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 0603563N *I Ship Concept Advanced 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	228.811	73.750	96.846	126.396	-	126.396	58.101	52.766	54.358	50.674	Continuing	Continuing
2196: *Design, Tools, Plans and Concepts*	7.088	23.101	33.595	21.520	-	21.520	11.505	10.643	9.659	9.791	Continuing	Continuing
3161: *NAVSEA Tech Authority*	205.776	27.267	34.247	12.205	-	12.205	15.176	11.708	10.471	10.051	Continuing	Continuing
3244: *Cybersecurity Engineering*	0.000	0.000	0.000	17.678	-	17.678	15.468	15.576	23.735	24.209	Continuing	Continuing
3376: *Strategic Sealift*	15.947	6.087	6.004	1.790	-	1.790	4.489	6.533	6.500	6.623	Continuing	Continuing
4037: *Common Hull Auxiliary Multi-Mission Platform (CHAMP)*	0.000	17.295	8.000	13.203	-	13.203	11.463	8.306	3.993	0.000	0.000	62.260
4044: *Next Generation Medium Amphibious Ship*	0.000	0.000	0.000	30.000	-	30.000	0.000	0.000	0.000	0.000	0.000	30.000
4045: *Next Generation Medium Logistics Ship*	0.000	0.000	0.000	30.000	-	30.000	0.000	0.000	0.000	0.000	0.000	30.000
9999: *Congressional Adds*	0.000	0.000	15.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	15.000

A. Mission Description and Budget Item Justification

The FY 2021 funding request was reduced by $12.087 million to account for the availability of prior year execution balances.

Project 2196 - This project provides the foundation for an affordable and mission capable surface ship force. It also supports the next step in the development of a transformed naval force by accomplishing the pre-milestone A (especially pre-concept decision) efforts for all potential surface combatants. These efforts are the required first step in the identification of relevant, effective, and affordable platform requirements for the future force. Additionally the integration of total ship systems, including combat systems, weapons systems and Hull, Mechanical and Electrical (HM&E) systems will be addressed for ships in the pre-milestone A stages of acquisition. Inadequate early planning, requirements definition, and ship concept formulation can result in downstream design, construction and operational problems. A more subtle and severely negative impact of neglecting this early effort is that the "best" concepts and technologies may never even be considered and the greatest potential ship design advances never realized. Designs and technologies must consider how to meet the threat over the life span of the class, which can last nearly a century. This project supports these requirements.

This project funds concept development engineering, mission effectiveness analysis, force architecture analysis, and other analyses for formulation of future surface ship force structure along with development of the platforms, payloads, people and processes required to accomplish these efforts. Advanced ship concept studies, ship and ship systems technology assessments, and the development and upgrade of ship concept design and engineering tools, methods, and criteria are funded in this project.

This project:

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 0603563N *I Ship Concept Advanced Design*

(1) Develops alternative surface ship force structure concepts including ships and unmanned surface vehicles.
(2) Evaluates the mission/force capability effectiveness and costs for these alternative surface fleet architectures.
(3) Performs fleet war fighting/mission effectiveness assessment studies.
(4) Identifies future surface ship requirements and characteristics necessary to meet future threats and support mission needs.
(5) Investigates new affordable ship concepts and evaluates technologies necessary to support these concepts.
(6) Provides design methods and automated design tools to develop and evaluate ship concepts.
(7) Supports development of Initial Capabilities Documents (ICD) and analogous early requirements documents for future ships.
(8) Develops and updates a Technology Investment Strategy (TIS) to help guide OPNAVs investments to achieve an effective future fighting force.

These efforts are done to support analysis; mission needs development and technology assessment in support of future fleet concepts and potential ship acquisition programs. These efforts are fundamental to the Navy's formulation of the future fleet requirements. These efforts support and maintain naval ship design and engineering capabilities in the design phase of developing concept design tools, criteria and methods.

Project 3161 - This project is the only R&D effort that provides a coordinated approach to the development of cross platform ship and weapon system designs and technologies "common" to multiple ships and systems. This project directly influences technical standards for design, construction, certification and operation and provides an avenue for innovative solutions and technologies to compete with legacy product requirements and specifications. This project conducts risk reduction of alternative technical architectures, designs and technology solutions that meet Fleet operational and technical requirements at lower cost; and develops engineering capabilities in the areas of design tools, criteria and methods. This project funds a prioritized portfolio of time-sensitive initiatives through the Cross Platform Systems Development (CPSD) Program, supporting NAVSEA Technical Authority and associated risk reduction activity. The areas of exploration for CPSD include Ship Technology Improvements, Fleet Maintenance and Life Cycle Cost Reduction, Advanced Manufacturing and Material Technology, Additive Manufacturing, Digital Framework/Electromagnetic Environment and Development and Unmanned Systems and Cybersecurity. The research products developed by this project directly support and influence both current Fleet requirements and future acquisition programs by providing a range of technically acceptable alternatives and evaluation of emerging technologies. The prototypes, standards/specs, tools and processes and other products developed in this project focus on technical requirements and technologies applicable to multiple ship classes or systems. Products from this project transition directly to early-stage ship design for Ship Preliminary Design and Feasibility Studies, Program Executive Office (PEO) ship acquisition programs, and Systems Engineering Technical Authority (SETA) requirements documentation. Tasks within this project include R&D efforts focused on increasing sustainment technologies and improving performance at reduced cost for current and future naval platforms.

Project 3244 - This effort funds the research, design, development, testing, and installation of Cybersecurity solutions for all installed integrated computer networks to include shipboard Hull Mechanical and Electrical (HM&E), Navigation Systems, Combat Systems, Fire Control, Sonar, Radar, Communications and all other shipboard computerized control systems for all afloat U.S. Navy platforms. Cybersecurity Engineering supports the development of specifications and standards for the Cybersecurity of all Navy Control Systems (NCS).

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 0603563N *I Ship Concept Advanced Design*

Project 3376 - Strategic Sealift Research and Development - Develops new concepts and technologies which can be applied to or will enable future strategic sealift, and Seabasing systems. The technologies include ship configuration concepts, equipment to increase cargo handling and cargo loading/unloading rates (including commercial and merchant ship systems), improved man/machine interfaces, improved structural configurations and materials, and Logistics-Over-the-Shore (LOTS) equipment and system improvements. FY2016 and prior years (FY2014 and earlier) efforts were financed under the National Defense Sealift Fund (NDSF) BA 04 Project 3116 Strategic Sealift Research and Development. FY2015, FY2017, and FY2019-FY2024 efforts are financed under this RDT&E,N program element and project (3376).

Project 4037 - This project supports Common Hull Auxiliary Multi-Mission Platform (CHAMP)Design and Total Ship Integration. The CHAMP concept leverages a new approach to requirements generation and shipbuilding to replace aging mission specific designs with a common hull to reduce life cycle costs, leverage tailored payloads, and stabilize the industrial base. Identified missions include: sealift, aviation intermediate maintenance support, medical services, command & control, and submarine tending. Funding will inform requirements definition, early industry engagement and follow-on assessment across CHAMP mission functionality.

Project 4044 - In accordance with the Commandant's Planning Guidance and Chief of Naval Operations, Warfighting Requirements and Capabilities direction in support of the Integrated Naval Force Structure Assessment (INFSA), the Navy will evaluate next generation medium amphibious platform solutions in support of Distributed Maritime Operations (DMO), Littoral Operations in Contested Environment (LOCE), and Expeditionary Advanced Base Operations (EABO) concepts.

Project 4045 - The Navy established the Intra-Theater Small Auxiliary Logistics Platform Task Force in support of the Integrated Naval Force Structure Assessment (INFSA), to evaluate next generation medium platform solutions for logistics mission requirements in support of Distributed Maritime Operations (DMO) and Littoral Operations in Contested Environment (LOCE). This includes a family of vessels with commercial designs tailored for military applications.

Project 9999 (Congressional Add)- Funding provided in the Department of Defense Appropriations Act, 2020 for Advanced Manufacturing of Critical Scale Materials and High-Pressure Cold Spray Systems.

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 0603563N *I Ship Concept Advanced Design*

B. Program Change Summary ($ in Millions)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Previous President's Budget	74.603	81.846	47.514	-	47.514
Current President's Budget	73.750	96.846	126.396	-	126.396
Total Adjustments	-0.853	15.000	78.882	-	78.882
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	15.000			
• Congressional Directed Transfers	-	-			
• Reprogrammings	0.650	0.000			
• SBIR/STTR Transfer	-1.503	0.000			
• Program Adjustments	0.000	0.000	78.716	-	78.716
• Rate/Misc Adjustments	0.000	0.000	0.166	-	0.166

Congressional Add Details ($ in Millions, and Includes General Reductions)	FY 2019	FY 2020
Project: 9999: *Congressional Adds*		
Congressional Add: *Additive Manufacturing*	0.000	5.000
Congressional Add: *High pressure cold spray system*	0.000	10.000
Congressional Add Subtotals for Project: 9999	0.000	15.000
Congressional Add Totals for all Projects	0.000	15.000

Change Summary Explanation

The FY 2021 funding request was reduced by $12.087 million to account for the availability of prior year execution balances.

The FY 2021 funding request increase supports SABER integration, Common Hull Auxiliary Multi-Mission Platform (CHAMP) design and development of ship specifications, and concept design for medium amphibious and logistics ships. The Cybersecurity Pillar (CPSD F) transferred from Project 3161 to Project 3244 to restructure Cybersecurity efforts into a separate project.

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 0603563N / *Ship Concept Advanced Design*	Project (Number/Name) 2196 / *Design, Tools, Plans and Concepts*	

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
2196: *Design, Tools, Plans and Concepts*	7.088	23.101	33.595	21.520	-	21.520	11.505	10.643	9.659	9.791	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Project 2196 - This project provides the foundation for an affordable and mission capable surface ship force. It also supports the next step in the development of a transformed naval force by accomplishing the pre-milestone A (especially pre-concept decision) efforts for all potential surface combatants. These efforts are the required first step in the identification of relevant, effective, and affordable platform requirements for the future force. Additionally the integration of total ship systems, including combat systems, weapons systems and Hull, Mechanical and Electrical (HM&E) systems will be addressed for ships in the pre-milestone A stages of acquisition. Inadequate early planning, requirements definition, and ship concept formulation can result in downstream design, construction and operational problems. A subtler and severely negative impact of neglecting this early effort is that the "best" concepts and technologies may never even be considered and the greatest potential ship design advances never realized. Designs and technologies must consider how to meet the threat over the life span of the class, which can last nearly a century. This project supports this requirement.

This project funds concept development engineering, mission effectiveness analysis, force architecture analysis, and other analyses for formulation of future surface ship force structure along with development of the platforms, payloads, people and processes required to accomplish these efforts. Advanced ship concept studies, ship and ship systems technology assessments, and the development and upgrade of ship concept design and engineering tools, methods, and criteria are funded in this project.

This project:
(1) Develops alternative surface ship force structure concepts including ships and unmanned surface vehicles.
(2) Evaluates the mission/force capability effectiveness and costs for these alternative surface fleet architectures.
(3) Performs fleet war fighting/mission effectiveness assessment studies.
(4) Identifies future surface ship requirements and characteristics necessary to meet future threats and support mission needs.
(5) Investigates new affordable ship concepts and evaluates technologies necessary to support these concepts
(6) Provides design methods and automated design tools to develop and evaluate ship concepts.
(7) Supports development of Initial Capabilities Documents (ICD) and analogous early requirements documents for future ships.
(8) Develops and updates a Technology Invest Strategy to help guide OPNAVs investments to achieve an effective future fighting force

These efforts are done to support analysis; mission needs development and technology assessment in support of future fleet concepts and potential ship acquisition programs. These efforts are fundamental to the Navy's formulation of the future fleet requirements. These efforts support and maintain naval ship design and engineering capabilities in the design phase of developing concept design tools, criteria and methods.

