Exhibit R-2, RDT&E Budget Item Justification: PB 2022 Navy											Date: May 2021	
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 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 2020**	**FY 2021**	**FY 2022 Base**	**FY 2022 OCO**	**FY 2022 Total**	**FY 2023**	**FY 2024**	**FY 2025**	**FY 2026**	**Cost To Complete**	**Total Cost**
Total Program Element	304.261	100.887	131.741	111.590	-	111.590	-	-	-	-	-	-
2196: *Design, Tools, Plans and Concepts*	30.189	33.657	21.424	15.334	-	15.334	-	-	-	-	-	-
3161: *NAVSEA Tech Authority*	233.043	37.305	12.151	13.783	-	13.783	-	-	-	-	-	-
3244: *Cybersecurity Engineering*	0.000	0.000	16.099	15.199	-	15.199	-	-	-	-	-	-
3376: *Strategic Sealift*	22.034	5.769	1.782	9.949	-	9.949	-	-	-	-	-	-
4037: *Common Hull Auxiliary Multi-Mission Platform (CHAMP)*	18.995	9.685	2.553	0.000	-	0.000	-	-	-	-	-	-
4044: *Next Generation Medium Amphibious Ship*	0.000	0.000	23.866	13.183	-	13.183	-	-	-	-	-	-
4045: *Next Generation Medium Logistics Ship*	0.000	0.000	23.866	27.785	-	27.785	-	-	-	-	-	-
5010: *AS(X) Submarine Tender*	0.000	0.000	0.000	16.357	-	16.357	-	-	-	-	-	-
9999: *Congressional Adds*	0.000	14.471	30.000	0.000	-	0.000	-	-	-	-	-	-

A. Mission Description and Budget Item Justification

The FY 2022 funding request was reduced by $2.051 million to account for the availability of prior year execution balances.

Project 2196 - This project provides the analytical foundation for making informed force structure, capability and affordability decisions in the development of all future surface ship platforms, weapons, sensors and combat systems. It realizes this through total ship system engineering, technology integration, cost estimation, mission effectiveness analysis, force architecture synthesis, and force-level effectiveness analysis, as well as continuous development of the people, tools and processes required to accomplish these efforts efficiently. This includes early-stage concept development studies for all potential future surface ships. It also includes quantitative mission and force-level analysis to identify future capability gaps and requirements related to advances in threat capabilities, and evaluation of the effectiveness and affordability of potential future technology and concept of operations (CONOP) solutions. Results from this project are used to inform senior Navy leadership in support of budgetary decisions, Capability Evolution Plans (CEP), and Top Level Requirements (TLRs) related to surface ship force structure, platforms and major combat system elements. The FY 2022 budget submission was reduced from FY 2021 due to anticipated efficiencies gained following initial stand-up of new analysis capabilities in FY 2021, and full transition of DDG(X) Pre-Preliminary Design (PPD), Preliminary Design (PD) and Contract Design (CD) efforts to PE 0603564N/0411.

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 the CPSD Program 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. 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. This Project supported Navy COVID Rapid Response Testing (NCR2T) activities.

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).

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. FY 2015, FY 2017, and FY 2019 and future efforts are financed under this 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 - The Light Amphibious Warship (LAW) is a medium-sized landing ship that enables distributed maneuver and logistics such as Distributed Maritime Operations (DMO), Littoral Operations in a Contested Environment (LOCE), and Expeditionary Advanced Base Operations (EABO) in support of the newly established Marine Littoral Regiment (MLR). It is designed to fill the gap in capability between the Navy's large, multipurpose amphibious warfare "L" class ships and smaller landing vessels. This vessel will deploy tailored logistics, select power projection and strike capabilities.

Exhibit R-2, RDT&E Budget Item Justification: PB 2022 Navy	Date: May 2021
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 0603563N *I Ship Concept Advanced Design*

Project 4045 - The Next Generation Logistics Ship (NGLS) is planned to be a new class of ships to augment the current Combat Logistics Force ships, through the use of commercial ship designs tailored for military applications to conduct logistics missions. The NGLS will enable refueling, rearming, and resupply of Naval assets - afloat and ashore - in support of Distributed Maritime Operations, Littoral Operations Contested Environment, and Expeditionary Advanced Base Operations. The NGLS is envisioned to be smaller than existing ships in the Combat Logistics Force, and will operate near contested environments, sustaining afloat (Surface Action Group) and ashore (Expeditionary Advanced Base) requirements. NGLS is potentially a family of vessels (a Platform Supply Vessel (PSV) and/or Fast Supply Vessel (FSV)) with commercial designs tailored for military applications. RDT&E funding will continue to support requirements trade-off studies, development of indicative designs, specification development, and on a chartered logistics ship experimentation and proof-of-concepts focused on the Refuel, Resupply, and Rearm logistics missions.

Project 5010 - This project supports Submarine Tender Recapitalization Acquisition Documentation development, Preliminary Design, Detail Design, Program Management/Engineering Services and Total Ship Integration. The Submarine Tender approach leverages current Submarine Tender capabilities, Nuclear Support Facility, integrating new VACL and CLB capabilities into the requirements generation and shipbuilding contracts. Identified missions include: Submarine Tending, Re-arming, re-supply of material, medical/dental, Nuclear Support, Submarine Systems repair and other maintenance support. Funding will inform requirements definition, early industry engagement preliminary designs, trade studies, and follow-on assessment for Sub Tender.

Project 9999 (Congressional Add)- Funding provided in the Department of Defense Appropriations Act, 2021 for additive manufacturing, polymorphic build farm for open source technologies, defense industrial skills and technology training, and portable high pressure cold spray system. Funding provided in the Department of Defense Appropriations Act, 2020 for additive manufacturing and high pressure cold spray systems.

B. Program Change Summary ($ in Millions)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
Previous President's Budget	96.846	126.396	58.101	-	58.101
Current President's Budget	100.887	131.741	111.590	-	111.590
Total Adjustments	4.041	5.345	53.489	-	53.489
• Congressional General Reductions	-	-0.564			
• Congressional Directed Reductions	-	-24.091			
• Congressional Rescissions	-	-			
• Congressional Adds	-	30.000			
• Congressional Directed Transfers	-	-			
• Reprogrammings	7.498	0.000			
• SBIR/STTR Transfer	-3.457	0.000			
• Program Adjustments	0.000	0.000	55.312	-	55.312
• Rate/Misc Adjustments	0.000	0.000	-1.823	-	-1.823

Congressional Add Details ($ in Millions, and Includes General Reductions)	FY 2020	FY 2021
Project: 9999: *Congressional Adds*		
Congressional Add: *Additive Manufacturing*	4.824	5.000

Exhibit R-2, RDT&E Budget Item Justification: PB 2022 Navy	Date: May 2021
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 0603563N *I Ship Concept Advanced Design*

Congressional Add Details ($ in Millions, and Includes General Reductions)	FY 2020	FY 2021
Congressional Add: *High pressure cold spray system*	9.647	0.000
Congressional Add: *Defense industrial Skills and Technology Training*	0.000	5.000
Congressional Add: *Polymorphic Build Farm for Open Source Technologies*	0.000	10.000
Congressional Add: *Portable High Pressure Cold Spray System*	0.000	10.000
Congressional Add Subtotals for Project: 9999	14.471	30.000
Congressional Add Totals for all Projects	14.471	30.000

Change Summary Explanation

Program adjustments include:

2196 Naval Capability Integration Process - From the Sea (NCIP-FTS) - Funds are required to support execution of the NCIP-FTS process to include quantitative mission and force-level analysis.

4045 Next Generation Logistics Ship (NGLS) - Funds are required to conduct Vessel Experimentation/Demonstration/Proof of Concept by chartering commercial offshore support vessels to experiment and demonstrate concepts related to the Refuel, Resupply, and Rearm logistics missions that NGLS will perform.

Exhibit R-2A, RDT&E Project Justification: PB 2022 Navy			Date: May 2021
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 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
2196: *Design, Tools, Plans and Concepts*	30.189	33.657	21.424	15.334	-	15.334	-	-	-	-	-	-
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Project 2196 - This project provides the analytical foundation for making informed force structure, capability and affordability decisions in the development of all future surface ship platforms, weapons, sensors and combat systems. It realizes this through total ship system engineering, technology integration, cost estimation, mission effectiveness analysis, force architecture synthesis, and force-level effectiveness analysis, as well as continuous development of the people, tools and processes required to accomplish these efforts efficiently. This includes early-stage concept development studies for all potential future surface ships. It also includes quantitative mission and force-level analysis to identify future capability gaps and requirements related to advances in threat capabilities, and evaluation of the effectiveness and affordability of potential future technology and concept of operations (CONOP) solutions. Results from this project are used to inform senior Navy leadership in support of budgetary decisions, Capability Evolution Plans (CEP), and Top Level Requirements (TLRs) related to surface ship force structure, platforms and major combat system elements. The FY 2022 budget submission was reduced from FY 2021 due to anticipated efficiencies gained following initial stand-up of new analysis capabilities in FY 2021, and full transition of DDG(X) Pre-Preliminary Design (PPD), Preliminary Design (PD) and Contract Design (CD) efforts to PE 0603564N/0411.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
Title: Future Surface Combatant Force (FSCF) Analysis	9.257	12.674	9.563	0.000	9.563
Articles:	-	-	-	-	-
Description: FSCF analysis focuses on the long time-horizon, approximately 20-25 years in the future, to understand necessary changes in the surface combatant force's structure and capabilities, and informs near-term decisions and planning that drive these changes. FSCF Analysis provides warfighting effectiveness and cost analysis of force structure and concept of operations/employment (CONOP/CONEMP) alternatives, ship and combat system requirements, and key technology enablers for the FSCF to address future threats. It generates insights supporting budgetary decisions by senior Navy leadership, and assists in establishing Capability Evolution Plans (CEP) and long-term future Top Level Requirements (TLRs) for all future surface combatant ships and major combat system elements.					
FY 2021 Plans: Re-baseline FSCF analysis assumptions and align analysis with the Future Navy Force Study (FNFS). Develop future capability concepts and technology integration options for future ship classes, with a focus on future evolution of the MUSV and LUSV platforms. Integrate these concepts into alternative force package, Future					

