Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Navy											Date: February 2020	
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 2019**	**FY 2020**	**FY 2021 Base**	**FY 2021 OCO**	**FY 2021 Total**	**FY 2022**	**FY 2023**	**FY 2024**	**FY 2025**	**Cost To Complete**	**Total Cost**
Total Program Element	3,201.375	528.146	427.051	317.196	-	317.196	195.821	170.854	185.995	187.941	Continuing	Continuing
3220: *COLUMBIA Class Submarine Development*	3,177.248	501.133	419.051	317.196	-	317.196	195.821	103.802	117.601	118.179	Continuing	Continuing
3440: *SBSD Obsolescence*	0.000	0.000	0.000	0.000	-	0.000	0.000	20.281	20.687	21.101	Continuing	Continuing
3441: *SBSD Technology Refresh*	0.000	0.000	0.000	0.000	-	0.000	0.000	46.771	47.707	48.661	Continuing	Continuing
9999: *Congressional Adds*	24.127	27.013	8.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	59.140

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 SSBN New Design project, the COLUMBIA Class is to design and prepare for construction of 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 combat system 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 the Advanced Materials Propeller Program, Materials for Submarine Propulsor Applications and Naval Propulsion Foundry Center Facility Power Upgrades.

Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Navy	Date: February 2020
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 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Previous President's Budget	542.846	419.051	313.582	-	313.582
Current President's Budget	528.146	427.051	317.196	-	317.196
Total Adjustments	-14.700	8.000	3.614	-	3.614
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	8.000			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-14.700	0.000			
• Rate/Misc Adjustments	0.000	0.000	3.614	-	3.614

Congressional Add Details ($ in Millions, and Includes General Reductions)	FY 2019	FY 2020
Project: 9999: *Congressional Adds*		
Congressional Add: *Advanced Materials Propeller Program*	14.471	0.000
Congressional Add: *Naval Propulsion Foundry Center Facility Power Upgrades*	12.542	0.000
Congressional Add: *Materials for submarine propulsor applications*	0.000	8.000
Congressional Add Subtotals for Project: 9999	27.013	8.000
Congressional Add Totals for all Projects	27.013	8.000

Change Summary Explanation

The FY 2021 funding request was increased by +3.614M for rate/misc adjustments.

Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy			Date: February 2020
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603595N / *SSBN New Design*	Project (Number/Name) 3220 / *COLUMBIA Class Submarine Development*	

COST ($ in Millions)	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
3220: *COLUMBIA Class Submarine Development*	3,177.248	501.133	419.051	317.196	-	317.196	195.821	103.802	117.601	118.179	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

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.

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 start in FY 2021 along with continued development efforts for the class. In support of award for the COLUMBIA Build I modification (SSBN 826, SSBN 827, and associated design/support efforts) planned for FY2020, the Navy and Electric Boat reached a signed settlement framework on 20 December 2019. This will be a modification under the existing IPPD contract (N00024-17-C-2117). Award of the modification (as an option for the two hulls) is targeted for 3QFY2020 (baseline was October 2020). This in in line with the program's approved Acquisition Strategy. The program will request authorization of SSBN 826 in FY21, funded with three years of incremental funding in FY21-23, and 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.

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.

Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603595N / *SSBN New Design*	**Project (Number/Name)** 3220 / *COLUMBIA Class Submarine Development*

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, with a planned completion in 2019. 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 pre-construction 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 will address 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 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Title: Common Missile Compartment Design and Prototyping, and Whole Ship Design	156.744	143.080	126.464	0.000	126.464
Articles:	-	-	-	-	-
FY 2020 Plans: The combination of CMC Design and Prototyping with Whole Ship Study and Design represents the required LDY Shipbuilder design effort for the COLUMBIA Program. CMC Design and Prototyping: This funding applies to the design, systems engineering, prototyping, and vendor qualification activities needed to execute the schedule for CMC design and component / technology development for the COLUMBIA submarine. Included in this effort is continued development of CMC design products. Specific planned efforts in FY 2020 include: - The completion of all CMC Design Disclosures (approximately 1059 design disclosures) in support of the MTM build - Formal start of Lead Ship Construction in October 2020 which includes continued fabrication of MTs, manufacture of the MTM and delivery, and integration and test of SWSS systems for the land based test facility					

Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603595N / *SSBN New Design*	**Project (Number/Name)** 3220 / *COLUMBIA Class Submarine Development*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
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. Specific efforts in FY 2020 include: - The completion of all Arrangements (approximately 4086 arrangements including CMC arrangement) - 83 percent of total Design Disclosures (approximately 3904 design disclosures including CMC design disclosures) - Approximately 16 percent of logistics products (approximately 1575 logistics products including CMC products) Lead Ship Construction efforts commence in October 2020. Efforts will also continue towards integration of all CMC systems and interfaces with Rest of Ship and progressing ship integration of the Propulsor design. ***FY 2021 Base Plans:*** The combination of CMC Design and Prototyping with Whole Ship Study and Design represents the required LDY Shipbuilder design effort for the COLUMBIA Program. CMC Design and Prototyping: This funding applies to the design, systems engineering, prototyping construction, and vendor qualification activities needed required to execute the schedule for CMC construction schedule, design and component and/ technology development for the COLUMBIA submarine. Included in this effort is continued development of CMC design products and associated engineering/management efforts. Specific planned construction efforts for FY 2021 includes continued fabrication of Missile Tubes, Strategic Weapons Support System (SWSS) kits and continued construction of the Missile Tube Module (MTM). 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. - Specific efforts in FY2021 include: - About 95 percent of total Design Disclosures (approximately 4470 design disclosures including CMC design disclosures) - Approximately 30 percent of logistics products (approximately 2950 logistics products including CMC products)					

Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603595N / *SSBN New Design*	**Project (Number/Name)** 3220 / *COLUMBIA Class Submarine Development*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
- Planned construction effort in FY2021 includes construction efforts on all Super Modules (1, 2, 3, 4, 5, and 6) ***FY 2021 OCO Plans:*** N/A ***FY 2020 to FY 2021 Increase/Decrease Statement:*** Funding levels decreased as efforts continued shift to Detailed Design and construction efforts as engineering and component development efforts ramp down and are incorporated into the SCN-funded detail design (Plans).					
Title: NAVSEA R&D and Prototyping	169.323	158.808	128.422	0.000	128.422
Articles:	-	-	-	-	-
FY 2020 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 2020 include: Combat Systems: - Complete revisions to any Government Furnished Information (GFI) required to support construction and continue to deliver remaining GFI - Execute non-recurring engineering development activities required for COLUMBIA unique combat system components - Complete AN/BRR-6 reliability based engineering changes and conduct AN/BST-1 reliability engineering changes, qualification, and testing - Fabricate developmental Structurally Integrated Enclosures for combat systems vendor sites - Continue early environmental qualification testing of Government Furnished Equipment Component Development: - Continue Government support and oversight of development of the approximately 84 remaining of 101 remaining engineered components - Support diesel generator integration testing at compatibility test facility - Complete critical qualification testing for the air conditioning unit and commence COLUMBIA production unit build - Refurbish Advanced Carbon Dioxide Removal Unit (ACRU) following qualification testing and deliver to Naval Surface Warfare Center for reliability testing					

Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603595N / *SSBN New Design*	**Project (Number/Name)** 3220 / *COLUMBIA Class Submarine Development*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
- Support ACRU OPALT installation - Award ACRU production contract - Continue development and qualification of additive manufacturing processes for various components to meet performance requirements while reducing cost and schedule Propulsor and Shafting: - Complete down-select for the rotating portion of the propulsor after completing LSV testing and associated analysis - Begin reconfiguration of the Full Scale Bearing Test Facility (FSBTF) and installation of a propulsor bearing engineering demonstration model - Complete equipment installation and acceptance at the Naval Foundry and Propeller (NFPC) Shock, Structures and Composites: - Complete analysis of combined shock and submergence test results and full-scale design assessments - Continue assessment of which components require Large Vehicle Shock Testing for qualification - Continue fabrication of the forward pressure hull confirmation model - Complete fabrication of mold for Out of Autoclave bow dome - Continue navigation sonar system window fabrication - Complete development of composites inspection and maintenance procedures, criteria and evaluation methods Signatures: - Continue evaluation of data from PIKE model testing with stern section and update modeling tools as appropriate - Complete confirmation testing of the forward area design on DOLLY VARDEN and continue analysis of data - Update whole-boat signature predictions using updated modeling and predictive tools - Support Shipbuilder qualification testing of machinery components and devices Maneuvering, Ship Control and Hydrodynamic: - Continue developing CLB Submerged Operating Envelope by characterization of near-surface behavior for various sea states - Conduct Free Running Model hydrodynamic testing					
FY 2021 Base Plans:					

Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603595N / *SSBN New Design*	**Project (Number/Name)** 3220 / *COLUMBIA Class Submarine Development*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
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 2021 include: Combat Systems: - Initiate development of TI-24 Government Furnished Information in support of detailed design, production, and manufacturing integration - Continue AN/BST-1 reliability based engineering changes, qualification, and testing - Complete early environmental qualification testing of Government Furnished Equipment - Deliver developmental Structurally Integrated Enclosures to combat system vendor sites - Execute shock, explodable volume, HEMP, and early integration testing of components Component Development: - Continue Government support and oversight of development of the approximately 50 remaining out of 101 total engineered components - Complete shock and vibration testing of the diesel generator and commence COLUMBIA production unit build - Complete qualification testing for the air conditioning unit and complete COLUMBIA production unit build - Begin production of lead ship ACRU - Continue at-sea operational assessment of ACRU Propulsor and Shafting: - Complete reconfiguration of the Full Scale Bearing Test Facility with the installation of a propulsor bearing engineering demonstration model and commence testing - Complete documentation associated with lead ship propulsor down-selection Shock, Structures and Composites: - Begin procurements, planning and preparations for a large vehicle shock test series - Continue fabrication and begin instrumentation of the forward pressure hull confirmation model - Complete fabrication of Out of Autoclave bow dome and associated inspections - Continue navigation sonar system window fabrication Signatures: - Update whole-boat signature predictions using updated modeling and predictive tools					

Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603595N / *SSBN New Design*	**Project (Number/Name)** 3220 / *COLUMBIA Class Submarine Development*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
- Perform assessments on the impact of shipbuilder design/construction changes on performance - Provide test support, modeling updates and assessments for shipbuilder system development, component development and qualification testing Maneuvering, Ship Control and Hydrodynamic: - Continue developing CLB Submerged Operating Envelope by characterization of near-surface behavior for various sea states - Continue Free Running Model hydrodynamic testing - Continue maneuvering capability studies - Continue Hovering Missile Compensation Control System development - Continue Ship Control System development ***FY 2021 OCO Plans:*** N/A ***FY 2020 to FY 2021 Increase/Decrease Statement:*** Funding levels decreased as government engineering and component development efforts ramp down and are incorporated into the SCN-funded detail design (Plans).					
Title: Systems Engineering/Program Management	59.342	61.865	35.395	0.000	35.395
Articles:	-	-	-	-	-
FY 2020 Plans: Continue Program Management and System Engineering activities including: - Program Office will continue efforts to manage, coordinate, and oversee all efforts of the program including shipbuilder and government activities - Early Strategic Program System Integration into NPES Systems - Continue efforts on the COLUMBIA Electronics Integration Plan to support shore side Command and Control integration and test, and execution of integration risk mitigations as identified by the Integration Working Group (IWG) - The COLUMBIA LFT&E program will conduct COTS fragility testing of Sonar, Combat, and Imaging (and potentially SWS) components on the DSSM at NSWC Philadelphia - Procure Strategic Weapons System components in support of fragility testing in late FY 2021 or early FY 2022 - Test the COLUMBIA Class Shock Isolated Deck high capacity mounts (HCMs) and Fluid Viscous Dampers (FVDs) to determine the level of shock at which they fail					

Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603595N / *SSBN New Design*	**Project (Number/Name)** 3220 / *COLUMBIA Class Submarine Development*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
- Maturation of COLUMBIA survivability M&S and reporting of developmental test results will continue at NUWC Newport to support Commander Operational Test & Evaluation Force (COMOPTEVFOR) accreditation before Initial Operational Test and Evaluation (IOT&E) in FY 2028 - Continue multi-year Gap Analysis Industrial Utilization Study (GAIUS) to determine CLB unique maintenance facility requirements for Trident Refit Facilities - Continue non-MILCON studies and preparations at affected shore facilities - Conduct Cybersecurity EDT events on Submarine Warfare Federated Tactical Systems (SWFTS) components not assessed in prior years and to assess Technology Insertion and Advanced Processer Build (TI/APB) fixes from the 2017 and 2018 Cybersecurity EDT events - Report on results of developmental testing conducted to DD(DTE&P) in accordance with the TEMP					
FY 2021 Base Plans: Program Office will continue efforts to manage, coordinate, and oversee all efforts of the program including shipbuilder and government activities - Conduct SWS fragility testing at NSWC Philadelphia - Execute the COLUMBIA Survivability M&S execution plan at NUWC with the objective of assuring that the suite will support accreditation by COMOPTEVFOR before Initial Operational Test and Evaluation in FY2028 - Test the COLUMBIA Class Shock Isolated Deck high capacity mounts and fluid viscous dampers as part of the COLUMBIA LFT&E program - Complete and validate the USS COLUMBIA (SSBN 826) Program Validated Online Lifecycle Threat (VOLT) report - Complete the Joint COLUMBIA Class and VIRGINIA Class SWFTS TI-16 Cybersecurity Early Developmental Test (EDT) 18-1 test event by the National Cyber Range (NCR) and the NAVSEA Red Team - The COLUMBIA Class Program Office will continue to report on results of developmental testing being conducted to DD(DT&E) in accordance with the TEMP - Conduct Cyber Risk assessments to support continual cyber security development - The NPES division will manage and coordinate government laboratories and sub-system Participating Area Managers (PARMs) to begin detailed design of the SSBN827 TI-24 NPES configuration - Conduct efforts to validate that the design of the TI-24 COATS configuration can be retrofit on lead ship during PSA with acceptable risk - Early Strategic Program System Integration into NPES Systems - Continue multi-year GAIUS to determine CLB unique maintenance facility requirements for Trident Refit Facilities					

Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603595N / *SSBN New Design*	**Project (Number/Name)** 3220 / *COLUMBIA Class Submarine Development*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
- Continue non-MILCON studies and preparations at affected shore facilities, such as Utility and Mooring assessments - Receive stakeholder concurrence on maintenance product development processes, including roles and responsibilities ultimately resulting in an approved Class Maintenance Plan to support Lead Ship Delivery - Maintenance of COLUMBIA Electronics Integration Plan to support shore side Command and Control integration and test, and execution of integration risks as identified by the Integration Working Group (IWG) ***FY 2021 OCO Plans:*** N/A ***FY 2020 to FY 2021 Increase/Decrease Statement:*** Funding levels in RDTE decrease as Program Management and oversight of the design and construction begins to shift to into the SCN-funded Plans line.					
Title: Strategic Weapons System Integration	115.724	55.298	26.915	0.000	26.915
Articles:	-	-	-	-	-
FY 2020 Plans: - Continue system engineering efforts required for the re-hosting and integration of the TRIDENT II (D5) SWS on the COLUMBIA submarine including review, modification and update of SWS Coordination, Interface and Arrangement Drawings for SWS equipment within the CMC and performing associated Logistic Support activities - Complete the launcher qualification report - Continue utilization of the SWS Fire Control and Navigation Engineering Test Systems within the land-based test berths / facilities for SWS Subsystem hardware and software integration, verification and validation - Continue development of special test vehicles - Complete installation of the COLUMBIA Launch Tube at SWS Ashore and achieve COLUMBIA configuration Initial Operating Capability (IOC) - Commence Strategic Weapon Support Systems (SWSS) Verification and Validation (V&V) testing at SWS Ashore - Commence proofing of Shipyard Installation Test Program (SITP) Test Procedures at SWSA - Conduct SWS Training System-level CDR involving both the SWS Fire Control and Navigation Subsystems - Conduct Strategic Weapon Training System (SWTS) Preliminary Design Review (PDR) - Deliver a Guidance Handling Cart prototype to SWS Ashore - Conduct Production Readiness Reviews for SWS Launcher, Fire Control and Guidance Subsystems					

Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy		Date: February 2020
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B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
- Conduct Navigation Software Qualification Test, Pre-Production performance testing and Navigation Trainer Production Readiness Review - Deliver Reentry Body Simulator Assemblies - Continue efforts of the Integration Working Group for the integration of NPES with the SWS ***FY 2021 Base Plans:*** - Continue system engineering efforts required for the re-hosting and integration of the TRIDENT II (D5) SWS on the COLUMBIA submarine including review, modification and update of SWS Coordination, Interface and Arrangement Drawings for SWS equipment within the CMC and performing associated Logistic Support activities - Continue utilization of the SWS Fire Control Engineering Test Systems within the land-based test berths / facilities for SWS Subsystem hardware and software integration, verification and validation - Conduct Fire Control System / SWSS Regression Testing - Complete development of and conduct verification testing of special test vehicles - Continue Strategic Weapon Support Systems (SWSS) Verification and Validation (V&V) testing at SWS Ashore - Continue proofing of Shipyard Installation Test Program (SITP) Test Procedures at SWSA - Conduct Strategic Weapon Training System (SWTS) Critical Design Review (CDR) - Continue efforts of the Integration Working group for the integration of NPES with the SWS ***FY 2021 OCO Plans:*** N/A ***FY 2020 to FY 2021 Increase/Decrease Statement:*** Funding levels decreased as SWS Integration efforts ramp down and are incorporated into the SCN-funded detail design (Plans).					
Accomplishments/Planned Programs Subtotals	501.133	419.051	317.196	0.000	317.196

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
• RDTEN/0603570N/3219: *SBSD Nuclear Technology Development*	190.100	114.006	80.085	-	80.085	60.142	56.841	54.400	44.385	Continuing	Continuing
• RDTEN/0101221N/0951: *Joint Warhead Fuze Sustainment Program*	61.612	23.226	17.330	-	17.330	6.872	3.091	0.000	0.000	0.000	722.664

Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy		Date: February 2020
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C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
• OPN/5358: *Strategic Missile Systems Equip*	253.579	258.933	258.910	-	258.910	272.865	271.139	263.819	269.083	0.000	2,917.401
• WPN/1250: *TRIDENT II Mods*	1,048.011	1,165.736	1,173.837	-	1,173.837	1,159.348	1,187.041	1,247.575	1,291.194	2,176.384	19,011.964
• OMN/1D2D: *Fleet Ballistic Missile*	1,357.232	1,418.436	1,428.102	-	1,428.102	1,474.696	1,528.487	1,571.917	1,606.044	0.000	10,384.914
• SCN/1045: *COLUMBIA Class Submarine*	3,173.400	1,820.927	4,014.650	-	4,014.650	3,996.677	4,150.151	5,204.052	6,107.939	85,685.907	115,788.666
• MCN/32414106: *Submarine Propulsor Manufacturing Support Facility*	71.050	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	71.050
• MCN/64482044: *MCON Design*	114.476	233.220	85.747	10.790	96.537	98.201	80.502	86.809	86.429	0.000	796.174
• MCN/42237676: *TRIDENT Training Facility Phase I*	0.000	0.000	0.000	-	0.000	0.000	53.100	0.000	0.000	0.000	53.100
• MCN/42237684: *TRIDENT Refit Facility*	0.000	0.000	0.000	-	0.000	0.000	0.000	0.000	26.700	0.000	26.700