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 0603563N / *Ship Concept Advanced Design*	**Project (Number/Name)** 2196 / *Design, Tools, Plans and Concepts*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Title: Ship Concepts and Mission Need Analysis	1.123	0.494	0.000	0.000	0.000
Articles:	-	-	-	-	-
Description: Develop ship concepts and perform analysis for potential ships and Force Architectures 5-30 years out in shipbuilding plan. Develop design methods and engineering tools to support the development of ship concepts and forces. ***FY 2020 Plans:*** Continue development of ship and force designs and their evaluations for multi-mission effectiveness and costs. ***FY 2021 Base Plans:*** N/A ***FY 2021 OCO Plans:*** N/A ***FY 2020 to FY 2021 Increase/Decrease Statement:*** The $0.494 decrease between FY 2020 and FY 2021 is due to the transition to Future Surface Combatant Force Analysis of Alternatives.					
Title: Future Surface Combatant Studies	21.978	33.101	19.020	0.000	19.020
Articles:	-	-	-	-	-
Description: This effort will lay the analytic foundation for the development of the Future Surface Combatant Force (FSCF). Ships produced from this effort will fill critical gaps in the fleet in the 2045 timeframe created by the decommissioning of CG 47, DDG 51, and LCS 1/2 ships. Unmanned surface vessels concepts and CONOPS will be developed to decouple mission capability from manned force structure. ***FY 2020 Plans:*** Continue development for the Future Surface Combatant Force, including shipyard engagement. Technology integration studies to support various surface combatant platforms required to deliver the Future Surface Combatant Force. Completion of the initial Unmanned Surface Vehicle requirements evaluation and development. Technology Investment Strategy (TIS) that will outline current capability gaps identified in the FY19 FSCF AoA and potential path of investment to fill gaps. The Design Reference Mission (DRM) that defines the baseline operational context will be completed so that current and future surface ship programs can leverage it. Top Level Requirements will be drafted for Large Surface Combatant (LSC) Block II, Small Surface					

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 0603563N / *Ship Concept Advanced Design*	**Project (Number/Name)** 2196 / *Design, Tools, Plans and Concepts*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Combatant (SSC), Medium USV (MUSV) Block III, Large USV (LUSV) Block III, and Integrated Combat System (ICS). ***FY 2021 Base Plans:*** Continue development of platforms as outlined in the Surface Combatant Evolution Plan (SCEP). Technology integration studies in line with the SCEP and TIS. ***FY 2021 OCO Plans:*** N/A ***FY 2020 to FY 2021 Increase/Decrease Statement:*** Large Surface Combatant is transitioning from a NACT pre-milestone A program to a post milestone A program funded outside of NACT in FY21. This causes a reduction in overall NACT budget priorities.					
Title: Naval Capability Integration Process (NCIP) - From the Sea (FTS) ***Articles:*** ***Description:*** The Naval Capability Integration Process (NCIP) is an annual process analyzing current and future Navy capabilities against future stressing threats providing fully informed quantitative mission and impacts in support of threat based decisions. No longer are effects chains confined to one platform. Effects chains are becoming more complex and fielding them requires coordination and analysis across all Systems Commands (SYSCOMS) and Resource Sponsors. Work is integrated with NCIP-From the Air (FTA) and NCIP- Information Warfare (IW) ensuring alignment of system functions, schedules, and funding in order to field integrated warfighting capabilities. ***FY 2020 Plans:*** N/A ***FY 2021 Base Plans:*** Continue the annual informed Capabilities-Based Assessments (CBA) such as advanced Naval surface fires and Integrated Air and Missile Defense to identify future capability requirements. Develop metrics to describe the effectiveness of solutions, evaluate current and programmed systems ability to meet capability requirements and determine capability gaps. Expand warfighting gap assessments addressing interaction of mission area kill chain platforms, sensors, and weapons in a system-of-system construct. ***FY 2021 OCO Plans:***	0.000 -	0.000 -	1.000 -	0.000 -	1.000 -

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 0603563N / *Ship Concept Advanced Design*	**Project (Number/Name)** 2196 / *Design, Tools, Plans and Concepts*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
N/A ***FY 2020 to FY 2021 Increase/Decrease Statement:*** The increase is due to the new NCIP-FTS effort to maintain ongoing integration analysis efforts in order to pace threat capabilities.					
Title: CREATE ***Articles:*** ***Description:*** CREATE Ships efforts maintain Naval architecture industrial base tools utilized as critical enablers of naval ship design. Efforts include High Performing Computing environment tool upkeep and refinements to inform many ship design activities including Rapid Design Integration, Shock & Damage impacts and mitigations, Hydrodynamics design and Structural design utilization. ***FY 2020 Plans:*** N/A ***FY 2021 Base Plans:*** FY 2021 plans include development of tools to support future major acquisition programs, specifically including activities on the Integrated Structural Design Environment (ISDE) tooling, and support of high speed computing capabilities. ***FY 2021 OCO Plans:*** N/A ***FY 2020 to FY 2021 Increase/Decrease Statement:*** The increase in funding is to support future surface ship designs and major acquisition programs.	0.000 -	0.000 -	1.500 -	0.000 -	1.500 -
Accomplishments/Planned Programs Subtotals	23.101	33.595	21.520	0.000	21.520

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/0204202N: *DDG-1000*	137.004	111.435	208.448	-	208.448	90.883	30.343	12.076	4.309	Continuing	Continuing
• RDTEN/0603512N: *Carrier Systems Development*	5.388	4.997	7.559	-	7.559	7.393	9.654	7.951	5.857	Continuing	Continuing

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 0603563N / *Ship Concept Advanced Design*	**Project (Number/Name)** 2196 / *Design, Tools, Plans and Concepts*

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/0603564N: *Ship Preliminary Design/Feasibility*	12.839	22.534	70.270	-	70.270	156.841	158.832	159.542	83.610	Continuing	Continuing
• RDTEN/0604567N: *Ship Contract Design/Live Fire T&E*	69.337	46.809	51.853	-	51.853	57.336	57.082	56.612	46.176	Continuing	Continuing
• RDTEN/0603582N: *Combat System Integration*	15.710	17.251	17.843	-	17.843	17.991	18.353	18.724	18.646	Continuing	Continuing

Remarks

D. Acquisition Strategy

This is a non-acquisition program that develops, evaluates, and validates early stages of total ship concepts and technologies in support of SCN planning and potential future ship acquisition programs. This program also supports development, demonstration, evaluation, and validation of engineering tools, methods, and criteria for those concept designs and assessments.

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 0603563N / *Ship Concept Advanced Design*	Project (Number/Name) 2196 / *Design, Tools, Plans and Concepts*	

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
Systems Engineering	C/CPFF	FSCF AoA Various Contractors : Various	0.584	2.677	Feb 2019	1.195	Feb 2020	1.000	Feb 2021	-		1.000	Continuing	Continuing	Continuing
Systems Engineering	WR	FSCF AoA NSWC : Various	0.906	1.000	Feb 2019	1.000	Feb 2020	6.800	Nov 2020	-		6.800	Continuing	Continuing	Continuing
Systems Engineering	WR	FSCF AoA NSWC DD : Dahlgren, VA	1.662	1.275	Nov 2018	2.000	Nov 2019	4.020	Dec 2020	-		4.020	Continuing	Continuing	Continuing
Systems Engineering	WR	FSCF AoA NSWC PD : Philadelphia, PA	0.675	1.250	Nov 2018	0.000	Nov 2019	0.000		-		0.000	Continuing	Continuing	Continuing
Systems Engineering	WR	FSCF AoA NIWC : San Diego, CA	0.172	0.000		2.200	Nov 2019	0.000		-		0.000	Continuing	Continuing	Continuing
Systems Engineering	WR	FSCF AoA JHU APL : Baltimore, MD	0.000	0.000		0.500	Feb 2020	0.000		-		0.000	Continuing	Continuing	Continuing
Systems Engineering	WR	FSCF AoA NSWC CD : Carderock, MD	0.612	1.918	Oct 2018	1.000	Oct 2019	2.200	Nov 2020	-		2.200	Continuing	Continuing	Continuing
Engineering Development	C/CPFF	FSCF AoA Various Contractors : Various	0.171	7.127	Feb 2019	0.000	Feb 2020	5.000	Nov 2020	-		5.000	Continuing	Continuing	Continuing
Engineering Development	WR	FSCF AoA NSWC CD : Carderock, MD	1.986	1.289	Nov 2018	1.000	Nov 2019	0.000		-		0.000	Continuing	Continuing	Continuing
Engineering Development	C/BA	FSCF AoA NSWC : Various	0.000	1.610	Feb 2019	0.100	Feb 2020	0.000		-		0.000	Continuing	Continuing	Continuing
Demonstration & Evaluation	C/CPFF	FSCF AoA Various Contractors : Various	0.029	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Test & Evaluation	C/CPFF	FSCF AoA Various Contractors : Various	0.020	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Engineering Development	WR	FSCF AoA NSWC PD : Philadelphia, PA	0.000	1.900	Nov 2018	0.000	Nov 2019	0.000		-		0.000	0.000	1.900	-
Engineering Development	WR	FSCF AoA NSWC DD : Dahlgren, VA	0.000	2.405	Nov 2018	0.000	Nov 2019	0.000		-		0.000	0.000	2.405	-
Engineering Development	WR	FSCF AoA NAVAIR : Patuxent River, MD	0.196	0.000		0.200	Nov 2019	0.000		-		0.000	0.000	0.396	-

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 0603563N / *Ship Concept Advanced Design*	**Project (Number/Name)** 2196 / *Design, Tools, Plans and Concepts*

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
Systems Engineering	WR	FSCF AoA NUWC : Newport, RI	0.075	0.000		0.400	Nov 2019	0.000		-		0.000	0.000	0.475	-
Systems Engineering	C/CPFF	LSC Pre-PD Various Contractors : Various	0.000	0.000		14.000	Feb 2020	0.000		-		0.000	0.000	14.000	-
Systems Engineering	WR	LSC Pre-PD NSWC : Various	0.000	0.000		3.500	Feb 2020	0.000		-		0.000	0.000	3.500	-
Systems Engineering	WR	LSC Pre-PD NSWC DD : Dahlgren, VA	0.000	0.000		1.800	Nov 2019	0.000		-		0.000	0.000	1.800	-
Systems Engineering	WR	LSC Pre-PD NSWC PD : Philadelphia, PA	0.000	0.000		1.600	Nov 2019	0.000		-		0.000	0.000	1.600	-
Systems Engineering	WR	LSC Pre-PD NIWC : San Diego, CA	0.000	0.000		0.600	Nov 2019	0.000		-		0.000	0.000	0.600	-
Systems Engineering	WR	LSC Pre-PD NSWC CD : Carderock, MD	0.000	0.000		2.500	Oct 2019	0.000		-		0.000	0.000	2.500	-
Systems Engineering	WR	T-AGS(X) NSWC CD : Carderock, MD	0.000	0.650	Mar 2019	0.000		0.000		-		0.000	0.000	0.650	-
Systems Engineering	C/CPFF	NCIP NSMA : Washington DC	0.000	0.000		0.000		1.000	Nov 2020	-		1.000	0.000	1.000	-
Systems Engineering	C/CPFF	CREATE : Washington DC	0.000	0.000		0.000		1.500	Nov 2020	-		1.500	0.000	1.500	-
		Subtotal	7.088	23.101		33.595		21.520		-		21.520	Continuing	Continuing	N/A

Remarks

Changes in Systems Engineering between FY20 and FY21 to support changing program priorities and needs to support continuing and future AoA's and RET's. The Future Surface Combatant Force (FSCF) AOA team will be performing detailed analysis to move from IOVs set out in the FSCF Initial Capabilities Document(ICD) to threshold and objective requirements, and multiple concept formulation teams will be stood up to both develop the workforce as well as to develop concepts in order to shorten the acquisition timeline for future programs.

This funding is essential to:
- Ensure participation in AoA/RET to examine the alternative concepts and feasibility of acquisition strategies
- Prepare required documents for Alternative Systems Reviews (ASR) after the AoA and Navy determines preferred material solution(s)
- Perform operational & technical analysis on preferred material solutions
- Establish program framework and strategies

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 0603563N / *Ship Concept Advanced Design*	**Project (Number/Name)** 2196 / *Design, Tools, Plans and Concepts*

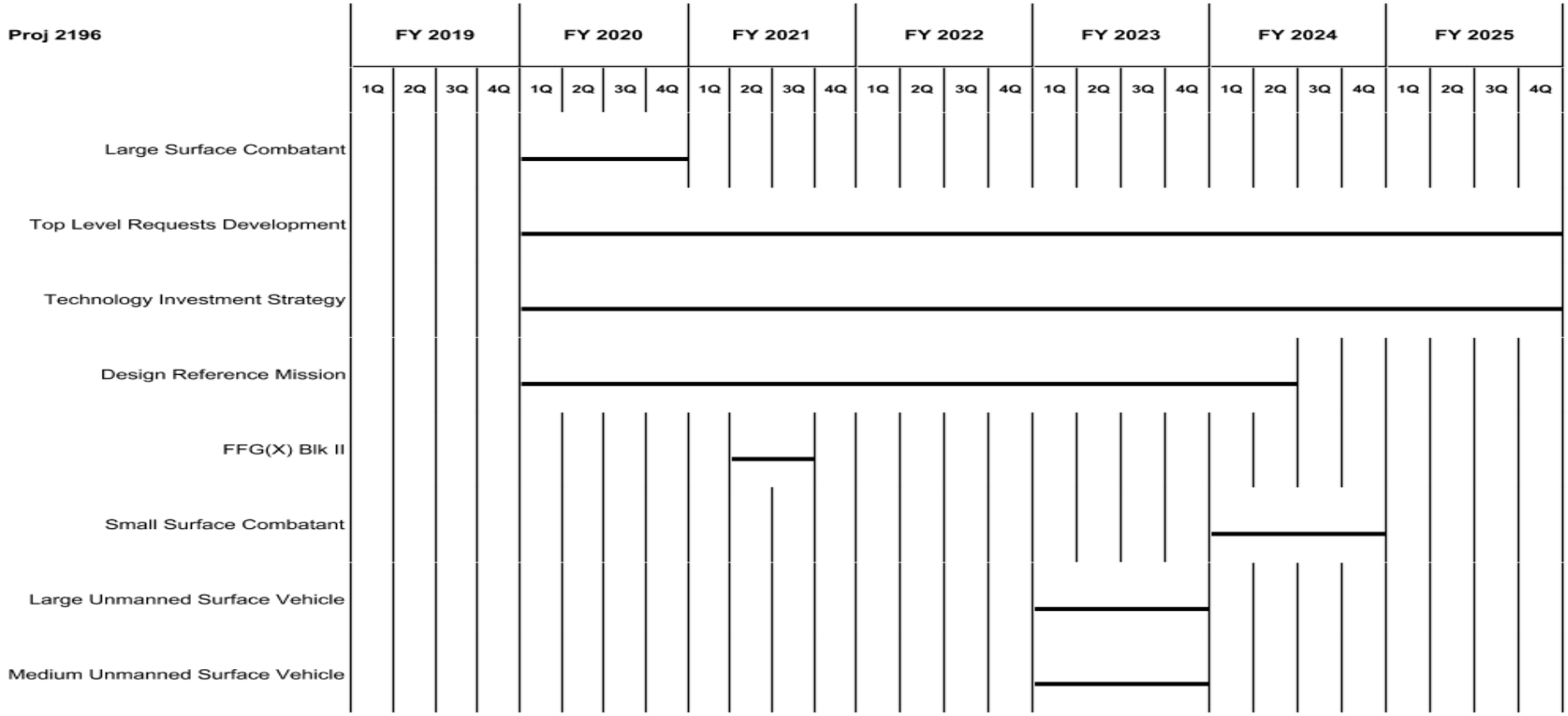
Product Development ($ in Millions)