Exhibit R-2A, RDT&E Project Justification: PB 2022 Navy		Date: May 2021
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 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
Force Architecture (FFA), and CONOPs alternatives. Assess cost and warfighting effectiveness of alternatives to produce insights that inform Capability Evolution Plan (CEP) development, future ship and combat system Top Level Requirements (TLR) definition, and technology investment decisions by senior Navy leadership. ***FY 2022 Base Plans:*** Excursion Analysis, including evaluation of FY21 results' sensitivity to key assumptions and exploration of additional cost, capability and CONOP tradeoffs. ***FY 2022 OCO Plans:*** N/A ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Decrease from FY 2021 to FY 2022 is due to increased costs in FY2021 to stand-up new analysis capabilities.					
Title: Naval Capability Integration Process (NCIP) - From the Sea (FTS)	0.000	1.000	4.271	0.000	4.271
Articles:	-	-	-	-	-
Description: NCIP is an annual process analyzing current, programmed, and non-programmed near-term capability alternatives relative to stressing threats in the short time-horizon, approximately 10 years in the future. NCIP-FTS focuses on surface combatant contributions to integrated effects chains, especially for Naval Surface Fires and Integrated Air and Missile Defense, and is aligned with NCIP From the Air (FTA), Information Warfare (IW), Anti-Submarine Warfare (ASW), and Marine Corp efforts. NCIP evaluates platform, weapon, sensor and combat system capabilities to address warfighting requirements and gaps, and supports investment decisions that focus resources where they will have the greatest warfighting impact. ***FY 2021 Plans:*** Continue NCIP-FTS Concept of Employment (CONEMP) and effects chain definition process for current, programmed and non-programmed near-term capability alternatives. ***FY 2022 Base Plans:*** Introduce quantitative mission and force-level effectiveness analysis to the annual NCIP-FTS process. Develop metrics to describe the effectiveness of solutions. Evaluate the ability of current, programmed and non-programmed near-term capabilities to address capability requirements and gaps within integrated effects chains relative to future stressing threats. ***FY 2022 OCO Plans:***					

Exhibit R-2A, RDT&E Project Justification: PB 2022 Navy		Date: May 2021
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 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
N/A ***FY 2021 to FY 2022 Increase/Decrease Statement:*** The increase is to fund the full level of effort needed to execute the NCIP-FTS process to include quantitative mission and force-level analysis.					
Title: DDG(X) (Formerly Large Surface Combatant)	24.400	7.000	0.000	0.000	0.000
Articles:	-	-	-	-	-
Description: In FY 2020, DDG(X) Design and Analysis was funded within PE 0603563N/2196 as part of the Future Surface Combatant Studies effort. During Continuing Resolution, DDG(X) Design and Analysis continued to be partially funded through PE 0603563N/2196. In FY 2022, funding for DDG(X) Pre-Preliminary Design (PPD), Preliminary Design (PD) and Contract Design (CD) efforts will fully reside within PE 0603564N/0411. DDG(X) Design and Analysis has been listed as a separate effort from continuing Future Surface Combatant Force (FSCF) Analysis in order to clarify differences between them, although both efforts were combined under the Future Surface Combatant Studies title in previous budgets. DDG(X) efforts within PE 0603564N/0411 encompass program and engineering efforts leading to a low risk Contract Design technical package and release of a Request for Proposal for the Detail Design and Construction of the lead DDG(X) ship. ***FY 2021 Plans:*** FY 2021 efforts funded through PE 0603563N/2196 include cost/ capability trades to establish draft Capability Development Document (CDD) requirements, identification and closure of key design knowledge gaps and decision points, and set-based engineering resulting in identification of critical system attributes and requirements. ***FY 2022 Base Plans:*** N/A. Transition to PE 0603564N/0411. ***FY 2022 OCO Plans:*** N/A ***FY 2021 to FY 2022 Increase/Decrease Statement:*** In FY 2022, funding related to DDG(X) Pre-Preliminary Design (PPD), Preliminary Design (PD) and Contract Design (CD) efforts will fully reside within PE 0603564N/0411.					
Title: Ship Design Tool Development	0.000	0.750	1.500	0.000	1.500
Articles:	-	-	-	-	-

Exhibit R-2A, RDT&E Project Justification: PB 2022 Navy		Date: May 2021
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 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
Description: Develop and maintain ship design and evaluation tools that are critical enablers for affordable and effective maturation of new surface ship programs through engineering analysis. Focus areas include rapid ship design and integration, as well as shock, damage, hydrodynamic, and structural design and analysis. It also includes utilization of high performance computing (HPC) environments to achieve improved tool fidelity and efficiency. ***FY 2021 Plans:*** Develop tools to support future major acquisition programs. Conduct efforts to improve rapid ship design and integration tools, design for and measure ship producibility and affordability metrics, and validate HPC tools for hydrodynamics, shock and damage analysis. ***FY 2022 Base Plans:*** Continue development of ship design and analysis tools to improve efficiency and fidelity, ultimately supporting more affordable and capable future ships. ***FY 2022 OCO Plans:*** N/A ***FY 2021 to FY 2022 Increase/Decrease Statement:*** FY 2022 funding increased to support annual level of effort needed to develop and maintain ship design and evaluation tools in support of surface ship programs.					
Accomplishments/Planned Programs Subtotals	33.657	21.424	15.334	0.000	15.334

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
• RDTEN/0603564N/0411: *DDG(X) Concept Development*	0.000	12.946	80.354	-	80.354	-	-	-	-	-	-
• RDTEN/0603178N/3066: *Large Unmanned Surface Vessel (LUSV)*	0.000	69.634	145.674	-	145.674	-	-	-	-	-	-
• RDTEN/0603178N/3067: *Unmanned Surface Vehicle Enabling Capabilities*	0.000	22.113	170.838	-	170.838	-	-	-	-	-	-

Exhibit R-2A, RDT&E Project Justification: PB 2022 Navy		Date: May 2021
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 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost

Remarks

D. Acquisition Strategy

This is a non-acquisition program that develops and evaluates future surface ship force structure and platform concepts in support of budgetary decisions, Capability Evolution Plans (CEP), and Top Level Requirements (TLRs) related to surface ship force structure, platforms and major combat system elements.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Navy			Date: May 2021
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 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Systems Engineering	C/CPFF	FSCF Analysis Various Contractors : Various	7.608	1.195	Feb 2020	1.000	Feb 2021	1.000	Jan 2022	-		1.000	-	-	-
Systems Engineering	WR	FSCF Analysis NSWC : Various	11.136	1.000	Feb 2020	0.924	Dec 2020	8.563	Oct 2021	-		8.563	-	-	-
Systems Engineering	WR	FSCF Analysis NSWC DD : Dahlgren, VA	2.937	2.000	Nov 2019	5.250	Dec 2020	0.000		-		0.000	-	-	-
Systems Engineering	WR	FSCF Analysis NIWC : San Diego, CA	0.172	2.200	Nov 2019	0.050	Nov 2020	0.000		-		0.000	-	-	-
Systems Engineering	WR	FSCF Analysis JHU APL : Baltimore, MD	0.000	0.500	Feb 2020	0.000		0.000		-		0.000	-	-	-
Systems Engineering	WR	FSCF Analysis NSWC CD : Carderock, MD	2.530	1.000	Oct 2019	2.200	Nov 2020	0.000		-		0.000	-	-	-
Systems Engineering	WR	FSCF Analysis NUWC : Newport, RI	0.075	0.400	Nov 2019	1.200	Dec 2020	0.000		-		0.000	-	-	-
Systems Engineering	WR	FSCF Analysis NRL : Washington DC	0.000	0.000		1.630	Feb 2021	0.000		-		0.000	-	-	-
Systems Engineering	WR	FSCF Analysis NAVAIR : Patuxent River, MD	0.196	0.200	Nov 2019	0.420	Feb 2021	0.000		-		0.000	-	-	-
Engineering Development	WR	FSCF Analysis NSWC CD : Carderock, MD	3.275	1.000	Nov 2019	0.000		0.000		-		0.000	-	-	-
Engineering Development	C/BA	FSCF Analysis NSWC : Various	1.610	0.100	Feb 2020	0.000		0.000		-		0.000	-	-	-
Systems Engineering	C/CPFF	DDG(X) Pre-PD Various Contractors : Various	0.000	14.000	Feb 2020	2.200	Dec 2020	0.000		-		0.000	-	-	-
Systems Engineering	WR	DDG(X) Pre-PD NSWC : Various	0.000	3.562	Feb 2020	1.500	Nov 2020	0.000		-		0.000	-	-	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Navy		Date: May 2021
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 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Systems Engineering	WR	DDG(X) Pre-PD NSWC DD : Dahlgren, VA	0.000	1.800	Nov 2019	0.500	Dec 2020	0.000		-		0.000	-	-	-
Systems Engineering	WR	DDG(X) Pre-PD NSWC PD : Philadelphia, PA	0.000	1.600	Nov 2019	0.500	Dec 2020	0.000		-		0.000	-	-	-
Systems Engineering	WR	DDG(X) Pre-PD NIWC : San Diego, CA	0.000	0.600	Nov 2019	0.000		0.000		-		0.000	-	-	-
Systems Engineering	WR	DDG(X) Pre-PD NSWC CD : Carderock, MD	0.000	2.500	Oct 2019	2.300	Dec 2020	0.000		-		0.000	-	-	-
Systems Engineering	WR	T-AGS(X) NSWC CD : Carderock, MD	0.650	0.000		0.000		0.000		-		0.000	-	-	-
Systems Engineering	C/CPFF	NCIP NSMA : Washington DC	0.000	0.000		0.700	Nov 2020	1.000	Jan 2022	-		1.000	-	-	-
Systems Engineering	WR	NCIP Dahlgren : Dahlgren, VA	0.000	0.000		0.300	Feb 2021	3.271	Nov 2021	-		3.271	-	-	-
Systems Engineering	WR	Tools Development : Carderock, MD	0.000	0.000		0.750	Feb 2021	1.500	Jan 2022	-		1.500	-	-	-
		Subtotal	30.189	33.657		21.424		15.334		-		15.334	-	-	N/A