Remarks

D. Acquisition Strategy

The Common Missile Compartment (CMC) is 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 2021 Navy		Date: February 2020
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 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Product Development	SS/CPFF	Ship Design Contractor-EB : Groton, CT	1,447.732	156.744	Oct 2018	143.080	Oct 2019	126.464	Oct 2020	-		126.464	Continuing	Continuing	Continuing
Product Development	WR	NSWC : Carderock, MD	484.468	72.115	Oct 2018	59.196	Oct 2019	37.461	Oct 2020	-		37.461	Continuing	Continuing	Continuing
Product Development	WR	NSWC : Philadelphia, PA	58.933	18.250	Oct 2018	19.577	Oct 2019	16.207	Oct 2020	-		16.207	Continuing	Continuing	Continuing
Product Development	WR	NUWC : Newport, RI	79.093	26.182	Oct 2018	36.263	Oct 2019	39.309	Oct 2020	-		39.309	Continuing	Continuing	Continuing
Product Development	Various	NAVSEA : Various	189.772	52.776	Oct 2018	43.772	Oct 2019	35.445	Oct 2020	-		35.445	Continuing	Continuing	Continuing
Product Development	SS/CPFF	ARL Penn State University : State College, PA	2.261	0.950	Oct 2018	0.600	Oct 2019	0.000		-		0.000	Continuing	Continuing	Continuing
Product Development	SS/CPFF	NGMS : Sunnyvale, CA	171.788	22.109	Oct 2018	3.860	Oct 2019	0.014	Oct 2020	-		0.014	Continuing	Continuing	Continuing
Product Development	SS/CPFF	JHU/APL : Laurel, MD	20.096	5.310	Jan 2019	2.765	Nov 2019	1.507	Nov 2020	-		1.507	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	9.938	0.228	Oct 2018	0.074	Oct 2019	0.000		-		0.000	Continuing	Continuing	Continuing
Product Development	SS/CPFF	LMRMS : Mitchel Field, NY	71.379	8.436	Oct 2018	4.442	Oct 2019	0.020	Oct 2020	-		0.020	Continuing	Continuing	Continuing
Product Development	C/CPFF	EMCUBE : Alexandria, VA	3.199	0.587	Oct 2018	0.247	Oct 2019	0.589	Oct 2020	-		0.589	Continuing	Continuing	Continuing
Product Development	SS/CPFF	LMS : Sunnyvale, CA	95.302	15.954	Feb 2019	6.186	Oct 2019	1.913	Oct 2020	-		1.913	Continuing	Continuing	Continuing
Product Development	SS/CPFF	JRC : Washington, DC	3.517	1.176	Oct 2018	1.139	Oct 2019	0.000		-		0.000	Continuing	Continuing	Continuing
Product Development	C/CPFF	GDMS : Pittsfield, MA	128.181	20.779	Nov 2018	5.412	Oct 2019	9.911	Oct 2020	-		9.911	Continuing	Continuing	Continuing
Product Development	WR	CNSW : China Lake, CA	69.701	12.542	Nov 2018	8.085	Oct 2019	0.000		-		0.000	Continuing	Continuing	Continuing
Product Development	SS/CPFF	IEC : Anaheim, CA	3.319	0.384	Oct 2018	0.107	Oct 2019	0.000		-		0.000	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 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 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Product Development	WR	NSWC : Dahlgren, VA	20.694	7.182	Oct 2018	5.159	Oct 2019	0.000		-		0.000	Continuing	Continuing	Continuing
Product Development	SS/CPFF	BAE : Rockville, MD	36.740	6.316	Oct 2018	3.223	Oct 2019	4.529	Oct 2020	-		4.529	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	54.113	7.491	Nov 2018	7.914	Nov 2019	6.308	Nov 2020	-		6.308	Continuing	Continuing	Continuing
Product Development	SS/CPFF	GDEB : Groton, CT	4.670	2.723	Oct 2018	0.769	Oct 2019	0.189	Oct 2020	-		0.189	Continuing	Continuing	Continuing
Product Development	Various	SSP : Various	15.346	1.869	Oct 2018	4.325	Oct 2019	1.935	Oct 2020	-		1.935	Continuing	Continuing	Continuing
Product Development	SS/CPFF	SPA : Alexandria, VA	9.871	1.688	Oct 2018	0.991	Oct 2019	0.000		-		0.000	Continuing	Continuing	Continuing
		Subtotal	2,983.982	441.791		357.186		281.801		-		281.801	Continuing	Continuing	N/A

