generation U.S. ballistic missile submarine (SSBN), the COLUMBIA Class.

Project Unit 3220: The objective of the COLUMBIA Class Submarine Development is to design, prepare for, and support construction and delivery of the class that is the replacement of the OHIO Class SSBN.

Project Unit 3440: This project provides the engineering development and program management required to outfit, upgrade, and support each ship of the COLUMBIA Class Submarine with a Non- Propulsion Electronics System (combat, sonar, etc.) that satisfies requirements to meet its sole mission of Strategic Deterrence over the class life cycle.

Project Unit 3441: This project encompasses ship system development, coordination, and management efforts for the COLUMBIA Class Submarine Technology Insertion Program and Technology Refresh Program over the class life cycle.

Project Unit 9999: This Congressional Add project funds efforts for COLUMBIA Rapid Composites for Wet Submarine Application.

Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Navy	Date: March 2024
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 0603595N *I SSBN New Design*

B. Program Change Summary ($ in Millions)	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
Previous President's Budget	344.981	257.076	193.861	-	193.861
Current President's Budget	334.261	257.076	189.631	-	189.631
Total Adjustments	-10.720	0.000	-4.230	-	-4.230
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-0.129	0.000			
• SBIR/STTR Transfer	-10.590	0.000			
• Rate/Misc Adjustments	-0.001	0.000	-4.230	-	-4.230

Congressional Add Details ($ in Millions, and Includes General Reductions)	FY 2023	FY 2024
Project: 9999: *Congressional Adds*		
Congressional Add: *Rapid composites for wet submarine application*	8.681	0.000
Congressional Add Subtotals for Project: 9999	8.681	0.000
Congressional Add Totals for all Projects	8.681	0.000

Change Summary Explanation

FY2023 decrease from PB24 due to SBIR reduction and cancelled accounts. FY25 decrease from PB24 due to misc rate adjustments. FY26 - FY28 increases due to restoration of total force management and alignment with the NRE RDT&E Requirements from the 2022 05C Cost Checkpoint. FY29 decrease begins as design ramps down.

Exhibit R-2A, RDT&E Project Justification: PB 2025 Navy											Date: March 2024	
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0603595N / *SSBN New Design*				Project (Number/Name) 3220 / *COLUMBIA Class Submarine Development*			
COST ($ in Millions)	**Prior Years**	**FY 2023**	**FY 2024**	**FY 2025 Base**	**FY 2025 OCO**	**FY 2025 Total**	**FY 2026**	**FY 2027**	**FY 2028**	**FY 2029**	**Cost To Complete**	**Total Cost**
3220: *COLUMBIA Class Submarine Development*	4,052.094	260.504	185.739	118.333	-	118.333	139.218	130.628	138.419	98.957	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

Project MDAP/MAIS Code: 444

A. Mission Description and Budget Item Justification

The COLUMBIA Submarine Class Program (previously the OHIO Replacement Class) is developing the next generation sea-based strategic deterrent. The funding applies to the design, systems engineering, prototyping, and vendor qualification activities needed to execute the schedule for Common Missile Compartment (CMC) design, whole ship design, and component technologies development for the next generation U.S. ballistic missile submarine (SSBN). This RDT&E program supports cooperation with the United Kingdom (UK) to maintain strategic deterrence, based on a single effort to develop a CMC as agreed by the UK Secretary of State for Defense and the U.S. Secretary of Defense in 2009. At the COLUMBIA Program Semi-Annual Interim Progress Review (IPR) held on August 30, 2021, the USD(A&S) Milestone Decision Authority (MDA) directed COLUMBIA to be funded to the program baseline, including Integrated Enterprise Plan (IEP) funding as reflected in this budget submission. The total RDTE FY2024 decrease of $77.185M from FY2023 RDTEN controls ($160.132M in the FYDP) is due to adjusting funding for the COLUMBIA Class Program to the baseline and an overall shift to SCN. FY2026-FY2028 decreases and then increases due to T&E efforts

The COLUMBIA program strategy is to leverage the re-use of existing Submarine system designs (as applicable), focus on lifecycle Total Ownership Cost (TOC) affordability, and meet the military requirements established for this SSBN to achieve mission success in a challenging environment. The requested funding levels provide for the Technology Development, Design, Engineering, and Integration efforts necessary to support the COLUMBIA Class SSBN lead ship construction along with continued development and design support for construction of the class. A Contract Modification for ongoing design/advance construction efforts was awarded on 22 Jun 2020, which also included the Build I Option for the First Two Ships. This was a Pre-Priced Option for the two ships, SSBN 826 and SSBN 827, and associated design/support efforts. This was a modification of the current Integrated Product & Process Development (IPPD) contract (N00024-17-C-2117) and is in line with the program's approved Acquisition Strategy. The program requested authorization of SSBN 826 in FY21, funded with three years of incremental funding in FY21-23, and is requesting authorization of SSBN 827 in FY24, funded with two years of incremental funding in FY24-25. The RDT&E efforts support this plan.

The following key activities support the COLUMBIA Class SSBN Program:
1. Design and development of a missile compartment, launch system, and Strategic Weapons Support Systems (SWSS) to meet U.S. strategic requirements while cooperating with the UK on modernizing its strategic deterrent in accordance with Presidential direction (December 2006).
2. Concept Definition, System Definition, and Detailed Design for remaining portions of the ship accomplished through a Design/Build/Sustain approach modeled after the approach used by the VIRGINIA Class program.
3. Engineering and integration of existing technologies and development of new technologies required to provide the capabilities necessary to ensure platform operational effectiveness and minimize life cycle cost.
4. Ongoing design support for construction of the submarine class.

Exhibit R-2A, RDT&E Project Justification: PB 2025 Navy		Date: March 2024
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603595N / *SSBN New Design*	**Project (Number/Name)** 3220 / *COLUMBIA Class Submarine Development*

COLUMBIA Class SSBN concept study, system definition prototyping, and technology development efforts support design, systems engineering, component development and vendor qualification activities needed to develop the CMC design and the COLUMBIA whole ship design. The COLUMBIA design timelines are based on a design approach proven on the VIRGINIA Class Program, adjusted for the additional complexity of a missile compartment and Strategic Weapons Systems (SWS). Planned technical studies and prototyping are necessary to reduce risks associated with updating SSBN system designs for current technical standards and demonstrating design feasibility of developmental technology to meet the ship design and construction schedule.

The Navy continues to invest in program funded affordability initiatives similar to those employed successfully for VIRGINIA Class, but tailored to the unique SSBN mission and operational tempo of COLUMBIA Class to drive down overall program costs. Efforts focus on reducing ship construction costs through implementing more effective design features and fabrication and assembly methods for a more affordable submarine. As part of this effort, alternative procurement and contracting strategies are also being utilized to include Multi-Program Material Procurement (MPMP) and Economic Order Quantity (EOQ).

Activities were executed for the first article quad pack (FAQP) prototype of the CMC to support the UK DREADNOUGHT Program and COLUMBIA Program, and to continue validation of the Integrated Tube and Hull (ITH) build strategy. These activities included the continuation of the construction of the FAQP, which began August 2016, and completed in October 2019. This FAQP was determined to not be useable based on defective missile tubes and was cut apart to recover the missile tubes to use later in the program. The CMC program will mature required technologies and re-host the TRIDENT II D5 SWS (Launcher, Fire Control and Navigation) while ensuring no degradation to D5 security, safety, and performance. In addition, whole ship design efforts are focused on technologies requiring significant engineering, integration, and development time as well as those technologies that are required to support ship design and construction schedules such as the propulsor and maneuvering/ship control. These technologies are critical for stealth capability for a ship class that will be in service until the 2080s. Ship detailed design efforts include important activities such as finalizing ship arrangements, development of design disclosures to support build products, risk characterization, and mitigation, improvement and validation of performance prediction tools and improvement of design tools. Technology development addresses engineering and integration of existing technologies as well as maturation of developmental technologies.