Remarks

In FY 2022, funding related to DDG(X) Pre-Preliminary Design (PPD), Preliminary Design (PD) and Contract Design (CD) efforts will fully reside within PE 0603564N/0411.

	Prior Years	FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	30.189	33.657		21.424		15.334		-		15.334	-	-	N/A

Remarks

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

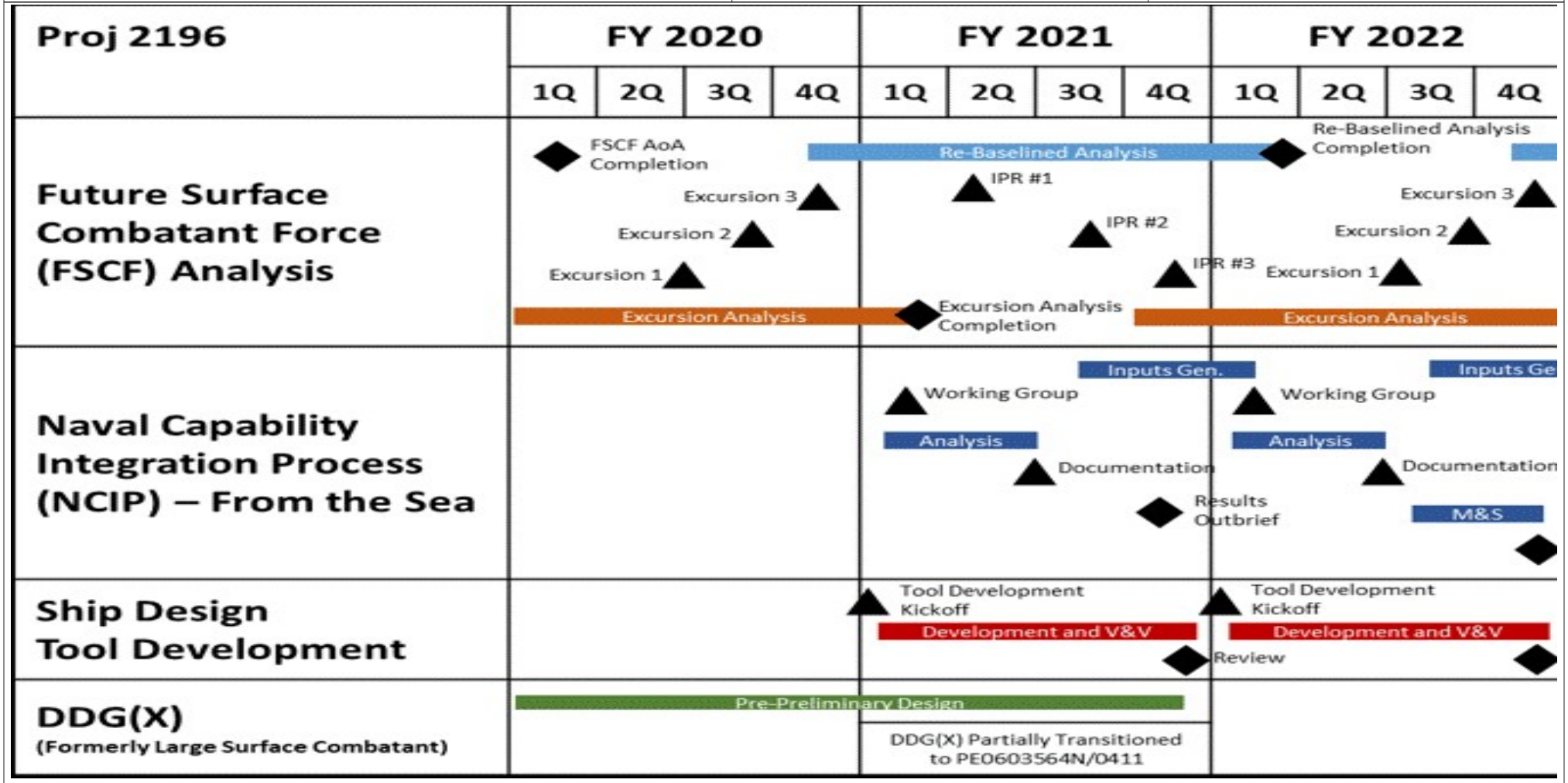

Exhibit R-4A, RDT&E Schedule Details: PB 2022 Navy		Date: May 2021
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603563N / *Ship Concept Advanced Design*	**Project (Number/Name)** 2196 / *Design, Tools, Plans and Concepts*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 2196				
Proj 2196A: Future Surface Combatant Force Analysis	1	2020	4	2022
Proj 2196B: Naval Capability Integration Process - From the Sea	1	2020	4	2022
Proj 2196C: Ship Design Tools Development	1	2020	4	2022

Exhibit R-2A, RDT&E Project Justification: PB 2022 Navy			Date: May 2021
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 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
3161: *NAVSEA Tech Authority*	233.043	37.305	12.151	13.783	-	13.783	-	-	-	-	-	-
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

Note

All Cross Platform System Development (CPSD) Pillars have been re-baselined in FY19 to better address CNO and NAVSEA Chief Engineer (SEA05) technical priorities. Starting in FY 2021, Cybersecurity Pillar (CPSD F) has been moved to an individual project, PU 3244.

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 re-baselined to better address CNO and NAVSEA Chief Engineer (SEA05) technical priorities and shall be comprised of the following functional areas, with the exception of Cyber Security (CPSD F) which was moved to an individual project starting in FY 2021.

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

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
Title: Navy COVID Rapid Response Team (NCR2T)	4.400	0.000	0.000	0.000	0.000
Articles:	-	-	-	-	-

Exhibit R-2A, RDT&E Project Justification: PB 2022 Navy		Date: May 2021
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B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
Description: A critical aspect of COVID-19 mitigation and response is social distancing and contact tracing. Maintaining social distancing is a challenging endeavor for US Navy personnel be it distance of time exposure variables. Self maintaining a contact log as Navy community perform work sometimes without clear understanding and knowledge of distance and time variables as well as personnel identification (name, etc). Utilizing a wearable device with applicable built-in technology and applications increases ability to identify exposure to others in proximity (both distance and time). Wearables also enable rapid contact tracing by quickly identifying other wearables that have been in proximity to a user of concern. Contact Tracing also provides monitoring capabilities that allow for early detection of the disease and thus possibly reduce further transmission of the virus. This effort is being performed utilizing Army support under US Army ASA (ALT) Chief Technology Officer Technology Analysis, Modeling and Prototyping (AMP) Studies Technical Instruction (TI): CTO/TI/009-Navy Proximity Tracking. ***FY 2021 Plans:*** N/A ***FY 2022 Base Plans:*** N/A ***FY 2022 OCO Plans:*** N/A ***FY 2021 to FY 2022 Increase/Decrease Statement:*** N/A					
Title: Ship Technology Improvements (CPSD A)	2.162	1.332	1.300	0.000	1.300
Articles:	-	-	-	-	-
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 2021 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 2022 Base Plans:***					