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
- Prepare required Milestone A documents for preferred material solution(s) - Develop technology development strategy															

	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	7.088	23.101		33.595		21.520		-		21.520	Continuing	Continuing	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 0603563N / *Ship Concept Advanced Design*	**Project (Number/Name)** 2196 / *Design, Tools, Plans and Concepts*



2021PB - 0603563N - 2196

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 0603563N / *Ship Concept Advanced Design*	**Project (Number/Name)** 2196 / *Design, Tools, Plans and Concepts*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 2196				
Large Surface Combatant: Large Surface Combatant	1	2020	4	2020
Top Level Requests Development: Top Level Requests Development	1	2020	4	2025
Technology Investment Strategy: Technology Investment Strategy	1	2020	4	2025
Design Reference Mission: Design Reference Mission	1	2020	2	2024
FFG(X) Blk II: FFG(X) Blk II	2	2021	3	2021
Small Surface Combatant: Small Surface Combatant	1	2024	4	2024
Large Unmanned Surface Vehicle: Large Unmanned Surface Vehicle	1	2023	4	2023
Medium Unmanned Surface Vehicle: Medium Unmanned Surface Vehicle	1	2023	4	2023

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 0603563N / *Ship Concept Advanced Design*	Project (Number/Name) 3161 / *NAVSEA Tech Authority*	

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
3161: *NAVSEA Tech Authority*	205.776	27.267	34.247	12.205	-	12.205	15.176	11.708	10.471	10.051	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This project has been established to support the NAVSEA Tech Authority with the coordination of design and development efforts for cross-platform applicability to result in more affordable, mission-capable, and interoperable surface ship forces including ships that are less expensive to build and operate with reduced manning, reduced support costs, and greater utilization of emerging technology.

NAVSEA Tech Authority efforts under Project 3161, known as the Cross Platform Systems Development (CPSD) Program transition directly to early-stage ship design for Ship Preliminary Design and Feasibility Studies and other Program Executive Office (PEO) ship design programs. While these efforts support concept exploration and mission needs assessment for potential future ship acquisition programs, they also develop cross-program technology solutions and associated Technical Authority products. The CPSD efforts are not direct efforts for specific, authorized shipbuilding programs. This project is the only R&D effort that provides a coordinated, collaborative approach to the development of: cross-platform naval ship and weapon system design, as well as engineering capabilities in the areas of design tools, criteria, and methods. The CPSD project also provides innovative solutions for current Fleet issues involving Technical Authority, such as interoperability issues with new systems or platforms, or broad technology insertion topics.

In FY19, all CPSD Pillars were rebaselined to better address CNO and NAVSEA Chief Engineer (SEA05) technical priorities and shall be comprised of the following functional areas:

CPSD A - Ship Technology Improvements
CPSD B - Fleet Maintenance and Life Cycle Cost Reduction
CPSD C - Additive and Advanced Manufacturing Technology
CPSD D - Digital Framework/Electromagnetic Environment and Development
CPSD E - Unmanned Systems
CPSD F - Cybersecurity

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Title: Ship Technology Improvements (CPSD A)	1.297	2.162	1.328	0.000	1.328
Articles:	-	-	-	-	-

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 0603563N / *Ship Concept Advanced Design*	**Project (Number/Name)** 3161 / *NAVSEA Tech Authority*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Description: This effort funds the analysis of ship system technologies to reduce design and construction costs. This also includes the development of validation tools to certify the safety and mission capability of platform concepts and eventually ships. ***FY 2020 Plans:*** Continue the development of ship construction technology improvements to reduce risk related to alternative technical architectures and designs. The Next Generation Cooling System (NGCS) to support our higher powered systems is a technology that will be improved. The Efficient Thermal Systems will utilize inherent thermal storage to improve and handle integration issues with current thermal management systems. ***FY 2021 Base Plans:*** Continue the development of ship construction technology improvements to reduce risk related to alternative technical architectures and designs. Further research regarding thermal loads will be conducted. ***FY 2021 OCO Plans:*** N/A ***FY 2020 to FY 2021 Increase/Decrease Statement:*** Decrease in funding from $2.162 to $1.328 due to Next Generation Cooling System (NGCS) project suite completion and transition to the Policy, Procedures, and Spec Development team within NAVSEA with fleet announcements of updates of how to adequately cool the higher-powered systems on surface ships.					
Title: Fleet Maintenance and Life Cycle Cost Reduction (CPSD B)	0.878	2.493	1.574	0.000	1.574
Articles:	-	-	-	-	-
Description: This effort funds the development of tools, analyses and technologies to reduce fleet life cycle costs, reduce life-cycle failure risk and improved refurbishment cycles. This will allow the Navy to better meet fleet operational and technical requirements and lower cost. ***FY 2020 Plans:*** Develop technologies to reduce in-service costs and technical risk associated with deployed technologies and systems. FY20 shall include a focus on technology improvements to reduce known in-service deficiencies. A suite of Standardized Guidelines for design tools will be researched to establish criteria for determining when					

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 0603563N / *Ship Concept Advanced Design*	**Project (Number/Name)** 3161 / *NAVSEA Tech Authority*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
a Departure of Specification (DFS) should be written, and develop a passivation procedure for in-situ and pre-installation tubes which are causing significant availability delays in the fleet. ***FY 2021 Base Plans:*** Efforts to develop technologies to reduce in-service costs and technical risk associated with deployed technologies and systems will be conducted. ***FY 2021 OCO Plans:*** N/A ***FY 2020 to FY 2021 Increase/Decrease Statement:*** Funding decrease from $2.493 to $1.574 due to Passivation Process for Copper Nickel Tubing Project and Corrosion task suite completion and transition to spec updates/development and ultimately the fleet.					
Title: Additive and Advanced Manufacturing Technology (CPSD C) ***Articles:*** ***Description:*** This effort funds the development of additive manufacturing technologies, advanced coating techniques, design and topology optimization, materials selection, characterization and process development. ***FY 2020 Plans:*** FY20 funding continues additive manufacturing (AM) technology RDT&E for metal and polymer components including materials characterization and process development, development of AM design and manufacturing standards, application and technical data package development; determining AM equipment performance requirements in dynamic environments (i.e. shipboard), ship integration requirements for AM equipment, and Navy-specific AM industrial base requirements including digital file transfer and cyber. ***FY 2021 Base Plans:*** FY21 funding continues additive manufacturing (AM) technology RDT&E for metal and polymer components including materials characterization and process development, development of AM design and manufacturing standards, application and technical data package development; determining AM equipment performance requirements in dynamic environments (I.e. shipboard), ship integration requirements for AM equipment, and navy-specific AM industrial base requirements including digital file transfer and cyber. ***FY 2021 OCO Plans:*** N/A ***FY 2020 to FY 2021 Increase/Decrease Statement:***	7.360 -	8.155 -	8.399 -	0.000 -	8.399 -

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 0603563N / *Ship Concept Advanced Design*	**Project (Number/Name)** 3161 / *NAVSEA Tech Authority*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Funding increase in FY21 for expanded metal additive manufacturing materials testing and process development for multiple AM processes, afloat metal AM RDT&E and digital additive manufacturing efforts.					
Title: Digital Framework/Electromagnetic Environment and Development (CPSD D) ***Articles:*** ***Description:*** Develop an understanding of the wireless electromagnetic environment (EME) on numerous ship classes and the vulnerability of these systems to hacking. ***FY 2020 Plans:*** Continue development of power management wireless capability and distribution technologies. Complete ship display system testing supporting HACK the Machine Event. ***FY 2021 Base Plans:*** Efforts will continue development of power management wireless capability and distribution technologies. ***FY 2021 OCO Plans:*** N/A ***FY 2020 to FY 2021 Increase/Decrease Statement:*** Funding decrease from $1.006 to $0.457 due to completion of HACK the MACHINE events and transition to test team for reporting, analysis, verification and validation.	0.405 -	1.006 -	0.457 -	0.000 -	0.457 -
Title: Unmanned Systems (CPSD E) ***Articles:*** ***Description:*** This effort funds the development and advancement of Navy unmanned systems across various platforms. Note: Unmanned system efforts in years prior to FY19 were captured under CPSD Pillar 1.0. ***FY 2020 Plans:*** Continue efforts that support development and rapid and sage deployment of unmanned systems with respect to reliability, maintainability and availability efficiencies, and over-watch capabilities. Provide weapon system alternatives for both large and small scale unmanned platforms. Perform evaluation of multi-scaled vehicles for deployment from various host vessels. ***FY 2021 Base Plans:***	0.588 -	0.978 -	0.447 -	0.000 -	0.447 -

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 0603563N / *Ship Concept Advanced Design*	**Project (Number/Name)** 3161 / *NAVSEA Tech Authority*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Efforts to focus on further development of quick deployment and maintenance efficiencies. Further research into over-watch capabilities will be conducted. Continued funding is required to provide weapon system alternatives for both large and small scale unmanned platforms. ***FY 2021 OCO Plans:*** N/A ***FY 2020 to FY 2021 Increase/Decrease Statement:*** The decrease from FY 2020 to FY 2021 is result of partnering to complete testing and verification of Reliability, Maintainability, and Availability (RMA) efficiency and RDT&E of the Overwatch tasks.					
Title: Cybersecurity (CPSD F)	16.739	19.453	0.000	0.000	0.000
Articles:	-	-	-	-	-
Description: This effort funds the research, design, development, testing, and installation of Cybersecurity solutions for all installed integrated computer networks to include shipboard Hull Mechanical and Electrical (HM&E), Navigation Systems, Combat Systems, Fire Control, Sonar, Radar, Communications and all other shipboard computerized control systems for all afloat U.S. Navy platforms. CPSD F supports the development of specifications and standards for the Cybersecurity of all Navy Control Systems (NCS). ***FY 2020 Plans:*** Continue engineering and development efforts to mature numerous cross-platform hardware and software Cybersecurity solutions that will be rapidly deployed on afloat systems to increase ship platforms and ship forces' ability to protect, detect, react to, and recover from Cybersecurity incidents on NCS's in real time. The plan will fund the research and development of situational awareness tools, boundary defense capabilities (to include Government-Off-The-Shelf (GOTS) tool Situational Awareness Boundary Enforcement and Response (SABER)), Cybersecurity-optimized network design, network inspection and detection, and operational indifference to Cybersecurity threats. This effort will continue development of system specifications related to Cybersecurity and development of enterprise standards for Cybersecurity of NCS's. The implementation will be expanded to additional enclaves and classes of ships on a schedule based on ship availability. Lifecycle sustainment requirements of reliability, maintainability, and supportability are tailored and implemented to suit future needs and the constantly evolving Cybersecurity threat landscape across the Navy enterprise. This effort will continue to address Navy Cyber T&E policy and requirements through the development of USS Secure, a distributed					

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 0603563N / *Ship Concept Advanced Design*	**Project (Number/Name)** 3161 / *NAVSEA Tech Authority*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
system of system cyber test and assessment capability. USS Secure provides full mission assurance cyber risk assessments through vulnerability and resolution testing of operational platforms and systems. ***FY 2021 Base Plans:*** Cybersecurity efforts will transfer to PU 3244 in FY 2021. ***FY 2021 OCO Plans:*** N/A ***FY 2020 to FY 2021 Increase/Decrease Statement:*** The $19.453 decrease in between FY 2020 to FY 2021 is due to transitioning of Cybersecurity efforts from PU 3161 to PU 3244.					
Accomplishments/Planned Programs Subtotals	27.267	34.247	12.205	0.000	12.205

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/0204202N: *DDG-1000*	137.004	111.435	208.448	-	208.448	90.883	30.343	12.076	4.309	Continuing	Continuing
• RDTEN/0603512N: *Carrier Systems Development*	5.388	4.997	7.559	-	7.559	7.393	9.654	7.951	5.857	Continuing	Continuing
• RDTEN/0603564N: *Preliminary Design/Feasibility Studies.*	12.839	22.534	70.270	-	70.270	156.841	158.832	159.542	83.610	Continuing	Continuing
• RDTEN/0604567N: *Ship Contcept Design/Live Fire T&E*	69.337	46.809	51.853	-	51.853	57.336	57.082	56.612	46.176	Continuing	Continuing
• RDTEN/0603582N: *Combat System Integration*	15.710	17.251	17.843	-	17.843	17.991	18.353	18.724	18.646	Continuing	Continuing

Remarks

D. Acquisition Strategy

This is a non-acquisition program that develops, evaluates, and validates early stages of total ship concepts and technologies in support of SCN planning and potential future ship acquisition programs. This program also supports development, demonstration, evaluation, and validation of engineering tools, methods, and criteria for those concept designs and assessments. This program provides validated engineering tools, methods, and criteria for ship, and weapon system concept designs and assessments while fostering collaboration and coordination of efforts resulting in more effective use of funding.