On 14 December 2016, the Secretary of the Navy announced the lead ship of the OHIO Replacement Program will be USS COLUMBIA (SSBN 826) which officially designates this program the COLUMBIA Class Submarine Program.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	**FY 2023**	**FY 2024**	**FY 2025 Base**	**FY 2025 OCO**	**FY 2025 Total**
Title: Common Missile Compartment Design and Prototyping, and Whole Ship Design	157.557	97.839	37.008	0.000	37.008
Articles:	-	-	-	-	-
FY 2024 Plans: Specific planned construction efforts for FY 2024 include: - Continued fabrication of Missile Tubes and Strategic Weapons Support System (SWSS) kits. - Continued Lead Ship Construction, which includes manufacture of the MTM for lead ship, and integration and test of SWSS					

Exhibit R-2A, RDT&E Project Justification: PB 2025 Navy		Date: March 2024
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603595N / *SSBN New Design*	**Project (Number/Name)** 3220 / *COLUMBIA Class Submarine Development*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
systems and Final Operating Capability (FOC) for the land-based test facility. Whole Ship Study and Design: This funding applies to the shipbuilder design, systems engineering, prototyping, and vendor qualification activities needed to execute the schedule for whole ship design and component / technology development for the COLUMBIA submarine, and associated engineering/management efforts. - Planned completion is approximately 57 percent of Maintenance Integrated Logistics Products (1226 of 2143). - Planned completion is approximately 81 percent of Provisioning Integrated Logistics Products (3535 of 4361). - Planned completion of approximately 81 percent of Logistics Technical Documentation products (635 of 787) - Specific planned construction efforts for FY 2024 including construction execution on all Super Modules (1, 2, 3, 4, 5, and 6). ***FY 2025 Base Plans:*** Specific planned construction efforts for FY 2025 include: - Continued fabrication of Missile Tubes and Strategic Weapons Support System (SWSS) kits. - Continued Lead Ship Construction, which includes manufacture of the MTM for lead ship, and integration and test of SWSS s systems and Final Operating Capability (FOC) for the land-based test facility. Whole Ship Study and Design: This funding applies to the shipbuilder design, systems engineering, prototyping, and vendor qualification activities needed to execute the schedule for whole ship design and component / technology development for the COLUMBIA submarine, and associated engineering/management efforts. - Planned completion is approximately 72 percent of Maintenance Integrated Logistics Products (1543 of 2143). - Planned completion is approximately 97 percent of Provisioning Integrated Logistics Products (4235 of 4361). - Planned completion of approximately 98 percent of Logistics Technical Documentation products (456 of 464). - Specific planned construction efforts for FY 2025 including construction execution on all Super Modules (1, 2, 3, 4, 5, and 6). ***FY 2025 OCO Plans:*** N/A ***FY 2024 to FY 2025 Increase/Decrease Statement:***					

Exhibit R-2A, RDT&E Project Justification: PB 2025 Navy		Date: March 2024
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603595N / *SSBN New Design*	**Project (Number/Name)** 3220 / *COLUMBIA Class Submarine Development*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
Decrease due to shipbuilder design performance, updates made in accordance with 2022 cost estimate and an overall shift to SCN.					
Title: NAVSEA R&D and Prototyping	55.871	53.090	48.409	0.000	48.409
Articles:	-	-	-	-	-
FY 2024 Plans: This funding applies to the Government combat systems, component and technology development for the COLUMBIA submarine essential to achieving required survivability, combat and communications capabilities. Efforts planned in FY 2024 include: Combat Systems: - Conduct electronic and platform integration risk mitigation testing of the TI-24 NPES configuration across vendor and navy development sites. - Conduct TI-20 design review and factory acceptance testing for applicable SSBN 826 NPES shipset deliveries. Component Development: - Continue Government support and oversight for the 25 components expected to be delivered in FY24. - Continue Government support and oversight of development of the 1 remaining of the 6 Stern Area System components. - Continue Government support and oversight for the 49 components expected to be delivered in FY24 for SSBN 827. - Continue support of diesel generator integration testing at compatibility test facility. - Complete shock testing of diesel generator set. - Deliver Advanced Propulsor Bearing to Shipbuilder for first hull. - Continue production of ACRUs for SSBN 827. - Deliver Main Shaft Seal to Shipbuilder for first hull. - Deliver Main Shaft Brake Lock & Turning Gear to Shipbuilder for first hull. - Continue reliability/operational testing of ACRU. - Continue at-sea operational assessment of ACRU on SSGN. Propulsor and Shafting: - Continue propulsor shock qualification analysis and design certification efforts.					

Exhibit R-2A, RDT&E Project Justification: PB 2025 Navy		Date: March 2024
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603595N / *SSBN New Design*	**Project (Number/Name)** 3220 / *COLUMBIA Class Submarine Development*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
- Continue to update performance achievability assessments to reflect as-manufactured parts. - Continue to develop alternative production methods for risk reduction of propulsor components. Shock, Structures, and Composites: - Continue test planning, test simulations and vehicle assessment for Large Vehicle Shock Testing. - Start Preparations for initial deep dive testing. - Deliver Out of Autoclave bow dome for SSBN 826. - Delivery of the first US shipset and third UK shipset of the Navigation Sonar System Windows. Signatures: - Update whole-boat signature predictions using updated modeling and predictive tools. - Support GFE design efforts for a system and demonstration testing. - Support Physical Scale Model Testing and Iterative Closest Contour Point (ICCP) algorithms updates to account for as-built and damage scenarios. - Begin preparations for a VA full scale test to demonstrate new measurement and modeling approach for verifying full scale performance planned for CLB First of Class testing as a potential life cycle savings. - Continue testing on GFE tow cable design. ***FY 2025 Base Plans:*** Combat Systems: - Initiate platform integration studies required to support introduction of a new network architecture designed to provide a common combat system computing environment and increase overall cyber resiliency. - Initiate Command and Control System Module hotel services engineering reviews to identify and resolve constraints which limit modernization opportunities within the 35 day refit period. Component Development: - Continue Government support and oversight for the 2 components expected to be delivered in FY25. - Continue Government support and oversight of development and delivery of the 1 remaining 1 Stern Area System component. - Continue Government support and oversight for the 17 components expected to be delivered in FY25 for SSBN 827.					