Exhibit R-2A, RDT&E Project Justification: PB 2022 Navy		Date: May 2021
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B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
Continue the development of ship construction technology improvements to reduce risk related to alternative technical architectures and designs. ***FY 2022 OCO Plans:*** N/A ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Decrease in program from FY 2021 to FY2022 is due to historical execution, program requirements have not diminished.					
Title: Fleet Maintenance and Life Cycle Cost Reduction (CPSD B) ***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 2021 Plans:*** Efforts to develop technologies to reduce in-service costs and technical risk associated with deployed technologies and systems. FY21 shall include a focus on technology improvements to reduce known in-service deficiencies. ***FY 2022 Base Plans:*** Efforts to develop technologies to reduce in-service costs and technical risk associated with deployed technologies and systems will be conducted. ***FY 2022 OCO Plans:*** N/A ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Decrease in FY 2021 to FY2022 is due to historical execution, program requirements have not diminished.	2.493 -	1.565 -	1.512 -	0.000 -	1.512 -
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.	8.161 -	8.350 -	10.734 -	0.000 -	10.734 -

Exhibit R-2A, RDT&E Project Justification: PB 2022 Navy		Date: May 2021
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B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
FY 2021 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 2022 Base Plans:*** FY22 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, afloat AM qualification of equipment and certification of components in shipboard environments and navy-specific AM industrial base requirements including digital file transfer and cyber. ***FY 2022 OCO Plans:*** N/A ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Funding increase in FY22 for expanded metal additive manufacturing materials testing and process development for multiple AM processes, digital additive manufacturing efforts and development of afloat additive manufacturing capabilities to qualify metal and polymer AM equipment for fabrication and certification of components					
Title: Digital Framework/Electromagnetic Environment and Development (CPSD D)	1.006	0.457	0.237	0.000	0.237
Articles:	-	-	-	-	-
Description: Develop an understanding of the wireless electromagnetic environment (EME) on numerous ship classes and the vulnerability of these systems to hacking. ***FY 2021 Plans:*** Continue development of power management wireless capability and distribution technologies. Complete ship display system testing supporting HACK the Machine Event. ***FY 2022 Base Plans:***					

Exhibit R-2A, RDT&E Project Justification: PB 2022 Navy		Date: May 2021
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B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
Efforts will continue development of power management wireless capability and distribution technologies. ***FY 2022 OCO Plans:*** N/A ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Decrease attributed to completion of system testing supporting HACK the Machine Event.					
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 2021 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 2022 Base Plans:*** N/A ***FY 2022 OCO Plans:*** N/A ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Decrease of funding due to other higher priority requirements.	0.978 -	0.447 -	0.000 -	0.000 -	0.000 -
Title: Cybersecurity (CPSD F) ***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	18.105 -	0.000 -	0.000 -	0.000 -	0.000 -

Exhibit R-2A, RDT&E Project Justification: PB 2022 Navy		Date: May 2021
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B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
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 2021 Plans:*** Cybersecurity efforts will transfer to PU 3244 in FY 2021. ***FY 2022 Base Plans:*** N/A ***FY 2022 OCO Plans:*** N/A					
Accomplishments/Planned Programs Subtotals	37.305	12.151	13.783	0.000	13.783

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
• RDTEN/0204202N: *DDG-1000*	111.435	208.448	90.883	-	90.883	-	-	-	-	-	-
• RDTEN/0603512N: *Carrier Systems Development*	4.997	7.559	7.393	-	7.393	-	-	-	-	-	-
• RDTEN/0603564N: *Preliminary Design/Feasibility Studies.*	22.534	70.270	156.841	-	156.841	-	-	-	-	-	-
• RDTEN/0604567N: *Ship Contcept Design/Live Fire T&E*	46.809	51.853	57.336	-	57.336	-	-	-	-	-	-
• RDTEN/0603582N: *Combat System Integration*	17.251	17.843	17.991	-	17.991	-	-	-	-	-	-

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 2022 Navy		Date: May 2021
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Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
CPSD Systems Engineering	C/CPFF	Various Contractors : Various	18.436	0.000		0.350	Jan 2021	0.000		-		0.000	-	-	-
CPSD Engineering Support	WR	NSWCCD, NSWCPD, NRL : Various	62.829	0.525	Feb 2020	1.001	Nov 2020	0.745	Jan 2022	-		0.745	-	-	-
CPSD Test and Evaluation	WR	NSWC : Various	11.910	0.000		0.201	Oct 2020	0.000		-		0.000	-	-	-
CPSD Systems Engineering	WR	NSWC DD : Dahlgren, VA	0.600	0.700	Nov 2019	0.140	Nov 2020	0.000		-		0.000	-	-	-
CPSD Systems Engineering	WR	NSWC CD : Carderock, MD	4.330	1.578	Nov 2019	0.550	Dec 2020	0.804	Nov 2021	-		0.804	-	-	-
CPSD Systems Engineering	WR	NSWC PD : Philadelphia, PA	2.620	0.700	Nov 2019	0.310	Oct 2020	1.000	Nov 2021	-		1.000	-	-	-
CPSD Systems Engineering	WR	NRL : Washington, D.C.	0.389	0.000		0.000		0.500	Nov 2021	-		0.500	-	-	-
CPSD Engineering Development	WR	NSWC DD : Dahlgren, VA	2.150	0.434	Dec 2019	0.000		0.000		-		0.000	-	-	-
CPSD Engineering Development	WR	NSWC CD : Carderock, MD	4.367	0.776	Dec 2019	0.000		0.000		-		0.000	-	-	-
CPSD Engineering Development	WR	NSWC PD : Philadelphia, PA	1.282	0.570	Nov 2019	0.478	Jan 2021	0.000		-		0.000	-	-	-
Cybersecurity Technologies	C/CPFF	JHU/APL : Baltimore, MD	8.223	2.108	May 2020	0.000		0.000		-		0.000	-	-	-
Cybersecurity Technologies	C/CPFF	MITRE : McLean, VA	1.108	0.000		0.000		0.000		-		0.000	-	-	-
Cybersecurity Technologies	MIPR	PNNL DOE : Richland, WA	0.900	0.000		0.000		0.000		-		0.000	-	-	-
Cybersecurity Technologies	WR	NUWC Keyport : Keyport, WA	0.350	0.200	Dec 2019	0.000		0.000		-		0.000	-	-	-
Cybersecurity Technologies	WR	NUWC Newport : Newport, RI	0.600	1.706	Dec 2019	0.000		0.000		-		0.000	-	-	-
Cybersecurity Technologies	WR	NSWC Crane : Crane, IN	0.350	0.350	Dec 2019	0.000		0.000		-		0.000	-	-	-

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Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Cybersecurity Technologies	WR	NSWC DD : Dahlgren, VA	7.600	8.314	Dec 2019	0.000		0.000		-		0.000	-	-	-
Cybersecurity Technologies	WR	NSWC PD : Philadelphia, PA	2.100	2.500	Dec 2019	0.000		0.000		-		0.000	-	-	-
Additive Manufacturing	WR	NSWC CD : Carderock, MD	0.000	2.590	Nov 2019	3.088	Oct 2020	2.000	Oct 2021	-		2.000	-	-	-
Additive Manufacturing	WR	NSWC PD : Philadelphia, PA	0.000	1.180	Nov 2019	1.244	Oct 2020	1.800	Oct 2021	-		1.800	-	-	-
Additive Manufacturing	Various	NUWC Newport : Newport, RI	0.000	0.317	Mar 2020	0.286	Nov 2020	0.400	Oct 2021	-		0.400	-	-	-
Additive Manufacturing	WR	NUWC Keyport : Keyport, WA	0.000	0.100	Nov 2019	0.000		0.000		-		0.000	-	-	-
Additive Manufacturing	WR	NUWC Keyport : Mechanicbsurg, PA	0.000	0.083	Nov 2019	0.052	Nov 2020	0.000		-		0.000	-	-	-
Additive Manufacturing	C/CPFF	JHU APL : Baltimore, MD	0.000	0.735	Nov 2020	0.149	Jan 2021	1.200	Jan 2022	-		1.200	-	-	-
Additive Manufacturing	C/CPFF	PSU ARL : State College, PA	0.000	0.825	Jun 2020	0.000		1.000	Jan 2022	-		1.000	-	-	-
Additive Manufacturing	C/CPFF	Various Contracts : Various	0.000	1.378	May 2020	0.825	Jan 2021	2.943	Jan 2022	-		2.943	-	-	-
Additive Manufacturing	WR	NRL : Washington DC	0.000	0.125	Mar 2020	0.000		0.000		-		0.000	-	-	-
Additive Manufacturing	WR	NSWC Port Hueneme : Port Hueneme, CA	0.000	0.075	Jun 2020	0.000		0.000		-		0.000	-	-	-
Additive Manufacturing	WR	NAVAIR : Patuxent River, MD	0.000	0.100	Nov 2019	0.000		0.100	Nov 2021	-		0.100	-	-	-
Additive Manufacturing	WR	NSWC Crane : Crane, IN	0.000	0.153	Jun 2020	0.000		0.100	Oct 2021	-		0.100	-	-	-
Additive Manufacturing	WR	NSWC IH : Indian Head, MD	0.000	0.085	Sep 2020	0.234	Dec 2020	0.500	Nov 2021	-		0.500	-	-	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Navy		Date: May 2021
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Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Additive Manufacturing	WR	Various : Not Specified	0.000	0.000		0.480	Nov 2020	0.000		-		0.000	-	-	-
Additive Manufacturing	Various	Various : SBIR Withold	0.000	0.320	Aug 2020	0.336	Jan 2021	0.391	Jan 2022	-		0.391	-	-	-
NCR2T AM	WR	Various : Not Specified	0.000	0.000		1.275	Oct 2020	0.000		-		0.000	-	-	-
NCR2T CPSD	WR	Various : Not Specified	0.000	0.000		0.776	Oct 2020	0.000		-		0.000	-	-	-
NCR2T BTR	C/CPFF	Various : Not Specified	0.000	4.400	Oct 2020	0.000		0.000		-		0.000	-	-	-
Prior Years G/WR	WR	Various : Not Specified	89.747	0.000		0.000		0.000		-		0.000	-	-	-
Prior Years C/CPFF	C/BA	Various : Not Specified	4.899	0.000		0.000		0.000		-		0.000	-	-	-
		Subtotal	224.790	32.927		11.775		13.483		-		13.483	-	-	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Cybersecurity Technologies	WR	NSWC CD : Carderock, MD	1.489	1.080	Dec 2019	0.000		0.000		-		0.000	-	-	-
Cybersecurity Technologies	MIPR	NIWC : Various	0.250	0.250	Dec 2019	0.000		0.000		-		0.000	-	-	-
Cybersecurity Technologies	C/CPFF	Various Contractors : Various	1.500	1.803	Jan 2020	0.000		0.000		-		0.000	-	-	-
		Subtotal	3.239	3.133		0.000		0.000		-		0.000	-	-	N/A