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 0603563N / *Ship Concept Advanced Design*	Project (Number/Name) 3161 / *NAVSEA Tech Authority*	

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
Systems Engineering	C/CPFF	Various Contractors : Various	18.436	0.000		0.000		0.350	Jan 2021	-		0.350	Continuing	Continuing	Continuing
Systems Engineering	WR	NSWC, NUWC, CDSA : Various	62.829	0.000		0.360	Feb 2020	0.900	Nov 2020	-		0.900	Continuing	Continuing	Continuing
Engineering Development	C/CPFF	DRS : Stevensville, MD	3.249	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Engineering Development	WR	NSWC, NUWC : Various	53.465	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Demonstration & Evaluation	WR	NSWC : Various	20.044	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Demonstration & Evaluation	WR	NIWC : Various	1.922	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Test and Evaluation	WR	NSWC : Various	11.910	0.000		0.000		0.238	Oct 2020	-		0.238	Continuing	Continuing	Continuing
Systems Engineering	WR	NSWC DD : Dahlgren, VA	0.600	0.000		0.000		0.140	Nov 2020	-		0.140	Continuing	Continuing	Continuing
Systems Engineering	WR	NSWC CD : Carderock, MD	3.280	1.050	Dec 2018	1.878	Nov 2019	0.550	Dec 2020	-		0.550	Continuing	Continuing	Continuing
Systems Engineering	WR	NSWC PD : Philadelphia, PA	2.620	0.000		0.700	Nov 2019	0.310	Oct 2020	-		0.310	Continuing	Continuing	Continuing
Systems Engineering	WR	NRL : Washington, D.C.	0.138	0.251	Mar 2019	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Systems Engineering	C/CPFF	ALION : Wahington, D.C.	0.360	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Systems Engineering	C/CPFF	CSC : Washington, D.C.	0.900	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Systems Engineering	MIPR	Army Research Lab : Aberdeen Proving Ground, MD	0.225	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Engineering Development	WR	NUWC Newport : Newport, RI	0.646	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Engineering Development	WR	NUWC Keyport : Keyport, WA	0.450	0.000		0.000		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 0603563N / *Ship Concept Advanced Design*	Project (Number/Name) 3161 / *NAVSEA Tech Authority*	

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
Engineering Development	WR	NSWC Crane : Crane, IN	0.507	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Engineering Development	WR	NSWC DD : Dahlgren, VA	1.650	0.500	Dec 2018	0.787	Dec 2019	0.340	Nov 2020	-		0.340	Continuing	Continuing	Continuing
Engineering Development	WR	NSWC CD : Carderock, MD	3.364	1.003	Dec 2018	0.776	Dec 2019	0.000		-		0.000	Continuing	Continuing	Continuing
Engineering Development	WR	NSWC PD : Philadelphia, PA	0.782	0.500	Nov 2018	0.570	Nov 2019	0.478	Jan 2021	-		0.478	Continuing	Continuing	Continuing
Engineering Development	C/CPFF	CSC : Washington, D.C.	0.300	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Engineering Development	C/CPFF	JHU APL : Baltimore, MD	0.600	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Demonstration & Evaluation	WR	NUWC Keyport : Keyport, WA	0.150	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Demonstration & Evaluation	WR	NSWC CD : Carderock, MD	0.750	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Demonstration & Evaluation	WR	NSWC PD : Philadelphia, PA	0.375	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Cybersecurity Technologies	C/CPFF	JHU/APL : Baltimore, MD	6.723	1.500	May 2019	2.150	May 2020	0.000		-		0.000	Continuing	Continuing	Continuing
Cybersecurity Technologies	C/CPFF	MITRE : McLean, VA	1.108	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Cybersecurity Technologies	MIPR	PNNL DOE : Richland, WA	0.900	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Engineering Development	WR	NSWC Carderock : Carderock, MD	0.000	1.055	Oct 2018	0.000		0.000		-		0.000	0.000	1.055	-
Engineering Development	WR	NUWC Keyport Washington : Keyport, WA	0.000	0.020	Oct 2018	0.000		0.000		-		0.000	0.000	0.020	-
Engineering Development	WR	PHD NSWC : Port Hueneme, CA	0.090	0.000		0.000		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 0603563N / *Ship Concept Advanced Design*	Project (Number/Name) 3161 / *NAVSEA Tech Authority*	

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
Engineering Development	C/CPFF	Various Contractors : Various	0.000	5.099	Oct 2018	0.000		0.000		-		0.000	0.000	5.099	-
Cybersecurity Technologies	WR	NUWC Keyport : Keyport, WA	0.000	0.350	Dec 2018	0.200	Dec 2019	0.000		-		0.000	0.000	0.550	-
Cybersecurity Technologies	WR	NUWC Newport : Newport, RI	0.000	0.600	Dec 2018	1.706	Dec 2019	0.000		-		0.000	0.000	2.306	-
Cybersecurity Technologies	WR	NSWC Crane : Crane, IN	0.000	0.350	Dec 2018	0.350	Dec 2019	0.000		-		0.000	0.000	0.700	-
Cybersecurity Technologies	WR	NSWC DD : Dahlgren, VA	0.000	7.600	Dec 2018	8.814	Dec 2019	0.000		-		0.000	0.000	16.414	-
Cybersecurity Technologies	WR	NSWC PD : Philadelphia, PA	0.000	2.100	Dec 2018	2.500	Dec 2019	0.000		-		0.000	0.000	4.600	-
Systems Engineering	WR	NSWC IH : Indian Head, MD	0.000	0.000		0.635	Nov 2019	0.000		-		0.000	0.000	0.635	-
Systems Engineering	WR	NUWC Keyport : Keyport, WA	0.000	0.000		0.600	Nov 2019	0.000		-		0.000	0.000	0.600	-
Sys Engineering Additive Manufacturing	WR	NSWC CD : Carderock, MD	0.000	0.000		0.486	Nov 2019	1.850	Nov 2020	-		1.850	0.000	2.336	-
Eng Development Additive Manufacturing	WR	NSWC CD : Carderock, MD	0.000	0.000		2.600	Nov 2019	1.000	Nov 2020	-		1.000	0.000	3.600	-
Sys Engineering Additive Manufacturing	WR	NSWC PD : Philadelphia, PA	0.000	0.000		0.150	Nov 2019	0.700	Nov 2020	-		0.700	0.000	0.850	-
Eng Development Additive Manufacturing	WR	NSWC PD : Philadelphia, PA	0.000	0.000		0.450	Nov 2019	0.100	Nov 2020	-		0.100	0.000	0.550	-
Sys Engineering Additive Manufacturingd Item Text	WR	NUWC Newport : Newport, RI	0.000	0.000		0.300	Oct 2019	0.350	Oct 2020	-		0.350	0.000	0.650	-
Sys Engineering Additive Manufacturingext	WR	NUWC Keyport : Keyport, WA	0.000	0.000		0.150	Oct 2019	0.200	Oct 2020	-		0.200	0.000	0.350	-
Eng Development Additive Manufacturing	WR	NSWC DN : Dam Neck, VA	0.000	0.000		0.150	Nov 2019	0.150	Oct 2020	-		0.150	0.000	0.300	-
Sys Engineering Additive Manufacturing	C/CPFF	JHU APL : Baltimore, MD	0.000	0.000		0.450	Oct 2019	1.152	Oct 2020	-		1.152	0.000	1.602	-

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 0603563N / *Ship Concept Advanced Design*	**Project (Number/Name)** 3161 / *NAVSEA Tech Authority*

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
Eng Development Additive Manufacturing	C/CPFF	JHU APL : Baltimore, MD	0.000	0.000		0.350	Oct 2019	0.450	Oct 2020	-		0.450	0.000	0.800	-
Sys Engineering Additive Manufacturing	C/CPFF	PSU ARL : State College, PA	0.000	0.000		0.200	Oct 2019	0.000	Oct 2020	-		0.000	0.000	0.200	-
Eng Development Additive Manufacturing	C/CPFF	PSU ARL : State College, PA	0.000	0.000		0.350	Oct 2019	0.300	Oct 2020	-		0.300	0.000	0.650	-
Sys Engineering Additive Manufacturing	WR	USNA : Annapolis, MD	0.000	0.000		0.100	Oct 2019	0.100	Nov 2020	-		0.100	0.000	0.200	-
Sys Engineering Additive Manufacturing	C/CPFF	Various Contracts : Various	0.000	0.000		0.450	Mar 2020	0.472	Mar 2021	-		0.472	0.000	0.922	-
Eng Development Additive Manufacturing	C/CPFF	Various Contracts : Various	0.000	0.000		1.100	Mar 2020	0.950	Mar 2021	-		0.950	0.000	2.050	-
		Subtotal	198.373	21.978		29.312		11.080		-		11.080	Continuing	Continuing	N/A

Support ($ 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
Systems Engineering	WR	NUWC Newport : Newport, RI	0.300	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Systems Engineering	WR	NSWC DD : Dahlgren, VA	0.300	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Systems Engineering	WR	NSWC CD : Carderock, MD	0.750	0.500	Dec 2018	0.552	Dec 2019	0.500	Dec 2020	-		0.500	Continuing	Continuing	Continuing
Systems Engineering	WR	NSWC PD : Philadelphia, PA	0.425	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Systems Engineering	C/CPFF	G2OPS : Virginia Beach, VA	0.750	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Systems Engineering	C/CPFF	JHU/APL : Baltimore, MD	0.300	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Cybersecurity Technologies	WR	NSWC CD : Carderock, MD	0.000	1.489	Dec 2018	1.080	Dec 2019	0.000		-		0.000	0.000	2.569	-

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 0603563N / *Ship Concept Advanced Design*	Project (Number/Name) 3161 / *NAVSEA Tech Authority*	

Support ($ 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
Cybersecurity Technologies	MIPR	NIWC : Various	0.000	0.250	Dec 2018	0.250	Dec 2019	0.000		-		0.000	0.000	0.500	-
Cybersecurity Technologies	C/CPFF	Various Contractors : Various	0.000	1.500	Jan 2019	1.903	Jan 2020	0.000		-		0.000	0.000	3.403	-
Sys Engineering Additive Manufacturing	WR	NSWC CD : Carderock, MD	0.000	0.000		0.000		0.275	Nov 2020	-		0.275	0.000	0.275	-
Sys Engineering Additive Manufacturing	WR	NSWC PD : Philadelphia, PA	0.000	0.000		0.000		0.275	Nov 2020	-		0.275	0.000	0.275	-
Sys Engineering Additive Manufacturing	C/CPFF	Various Contractors : Various	0.000	0.000		0.000		0.075	Mar 2021	-		0.075	0.000	0.075	-
		Subtotal	2.825	3.739		3.785		1.125		-		1.125	Continuing	Continuing	N/A

Test and Evaluation ($ 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
Test Planning & Execution	WR	NSWC DD : Dahlgren, VA	0.060	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Cybersecurity Technologies	WR	NSWC CD : Carderock, MD	0.950	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Cybersecurity Technologies	C/CPFF	JHU/APL : Baltimore, MD	0.650	0.500	May 2019	0.500	May 2020	0.000		-		0.000	Continuing	Continuing	Continuing
Cybersecurity Technologies	WR	NSWC PD : Philadelphia, PA	0.000	0.000		0.000		0.000		-		0.000	0.000	0.000	-
		Subtotal	1.660	0.500		0.500		0.000		-		0.000	Continuing	Continuing	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 0603563N / *Ship Concept Advanced Design*	**Project (Number/Name)** 3161 / *NAVSEA Tech Authority*

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
PM/Travel	Allot	NAVSEA HQ : Washington, DC	0.799	0.050	Dec 2018	0.150	Dec 2019	0.000		-		0.000	Continuing	Continuing	Continuing
DAWDF	Various	Not Specified : Not Specified	0.145	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Program Mgmt Spt	WR	NUWC Newport : Newport, RI	0.096	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Program Mgmt Spt	WR	NSWC DD : Dahlgren, VA	0.300	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Program Mgmt Spt	WR	NSWC CD : Carderock, MD	0.750	0.250	Nov 2018	0.250	Nov 2019	0.000		-		0.000	Continuing	Continuing	Continuing
Program Mgmt Spt	C/CPFF	CSC : Washington, D.C.	0.315	0.250	Nov 2018	0.250	Nov 2019	0.000		-		0.000	Continuing	Continuing	Continuing
Program Mgmt Spt	C/FFP	ARDEC : Picatinny Arsenal, NJ	0.300	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Program Mgmt Spt	MIPR	PNNL DOE : Richland, WA	0.213	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Cybersecurity Technologies	C/CPFF	CSC : Washington, D.C.	0.000	0.250	Dec 2018	0.000		0.000		-		0.000	0.000	0.250	-
Cybersecurity Technologies	C/CPFF	Alion : Washington, D.C.	0.000	0.250	Dec 2018	0.000		0.000		-		0.000	0.000	0.250	-
Cybersecurity Technologies	MIPR	NAVSEA HQ : Washington, D.C.	0.000	0.000		0.000	Dec 2020	0.000		-		0.000	0.000	0.000	-
		Subtotal	2.918	1.050		0.650		0.000		-		0.000	Continuing	Continuing	N/A