Exhibit R-2A, RDT&E Project Justification: PB 2025 Navy		Date: March 2024
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603595N / *SSBN New Design*	**Project (Number/Name)** 3220 / *COLUMBIA Class Submarine Development*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
- Delivery of ACRUs for SSBN 827 - Continue reliability/operational testing of ACRU. - Continue at-sea operational assessment of ACRU on SSGN. - Completion of the Large Vehicle Shock Test at Aberdeen Proving Ground. - Deliver Main Thrust Bearing to shipbuilder for first hull. Propulsor and Shafting: - PU3220 funds are not intended to support propulsor and shafting in FY25. Signatures: - Update whole-boat signature predictions using updated modeling and predictive tools. - Support GFE design efforts for a system. - Support Physical Scale Model Testing and ICCP algorithms updates to account for as-built and damage scenarios. - Conduct VA full scale test to demonstrate new measurement and modeling approach for verifying full scale performance planned for CLB first of class and as a potential life cycle savings. ***FY 2025 OCO Plans:*** N/A ***FY 2024 to FY 2025 Increase/Decrease Statement:*** Decrease represents the updated program cost estimate from 2022 capturing updates to government component and technology development efforts, an overall shift to SCN, and commencement of follow ship R&D obsolescence and technology refresh starting in 2023.					
Title: Systems Engineering/Program Management	32.744	34.810	32.916	0.000	32.916
Articles:	-	-	-	-	-
FY 2024 Plans: - Execute Trident Training Facility (TTF) Kings Bay MILCON P676 on schedule to support Strategic System Programs (SSP) and NAVSEA ready for training dates. - Complete final design for Trident Refit Facility (TRF) Kings Bay P684. - Commence advanced planning studies for NBK-Bangor.					

Exhibit R-2A, RDT&E Project Justification: PB 2025 Navy		Date: March 2024
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603595N / *SSBN New Design*	**Project (Number/Name)** 3220 / *COLUMBIA Class Submarine Development*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
- Execute the OMN and UMC Waterfront Support projects in support of TRF and P684. - Utilize Early Contractor Involvement (ECI) and prepare TRF Kings Bay P684 contract in preparation of issuance in Q1 FY25. - Prepare TRF Bangor and TTF Bangor projects for CNIC POM 27 updates. Test and Evaluation: - Commence detailed planning for OT-B3, including completing the verification and validation of Simulation II Digital Weapons Analysis Framework (SIMII/DWAF), the Ship Control Operational Trainer, and Control System Module Off-Hull Assembly and Test Site (COATS) for the survivability and strike COI assessment. - Continue survivability modeling and simulation maturation. - Report DT results to Deputy Director, Developmental Testing, Evaluations, and Assessments (D.D((DTE&A)) and DOT&E in accordance with the TEMP. - Complete Operational Test (OT-B2), an Operational Observation of DT (OODT), at Strategic Weapons System Ashore facility to assess the CLB TEMP Strike Critical Operational Issues (COIs). - Continue detailed planning for lead ship (SSBN 826) Acoustic trials, Electromagnetic Trials, Hydrodynamic Trials, and Conventional Weapon's Launcher Trials. - Commence planning for an EDT 25 cybersecurity Capstone event on TI-24. This will be an enclave-level event similar to the EDT 23 event described above. - Cybersecurity CVI event on the Battery Monitoring System (BMS). - Cybersecurity CVI event on the Strategic Weapons Support Systems (SWSS). - Cybersecurity Early Developmental Test (EDT) 24 Capstone event on a VA Class TI-20/APB-19 (or 21) submarine. - Identify two Hull Mechanical and Electrical (HM&E) systems for cyber testing in FY25. - Continue Reconfigurable Test Shape (RTS) full scale development. - Complete COATS V&V Plan. Plan COATS V&V activities during COATS testing period.					
FY 2025 Base Plans:					

Exhibit R-2A, RDT&E Project Justification: PB 2025 Navy		Date: March 2024
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603595N / *SSBN New Design*	**Project (Number/Name)** 3220 / *COLUMBIA Class Submarine Development*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
- Execute Trident Training Facility (TTF) Kings Bay MILCON P676 on schedule to support Strategic System Programs (SSP) and NAVSEA ready for training dates. - Execute Trident Training Facility (TRF) Kings Bay MILCON P864 on schedule to support Strategic System Programs (SSP) and NAVSEA ready for maintenance. - Utilize Early Contractor Involvement (ECI) and prepare TRF Kings Bay P684 contract in preparation of issuance in Q1 FY25. - Design updates for TRF Bangor and TTF Bangor project in support of award in FY27. Test and Evaluation: - Complete OT-B3 verification and validation report. Conduct OT-B3 Operational Test Readiness Review and commence SIM II/DWAF runs for OT-B3. - Report DT results to DD((DTE&A) and DOT&E in accordance with the TEMP. - Complete COATS V&V activities culminating with the OPTEVFOR two-week OT period. Complete the V&V report and obtain accreditation from OPTEVFOR. - Update the Submarine Platform Cybersecurity T&E Strategy (TES) - Complete cybersecurity CVI events on two systems - Complete an EDT 25 cybersecurity Capstone event on either TI-22 or TI-24. This will be an enclave-level event similar to the EDT 23 event described above. - Identify two HM&E systems for cybersecurity testing in FY26 - Continue detailed planning for lead ship (SSBN 826) Acoustic trials, Electromagnetic Trials, Hydrodynamic Trials. - Continue CLB DASO planning activities. ***FY 2025 OCO Plans:*** N/A ***FY 2024 to FY 2025 Increase/Decrease Statement:*** Decrease due to updates made in accordance with 2022 cost estimate and an overall shift to SCN.					
Title: Strategic Weapons System Integration	14.332	0.000	0.000	0.000	0.000
Articles:	-	-	-	-	-

Exhibit R-2A, RDT&E Project Justification: PB 2025 Navy		Date: March 2024
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603595N / *SSBN New Design*	**Project (Number/Name)** 3220 / *COLUMBIA Class Submarine Development*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
FY 2024 Plans: R&D design efforts completed. R&D funding for first of class Test and Evaluation events required beginning in FY26. ***FY 2025 Base Plans:*** R&D design efforts completed. R&D funding for first of class Test and Evaluation events required beginning in FY26. ***FY 2025 OCO Plans:*** N/A ***FY 2024 to FY 2025 Increase/Decrease Statement:*** R&D design efforts conclude in FY23.					
Accomplishments/Planned Programs Subtotals	260.504	185.739	118.333	0.000	118.333

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	FY 2026	FY 2027	FY 2028	FY 2029	Cost To Complete	Total Cost
• RDTEN/0603570N/3219: *SBSD Nuclear Technology Development*	56.707	54.400	44.385	-	44.385	39.173	35.834	17.847	0.000	0.000	248.346
• RDTEN/0101221N/0951: *Joint Warhead Fuze Sustainment Program*	3.140	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	720.519
• OPN/5358: *Strategic Missile Systems Equip*	279.430	325.318	325.236	-	325.236	435.821	324.966	454.086	459.740	Continuing	Continuing
• WPN/1250: *TRIDENT II Mods*	1,125.164	1,284.705	1,793.867	-	1,793.867	2,493.122	2,957.029	3,315.219	3,304.999	4,352.768	33,679.299
• OMN/1D2D: *Fleet Ballistic Missile*	1,651.570	1,763.238	1,866.966	-	1,866.966	1,898.080	1,945.432	1,993.490	2,034.573	0.000	13,153.349
• SCN/1045: *COLUMBIA Class Submarine*	5,857.776	5,834.332	9,557.174	-	9,557.174	10,421.408	10,234.574	10,181.937	9,143.050	49,684.615	126,443.335
• MCN/64482044: *MCON Design*	520.442	502.827	603.254	-	603.254	398.368	261.624	318.644	351.474	0.000	2,956.633

Remarks

Exhibit R-2A, RDT&E Project Justification: PB 2025 Navy		Date: March 2024
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603595N / *SSBN New Design*	**Project (Number/Name)** 3220 / *COLUMBIA Class Submarine Development*