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Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Cybersecurity Technologies	WR	NSWC CD : Carderock, MD	0.950	0.000		0.000		0.000		-		0.000	-	-	-
Cybersecurity Technologies	C/CPFF	JHU/APL : Baltimore, MD	1.150	0.500	May 2020	0.000		0.000		-		0.000	-	-	-
Cybersecurity Technologies	WR	NSWC PD : Philadelphia, PA	0.000	0.000		0.000		0.000		-		0.000	-	-	-
		Subtotal	2.100	0.500		0.000		0.000		-		0.000	-	-	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
PM/Travel	Allot	NAVSEA HQ : Washington, DC	0.849	0.150	Dec 2019	0.000		0.000		-		0.000	-	-	-
Program Mgmt Spt	WR	NSWC CD : Carderock, MD	1.000	0.250	Nov 2019	0.000		0.000		-		0.000	-	-	-
Program Mgmt Spt	C/CPFF	CSC : Washington, D.C.	0.565	0.250	Nov 2019	0.000		0.000		-		0.000	-	-	-
Cybersecurity Technologies	C/CPFF	CSC : Washington, D.C.	0.250	0.000		0.000		0.000		-		0.000	-	-	-
Cybersecurity Technologies	C/CPFF	Alion : Washington, D.C.	0.250	0.000		0.000		0.000		-		0.000	-	-	-
Cybersecurity Technologies	MIPR	NAVSEA HQ : Washington, D.C.	0.000	0.000	Dec 2020	0.000		0.000		-		0.000	-	-	-
Additive Manufacturing	C/CPFF	Various : Various	0.000	0.090	Oct 2020	0.374	Jan 2021	0.250	Jan 2022	-		0.250	-	-	-
Additive Manufacturing	Allot	Various : Not Specified	0.000	0.005	Dec 2019	0.002	Dec 2020	0.050	Dec 2021	-		0.050	-	-	-
		Subtotal	2.914	0.745		0.376		0.300		-		0.300	-	-	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Navy			Date: May 2021
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	Prior Years	FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	233.043	37.305		12.151		13.783		-		13.783	-	-	N/A

Remarks

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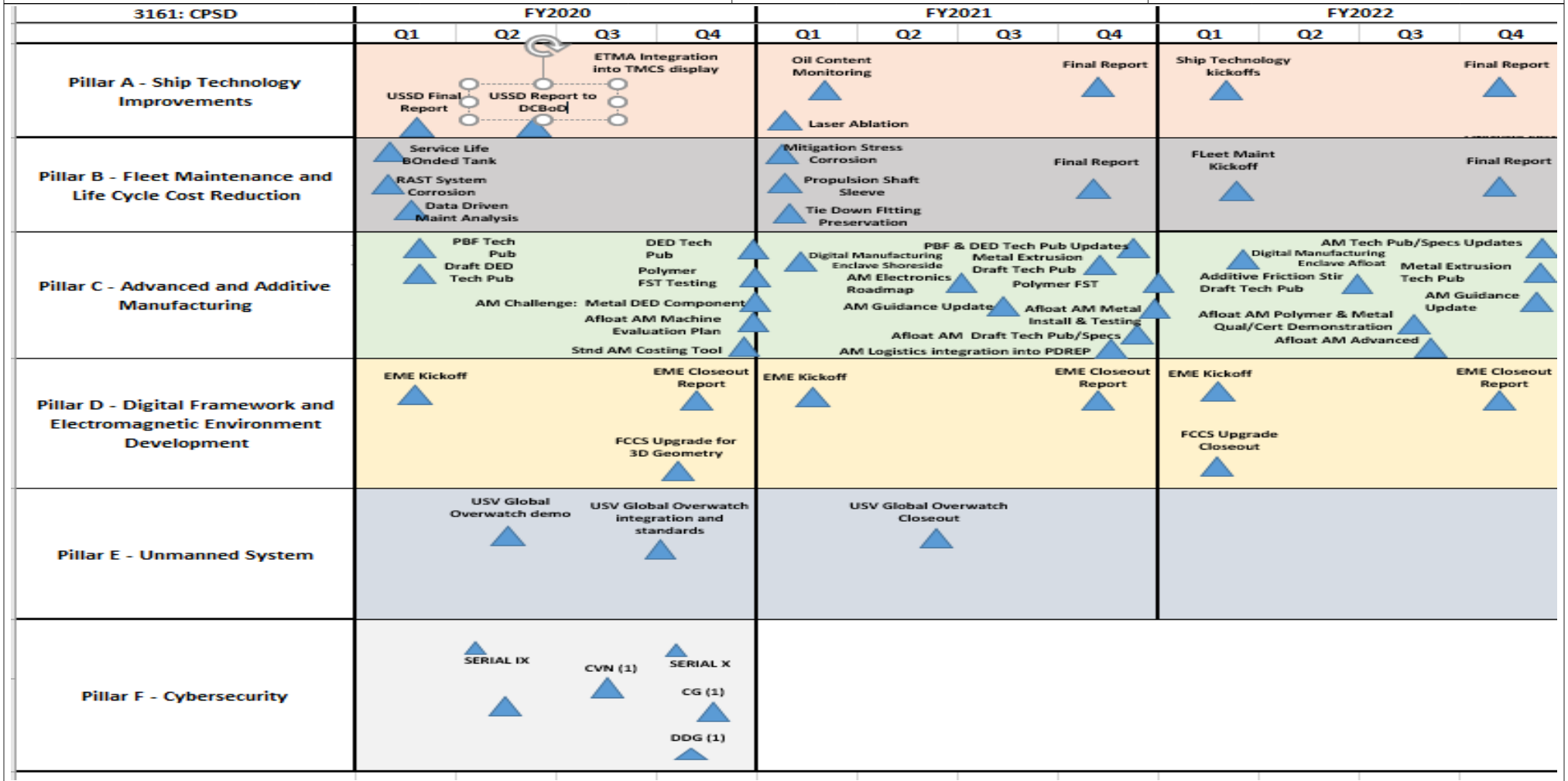

Exhibit R-4A, RDT&E Schedule Details: PB 2022 Navy		Date: May 2021
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Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 3161				
CPSD A - Ship Technology Improvements:	1	2020	4	2022
CPSD B - Fleet Maintenance and Life Cycle Cost Reduction:	1	2020	4	2022
CPSD C - Additive and Advanced Manufacturing Technology:	1	2020	4	2022
CPSD D - Digital Framework/Electromagnetic Environment and Development:	1	2020	4	2022
CPSD E - Unmanned Systems:	1	2020	4	2022
CPSD F - Cybersecurity:	2	2020	4	2020

Exhibit R-2A, RDT&E Project Justification: PB 2022 Navy			Date: May 2021
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 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
3244: *Cybersecurity Engineering*	0.000	0.000	16.099	15.199	-	15.199	-	-	-	-	-	-
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

Note

FY 2020 funding for Cybersecurity was part of project 3161 (CPSD F). FY 2021 and future funding has been broken out into project 3244.

A. Mission Description and Budget Item Justification

This effort funds two critical Cybersecurity programs, Situational Awareness Boundary Enforcement and Response (SABER) and USS SECURE. SABER is 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. USS SECURE is an operationally representative, distributed cross-SYSCOM, system of systems distributed test environment that supports cybersecurity testing at the system, enclave, platform and strike group level.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
Title: Cybersecurity	0.000	16.099	15.199	0.000	15.199
Articles:	-	-	-	-	-
FY 2021 Plans: Continue the rapid development and tailoring of Situational Awareness Boundary Enforcement and Response (SABER) cybersecurity capability on Afloat Navy platforms to increase Ship Forces' ability to protect, detect, react to, and recover from Cybersecurity incidents on Navy Control Systems (NCSs) in real time. This program will support the non-recurring engineering, modifications, tailoring, and life cycle maintenance of the nine approved Navy SABER Platform installations in FY21. This includes the research and development of situational awareness tools, boundary defense capabilities, Government-Off-The-Shelf (GOTS) tool SABER, Cybersecurity-optimized network design, network inspection and detection, and operational robustness to Cybersecurity threats. Software lifecycle sustainment requirements of reliability, maintainability, and supportability will be completed to support the nine shipboard installations in FY22 and support the four SABER systems in the Fleet.					