Remarks

The funding values in FY19 and FY20 was adjusted from the FY 2020 President's Budget request values in order to reflect execution actuals in FY19 and to properly align the execution of funding for FY20 within Product Development. The overall funding requirement has not increased and there is no cost growth. FY20 amounts for GDMS and BAE do not reflect the application of United Kingdom (UK) Common R&D funding for Common Missile Compartment (CMC) non-recurring engineering (NRE) efforts, which aligns with the approved UK funding profile, noted in the SAR report. UK funding accounts for 53% of SSP SWS CMC NRE efforts in FY20 and 22% in FY21.
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 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Contractor Management Support	C/CPFF	Various : Multiple Awards	102.925	34.145	Nov 2018	34.814	Nov 2019	17.750	Nov 2020	-		17.750	Continuing	Continuing	Continuing
Government Management Support	WR	Various: NSWC : Carderock, MD	68.049	14.350	Oct 2018	14.549	Oct 2019	9.295	Oct 2020	-		9.295	Continuing	Continuing	Continuing
Government Management Support	WR	Various: NSWC : Philadelphia, PA	6.529	2.415	Oct 2018	2.345	Oct 2019	1.802	Oct 2020	-		1.802	0.000	13.091	-
Government Management Support	WR	Various: NUWC : Newport, RI	10.143	3.947	Oct 2018	3.929	Oct 2019	2.673	Oct 2020	-		2.673	0.000	20.692	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 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 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Government Management Support	WR	Vairous: SUPSHIP : Groton, CT	3.514	3.845	Oct 2018	5.576	Oct 2019	3.375	Oct 2020	-		3.375	0.000	16.310	-
Travel	WR	NAVSEA HQ : Washington, D.C.	2.106	0.640	Nov 2018	0.652	Nov 2019	0.500	Nov 2020	-		0.500	Continuing	Continuing	Continuing
		Subtotal	193.266	59.342		61.865		35.395		-		35.395	Continuing	Continuing	N/A

Remarks

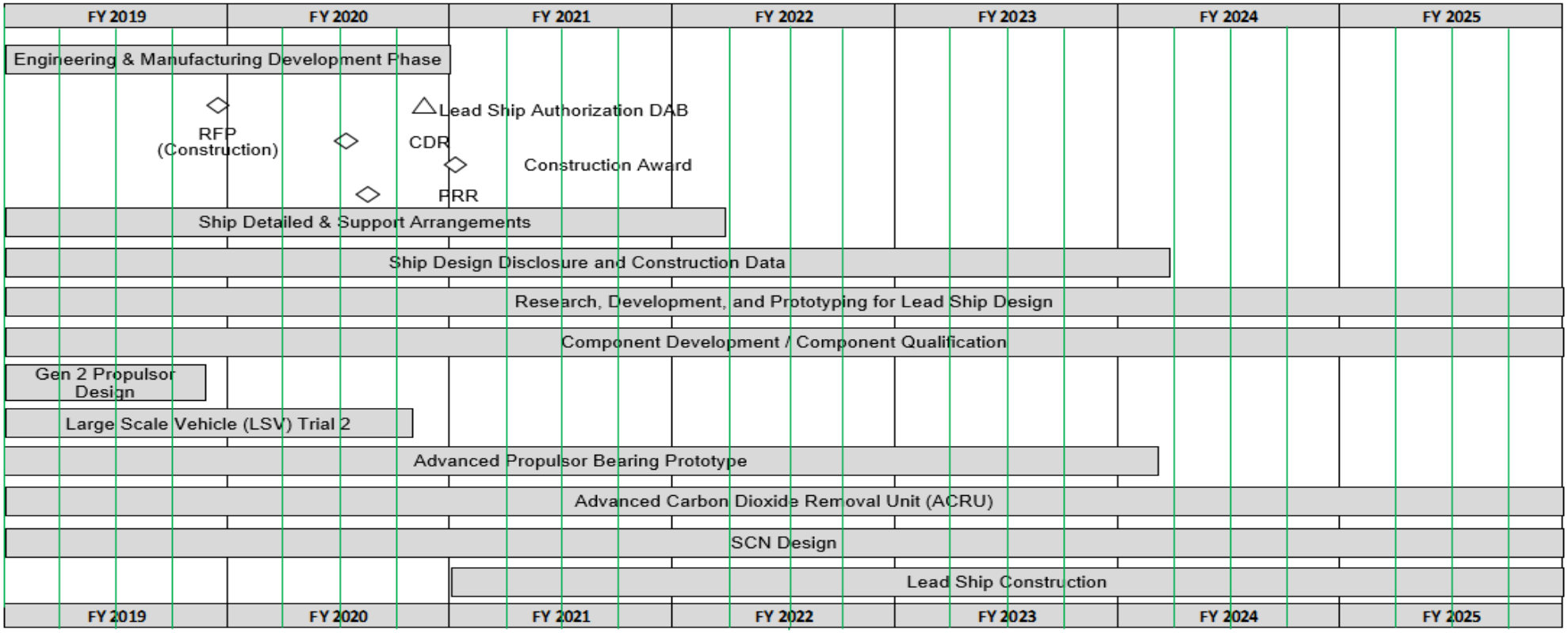
The funding values in FY19 and FY20 was adjusted from the FY 2020 President's Budget request values in order to reflect execution actuals in FY19 and to properly align the execution of funding for FY20 within Management Services. The overall funding requirement has not increased and there is no cost growth.