D. Acquisition Strategy

The Common Missile Compartment (CMC) will be designed and developed to support the U.S. and UK in development of the COLUMBIA and DREADNOUGHT SSBN programs enabling a common U.S.-UK CMC and maximizing the benefit of the ongoing U.S.-UK partnership in strategic deterrence. The COLUMBIA Class Program RDT&E efforts will support the design, construction and operations & support portions of the program. RDT&E efforts will be performed by Navy laboratories, shipyards, private industry, and University Affiliated Research Centers.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2025 Navy			Date: March 2024
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603595N / *SSBN New Design*	Project (Number/Name) 3220 / *COLUMBIA Class Submarine Development*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2023 Cost	FY 2023 Award Date	FY 2024 Cost	FY 2024 Award Date	FY 2025 Base Cost	FY 2025 Base Award Date	FY 2025 OCO Cost	FY 2025 OCO Award Date	FY 2025 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Product Development	SS/CPFF	Ship Design Contractor-EB : Groton, CT	1,717.556	157.557	Oct 2022	97.839	Oct 2023	37.008	Oct 2024	-		37.008	Continuing	Continuing	Continuing
Product Development	WR	NSWC : Carderock, MD	610.165	16.821	Oct 2022	17.888	Oct 2023	17.315	Oct 2024	-		17.315	Continuing	Continuing	Continuing
Product Development	WR	NSWC : Philadelphia, PA	96.760	6.500	Oct 2022	8.021	Oct 2023	5.775	Oct 2024	-		5.775	Continuing	Continuing	Continuing
Product Development	WR	NUWC : Newport, RI	138.096	13.836	Oct 2022	11.960	Oct 2023	12.224	Oct 2024	-		12.224	Continuing	Continuing	Continuing
Product Development	Various	NAVSEA : Various	282.164	18.714	Oct 2022	15.221	Oct 2023	13.095	Oct 2024	-		13.095	Continuing	Continuing	Continuing
Product Development	SS/CPFF	ARL Penn State University : State College, PA	3.811	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Product Development	SS/CPFF	NGMS : Sunnyvale, CA	198.509	4.121	Oct 2022	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Product Development	SS/CPFF	JHU/APL : Laurel, MD	29.088	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Product Development	WR	NUWC : Keyport, WA	0.652	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Product Development	SS/CPFF	DRAPER : Cambridge, MA	10.166	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Product Development	SS/CPFF	LMRMS : Mitchel Field, NY	85.225	0.210	May 2023	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Product Development	C/CPFF	EMCUBE : Alexandria, VA	4.033	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Product Development	SS/CPFF	LMS : Sunnyvale, CA	119.268	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Product Development	SS/CPFF	JRC : Washington, DC	5.832	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Product Development	C/CPFF	GDMS : Pittsfield, MA	159.985	3.026	Oct 2022	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Product Development	WR	CNSW : China Lake, CA	82.243	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Product Development	SS/CPFF	IEC : Anaheim, CA	3.983	1.295	Oct 2022	0.000		0.000		-		0.000	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2025 Navy		Date: March 2024
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603595N / *SSBN New Design*	**Project (Number/Name)** 3220 / *COLUMBIA Class Submarine Development*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2023 Cost	FY 2023 Award Date	FY 2024 Cost	FY 2024 Award Date	FY 2025 Base Cost	FY 2025 Base Award Date	FY 2025 OCO Cost	FY 2025 OCO Award Date	FY 2025 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Product Development	WR	NSWC : Dahlgren, VA	27.876	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Product Development	SS/CPFF	BAE : Rockville, MD	47.435	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Product Development	SS/CPFF	BNA : Huntington Beach, CA	3.217	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Product Development	WR	NSWC Crane : Crane, IN	70.578	3.732	Oct 2022	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Product Development	SS/CPFF	GDEB : Groton, CT	8.737	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Product Development	Various	SSP : Various	19.689	1.401	Jan 2023	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Product Development	SS/CPFF	SPA : Alexandria, VA	12.550	0.547	Mar 2023	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
		Subtotal	3,737.618	227.760		150.929		85.417		-		85.417	Continuing	Continuing	N/A

Remarks

There are no FY23 UK common funds. Other FY23-FY25 updates reflect the approved 2022 cost estimate.

Note: Various is used for multiple activities with different award dates.

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2023 Cost	FY 2023 Award Date	FY 2024 Cost	FY 2024 Award Date	FY 2025 Base Cost	FY 2025 Base Award Date	FY 2025 OCO Cost	FY 2025 OCO Award Date	FY 2025 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Contractor Management Support	C/CPFF	Various : Multiple Awards	171.884	14.049	Nov 2022	14.933	Nov 2023	14.844	Nov 2024	-		14.844	Continuing	Continuing	Continuing
Government Management Support	WR	Various: NSWC : Carderock, MD	96.948	10.110	Oct 2022	12.763	Oct 2023	11.001	Oct 2024	-		11.001	Continuing	Continuing	Continuing
Government Management Support	WR	Various: NSWC : Philadelphia, PA	11.289	1.240	Oct 2022	1.127	Oct 2023	1.120	Oct 2024	-		1.120	0.000	14.776	-
Government Management Support	WR	Various: NUWC : Newport, RI	18.019	2.625	Oct 2022	3.025	Oct 2023	3.007	Oct 2024	-		3.007	0.000	26.676	-
Government Management Support	WR	Various: SUPSHIP : Groton, CT	12.938	4.720	Oct 2022	2.962	Oct 2023	2.944	Oct 2024	-		2.944	0.000	23.564	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2025 Navy		Date: March 2024
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603595N / *SSBN New Design*	**Project (Number/Name)** 3220 / *COLUMBIA Class Submarine Development*

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2023 Cost	FY 2023 Award Date	FY 2024 Cost	FY 2024 Award Date	FY 2025 Base Cost	FY 2025 Base Award Date	FY 2025 OCO Cost	FY 2025 OCO Award Date	FY 2025 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Travel	WR	NAVSEA HQ : Washington, D.C.	3.398	0.000	Oct 2022	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
		Subtotal	314.476	32.744		34.810		32.916		-		32.916	Continuing	Continuing	N/A