Exhibit R-2A, RDT&E Project Justification: PB 2022 Navy		Date: May 2021
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 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
This effort will continue to advance numerous cross-platform Cybersecurity software solutions such as the utilization of Machine Learning and Artificial Intelligence that are on the critical path to ensuring our Cybersecurity capabilities can outpace the threat of nation state actors. This effort will address Navy Cyber T&E policy and requirements through the continued development of USS SECURE. USS SECURE connects systems, system-of-systems, and hardware in the loop facilities, in a virtually connected manner, leveraging Live Virtual Constructive (LVC) assets. USS SECURE will execute three test events in FY21 involving multiple platforms and systems and can respond to emergent T&E testing demands. ***FY 2022 Base Plans:*** Continue the rapid development and tailoring of Situational Awareness Boundary Enforcement and Response (SABER) cybersecurity capability on Afloat Navy platforms. This program will support the non-recurring engineering, modifications, tailoring, and life cycle maintenance of the 14 approved installations in FY22. This includes the research and development of situational awareness tools, boundary defense capabilities, Government-Off-The-Shelf (GOTS) tool SABER, Cybersecurity-optimized network design, network inspection and detection, and operational robustness to Cybersecurity threats. Software lifecycle sustainment requirements of reliability, maintainability, and supportability will continue to support the 14 approved SABER shipboard installations in FY22 and maintaining the 13 SABER systems in the fleet. Continue to advance and employ the use of Machine Learning and Artificial Intelligence. Continue to advance numerous cross-platform Cybersecurity software solutions and innovative research and development projects that are on the critical path to ensuring our Cybersecurity capabilities can outpace the threat of nation state actors. This effort will address Navy Cyber T&E policy and requirements through the continued development of USS SECURE. USS SECURE connects systems, system-of-systems, and hardware in the loop facilities, in a virtually connected manner, leveraging Live Virtual Constructive (LVC) assets. USS SECURE will execute three test events in FY22 involving multiple platforms and will continue to support emergent T&E testing demands. ***FY 2022 OCO Plans:*** N/A ***FY 2021 to FY 2022 Increase/Decrease Statement:***					

Exhibit R-2A, RDT&E Project Justification: PB 2022 Navy		Date: May 2021
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 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
Decrease from FY 2021 to FY 2022 is due to a change in USS SECURE test set up using a shared cost vice enterprise funding model to conduct Cybersecurity test and evaluation.					
Accomplishments/Planned Programs Subtotals	0.000	16.099	15.199	0.000	15.199

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 sustains the necessary Cybersecurity testing infrastructure at USS SECURE to ensure compliance with DoD and Navy Cybersecurity test and evaluation requirements in direct support of Navy acquisition programs.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Navy			Date: May 2021
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 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Cybersecurity Technologies	C/CPFF	JHU APL : Baltimore, MD	0.000	0.000		0.900	Mar 2021	0.853	Oct 2021	-		0.853	-	-	-
Cybersecurity Technologies	WR	NUWC Newport : Newport, RI	0.000	0.000		1.249	Oct 2020	1.300	Oct 2021	-		1.300	-	-	-
Cybersecurity Technologies	WR	NSWC DD : Dahlgren, VA	0.000	0.000		1.730	Oct 2020	1.700	Oct 2021	-		1.700	-	-	-
Cybersecurity Technologies	WR	NSWC PD : Philadelphia, PA	0.000	0.000		2.226	Oct 2020	2.000	Oct 2021	-		2.000	-	-	-
Cybersecurity Technologies	C/CPFF	Various Contractors : Various	0.000	0.000		1.010	Oct 2020	1.000	Oct 2021	-		1.000	-	-	-
		Subtotal	0.000	0.000		7.115		6.853		-		6.853	-	-	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Support	WR	NSWC CD : Carderock, MD	0.000	0.000		0.397	Oct 2020	0.339	Oct 2021	-		0.339	-	-	-
Program Management Support	WR	NIWC PAC : San Diego, CA	0.000	0.000		0.237	Oct 2020	0.240	Oct 2021	-		0.240	-	-	-
Cybersecurity Technologies	C/CPFF	Various Contractors : Various	0.000	0.000		3.297	Jan 2021	3.000	Jan 2022	-		3.000	-	-	-
		Subtotal	0.000	0.000		3.931		3.579		-		3.579	-	-	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Cybersecurity Technologies	WR	NAWC CL : China Lake, CA	0.000	0.000		0.173	Oct 2020	0.173	Oct 2021	-		0.173	-	-	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Navy			Date: May 2021
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 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Cybersecurity Technologies	WR	NSWC PD : Philadelphia, PA	0.000	0.000		0.090	Oct 2020	0.000		-		0.000	-	-	-
Cybersecurity Technologies	WR	NSWC CO : Corona, CA	0.000	0.000		0.830	Oct 2020	0.800	Oct 2021	-		0.800	-	-	-
Cybersecurity Technologies	WR	NSWC DD : Dahlgren, VA	0.000	0.000		3.911	Oct 2020	3.744	Oct 2021	-		3.744	-	-	-
		Subtotal	0.000	0.000		5.004		4.717		-		4.717	-	-	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
HQ PM Travel	Allot	NAVSEA HQ : Washington, DC	0.000	0.000		0.049	Oct 2020	0.050	Oct 2021	-		0.050	-	-	-
		Subtotal	0.000	0.000		0.049		0.050		-		0.050	-	-	N/A

	Prior Years	FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	0.000		16.099		15.199		-		15.199	-	-	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Navy		Date: May 2021
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603563N / *Ship Concept Advanced Design*	**Project (Number/Name)** 3244 / *Cybersecurity Engineering*

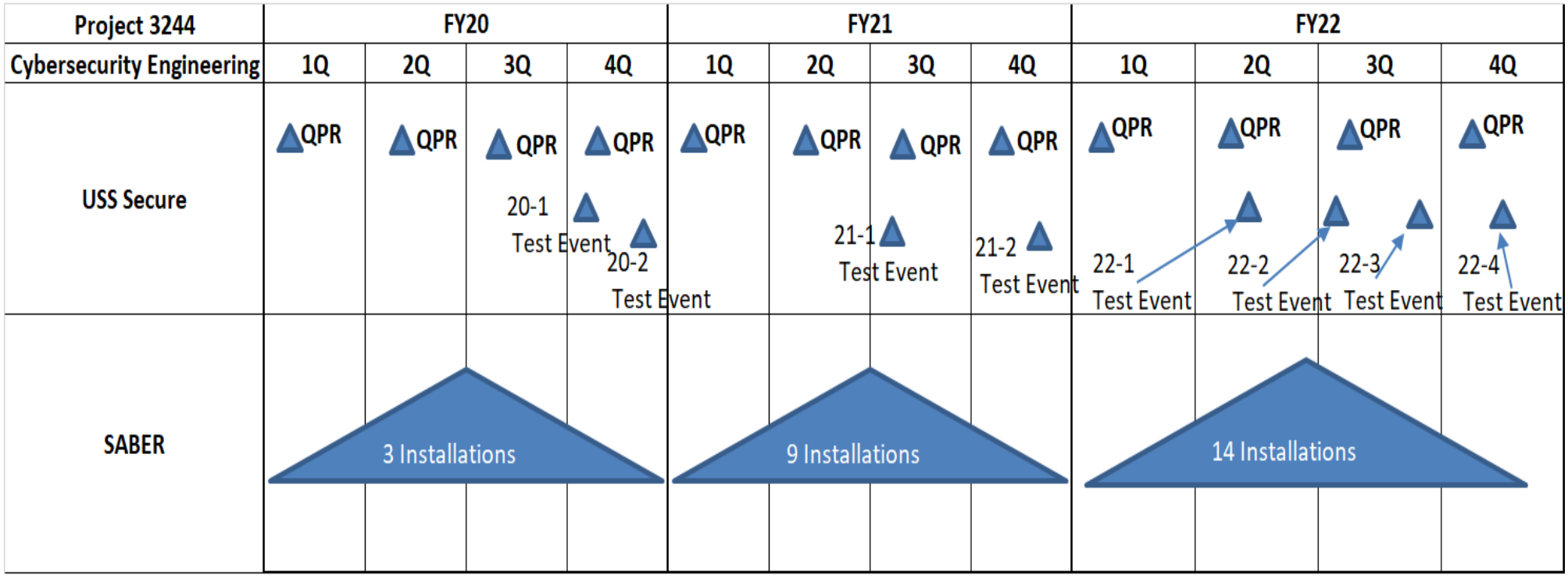

Exhibit R-4A, RDT&E Schedule Details: PB 2022 Navy		Date: May 2021
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603563N / *Ship Concept Advanced Design*	**Project (Number/Name)** 3244 / *Cybersecurity Engineering*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 3244				
Cybersecurity Engineering: USS Secure	1	2022	4	2022
Cybersecurity Engineering: SABER	1	2022	4	2022