	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	205.776	27.267		34.247		12.205		-		12.205	Continuing	Continuing	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 0603563N / *Ship Concept Advanced Design*	**Project (Number/Name)** 3161 / *NAVSEA Tech Authority*

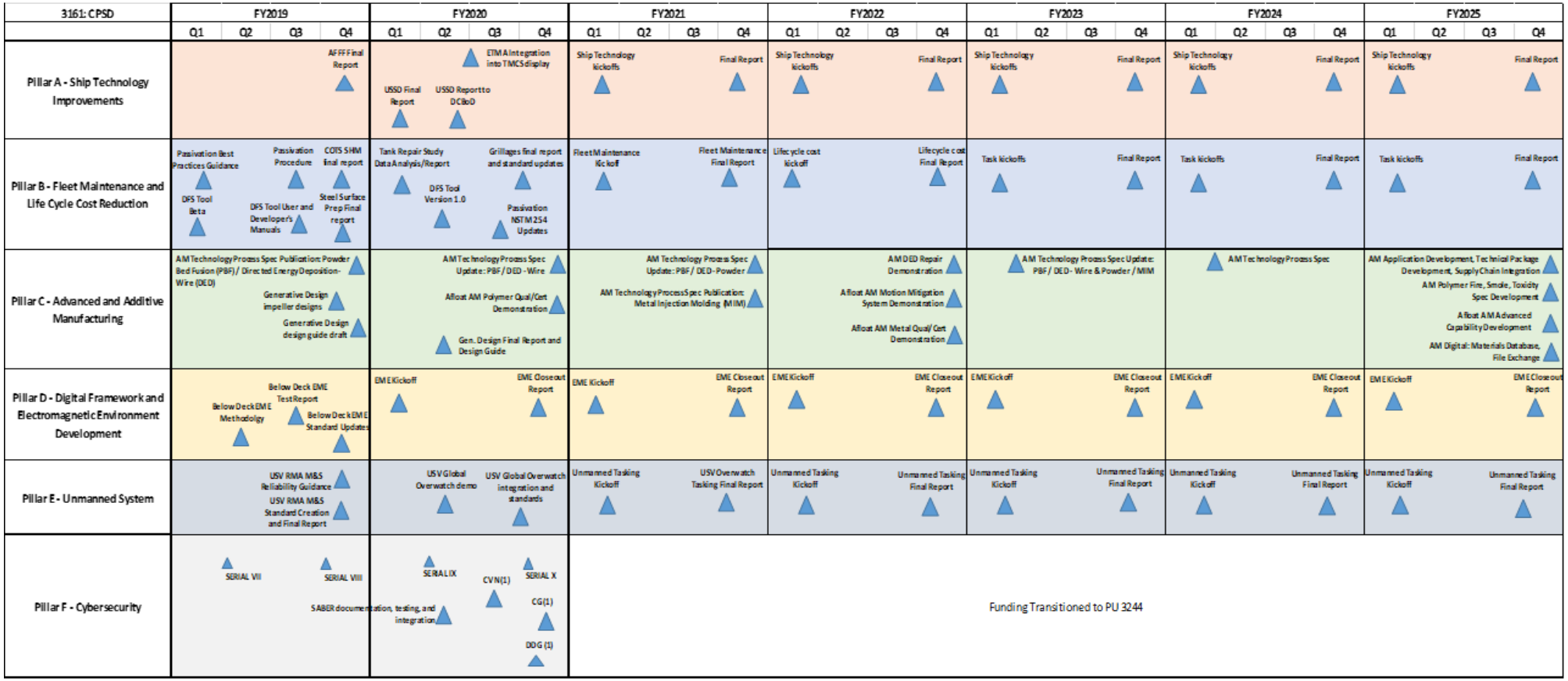


Exhibit R-4A, RDT&E Schedule Details: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603563N / *Ship Concept Advanced Design*	**Project (Number/Name)** 3161 / *NAVSEA Tech Authority*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 3161				
CPSD A - Ship Technology Improvements:	1	2019	4	2025
CPSD B - Fleet Maintenance and Life Cycle Cost Reduction:	1	2019	4	2025
CPSD C - Additive and Advanced Manufacturing Technology:	1	2019	4	2025
CPSD D - Digital Framework/Electromagnetic Environment and Development:	1	2019	4	2025
CPSD E - Unmanned Systems:	1	2019	4	2025
CPSD F - Cybersecurity:	1	2019	4	2020

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 0603563N / *Ship Concept Advanced Design*	Project (Number/Name) 3244 / *Cybersecurity Engineering*	

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
3244: *Cybersecurity Engineering*	0.000	0.000	0.000	17.678	-	17.678	15.468	15.576	23.735	24.209	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

Note

This project is not a new start. This effort was previously funded under PU 3161, NAVSEA Tech Authority.

A. Mission Description and Budget Item Justification

This effort funds the research, design, development, testing, and installation of Cybersecurity solutions for all installed integrated computer networks to include shipboard Hull Mechanical and Electrical (HM&E), Navigation Systems, Combat Systems, Fire Control, Sonar, Radar, Communications and all other shipboard computerized control systems for all afloat U.S. Navy platforms. Cybersecurity Engineering supports the development of specifications and standards for the Cybersecurity of all Navy Control Systems (NCS).

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Title: Cybersecurity	0.000	0.000	17.678	0.000	17.678
Articles:	-	-	-	-	-
FY 2020 Plans: FY 2020 plans remain in PU 3161 (CPSD F).					
FY 2021 Base Plans: Continue to mature all engineering and development efforts of numerous cross-platform hardware and software Cybersecurity solutions. Continue the rapid deployment on afloat systems to increase ship platforms and ship forces' ability to protect, detect, react to, and recover from Cybersecurity incidents on NCS's in real time. The plan will fund the research and development of situational awareness tools, boundary defense capabilities (to include Government-Off-The-Shelf (GOTS) tool Situational Awareness Boundary Enforcement and Response (SABER)), Cybersecurity-optimized network design, network inspection and detection, and operational robustness to Cybersecurity threats. The systems will be expanded to additional enclaves and classes of ships based on ship schedule availability. Lifecycle sustainment requirements of reliability, maintainability, and supportability are now being matured and executed to suit future needs and the constantly evolving Cybersecurity threat landscape across the Navy Enterprise. This effort will continue to address Navy Cyber T&E policy and requirements through the development of USS Secure, a distributed system of system cyber					

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 0603563N / *Ship Concept Advanced Design*	**Project (Number/Name)** 3244 / *Cybersecurity Engineering*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
test and assessment capability. USS Secure provides full mission assurance cyber risk assessments through vulnerability and resolution testing of operational platforms and systems. ***FY 2021 OCO Plans:*** N/A ***FY 2020 to FY 2021 Increase/Decrease Statement:*** This project was funded in FY 2020 under PU 3161, NAVSEA Tech Authority at $19.453M but transitioned into this PU, Cybersecurity Engineering, starting in FY 2021.					
Accomplishments/Planned Programs Subtotals	0.000	0.000	17.678	0.000	17.678

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

This is a non-acquisition program that designs, develops, and tests Cybersecurity solutions and technologies in support of control systems for all afloat U.S. Navy platforms. The capabilities are transitioned to acquisition programs for installation and sustainment. This program provides Navy Cyber T&E policy and requirements for acquisition programs.

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 0603563N / *Ship Concept Advanced Design*	Project (Number/Name) 3244 / *Cybersecurity Engineering*	

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
Cybersecurity Technologies	C/CPFF	JHU APL : Baltimore, MD	0.000	0.000		0.000		3.500	May 2021	-		3.500	Continuing	Continuing	Continuing
Cybersecurity Technologies	WR	NUWC Newport : Newport, RI	0.000	0.000		0.000		0.750	Dec 2020	-		0.750	0.000	0.750	-
Cybersecurity Technologies	WR	NSWC Crane : Crane, IN	0.000	0.000		0.000		0.200	Dec 2020	-		0.200	0.000	0.200	-
Cybersecurity Technologies	WR	NSWC DD : Dahlgren, VA	0.000	0.000		0.000		6.687	Dec 2020	-		6.687	0.000	6.687	-
Cybersecurity Technologies	WR	NSWC DD : Philadelphia, PA	0.000	0.000		0.000		2.000	Dec 2020	-		2.000	0.000	2.000	-
		Subtotal	0.000	0.000		0.000		13.137		-		13.137	Continuing	Continuing	N/A

Support ($ 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
Cybersecurity Technologies	WR	NSWC CD : Carderock, MD	0.000	0.000		0.000		0.250	Dec 2020	-		0.250	0.000	0.250	-
Cybersecurity Technologies	MIPR	NIWC : Various	0.000	0.000		0.000		0.250	Dec 2020	-		0.250	0.000	0.250	-
Cybersecurity Technologies	C/CPFF	Various Contractors : Various	0.000	0.000		0.000		2.771	Jan 2021	-		2.771	0.000	2.771	-
		Subtotal	0.000	0.000		0.000		3.271		-		3.271	0.000	3.271	N/A

Test and Evaluation ($ 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
Cybersecurity Technologies	C/CPFF	JHU APL : Baltimore, MD	0.000	0.000		0.000		0.500	May 2021	-		0.500	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 0603563N / *Ship Concept Advanced Design*	Project (Number/Name) 3244 / *Cybersecurity Engineering*	

Test and Evaluation ($ 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
Cybersecurity Technologies	WR	NSWC PD : Philadelphia, PA	0.000	0.000		0.000		0.500	Dec 2020	-		0.500	0.000	0.500	-
		Subtotal	0.000	0.000		0.000		1.000		-		1.000	Continuing	Continuing	N/A

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
Cybersecurity Technologies	MIPR	NAVSEA HQ : Washington, DC	0.000	0.000		0.000		0.270	Oct 2020	-		0.270	0.000	0.270	-
		Subtotal	0.000	0.000		0.000		0.270		-		0.270	0.000	0.270	N/A

	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	0.000	0.000		0.000		17.678		-		17.678	Continuing	Continuing	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 0603563N / *Ship Concept Advanced Design*	**Project (Number/Name)** 3244 / *Cybersecurity Engineering*

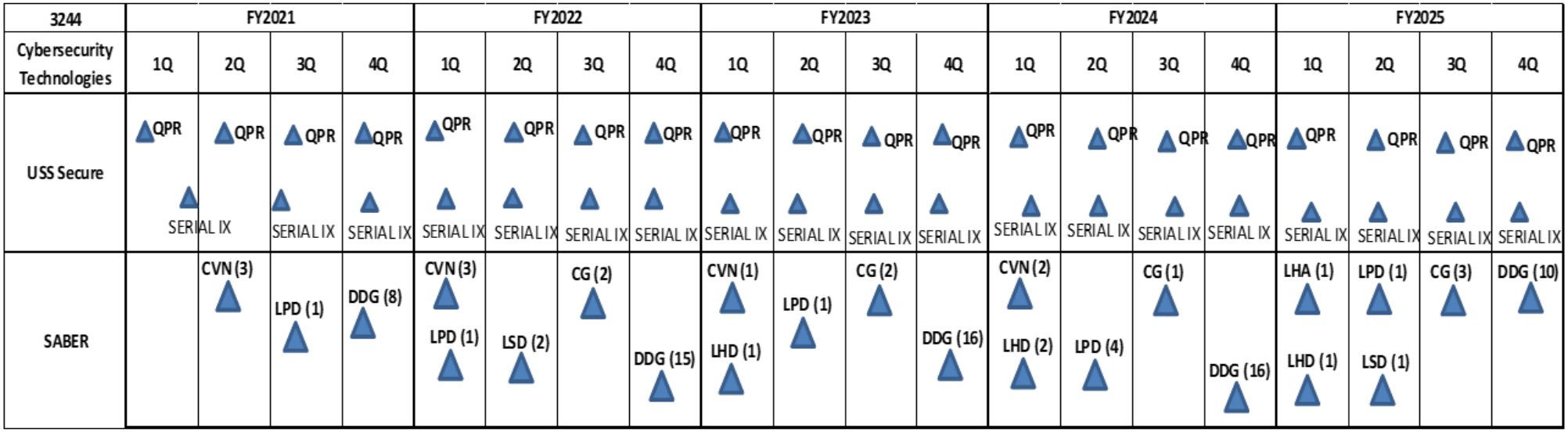


Exhibit R-4A, RDT&E Schedule Details: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603563N / *Ship Concept Advanced Design*	**Project (Number/Name)** 3244 / *Cybersecurity Engineering*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 3244				
Cybersecurity Engineering: USS Secure	1	2021	4	2025
Cybersecurity Engineering: SABER	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 0603563N / *Ship Concept Advanced Design*	Project (Number/Name) 3376 / *Strategic Sealift*	

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
3376: *Strategic Sealift*	15.947	6.087	6.004	1.790	-	1.790	4.489	6.533	6.500	6.623	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Project 3376 - Strategic Sealift Research and Development - Develops new concepts and technologies which can be applied to or will enable future strategic sealift, and Seabasing systems. The technologies include ship configuration concepts, equipment to increase cargo handling and cargo loading/unloading rates (including commercial and merchant ship systems), improved man/machine interfaces, improved structural configurations and materials, and Logistics-Over-the-Shore (LOTS) equipment and system improvements.