Remarks

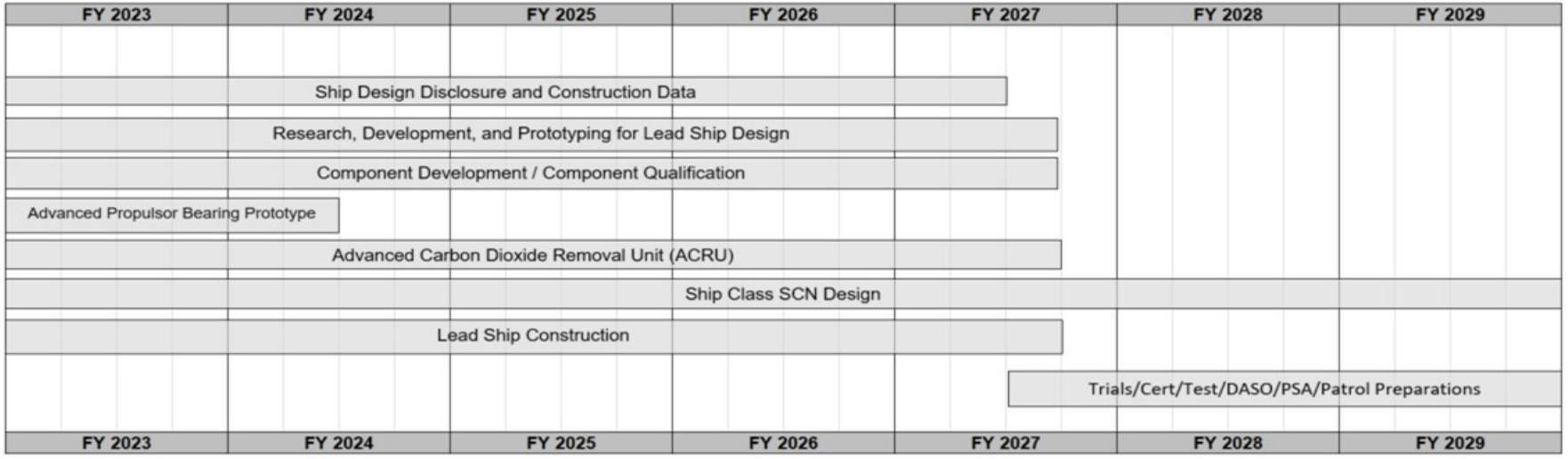
Since Lead ship authorization in 2021, Management Services requirements have been split funded 50/50% RDTE and SCN, with remaining balance funded with SCN full funding. FY23-FY25 match the approved 2022 cost estimate.

	Prior Years	FY 2023		FY 2024		FY 2025 Base		FY 2025 OCO		FY 2025 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	4,052.094	260.504		185.739		118.333		-		118.333	Continuing	Continuing	N/A

Remarks

The listed Award Dates represent the date on which initial obligations occur for the effort.

Exhibit R-4, RDT&E Schedule Profile: PB 2025 Navy		Date: March 2024
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603595N / *SSBN New Design*	**Project (Number/Name)** 3220 / *COLUMBIA Class Submarine Development*



DASO - Demonstration and Shakedown Operation
RDT&E - Research, Development, Test & Evaluation
SCN - Shipbuilding and Conversion, Navy

Exhibit R-4A, RDT&E Schedule Details: PB 2025 Navy		Date: March 2024
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603595N / *SSBN New Design*	**Project (Number/Name)** 3220 / *COLUMBIA Class Submarine Development*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Notes: * Effort began prior to 1st Quarter FY 2023. ** Effort continues past 4th Quarter of noted ending FY				
Ship Design Disclosure and Construction Data*	1	2023	2	2027
Research, Development, and Prototyping for Lead Ship Design*	1	2023	3	2027
Component Development / Component Qualification*	1	2023	3	2027
Advanced Propulsor Bearing Prototype *	1	2023	2	2024
Advanced Carbon Dioxide Removal Unit (ACRU)*	1	2023	3	2027
Ship Class SCN Design*, **	1	2023	4	2029
Lead Ship Construction**	1	2023	3	2027
Trials/Cert/Test/DASO/PSA/Patrol Preparations**	3	2027	4	2029

Exhibit R-2A, RDT&E Project Justification: PB 2025 Navy											Date: March 2024	
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0603595N / *SSBN New Design*				Project (Number/Name) 3440 / *SBSD Obsolescence*			
COST ($ in Millions)	**Prior Years**	**FY 2023**	**FY 2024**	**FY 2025 Base**	**FY 2025 OCO**	**FY 2025 Total**	**FY 2026**	**FY 2027**	**FY 2028**	**FY 2029**	**Cost To Complete**	**Total Cost**
3440: *SBSD Obsolescence*	0.000	19.738	21.655	21.395	-	21.395	21.844	22.218	22.098	22.558	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

Project MDAP/MAIS Code: 444

Note

Project 3440 (SBSD Obsolescence) is a new project in FY23. This project is not a new start but represents continuation of efforts previously executed under project 3220 in FY22 and earlier.

A. Mission Description and Budget Item Justification

This project provides the engineering development and program management effort required to sustain Non-Propulsion Electronic Systems (NPES) outfitting of each ship of the COLUMBIA Class throughout the duration of the 12-ship construction program. Non-recurring engineering activity is required to ensure specification compliant components are available for procurement as fleet common sub-systems, which evolve over the life of the program due to either competitive selection of new suppliers, component obsolescence replacement, increased technical performance, or improvements in reliability. Non-recurring engineering activity is needed to perform platform integration of the components, and software modification to accommodate electronic data exchange, COLUMBIA unique submarine environment qualification, and update of all logistics products.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
Title: Government Furnished/Contractor Furnished NPES Component Technology Refreshment	19.738	21.655	21.395	0.000	21.395
Articles:	-	-	-	-	-
FY 2024 Plans: - Conduct simulation/stimulation equipment validation at the COATS construction test site for all GFE supplied sensors and simulators. - Conduct first of class NPES validation/verification of NPES Ship Systems manual and casualty procedures. - Continue to perform lab based cyber security testing of the lead ship NPES design at COATS. - Conduct find-fix-repair of NPES software defects discovered during COATS testing. - Continue to perform incremental NPES sub-system integration testing with the Strategic Weapons Systems using simulators at vendor site visits.					
FY 2025 Base Plans: - Initiate DOCKSIDE testing and find-fix-repair of software defects. - Initiate 1st of Class NPES/SWS on-hull integration testing.					

Exhibit R-2A, RDT&E Project Justification: PB 2025 Navy		Date: March 2024
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603595N / *SSBN New Design*	**Project (Number/Name)** 3440 / *SBSD Obsolescence*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
- Conduct sub-system level and platform level engineering review of the TI-24 NPES configuration planned for SSBN 827 delivery. ***FY 2025 OCO Plans:*** N/A ***FY 2024 to FY 2025 Increase/Decrease Statement:*** Small decrease represents the net of misc rate adjustments and restoration of total force management and the updated program cost estimate from 2022 capturing updated program estimates.					
Accomplishments/Planned Programs Subtotals	19.738	21.655	21.395	0.000	21.395

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

The COLUMBIA Class Program RDT&E efforts will support the design, construction and operations & support portions of the program. RDT&E efforts will be performed by Navy laboratories, shipyards, private industry, and University Affiliated Research Centers.