Exhibit R-2A, RDT&E Project Justification: PB 2022 Navy			Date: May 2021
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 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
3376: *Strategic Sealift*	22.034	5.769	1.782	9.949	-	9.949	-	-	-	-	-	-
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: FY2016 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, FY2017, and FY2019 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 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
Title: Shipboard Crane Systems/Shipboard Cargo Systems	2.049	1.499	2.937	0.000	2.937
Articles:	-	-	-	-	-
FY 2021 Plans: Continue investigation and demonstration of shipboard crane/cargo system improvements including Vertical Launch System (VLS) Rearming and transfer capabilities. VLS rearming scope to include testing of newly developed ordnance handling equipment on board MSC vessels, and detailed design and start of fabrication of intermodal container system for transportation of VLS missile canisters.					
FY 2022 Base Plans: Continue investigation and demonstration of shipboard crane/cargo system improvements including VLS Rearming and transfer capabilities. VLS rearming scope to include completion of fabrication and start of testing of intermodal container system for transportation of VLS missile canisters. Perform concept development for Unmanned Surface Vessels (USV) sustainment capabilities.					
FY 2022 OCO Plans: N/A					
FY 2021 to FY 2022 Increase/Decrease Statement:					

Exhibit R-2A, RDT&E Project Justification: PB 2022 Navy		Date: May 2021
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 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
Budget increase of $1.438M reflects addition of USV sustainment concept development.					
Title: Sealift Concept Development ***Articles:*** ***FY 2021 Plans:*** N/A ***FY 2022 Base Plans:*** Resume 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. Initiate projects investigating concepts for improving the survivability of sealift vessels, sealift platform concepts for maritime prepositioning and fuel distribution to unmanned vessels, and a sealift force architecture study. ***FY 2022 OCO Plans:*** N/A ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Budget increase of $2.596M reflects planned start of project investigating survivability improvements for sealift vessels for Maritime Prepositioning Force platforms, fuel distribution, and sealift force architecture studies.	0.800 -	0.000 -	2.596 -	0.000 -	2.596 -
Title: Lighter/HSV Seabase to Shore Cargo Transfer ***Articles:*** ***FY 2021 Plans:*** N/A ***FY 2022 Base Plans:*** Concept development for USV logistics delivery system, including delivery of fuel from the seabase to shore. ***FY 2022 OCO Plans:*** N/A ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Budget increase of $3.884M is for USV logistics delivery system concept development.	1.520 -	0.000 -	3.884 -	0.000 -	3.884 -
Title: Advanced Tools	1.400	0.283	0.532	0.000	0.532

Exhibit R-2A, RDT&E Project Justification: PB 2022 Navy		Date: May 2021
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 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
Articles:	-	-	-	-	-
FY 2021 Plans: Continue investigation and demonstration of individual and multi-ship motion measurement and prediction Environmental and Ship Motion Forecasting (ESMF) system including continued testing of the ESD installation from FY19. ***FY 2022 Base Plans:*** Continue investigation and demonstration of individual and multi-ship motion measurement and prediction Environmental and Ship Motion Forecasting (ESMF) system to include installation and testing of the EPF 10. ***FY 2022 OCO Plans:*** N/A ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Budget increase of $249k reflects increase in maintenance and testing costs due to having two ESMF systems in the fleet.					
Accomplishments/Planned Programs Subtotals	5.769	1.782	9.949	0.000	9.949

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 2022 Navy		Date: May 2021
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 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Shipboard Crane Systems/ Shipboard Cargo Systems	WR	Various Contractors : Various	8.461	2.049	Jan 2020	1.499	Jan 2021	2.937	Jan 2022	-		2.937	-	-	-
Sealift Concept Development	WR	Various Contractors : Various	5.527	0.800	Jan 2020	0.000		2.596	Jan 2022	-		2.596	-	-	-
Lighter/HSV Seabase to Shore Cargo Transfer	WR	Various Contractors : Various	5.856	1.520	Jan 2020	0.000		3.884	Jan 2022	-		3.884	-	-	-
Advanced Tools	WR	Various : Various	2.190	1.400	Jan 2020	0.283	Jan 2021	0.532	Jan 2022	-		0.532	-	-	-
		Subtotal	22.034	5.769		1.782		9.949		-		9.949	-	-	N/A

Remarks

1. Prior Years column only includes FY2015 (project 3376), FY2017 (project 3376), FY2018 Congressional Add (project C403) and FY2019 (project 3376) funding as FY2016 and prior years (FY14 and earlier) were funded under NDSF BA 04 Project 3116 Strategic Sealift Research and Development.
2. Award dates reflect initial award of incremental execution.

	Prior Years	FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	22.034	5.769		1.782		9.949		-		9.949	-	-	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Navy		Date: May 2021
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603563N / *Ship Concept Advanced Design*	**Project (Number/Name)** 3376 / *Strategic Sealift*

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Navy		Date: May 2021
Appropriation/Budget Activity 1319 / 04	**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 2015, FY 2017, FY2018, FY2019 and out-year funds are financed under this program element.

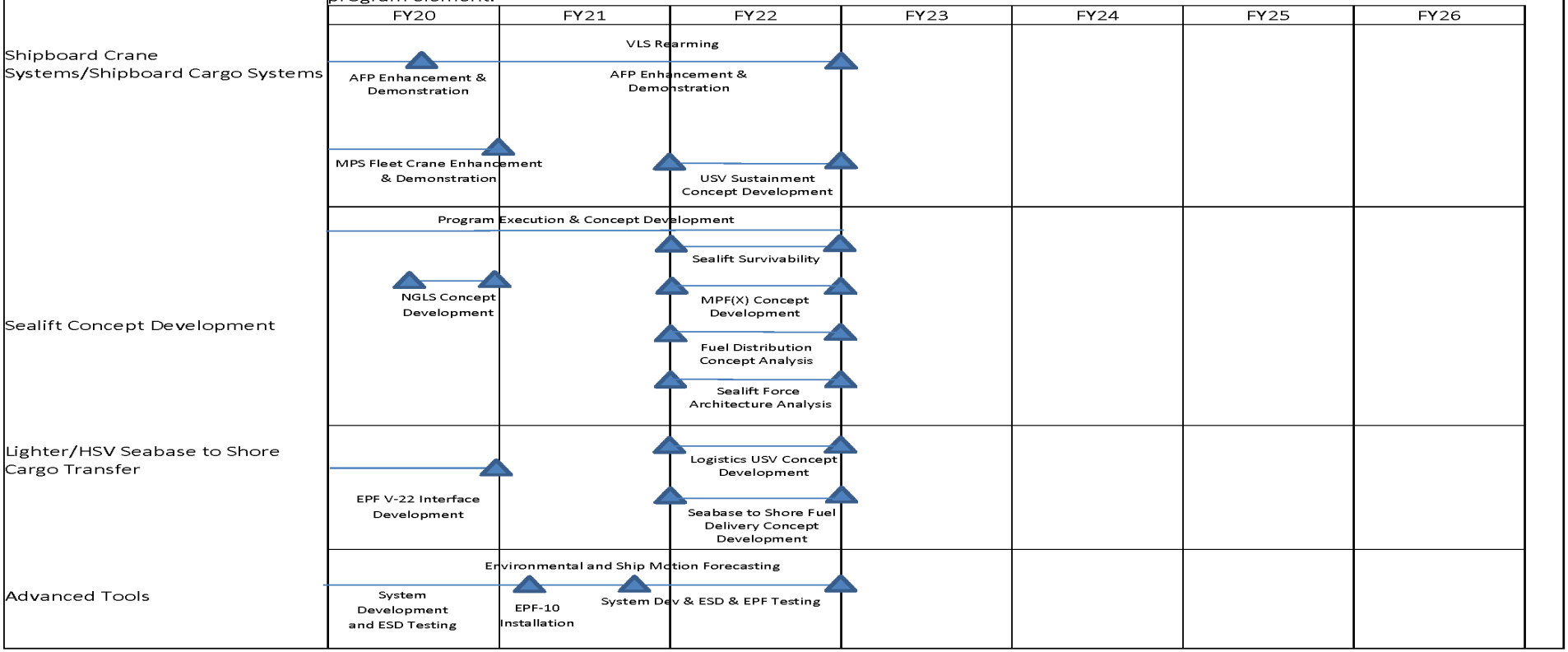

Exhibit R-4A, RDT&E Schedule Details: PB 2022 Navy		Date: May 2021
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603563N / *Ship Concept Advanced Design*	**Project (Number/Name)** 3376 / *Strategic Sealift*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 3376				
Shipboard Crane Systems/Shipboard Cargo Systems	1	2020	4	2022
--VLS Rearming	1	2020	4	2022
--AFP Enhancement & Demonstration	3	2020	4	2022
--USV Sustainment Concept Development	1	2022	4	2022
Sealift Concept Development	1	2020	4	2022
--MPF Concept Development	1	2022	4	2022
--Fuel Distribution Concept Development	1	2022	4	2022
--Sealift Force Architecture Analysis	1	2022	4	2022
--Sealift Survivability	1	2022	4	2022
Lighter/HSV Seabase to Shore Cargo Transfer	1	2020	4	2022
--Logistics USV Concept Development	1	2022	4	2022
--Seabase to Shore Fuel Delivery Concept Development	1	2022	4	2022
Advanced Tools	1	2020	4	2022
--Environmental & Ship Motion Forecasting (ESMF)	1	2020	4	2022
--System Development and ESD & EPF Testing	1	2020	4	2022
--EPF-10 Installation	1	2021	3	2021