Prior Years include: FY16 and prior years (FY2014 and earlier) efforts financed under the National Defense Sealift Fund (NDSF) BA 04 Project 3116 Strategic Sealift Research and Development; FY2015 and FY2017 efforts financed under this program element, RDT&E,N BA04, Project 3376 (Strategic Sealift); and FY2018 efforts financed under RDT&E,N BA 04 Project 9999/C403 (Congressional Adds).

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Title: Shipboard Crane Systems/Shipboard Cargo Systems	3.700	2.284	1.249	0.000	1.249
Articles:	-	-	-	-	-
FY 2020 Plans: Continue investigation and demonstration of shipboard crane/cargo system improvements including Vertical Launch System (VLS) Rearming and transfer capabilities. MPS Fleet Crane Enhancement demonstration to be completed.					
FY 2021 Base Plans: Continue investigation and demonstration of shipboard crane/cargo system improvements including VLS Rearming and transfer capabilities. VLS rearming scope to include fabrication and testing of intermodal container system for transportation of VLS missile canisters, and implementation of prototype ordnance stowage modifications on selected sealift vessels.					
FY 2021 OCO Plans: N/A					
FY 2020 to FY 2021 Increase/Decrease Statement: The decrease in FY 2021 is due to the completion of the MPS Fleet Crane Enhancement demonstration.					
Title: Sealift Concept Development	0.702	0.800	0.402	0.000	0.402

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 0603563N / *Ship Concept Advanced Design*	**Project (Number/Name)** 3376 / *Strategic Sealift*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Articles:	-	-	-	-	-
FY 2020 Plans: Continue providing Sealift Research and Technology development and program guidance and conduct Sealift ship concept development and analysis. This includes interacting with resource sponsors and fleet operators to develop concepts for sealift improvements, conducting feasibility and engineering analysis of concepts, and developing concepts into specific lines of effort, and providing program and technical management of projects.					
FY 2021 Base Plans: Continue providing Sealift Research and Technology development and program guidance and conduct Sealift ship concept development and analysis. This includes interacting with resource sponsors and fleet operators to develop concepts for sealift improvements, conducting feasibility and engineering analysis of concepts, and developing concepts into specific lines of effort, and providing program and technical management of projects.					
FY 2021 OCO Plans: N/A					
FY 2020 to FY 2021 Increase/Decrease Statement: The decrease in FY 2021 is due to the Departments decision to resource other higher priority efforts.					
Title: Lighter/HSV Seabase to Shore Cargo Transfer	0.385	1.520	0.000	0.000	0.000
Articles:	-	-	-	-	-
FY 2020 Plans: Continue development and demonstration of at-sea vehicle transfer capability. FY 2020 plans continue to support the EPF V-22 Interface Project. Increase in FY20 resulted from ramp-up of EPF V-22 Flight Deck Thermal Management project design development and testing to be completed in FY20 and transitioned to PMS 385 for implementation on EPF-13. One-year OSV Employment Analysis and MPS T-AKE C2 Enhancement to be completed in FY20.					
FY 2021 Base Plans: N/A					
FY 2021 OCO Plans: N/A					
FY 2020 to FY 2021 Increase/Decrease Statement:					

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 0603563N / *Ship Concept Advanced Design*	**Project (Number/Name)** 3376 / *Strategic Sealift*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
The Department divested itself of this effort in FY 2021 as FY 2020 efforts have been completed.					
Title: Advanced Tools	1.300	1.400	0.139	0.000	0.139
Articles:	-	-	-	-	-
FY 2020 Plans: Continue investigation and demonstration of individual and multi-ship motion measurement and prediction included installation on an EPF and supported testing on the EPF and ESD installs from FY19.					
FY 2021 Base Plans: Will conduct minor development plan review in preparation for ramp-up of ESB modular medical facility design capability to begin in FY22.					
FY 2021 OCO Plans: N/A					
FY 2020 to FY 2021 Increase/Decrease Statement: The decrease in FY 2021 is due to the Departments decision to resource other higher priority efforts.					
Accomplishments/Planned Programs Subtotals	6.087	6.004	1.790	0.000	1.790

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

Not applicable for SEALIFT R&D efforts.

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 0603563N / *Ship Concept Advanced Design*	**Project (Number/Name)** 3376 / *Strategic Sealift*

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
Shipboard Crane Systems/ Shipboard Cargo Systems	WR	Various Contractors : Various	4.761	3.700	Jan 2019	2.284	Jan 2020	1.249	Jan 2021	-		1.249	Continuing	Continuing	Continuing
Sealift Concept Development	WR	Various Contractors : Various	4.825	0.702	Jan 2019	0.800	Jan 2020	0.402	Jan 2021	-		0.402	Continuing	Continuing	Continuing
Lighter/HSV Seabase to Shore Cargo Transfer	WR	Various Contractors : Various	5.471	0.385	Jan 2019	1.520	Jan 2020	0.000		-		0.000	Continuing	Continuing	Continuing
Advanced Tools	WR	Various : Various	0.890	1.300	Jan 2019	1.400	Jan 2020	0.139	Jan 2021	-		0.139	Continuing	Continuing	Continuing
		Subtotal	15.947	6.087		6.004		1.790		-		1.790	Continuing	Continuing	N/A

Remarks

1. Prior Years column only includes FY2015 (project 3376), FY2017 (project 3376), and FY2018 Congressional Add (project C403) funding as FY2016 and prior years (FY14 and earlier) were funded under NDSF BA 04 Project 3116 Strategic Sealift Research and Development.

	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	15.947	6.087		6.004		1.790		-		1.790	Continuing	Continuing	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 0603563N / *Ship Concept Advanced Design*	**Project (Number/Name)** 3376 / *Strategic Sealift*

Note: FY2016 and prior year (FY14 and earlier) efforts were financed under the National Sealift Defense Fund (NDSF) BA 04, Project 3116 (Strategic Sealift Research and Development. FY 2017, FY2018, FY2019 and out-year funds are financed under this program element.

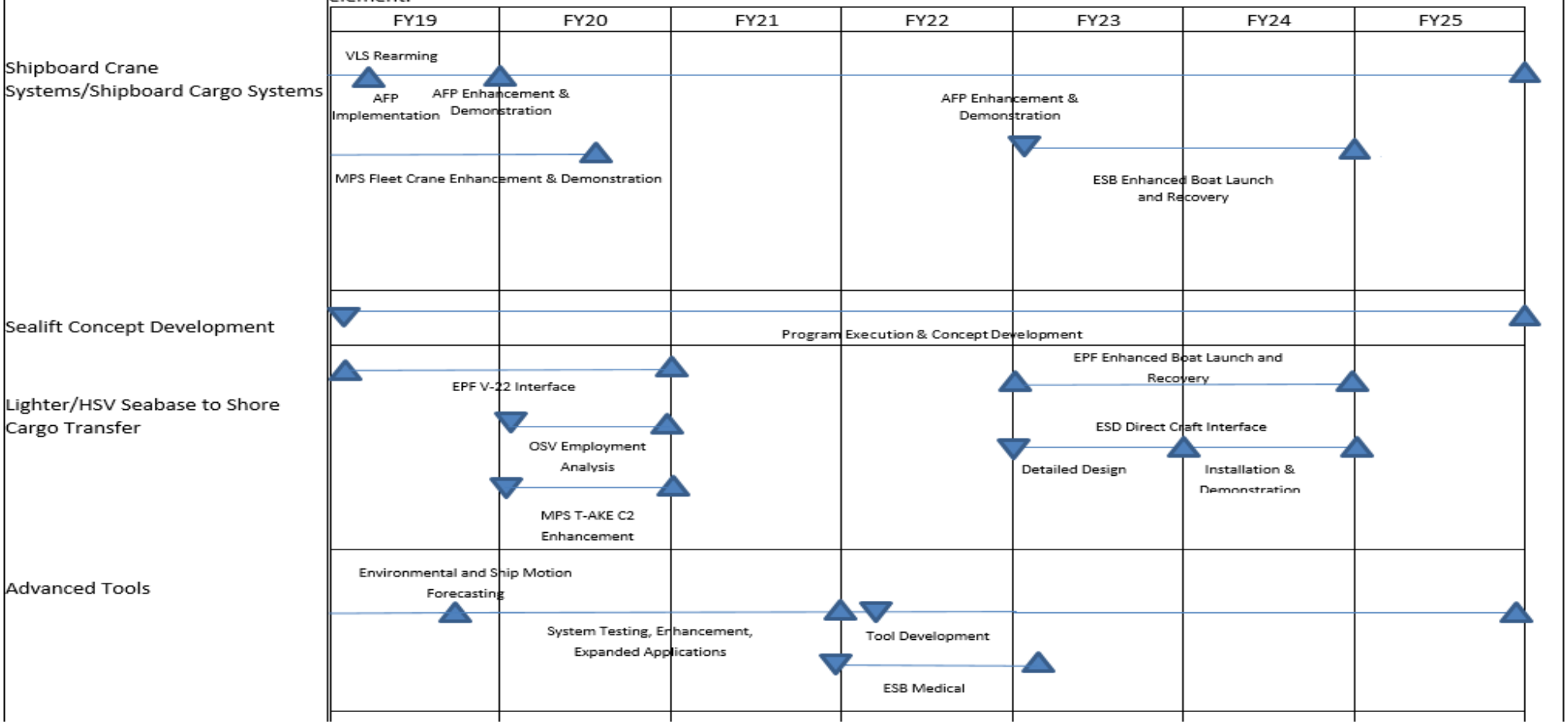


Exhibit R-4A, RDT&E Schedule Details: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603563N / *Ship Concept Advanced Design*	**Project (Number/Name)** 3376 / *Strategic Sealift*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 3376				
Shipboard Crane Systems/Shipboard Cargo Systems	1	2019	4	2025
VLS Rearming	1	2019	4	2025
AFP Implementation	1	2019	1	2020
AFP Enhancement & Demonstration	1	2020	4	2025
MPS Fleet Crane Enhancement & Demonstration	1	2019	3	2020
ESB Enhanced Boat Launch & Recovery	1	2023	4	2024
Sealift Concept Development	1	2019	4	2025
Lighter/HSV Seabase to Shore Cargo Transfer	1	2019	4	2024
EPF V-22 Interface	1	2019	4	2020
OSV Employment Analysis	1	2020	4	2020
MPS T-AKE C2 Enhancement	1	2020	4	2020
EPF Enhanced Boat Launch & Recovery	1	2023	4	2024
ESD Direct Craft Interface	1	2023	4	2024
ESD Direct Craft Interface Detailed Design	1	2023	4	2023
ESD Direct Craft Interface Installation & Demonstration	4	2023	4	2024
Advanced Tools	1	2019	4	2025
Environmental & Ship Motion Forecasting (ESMF)	3	2019	4	2021
System Testing, Enhancement, Expanded Applications	3	2019	4	2021
Tool Development	1	2022	4	2025
ESB Medical	4	2021	1	2023

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 0603563N / *Ship Concept Advanced Design*	Project (Number/Name) 4037 / *Common Hull Auxiliary Multi-Mission Platform (CHAMP)*	

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
4037: *Common Hull Auxiliary Multi-Mission Platform (CHAMP)*	0.000	17.295	8.000	13.203	-	13.203	11.463	8.306	3.993	0.000	0.000	62.260
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Common Hull Auxiliary Multi-Mission Platform (CHAMP) concept leverages a new approach to requirements generation and shipbuilding to replace aging mission specific designs with a common hull to reduce life cycle costs, leverage tailored payloads, and stabilize the industrial base. Identified CHAMP missions include: Sealift, Aviation Intermediate Maintenance support, Medical Services, Command & Control, and Submarine Tending. Funding will inform requirements definition, early industry engagement and follow-on assessment across CHAMP mission functionality.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Title: CHAMP Design and Total Ship Integration	17.295	8.000	13.203	0.000	13.203
Articles:	-	-	-	-	-
FY 2020 Plans: Additional options for Design Maturation are planned to be exercised to all four shipyards in Q1FY20. Continue development and obtain approval of the Sealift Capability Development Document (CDD) and provide engineering oversight for Industry Studies and Design Maturation.					
FY 2021 Base Plans: Begin the development of the Sealift DD&C RFP solicitation package. Continue Sealift Design Maturation efforts from FY20. Exercise options to all four shipyards for Sealift Preliminary Design. Develop the Submarine Tender CDD. Fund Government Planning Yard activity to design and develop ship specification for the Submarine Tender Nuclear Support Facility. Continue development of the Sealift DD&C RFP solicitation package. Provide engineering oversight for Sealift Design Maturation.					
FY 2021 OCO Plans: N/A					
FY 2020 to FY 2021 Increase/Decrease Statement: Additional $5.203M increase from FY2020 to FY2021 required to exercise options to four shipyards for Sealift Preliminary Design, fund a Government Planning Yard activity to design and develop ship specification for the Submarine Tender Nuclear Support Facility as well as to develop the Sealift DD&C solicitation package.					
Accomplishments/Planned Programs Subtotals	17.295	8.000	13.203	0.000	13.203

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 0603563N / *Ship Concept Advanced Design*	**Project (Number/Name)** 4037 / *Common Hull Auxiliary Multi-Mission Platform (CHAMP)*

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
• SCN/5094: *CHAMP Procurement*	0.000	0.000	0.000	-	0.000	0.000	500.000	0.000	0.000	0.000	500.000
• SCN/5010: *AS Submarine Tender*	0.000	0.000	0.000	-	0.000	0.000	0.000	500.000	0.000	0.000	500.000

Remarks

D. Acquisition Strategy

Contracts were awarded to four Shipyards for CHAMP Trade-Off Studies on 29 May 2019. Additional options for CHAMP Design Maturation and Special Studies are planned for FY20. These options will be exercised based on the results of the Trade-Off Studies. These efforts will inform Government requirements definition for future Ship acquisition.