Project 3440 funding has been realigned from Project 3220 funding in FY23 and later to mimic the Virginia Class Submarine follow ship cost tracking model.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2025 Navy			Date: March 2024
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603595N / *SSBN New Design*	Project (Number/Name) 3440 / *SBSD Obsolescence*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2023 Cost	FY 2023 Award Date	FY 2024 Cost	FY 2024 Award Date	FY 2025 Base Cost	FY 2025 Base Award Date	FY 2025 OCO Cost	FY 2025 OCO Award Date	FY 2025 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Product Development	SS/CPFF	Lockheed-Martin : Manassas, VA	0.000	5.424	Nov 2022	0.000	Nov 2023	1.559	Nov 2024	-		1.559	Continuing	Continuing	Continuing
Product Development	WR	NUWC : Newport, RI	0.000	3.574	Oct 2022	1.511	Oct 2023	1.651	Oct 2024	-		1.651	Continuing	Continuing	Continuing
Product Development	WR	NSWC : Philadelphia, PA	0.000	1.583	Oct 2022	3.937	Oct 2023	3.549	Oct 2024	-		3.549	Continuing	Continuing	Continuing
Product Development	WR	NUWC : Keyport, WA	0.000	1.120	Oct 2022	2.452	Oct 2023	2.252	Oct 2024	-		2.252	Continuing	Continuing	Continuing
Product Development	WR	NSWC Carderock : Bethesda, MD	0.000	0.517	Oct 2022	2.875	Oct 2023	2.475	Oct 2024	-		2.475	Continuing	Continuing	Continuing
Product Development	SS/CPFF	GDEB : Groton, CT	0.000	3.510	Nov 2022	3.894	Nov 2023	3.177	Nov 2024	-		3.177	Continuing	Continuing	Continuing
Product Development	SS/CPFF	Lockheed-Martin : Syracuse, NY	0.000	0.650	Nov 2022	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Product Development	WR	NIWC LANT : Charleston SC	0.000	0.887	Oct 2022	2.114	Oct 2023	2.114	Oct 2024	-		2.114	Continuing	Continuing	Continuing
Product Development	SS/CPFF	GDMS : Pittsfield, MA	0.000	0.750	Nov 2022	0.058	Nov 2023	0.058	Nov 2024	-		0.058	Continuing	Continuing	Continuing
Product Development	SS/CPFF	GDMS : Fair Lakes, VA	0.000	0.815	Nov 2022	0.000	Nov 2023	0.450	Nov 2024	-		0.450	Continuing	Continuing	Continuing
Product Development	WR	NSWC : Port Hueneme CA	0.000	0.050	Oct 2022	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Product Development	SS/CPFF	Progeny Systems : Manassas, VA	0.000	0.858	Nov 2022	0.417	Nov 2023	0.650	Nov 2024	-		0.650	Continuing	Continuing	Continuing
Product Development	WR	NIWC PAC : San Diego, CA	0.000	0.000		0.407	Oct 2023	0.710	Oct 2024	-		0.710	0.000	1.117	-
Product Development	SS/CPFF	SEDNA, Digital Solutions : Manassas, VA	0.000	0.000		3.990	Nov 2023	2.750	Nov 2024	-		2.750	0.000	6.740	-
		Subtotal	0.000	19.738		21.655		21.395		-		21.395	Continuing	Continuing	N/A

Remarks

All non-recurring engineering development activity is performed using engineering services Contract Line Item Numbers (CLINs) from existing Original Equipment Manufacturer (OEM) contracts, or field activity direct tasking. Funding levels reflect the approved 2022 cost estimate.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2025 Navy			Date: March 2024
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603595N / *SSBN New Design*	Project (Number/Name) 3440 / *SBSD Obsolescence*	

	Prior Years	FY 2023		FY 2024		FY 2025 Base		FY 2025 OCO		FY 2025 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	19.738		21.655		21.395		-		21.395	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2025 Navy		Date: March 2024
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603595N / *SSBN New Design*	**Project (Number/Name)** 3440 / *SBSD Obsolescence*

FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	FY 2029
Monitor all 15 major Non-Propulsion Electronic Systems (NPES) for technology obsolescence issues and formulate mitigation action plans						
Execute component re-design, component qualification, sub-system integration, and platform integration						
FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	FY 2029

Exhibit R-4A, RDT&E Schedule Details: PB 2025 Navy		Date: March 2024
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603595N / *SSBN New Design*	**Project (Number/Name)** 3440 / *SBSD Obsolescence*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 3440				
* Effort began prior to 1st quarter FY 2023. ** Effort continues past 4th Quarter FY 2029.: Monitor all 15 major NPES for technology obsolescence issues and formulate mitigation action plans**	1	2023	4	2029
* Effort began prior to 1st quarter FY 2023. ** Effort continues past 4th Quarter FY 2029.: Execute component re-design, component qualification, sub-system integration, and platform integration**	1	2023	4	2029

Exhibit R-2A, RDT&E Project Justification: PB 2025 Navy											Date: March 2024	
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0603595N / *SSBN New Design*				Project (Number/Name) 3441 / *SBSD Technology Refresh*			
COST ($ in Millions)	**Prior Years**	**FY 2023**	**FY 2024**	**FY 2025 Base**	**FY 2025 OCO**	**FY 2025 Total**	**FY 2026**	**FY 2027**	**FY 2028**	**FY 2029**	**Cost To Complete**	**Total Cost**
3441: *SBSD Technology Refresh*	0.000	45.338	49.682	49.903	-	49.903	50.852	51.799	51.519	52.614	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

Project MDAP/MAIS Code: 444

Note

Project 3441 (SBSD Technology Refresh) is a new project in FY23. This project is not a new start but represents continuation of efforts previously executed under project 3220 in FY22 and earlier.

A. Mission Description and Budget Item Justification

This project encompasses ship system development, coordination, and management efforts for the COLUMBIA Class Submarine Technology Insertion Program and Technology Refresh Program over the life cycle. The purpose of the Technology Insertion Program is to efficiently upgrade performance of all hulls by virtue of improvements in HM&E ship systems. The purpose of the Technology Refresh Program is to develop, coordinate, and manage technical refresh plans for ship systems reliant on Commercial off the Shelf (COTS) technology that have short product life cycles to ensure materiel solutions for obsolescence issues. Additionally, this project will support mitigation of obsolescence issues for HM&E components that are not included in systems that have not historically had a formal Tech Refresh plan. Technology development implementation and logistics for developmental items, and COLUMBIA Class test & evaluation for these items are also included. Testing of components and systems will be used to inform performance predictions for later ships in the class and determine if design changes are needed. Technologies developed in this program will be considered for applicability to the VIRGINIA Program for commonality opportunities. The thrust of these efforts will be to maintain required technical performance and materiel readiness of COLUMBIA SSBNs in order to support the Sea Based Strategic Deterrence (SBSD) mission.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	**FY 2023**	**FY 2024**	**FY 2025 Base**	**FY 2025 OCO**	**FY 2025 Total**
Title: Hull, Mechanical, and Electrical Technical Refresh, Obsolescence Design, and Integration Efforts	28.477	31.577	27.543	0.000	27.543
Articles:	-	-	-	-	-
FY 2024 Plans: - Utilize government organizations, programs and facilities to develop additional qualified sources and, when necessary, redesign components to resolve obsolescence issues for the COLUMBIA Submarine Class. - Encourage and assist industry partners in advanced Diminishing Manufacturing Sources Material Shortages (DMSMS) planning and obsolescence resolution during construction and initial fielding of the COLUMBIA Submarine Class. - Develop Long-term Technology Refresh plans for the Contractor Furnished Equipment (CFE) and Government Furnished Equipment (GFE) HM&E systems to ensure material availability over the life cycle of the COLUMBIA Submarine Class.					