	Prior Years	FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	3,177.248	501.133		419.051		317.196		-		317.196	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 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603595N / *SSBN New Design*	**Project (Number/Name)** 3220 / *COLUMBIA Class Submarine Development*



CDD - Capabilities Development Document
CDR - Critical Design Review
CPD - Capability Production Document
DAB - Defense Acquisition Board
IPR - In Progress Review
JROC - Joint Requirements Oversight Council
LLTM - Long Lead Time Material
PDR - Preliminary Design Review
PRR – Production Readiness Review
RDT&E - Research, Development, Test, & Evaluation
RFP - Request for Proposal
SCN - Shipbuilding and Conversion, Navy
SRR - System Requirements Review

Exhibit R-4A, RDT&E Schedule Details: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 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 2019. ** Effort continues past 4th Quarter FY 2025				
Ship Detailed & Support Arrangements*	1	2019	1	2022
Ship Design Disclosure and Construction Data*	1	2019	1	2024
Research, Development, and Prototyping for Lead Ship*, **	1	2019	4	2025
Component Development/Component Qualification* , **	1	2019	4	2025
Gen 2 Propulsor Design*	1	2019	4	2019
Large Scale Vehicle (LSV) Trials*	1	2019	4	2020
Advanced Propulsor Bearing Prototype*	1	2019	1	2024
Advanced Carbon Dioxide Removal Unit (ACRU)*, **	1	2019	4	2025
SCN Design*, **	1	2019	4	2025
Lead Ship Construction**	1	2021	4	2025

Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy			Date: February 2020
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603595N / *SSBN New Design*	Project (Number/Name) 3440 / *SBSD Obsolescence*	

COST ($ in Millions)	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
3440: *SBSD Obsolescence*	0.000	0.000	0.000	0.000	-	0.000	0.000	20.281	20.687	21.101	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This project provides the engineering development and program management required to outfit, upgrade, and support each ship of the COLUMBIA Class Submarine with a combat system that satisfies requirements to meet its sole mission of Strategic Deterrence over the class life cycle. The fully integrated combat system, also referred to as the Non-Propulsion Electronics System (NPES), is comprised of a collection of functional sub-systems, including Sonar, Tactical Navigation, Exterior Communications, Radar, Imaging, Large Vertical Array, Submarine Warfare Federated Tactical System (SWFTS) virtualization, Electronic Support, etc., 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, unique submarine environment qualification and update of all logistics products.

Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy			Date: February 2020
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603595N / *SSBN New Design*	Project (Number/Name) 3441 / *SBSD Technology Refresh*	

COST ($ in Millions)	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
3441: *SBSD Technology Refresh*	0.000	0.000	0.000	0.000	-	0.000	0.000	46.771	47.707	48.661	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

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 future hulls by virtue of improvements in 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. Technology development implementation and logistics for developmental items, and COLUMBIA Class test & evaluation for these items are also included. 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.

Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy			Date: February 2020
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603595N / *SSBN New Design*	Project (Number/Name) 9999 / *Congressional Adds*	

COST ($ in Millions)	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
9999: *Congressional Adds*	24.127	27.013	8.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	59.140
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Congressional Add supporting the development of composite materials for COLUMBIA Class Propulsion. FY19 Congressional Add supports the continued development of composite materials and also provides funding for the Naval Propulsion Foundry Center Facility Power Upgrades.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020
Congressional Add: Advanced Materials Propeller Program ***FY 2019 Accomplishments:*** Continue the design and fabrication of composite Advanced Propulsor Bearing shaft components, Advanced Composite Control Surfaces, as well as composite CNC machining and inspection/ handling fixturing for propulsor components. ***FY 2020 Plans:*** Using the FY19 funding, continue the design and fabrication of composite Advanced Propulsor Bearing shaft components, Advanced Composite Control Surfaces, as well as composite CNC machining and inspection/handling fixturing for propulsor components.	14.471	0.000
Congressional Add: Naval Propulsion Foundry Center Facility Power Upgrades ***FY 2019 Accomplishments:*** Complete initial Power/Utility upgrades, and support power/utility work and execute procurement of large, high speed milling machines contracted via Defense Logistics Agency (Aviation). These new machines will make use of the additional power provided to the Naval Foundry and Propeller Center (NFPC). Installation, acceptance and turnover to production for the machines will complete in FY20. ***FY 2020 Plans:*** Using the FY19 funding, complete installation, acceptance, and turnover to production for the machines.	12.542	0.000
Congressional Add: Materials for submarine propulsor applications ***FY 2019 Accomplishments:*** N/A ***FY 2020 Plans:*** Continue efforts from Advanced Materials Propeller Program for the design and fabrication of composite Advanced Propulsor Bearing shaft components, Advanced Composite Control Surfaces, as well as composite CNC machining and inspection/handling fixturing for propulsor components.	0.000	8.000
Congressional Adds Subtotals	27.013	8.000

Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603595N / *SSBN New Design*	**Project (Number/Name)** 9999 / *Congressional Adds*

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Navy			Date: February 2020
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 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 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Product Development	SS/CPFF	Seeman Composites : Gulfport, MS	1.171	0.000		8.000	Aug 2020	0.000		-		0.000	0.000	9.171	-
Product Development	TBD	Seeman Comp : Gulfport, MS	20.442	11.209	Sep 2019	0.000		0.000		-		0.000	0.000	31.651	-
Product Devlopment	WR	NSWC : Carderock, MD	2.514	3.262	Nov 2019	0.000		0.000		-		0.000	0.000	5.776	-
Product Development	C/FFP	DLA Aviation : Richmond, VA	0.000	12.542	Nov 2018	0.000		0.000		-		0.000	0.000	12.542	-
		Subtotal	24.127	27.013		8.000		0.000		-		0.000	0.000	59.140	N/A

Remarks

Seeman Composites follow on contract plan award date February 2019.