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 0603563N / *Ship Concept Advanced Design*	**Project (Number/Name)** 4037 / *Common Hull Auxiliary Multi-Mission Platform (CHAMP)*

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
Industry Studies & Design	C/FFP	Various : Various	0.000	11.600	May 2019	7.400	Jan 2020	9.413	Dec 2020	-		9.413	0.000	28.413	-
PM & Engineering Support	Various	Various : Various	0.000	4.695	Oct 2018	0.600	Oct 2019	3.790	Oct 2020	-		3.790	0.000	9.085	-
		Subtotal	0.000	16.295		8.000		13.203		-		13.203	0.000	37.498	N/A

Support ($ 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
Program Documentation Development	Various	Various : Various	0.000	1.000	Oct 2018	0.000		0.000		-		0.000	0.000	1.000	-
		Subtotal	0.000	1.000		0.000		0.000		-		0.000	0.000	1.000	N/A

	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	0.000	17.295		8.000		13.203		-		13.203	0.000	38.498	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 0603563N / *Ship Concept Advanced Design*	**Project (Number/Name)** 4037 / *Common Hull Auxiliary Multi-Mission Platform (CHAMP)*

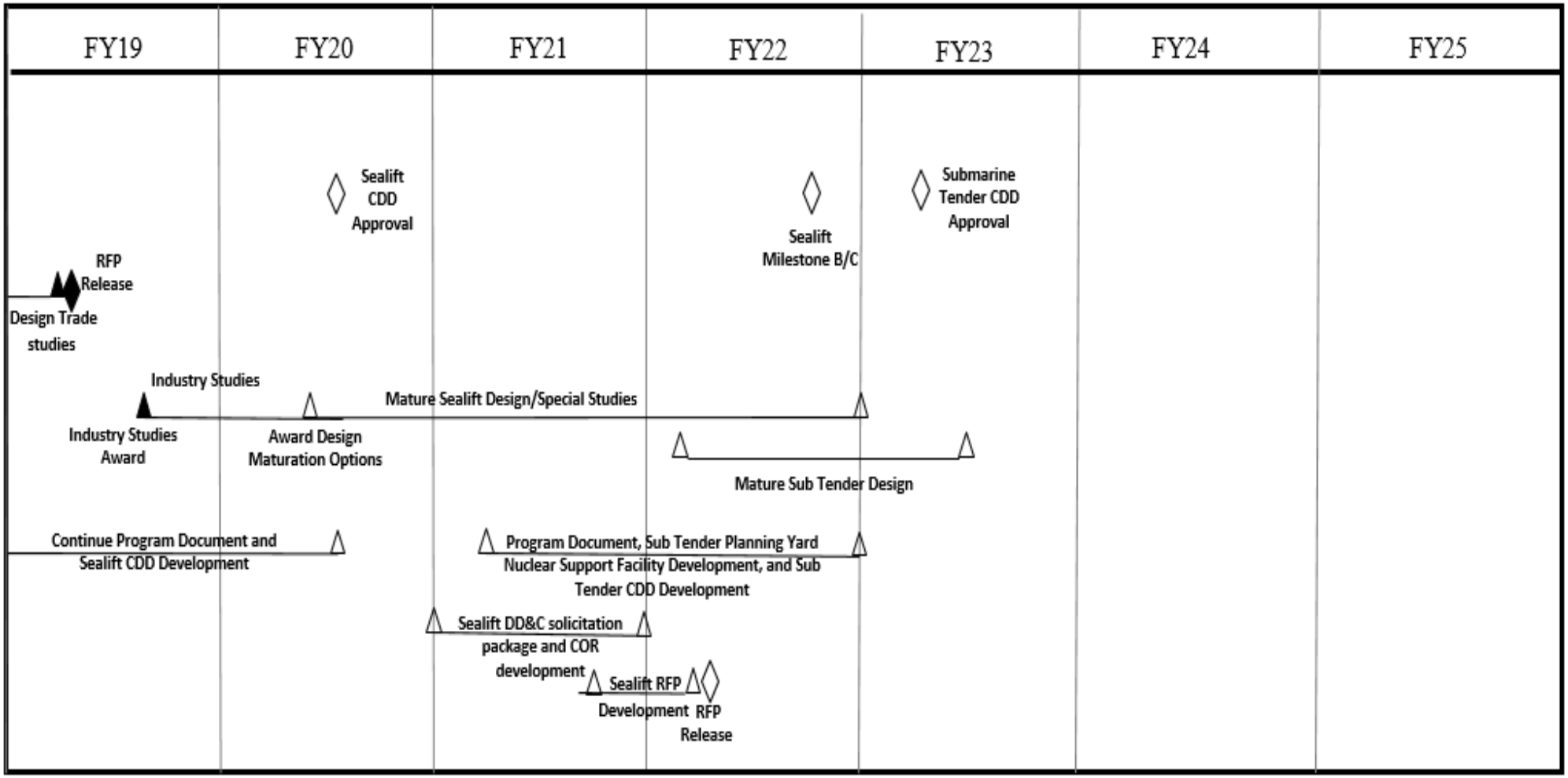


Exhibit R-4A, RDT&E Schedule Details: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603563N / *Ship Concept Advanced Design*	**Project (Number/Name)** 4037 / *Common Hull Auxiliary Multi-Mission Platform (CHAMP)*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 4037				
Program Documentation & Sealift CDD Development	1	2019	1	2019
Design Trade Studies	1	2019	2	2019
Design Trade Studies RFP Release	2	2019	2	2019
Sealift Industry Design Maturation/Special Studies	3	2019	1	2023
Submarine Tender Industry Design Maturation/Special Studies	1	2022	3	2023
Sealift CDD Approval	3	2020	3	2020
Submarine Tender Program Documentation, CDD Development, and Planning Yard Facillity	1	2021	1	2023
Sealift DD&C solicitation package and COR development	1	2021	1	2022
Sealift Milestone B/C	4	2022	4	2022
Sealift RFP Development	3	2021	1	2022
Sealift RFP Release	1	2022	1	2022
Submarine Tender CDD Approval	2	2023	2	2023

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 0603563N / *Ship Concept Advanced Design*	Project (Number/Name) 4044 / *Next Generation Medium Amphibious Ship*	

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
4044: *Next Generation Medium Amphibious Ship*	0.000	0.000	0.000	30.000	-	30.000	0.000	0.000	0.000	0.000	0.000	30.000
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

Note

This project is a new start.

A. Mission Description and Budget Item Justification

In accordance with the Commandant's Planning Guidance and Chief of Naval Operations, Warfighting Requirements and Capabilities direction in support of the Integrated Naval Force Structure Assessment (INFSA), the Navy will
evaluate next generation medium amphibious platform solutions in support of Distributed Maritime Operations (DMO), Littoral Operations in Contested Environment (LOCE), and Expeditionary Advanced Base Operations (EABO)
concepts.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Title: Next Generation Medium Amphibious Ship	0.000	0.000	30.000	0.000	30.000
Articles:	-	-	-	-	-
FY 2020 Plans: N/A					
FY 2021 Base Plans: FY 2021 funds support concept evaluation/design, industry studies and exploration for a medium lift intra-theater amphibious support vessel. Efforts include requirements development, systems engineering, naval architecture and marine engineering, and operations research analysis. Following completion of the Integrated Naval Force Structure Assessment (INFSA) and as informed by the above efforts, follow-on funding requirements will be established during the Department of Navy's programming process.					
FY 2021 OCO Plans: N/A					
FY 2020 to FY 2021 Increase/Decrease Statement:					

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 0603563N / *Ship Concept Advanced Design*	**Project (Number/Name)** 4044 / *Next Generation Medium Amphibious Ship*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
FY21 funds support concept evaluation, ship configuration development, and industry studies focused primarily on the requirements development, systems engineering, naval architecture and marine engineering, and operations research analysis of Next Generation Medium Amphibious Ships.					
Accomplishments/Planned Programs Subtotals	0.000	0.000	30.000	0.000	30.000

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

This is a non-acquisition program that designs, develops, and tests Distributed Maritime Operations (DMO), Littoral Operations in Contested Environment (LOCE), and Expeditionary Advanced Base Operations (EABO) concepts.

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 0603563N / *Ship Concept Advanced Design*	Project (Number/Name) 4044 / *Next Generation Medium Amphibious Ship*	

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
Industry Studies & Design	TBD	Various : Various	0.000	0.000		0.000		21.500	Jan 2021	-		21.500	0.000	21.500	-
		Subtotal	0.000	0.000		0.000		21.500		-		21.500	0.000	21.500	N/A

Support ($ 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
PM & Engineering Support	TBD	Various : Various	0.000	0.000		0.000		5.000	Nov 2020	-		5.000	0.000	5.000	-
Special Studies	TBD	Various : Various	0.000	0.000		0.000		2.500	Dec 2020	-		2.500	0.000	2.500	-
		Subtotal	0.000	0.000		0.000		7.500		-		7.500	0.000	7.500	N/A

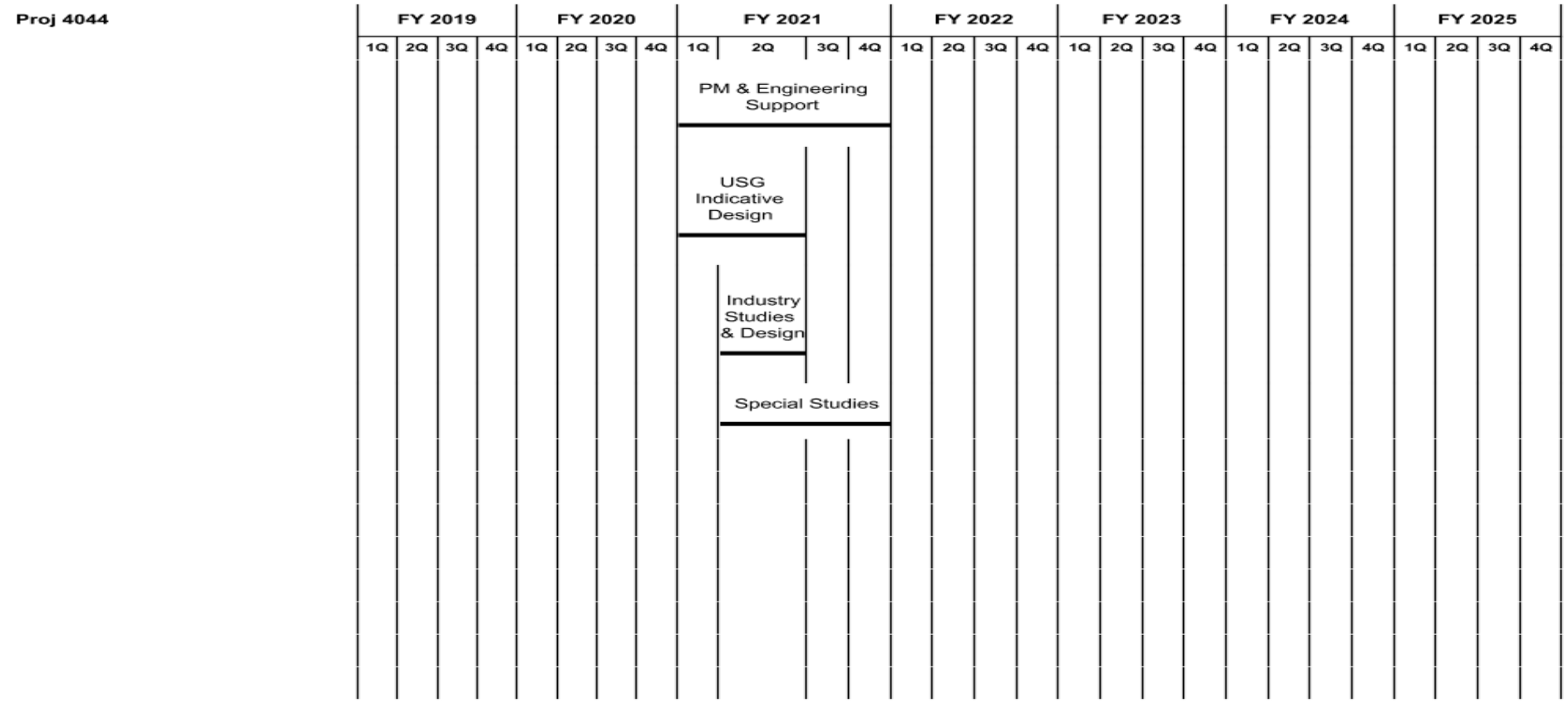
Test and Evaluation ($ in Millions)

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
USG Indicative Design	TBD	Various : Various	0.000	0.000		0.000		1.000	Nov 2020	-		1.000	0.000	1.000	-
		Subtotal	0.000	0.000		0.000		1.000		-		1.000	0.000	1.000	N/A

	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	0.000	0.000		0.000		30.000		-		30.000	0.000	30.000	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 0603563N / *Ship Concept Advanced Design*	**Project (Number/Name)** 4044 / *Next Generation Medium Amphibious Ship*



2021PB - 0603563N - 4044

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 0603563N / *Ship Concept Advanced Design*	**Project (Number/Name)** 4044 / *Next Generation Medium Amphibious Ship*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 4044				
PM & Engineering Support	1	2021	4	2021
USG Indicative Design	1	2021	2	2021
Industry Studies & Design	2	2021	2	2021
Special Studies	2	2021	4	2021

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 0603563N / *Ship Concept Advanced Design*	Project (Number/Name) 4045 / *Next Generation Medium Logistics Ship*	

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
4045: *Next Generation Medium Logistics Ship*	0.000	0.000	0.000	30.000	-	30.000	0.000	0.000	0.000	0.000	0.000	30.000
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

Note

This project is a new start.