Exhibit R-2A, RDT&E Project Justification: PB 2025 Navy		Date: March 2024
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603595N / *SSBN New Design*	**Project (Number/Name)** 3441 / *SBSD Technology Refresh*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
- Develop long-term Tech Refresh plans CFE and GFE HM&E systems to ensure material availability over the life cycle of the COLUMBIA Submarine Class. ***FY 2025 Base Plans:*** - Continue to develop the supplier base for the COLUMBIA Submarine Class. - Develop additional fidelity of the Technology Refresh plans for the COLUMBIA Submarine Class. - Assist in development of firmware and software life cycle tracking systems for the COLUMBIA Submarine Class. ***FY 2025 OCO Plans:*** N/A ***FY 2024 to FY 2025 Increase/Decrease Statement:*** - Decrease due to updates made in accordance with the 2022 cost estimate.					
Title: Systems Engineering, Test and Evaluation	16.861	18.105	22.360	0.000	22.360
Articles:	-	-	-	-	-
FY 2024 Plans: Systems Engineering, Test and Evaluation Ship Control, Hydrodynamics and Shock - Continue support incorporation of Steady Flight Assist in Ship Control Algorithm. - Support certification of Ship control algorithm with Hardware updates. - Support HMCCS design Certification. - IV&V support for the Columbia Ship control System design and development. - Updated Steering and Diving (Primary and Backup) and Trim and Ballast (ABAT) algorithms (software) to support Ship control Software (SCS) Revision 0.1. - Tasking will begin to pivot to support for SSM development requiring hundreds of simulation runs supporting SSM procedures. - Simulation Support free-running model test prior to FY28 Hydrodynamic Performance Trial (HPT) characterization cycle will be performed. The test will continue to support Characterization of CLB Operational Boundaries. - Characterization of CLB Operational Boundaries will continue. - Support the Large Vehicle Shock Test. Diesel Exhaust					

Exhibit R-2A, RDT&E Project Justification: PB 2025 Navy		Date: March 2024
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603595N / *SSBN New Design*	**Project (Number/Name)** 3441 / *SBSD Technology Refresh*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
- Complete 5000, 3000 and 500 hour durations of Phase III Hot Corrosion Diesel Exhaust and seawater exposure of the down selected material to verify their suitability as the build material for the Diesel Exhaust. - Complete multiple iterations of the Phase III material testing and characterization of the down selected material to verify their suitability as the build material for the Diesel Exhaust. Propulsor and Shafting - Continue modal testing of as built propulsor components and assemblies. - Continue analyzing modal testing data to inform and improve computational models, and update performance predictions. - Continue testing of propulsor bearing first production unit at Full Scale Bearing Test Facility to evaluate performance and generate design feedback. - Continue evaluating the corrosion and fatigue performance of propulsor and shafting components. Signatures - Support GFE System Software Build 2.0 and technology refresh for CLB lead ship via updated design efforts based on lessons learned from Future Naval Capability Demonstration effort and ongoing design evolution. - Support Modeling efforts to improve prediction capabilities and support reviews/assessments of Shipbuilder products by Subject Matter Experts. - Develop updated modeling tools which support near-real time analysis and diagnostics of signature issues identified during final ship construction and/or first of class at-sea demonstration testing. Improved and matured modeling tools can reduce future costs associated with R7D testing of signature issues. - Support GFI Design Updates in accordance with ongoing design evolutions, obsolescence evaluation and improvements, and associated engineering efforts.					
FY 2025 Base Plans: Ship Control, Hydrodynamics and Shock - Support Ship Control System, System Acceptance Testing (SAT). - Provide Final Steering and Diving (primary & backup) and Trim and Ballast (ABAT) algorithms (software) to EB for testing of SCS revision 0.1. - Support crew trainer development at EB, Groton, CT. - IV&V support for the Columbia Ship Control System design and development. - Independent System and Software Safety review support for Columbia Ship Control System design and development. - Continue simulation development focus on refining operational boundaries.					

Exhibit R-2A, RDT&E Project Justification: PB 2025 Navy		Date: March 2024
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603595N / *SSBN New Design*	**Project (Number/Name)** 3441 / *SBSD Technology Refresh*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
- Support for SSM development. Diesel Exhaust - Complete the Phase III material testing and characterization of the down selected material to verify material suitability for the Diesel Exhaust. Complete the testing report and generate the Objective Quality Evidence to support a Material Selection Information submittal for NAVSEA approval. Propulsor and Shafting - Update propulsor shock qualification analysis and design certification efforts based on as produced propulsor components. - Update performance achievability assessments to reflect as-manufactured parts. - Support emergent design requirements during installation of propulsor components at the shipyard. Signatures - Continue to support GFE system tech refresh and integration into lead ship baseline and follow-on hulls based on lessons learned from future naval capability efforts and component acceptance and integration testing. - Continue to enhance modeling tools which support near-real time analysis and diagnostics of signature issues identified during final ship construction and/or first of class at-sea demonstration testing. Improved and matured modeling tools can reduce future costs associated with R&D testing of signature issues. ***FY 2025 OCO Plans:*** N/A ***FY 2024 to FY 2025 Increase/Decrease Statement:*** Increase primarily due to planned shock test in FY25. Funding aligns with the updated program cost estimate from 2022 capturing updated program estimates.					
Accomplishments/Planned Programs Subtotals	45.338	49.682	49.903	0.000	49.903

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

Exhibit R-2A, RDT&E Project Justification: PB 2025 Navy		Date: March 2024
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603595N / *SSBN New Design*	**Project (Number/Name)** 3441 / *SBSD Technology Refresh*

D. Acquisition Strategy

The COLUMBIA Class Program RDT&E efforts will support the design, construction and operations & support portions of the program. RDT&E efforts will be performed by Navy laboratories, shipyards, private industry, and University Affiliated Research Centers.

Project 3441 funding has been realigned from Project 3220 funding in FY23 and later to mimic the Virginia Class Submarine follow ship cost tracking model.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2025 Navy		Date: March 2024
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603595N / *SSBN New Design*	**Project (Number/Name)** 3441 / *SBSD Technology Refresh*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2023 Cost	FY 2023 Award Date	FY 2024 Cost	FY 2024 Award Date	FY 2025 Base Cost	FY 2025 Base Award Date	FY 2025 OCO Cost	FY 2025 OCO Award Date	FY 2025 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Product Development	Various	NSWC Carderock : Bethesda, MD	0.000	6.624	Oct 2022	9.662	Oct 2023	14.628	Oct 2024	-		14.628	Continuing	Continuing	Continuing
Product Development	Various	JHU/APL : Laurel, MD	0.000	0.645	Oct 2022	0.250	Oct 2023	0.250	Oct 2024	-		0.250	Continuing	Continuing	Continuing
Product Development	Various	NRL : Washington, DC	0.000	3.494	Nov 2022	3.534	Nov 2023	3.028	Nov 2024	-		3.028	Continuing	Continuing	Continuing
Product Development	TBD	GDEB : Groton, CT	0.000	10.291	Nov 2022	12.758	Nov 2023	7.711	Nov 2024	-		7.711	Continuing	Continuing	Continuing
Product Development	Various	NSWC : Philadelphia, PA	0.000	3.884	Oct 2022	1.853	Oct 2023	1.652	Oct 2024	-		1.652	Continuing	Continuing	Continuing
Product Development	Various	ARL PSU : State College, PA	0.000	2.215	Nov 2022	2.805	Nov 2023	3.050	Nov 2024	-		3.050	Continuing	Continuing	Continuing
Product Development	Various	GSA : Washington, DC	0.000	12.720	Oct 2022	12.925	Oct 2023	12.679	Oct 2024	-		12.679	0.000	38.324	-
Product Development	Various	NUWC : Newport, RI	0.000	5.465	Oct 2022	5.895	Oct 2023	6.905	Oct 2024	-		6.905	0.000	18.265	-
		Subtotal	0.000	45.338		49.682		49.903		-		49.903	Continuing	Continuing	N/A

Remarks

The listed Award Dates represent the date on which initial obligations occur for the effort. Funding levels reflect the approved 2022 cost estimate and updated inflation/rates values.