	Prior Years	FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	24.127	27.013		8.000		0.000		-		0.000	0.000	59.140	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603595N / *SSBN New Design*	**Project (Number/Name)** 9999 / *Congressional Adds*

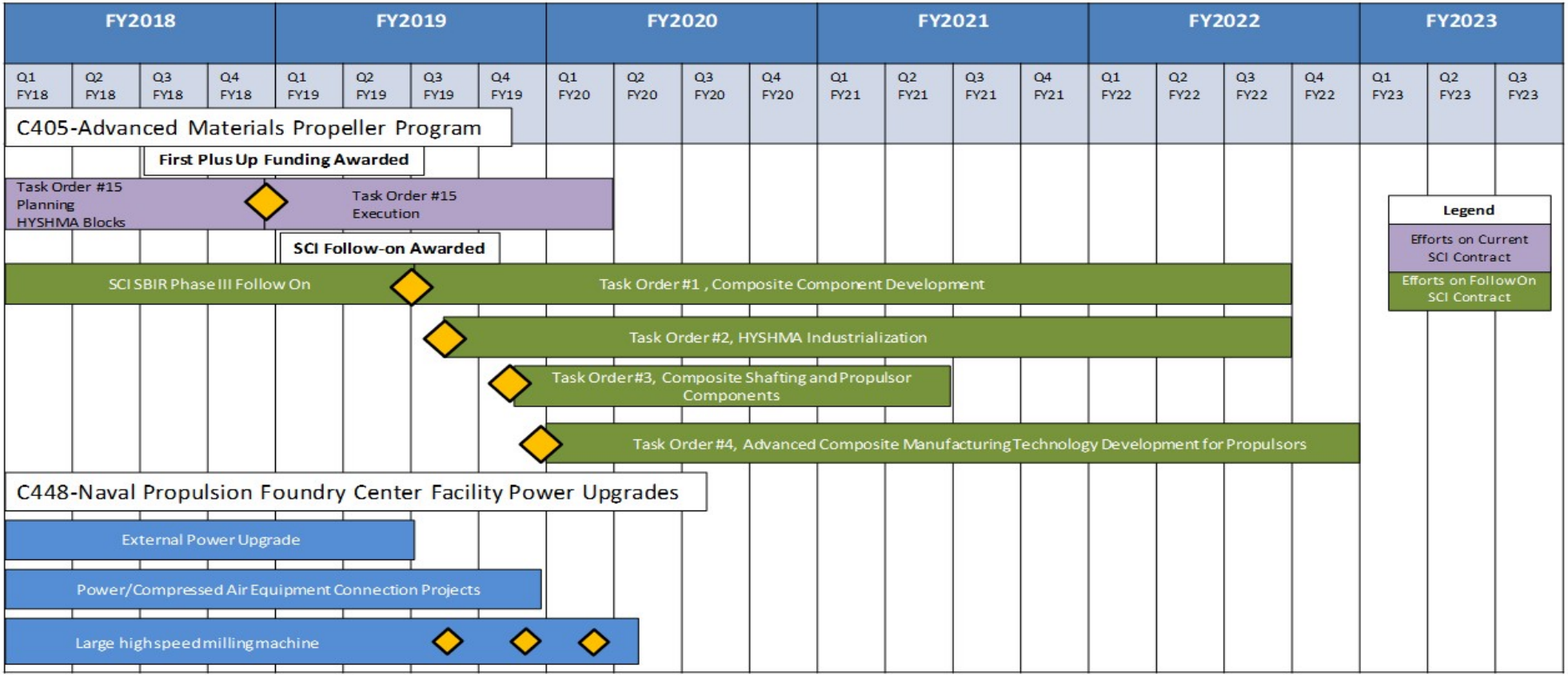


Exhibit R-4A, RDT&E Schedule Details: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603595N / *SSBN New Design*	**Project (Number/Name)** 9999 / *Congressional Adds*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 9999 Note: * Effort began prior to 1st quarter FY 2019				
Initial Award on Current Vehicle (Delivery Order #15)*	1	2019	2	2020
SCI SBIR Phase III, Task Order #1, Composite Component Development	2	2019	4	2022
Task Order #2, HYSHMA Industrialization	3	2019	4	2022
Task Order #3, Composite Shafting and Propulsor Components	4	2019	2	2021
Task Order #4, Advanced Composite Manufacturing Technology Development	4	2019	4	2022
External Power Upgrade*	1	2019	3	2019
Power/Compressed Air Equipment Connection Projects*	1	2019	4	2019
First large high speed milling machine*	1	2019	3	2019
Second large high speed milling machine*	1	2019	4	2019
Third large high speed milling machine*	1	2019	1	2020