A. Mission Description and Budget Item Justification

The Navy established the Intra-Theater Small Auxiliary Logistics Platform Task Force in support of the Integrated Naval Force Structure Assessment (INFSA), to evaluate next generation medium platform solutions for logistics mission requirements in support of Distributed Maritime Operations (DMO) and Littoral Operations in Contested Environment (LOCE). This includes a family of vessels with commercial designs tailored for military applications.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Title: Next Generation Medium Logistics Ship	0.000	0.000	30.000	0.000	30.000
Articles:	-	-	-	-	-
FY 2020 Plans: N/A					
FY 2021 Base Plans: FY 2021 funds support concept evaluation, ship configuration development, and industry studies focused primarily on the Refuel, Resupply, and Rearm logistics missions. Efforts include requirements development, systems engineering, naval architecture and marine engineering, and operations research analysis. Following completion of the Integrated Naval Force Structure Assessment (INFSA) and as informed by the above efforts, follow-on funding requirements will be established during the Department of Navy's programming process.					
FY 2021 OCO Plans: N/A					
FY 2020 to FY 2021 Increase/Decrease Statement:					

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 0603563N / *Ship Concept Advanced Design*	**Project (Number/Name)** 4045 / *Next Generation Medium Logistics Ship*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
FY21 funds support concept evaluation, ship configuration development, and industry studies focused primarily on the requirements development, systems engineering, naval architecture and marine engineering, and operations research analysis of Next Generation Medium Logistics Ships.					
Accomplishments/Planned Programs Subtotals	0.000	0.000	30.000	0.000	30.000

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

This is a non-acquisition program that designs, develops, and tests the Integrated Naval Force Structure Assessment (INFSA), to evaluate next generation medium platform solutions for logistics mission requirements in support of Distributed Maritime Operations (DMO) and Littoral Operations in Contested Environment (LOCE). This includes a family of vessels with commercial designs tailored for military applications.

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 0603563N / *Ship Concept Advanced Design*	Project (Number/Name) 4045 / *Next Generation Medium Logistics Ship*	

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
Industry Studies & Design	C/BA	Not Specified : Not Specified	0.000	0.000		0.000		21.500	Jan 2021	-		21.500	0.000	21.500	-
		Subtotal	0.000	0.000		0.000		21.500		-		21.500	0.000	21.500	N/A

Support ($ 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
PM & Engineering Support	C/BA	Not Specified : Not Specified	0.000	0.000		0.000		5.000	Nov 2020	-		5.000	0.000	5.000	-
Special Studies	C/BA	Not Specified : Not Specified	0.000	0.000		0.000		2.500	Dec 2020	-		2.500	0.000	2.500	-
		Subtotal	0.000	0.000		0.000		7.500		-		7.500	0.000	7.500	N/A

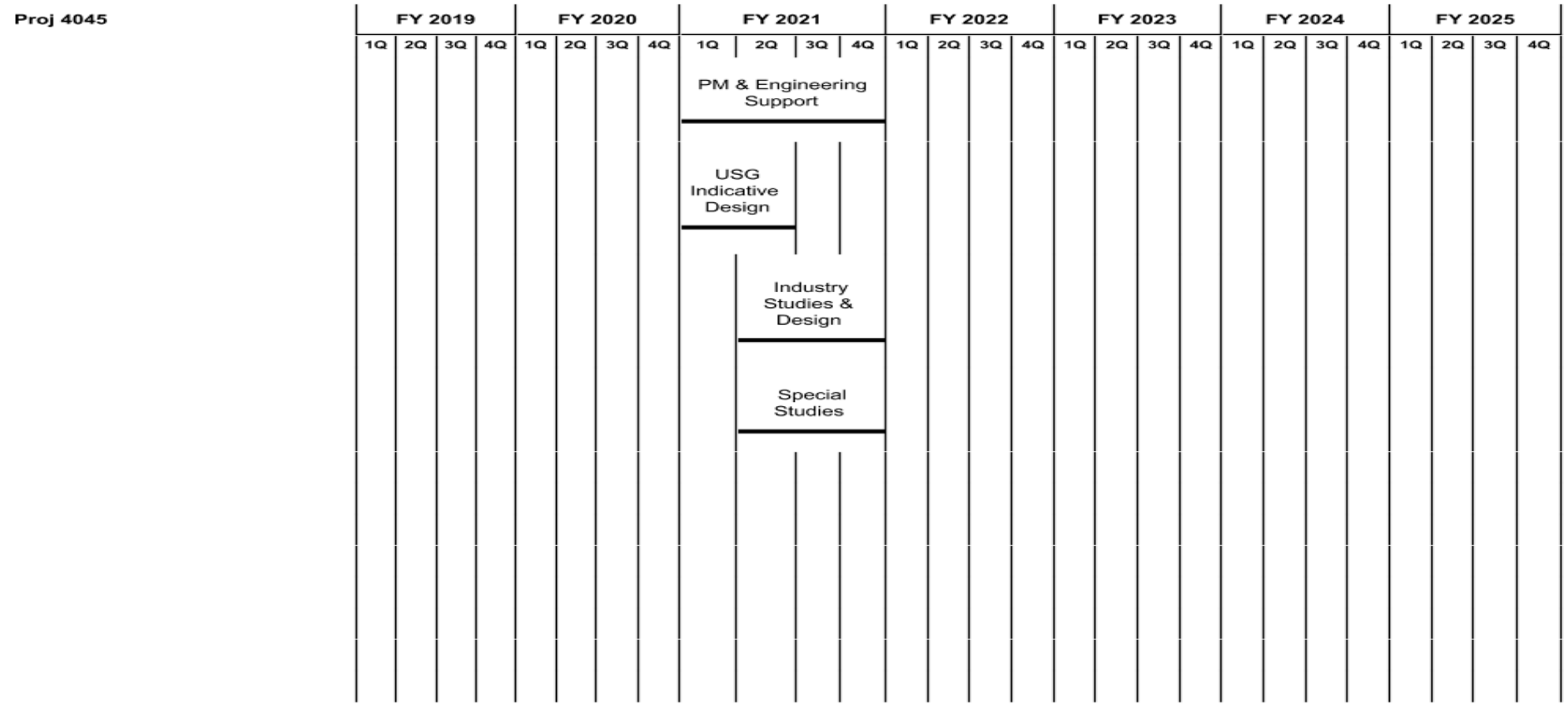
Test and Evaluation ($ in Millions)

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
USG Indicative Design	C/BA	Not Specified : Not Specified	0.000	0.000		0.000		1.000	Dec 2020	-		1.000	0.000	1.000	-
		Subtotal	0.000	0.000		0.000		1.000		-		1.000	0.000	1.000	N/A

	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	0.000	0.000		0.000		30.000		-		30.000	0.000	30.000	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 0603563N / *Ship Concept Advanced Design*	**Project (Number/Name)** 4045 / *Next Generation Medium Logistics Ship*



2021PB - 0603563N - 4045

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 0603563N / *Ship Concept Advanced Design*	**Project (Number/Name)** 4045 / *Next Generation Medium Logistics Ship*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 4045				
PM & Engineering Support	1	2021	4	2021
USG Indicative Design	1	2021	2	2021
Industry Studies & Design	2	2021	4	2021
Special Studies	2	2021	4	2021

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 0603563N / *Ship Concept Advanced 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*	0.000	0.000	15.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	15.000
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Project C439 - Advanced Manufacturing of Critical Scale Materials-$5M
Funding provided in the Department of Defense Appropriations Act, 2020 to ensure the next generation of submarines incorporates the most cutting edge technologies, the Navy must advance the qualification and certification of Advanced Manufacturing (AM) processes, materials, and components to allow the Navy to integrate AM capabilities into current and future systems and platforms. The committee directs the Secretary of the Navy to report to the committee by December 1, 2019 on what efforts are underway to integrate AM. Further, as part of this report, the committee directs the Navy to include specific information about the testing and qualification of processes, materials, and components required to meet Columbia Class requirements and milestones.

Project C580 - High-Pressure Cold Spray Systems-$10M
Funding provided in the Department of Defense Appropriations Act, 2020 to conduct research, development, and prototyping for high-pressure cold spray systems. Sustainment drives significant lifecycle costs to ships and submarines. The utilization of high-pressure cold spray systems for ship and submarine sustainment, including maintenance and repairs can result in significant efficiencies and cost savings for the Navy.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020
Congressional Add: Additive Manufacturing ***FY 2019 Accomplishments:*** N/A ***FY 2020 Plans:*** Advanced Manufacturing of Critical Scale Materials-$5M To ensure the next generation of submarines incorporates the most cutting edge technologies, the Navy must advance the qualification and certification of Advanced Manufacturing (AM) processes, materials, and components to allow the Navy to integrate AM capabilities into current and future systems and platforms. The committee directs the Secretary of the Navy to report to the committee by December 1, 2019 on what efforts are underway to integrate AM. Further, as part of this report, the committee directs the Navy to include specific information about the testing and qualification of processes, materials, and components required to meet Columbia Class requirements and milestones.	0.000	5.000
Congressional Add: High pressure cold spray system	0.000	10.000

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 0603563N / *Ship Concept Advanced Design*	**Project (Number/Name)** 9999 / *Congressional Adds*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020
FY 2019 Accomplishments: N/A ***FY 2020 Plans:*** The Congressional Add for High-Pressure Cold Spray Systems was inadvertently aligned to NAVAIR MH-60 NRE, PE 0702206N as appropriated and lists BSO 24 and N96 as the RS. The Add was moved to NAVSEA BA04 LI 0603563N for execution to match Congressional intent of ships and submarines sustainment. The High-Pressure Cold Spray Systems Congressional Add will conduct research, development, and prototyping for high-pressure cold spray systems. Sustainment drives significant lifecycle costs to ships and submarines. The utilization of high-pressure cold spray systems for ship and submarine sustainment, including maintenance and repairs can result in significant efficiencies and cost savings for the Navy.		
Congressional Adds Subtotals	0.000	15.000

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603563N / *Ship Concept Advanced 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
Advanced Manufacturing of Critical Scale Materials	TBD	Various : Various	0.000	0.000		1.000	May 2020	0.000		-		0.000	0.000	1.000	-
Battery Prototype	TBD	Various : Various	0.000	0.000		1.500	Apr 2020	0.000		-		0.000	0.000	1.500	-
		Subtotal	0.000	0.000		2.500		0.000		-		0.000	0.000	2.500	N/A

Support ($ 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
Program Management Support	TBD	Various : Various	0.000	0.000		0.500	Jan 2020	0.000		-		0.000	0.000	0.500	-
		Subtotal	0.000	0.000		0.500		0.000		-		0.000	0.000	0.500	N/A

Test and Evaluation ($ 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
Battery T&E	TBD	Various : Various	0.000	0.000		10.000	Apr 2020	0.000		-		0.000	0.000	10.000	-
Advanced Manufacturing of Critical Scale Materials	TBD	Various : Various	0.000	0.000		2.000	May 2020	0.000		-		0.000	0.000	2.000	-
		Subtotal	0.000	0.000		12.000		0.000		-		0.000	0.000	12.000	N/A

	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
Project Cost Totals	0.000	0.000		15.000		0.000		-		0.000	0.000	15.000	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 0603563N / *Ship Concept Advanced Design*	**Project (Number/Name)** 9999 / *Congressional Adds*

	FY 2019				FY 2020				FY 2021				FY 2022				FY 2023				FY 2024				FY 2025			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Proj 9999																												
Advanced Manufacturing of Critical Scale Materials						[redacted]																						
High-Pressure Cold Spray Systems						[redacted]																						

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 0603563N / *Ship Concept Advanced Design*	**Project (Number/Name)** 9999 / *Congressional Adds*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 9999				
Advanced Manufacturing of Critical Scale Materials	2	2020	4	2020
High-Pressure Cold Spray Systems	2	2020	4	2020