	Prior Years	FY 2023		FY 2024		FY 2025 Base		FY 2025 OCO		FY 2025 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	45.338		49.682		49.903		-		49.903	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2025 Navy		Date: March 2024
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603595N / *SSBN New Design*	**Project (Number/Name)** 3441 / *SBSD Technology Refresh*

Exhibit R-4A, RDT&E Schedule Details: PB 2025 Navy		Date: March 2024
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603595N / *SSBN New Design*	**Project (Number/Name)** 3441 / *SBSD Technology Refresh*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 3441				
* Effort began prior to 1st quarter FY 2023. ** Effort continues past 4th Quarter of noted ending FY.: Hydrodynamics**	1	2023	4	2029
* Effort began prior to 1st quarter FY 2023. ** Effort continues past 4th Quarter of noted ending FY.: Ship Control **	1	2023	4	2029
* Effort began prior to 1st quarter FY 2023. ** Effort continues past 4th Quarter of noted ending FY.: Signatures**	1	2024	4	2029
* Effort began prior to 1st quarter FY 2023. ** Effort continues past 4th Quarter of noted ending FY.: Diesel Exhaust	1	2023	4	2025
* Effort began prior to 1st quarter FY 2023. ** Effort continues past 4th Quarter of noted ending FY.: Propulsor and Shafting**	1	2023	4	2029
* Effort began prior to 1st quarter FY 2023. ** Effort continues past 4th Quarter of noted ending FY.: Shock Testing	2	2023	4	2026
* Effort began prior to 1st quarter FY 2023. ** Effort continues past 4th Quarter of noted ending FY.: GFI Design Upgrades**	1	2023	4	2029
* Effort began prior to 1st quarter FY 2023. ** Effort continues past 4th Quarter of noted ending FY.: Monitor, redesign, and qualify CFE and GFE for HM&E components to mitigate obsolescence issue	1	2023	4	2027
* Effort began prior to 1st quarter FY 2023. ** Effort continues past 4th Quarter of noted ending FY.: Develop and implement tech refresh plans for 20 CFE and GFE HM&E systems	1	2023	4	2027

Exhibit R-2A, RDT&E Project Justification: PB 2025 Navy											Date: March 2024	
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0603595N / *SSBN New Design*				Project (Number/Name) 9999 / *Congressional Adds*			
COST ($ in Millions)	**Prior Years**	**FY 2023**	**FY 2024**	**FY 2025 Base**	**FY 2025 OCO**	**FY 2025 Total**	**FY 2026**	**FY 2027**	**FY 2028**	**FY 2029**	**Cost To Complete**	**Total Cost**
9999: *Congressional Adds*	14.471	8.681	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	23.152
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Congressional Add supports the continued development of COLUMBIA Class Submarines composite materials.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2023	FY 2024
Congressional Add: Rapid composites for wet submarine application	8.681	0.000
FY 2023 Accomplishments: Continued manufacturing process development and demonstration of composite materials for submarine propulsor and shafting components at large scale and full scale.		
FY 2024 Plans: Continue manufacturing process development and demonstration of composite materials for submarine propulsor and shafting components at large scale and full scale.		
Congressional Adds Subtotals	8.681	0.000

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2025 Navy		Date: March 2024
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603595N / *SSBN New Design*	**Project (Number/Name)** 9999 / *Congressional Adds*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2023 Cost	FY 2023 Award Date	FY 2024 Cost	FY 2024 Award Date	FY 2025 Base Cost	FY 2025 Base Award Date	FY 2025 OCO Cost	FY 2025 OCO Award Date	FY 2025 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Product Development	SS/CPFF	Seeman Composites : Gulfport, MS	4.148	0.000		0.000		0.000		-		0.000	0.000	4.148	-
Product Development	SS/CPFF	Seeman Comp. : Gulfport, MS	1.640	0.000		0.000		0.000		-		0.000	0.000	1.640	-
Product Development	WR	NSWC/Carderock : Carderock, MD	3.859	8.681	Sep 2023	0.000		0.000		-		0.000	0.000	12.540	-
Product Development	C/FFP	Beast Code : Fort Walton Beach, FL	4.824	0.000		0.000		0.000		-		0.000	0.000	4.824	-
		Subtotal	14.471	8.681		0.000		0.000		-		0.000	0.000	23.152	N/A

Remarks

The listed Award Dates represent the date on which initial obligations occur for the effort.

	Prior Years	FY 2023 Cost	FY 2023 Award Date	FY 2024 Cost	FY 2024 Award Date	FY 2025 Base Cost	FY 2025 Base Award Date	FY 2025 OCO Cost	FY 2025 OCO Award Date	FY 2025 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	14.471	8.681		0.000		0.000		-		0.000	0.000	23.152	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2025 Navy		Date: March 2024
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603595N / *SSBN New Design*	**Project (Number/Name)** 9999 / *Congressional Adds*

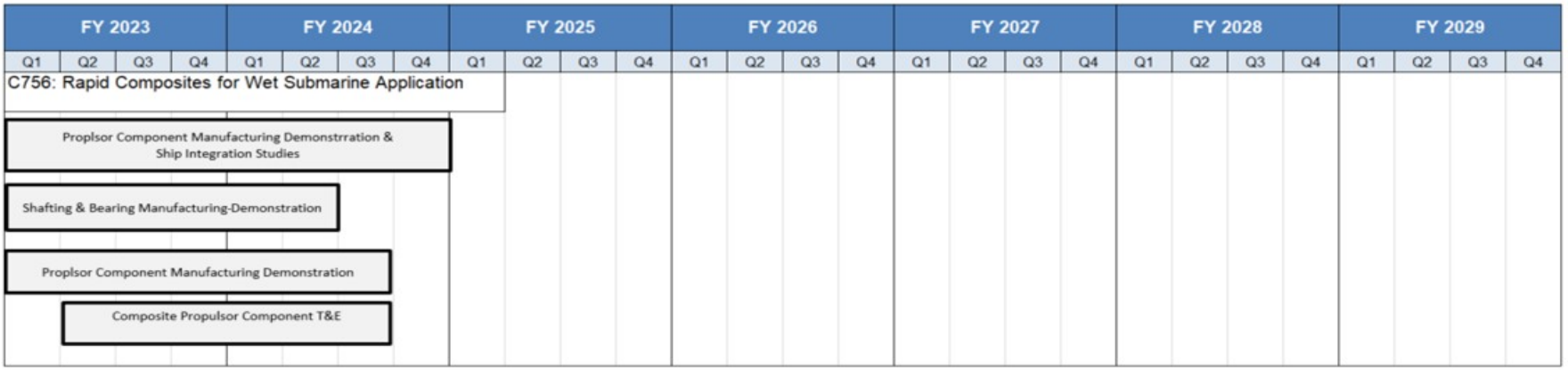


Exhibit R-4A, RDT&E Schedule Details: PB 2025 Navy		Date: March 2024
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603595N / *SSBN New Design*	**Project (Number/Name)** 9999 / *Congressional Adds*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 9999				
C756: Rapid Composites for Wet Submarine Application: Propulsor Component Manufacturing Demonstration and Ship Integration Studies*	1	2023	4	2024
C756: Rapid Composites for Wet Submarine Application: Shafting and Bearing Manufacturing Demonstration*	1	2023	2	2024
C756: Rapid Composites for Wet Submarine Application: Propulsor Component Manufacturing Demonstration*	1	2023	3	2024
C756: Rapid Composites for Wet Submarine Application: Composite Propulsor Component Test and Evaluation	2	2023	3	2024