Exhibit R-2A, RDT&E Project Justification: PB 2022 Navy			Date: May 2021
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 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
4037: *Common Hull Auxiliary Multi-Mission Platform (CHAMP)*	18.995	9.685	2.553	0.000	-	0.000	-	-	-	-	-	-
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 and has evolved over the last two years. In FY 2021 the new construction SEALIFT program was cancelled with the SCN funding being reallocated to MARAD buy used program for RRF.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
Title: CHAMP Design and Total Ship Integration	9.685	2.553	0.000	0.000	0.000
Articles:	-	-	-	-	-
FY 2021 Plans: Complete SEALIFT design maturation in May 2021 with detailed documentation archived for utilization as reference document when new construction SEALIFT is reprogrammed in the NAVY planning. Develop Draft Acquisition Documentation for Submarine Tender (Sub Tender) as items will be completed under PE 0602563N Project 5010 which is established in FY 2022.					
FY 2022 Base Plans: None					
FY 2022 OCO Plans: N/A					
FY 2021 to FY 2022 Increase/Decrease Statement: Decrease of funds from FY 2021 to FY 2022 is due to funding associated with AS(X) Submarine Tender being shifted to PE 0602563N Project 5010 for AS(X) Preliminary Design proposal evaluation, PD Award, and the start of design as well as the start of AS(X) DD&C RFP development.					
Accomplishments/Planned Programs Subtotals	9.685	2.553	0.000	0.000	0.000

C. Other Program Funding Summary ($ in Millions)

N/A

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

Remarks

D. Acquisition Strategy

The CHAMP Sealift T-AKR(X) Acquisition Strategy and Planning ended with cancellation of program. Submarine Tender Acquisition Strategy is in developmental phase and is being developed.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Navy			Date: May 2021
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 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Industry Studies & Design	C/FFP	Various : Various	11.600	7.458	Mar 2020	0.000	Nov 2020	0.000		-		0.000	-	-	-
PM & Engineering Support	Various	Various : Various	6.395	1.977	Oct 2019	2.053	Oct 2020	0.000		-		0.000	-	-	-
		Subtotal	17.995	9.435		2.053		0.000		-		0.000	-	-	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Documentation Development	Various	Various : Various	1.000	0.250	Oct 2019	0.500	Oct 2020	0.000		-		0.000	-	-	-
		Subtotal	1.000	0.250		0.500		0.000		-		0.000	-	-	N/A

	Prior Years	FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	18.995	9.685		2.553		0.000		-		0.000	-	-	N/A

Remarks

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

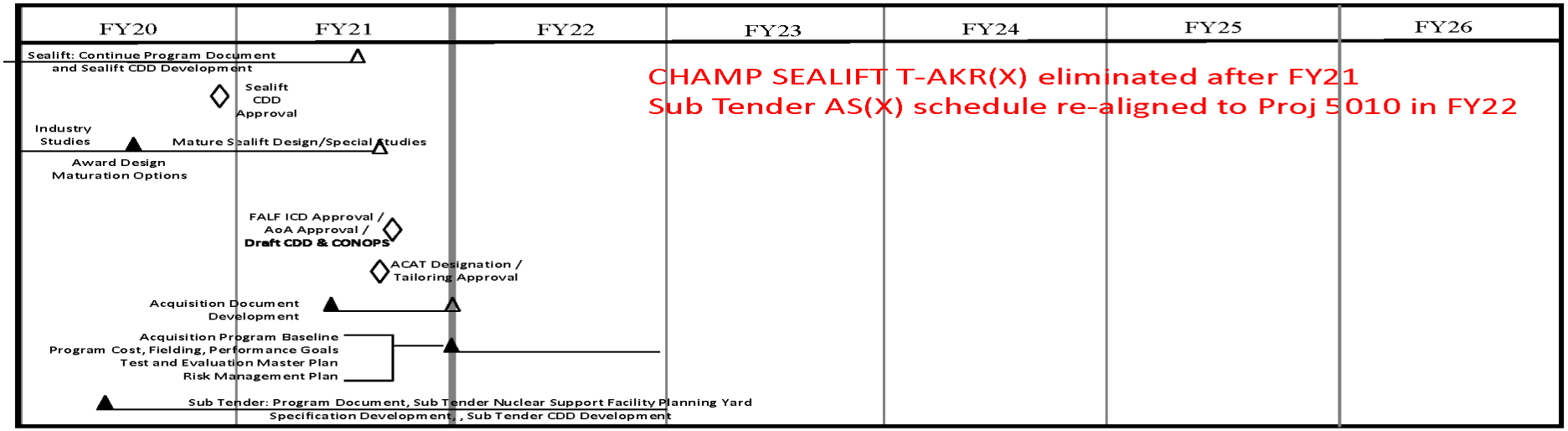

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Exhibit R-4A, RDT&E Schedule Details: PB 2022 Navy		Date: May 2021
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603563N / *Ship Concept Advanced Design*	**Project (Number/Name)** 4037 / *Common Hull Auxiliary Multi-Mission Platform (CHAMP)*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 4037				
Sealift Program Documentation & Sealift CDD Development	1	2020	2	2021
Submarine Tender Program Documentation, CDD Development, and NSF PY Spec Development	2	2020	4	2022
Sealift Design Maturation	3	2020	4	2021

Exhibit R-2A, RDT&E Project Justification: PB 2022 Navy			Date: May 2021
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 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
4044: *Next Generation Medium Amphibious Ship*	0.000	0.000	23.866	13.183	-	13.183	-	-	-	-	-	-
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

Note

FY2021 PB21 Congressional reduction of $6.000 million from the requested amount considered excess to need.

A. Mission Description and Budget Item Justification

The Light Amphibious Warship (LAW) is a medium-sized landing ship that enables distributed maneuver and logistics such as Distributed Maritime Operations (DMO), Littoral Operations in a Contested Environment (LOCE), and Expeditionary Advanced Base Operations (EABO) in support of the newly established Marine Littoral Regiment (MLR). It is designed to fill the gap in capability between the Navy's large, multipurpose amphibious warfare "L" class ships and smaller landing vessels. This ship will deploy tailored logistics, select power projection and strike capabilities.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
Title: Next Generation Medium Amphibious Ship	0.000	23.866	13.183	0.000	13.183
Articles:	-	-	-	-	-
FY 2021 Plans: FY2021 funds support award of the Concept Study/Preliminary Design (CS/PD) design contract and development of required acquisition, logistics and test documentation. FY2021 also funds the execution of studies to establish required infrastructure necessary for Fleet introduction, Analysis of Alternatives (AoA), as well as the development and analysis of Navy baseline ship model used to study various ship characteristics.					
FY 2022 Base Plans: FY2022 funding completes the preliminary design efforts and continues the studies for manpower, maintenance, training, and facilities, to finalize LAW manning and infrastructure requirements. FY2022 completes the acquisition documentation for Milestones B/C and Program Initiation, as well as supports the development, issuance and evaluation of the lead ship Request for Proposal (RFP).					
FY 2022 OCO Plans: N/A					
FY 2021 to FY 2022 Increase/Decrease Statement:					

Exhibit R-2A, RDT&E Project Justification: PB 2022 Navy		Date: May 2021
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 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
Decrease of $10.683 million from FY2021 to FY2022 is due the contract award of Concept Studies/Preliminary Design phase.					
Accomplishments/Planned Programs Subtotals	0.000	23.866	13.183	0.000	13.183

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

The Acquisition Strategy was signed in Q2FY2021 in support of the Request for Proposal (RFP) for the Concept Study/Preliminary Design phase.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Navy		Date: May 2021
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 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Preliminary/Contract Design	TBD	Various : Various	0.000	0.000		12.000	May 2021	0.497	Nov 2021	-		0.497	-	-	-
		Subtotal	0.000	0.000		12.000		0.497		-		0.497	-	-	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Engineering Support	TBD	Various : Various	0.000	0.000		7.000	Nov 2020	5.750	Nov 2021	-		5.750	-	-	-
Logistics Support	TBD	Various : Various	0.000	0.000		1.500	Nov 2020	4.491	Nov 2021	-		4.491	-	-	-
Program Mgmt Support	TBD	Various : Various	0.000	0.000		1.366	Nov 2020	2.000	Nov 2021	-		2.000	-	-	-
		Subtotal	0.000	0.000		9.866		12.241		-		12.241	-	-	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Test Plans	TBD	Various : Various	0.000	0.000		1.000	Nov 2020	0.445	Nov 2021	-		0.445	-	-	-
Model & Simulation Plan	TBD	Various : Various	0.000	0.000		1.000	Nov 2020	0.000		-		0.000	-	-	-
		Subtotal	0.000	0.000		2.000		0.445		-		0.445	-	-	N/A

	Prior Years	FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	0.000		23.866		13.183		-		13.183	-	-	N/A

Remarks

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

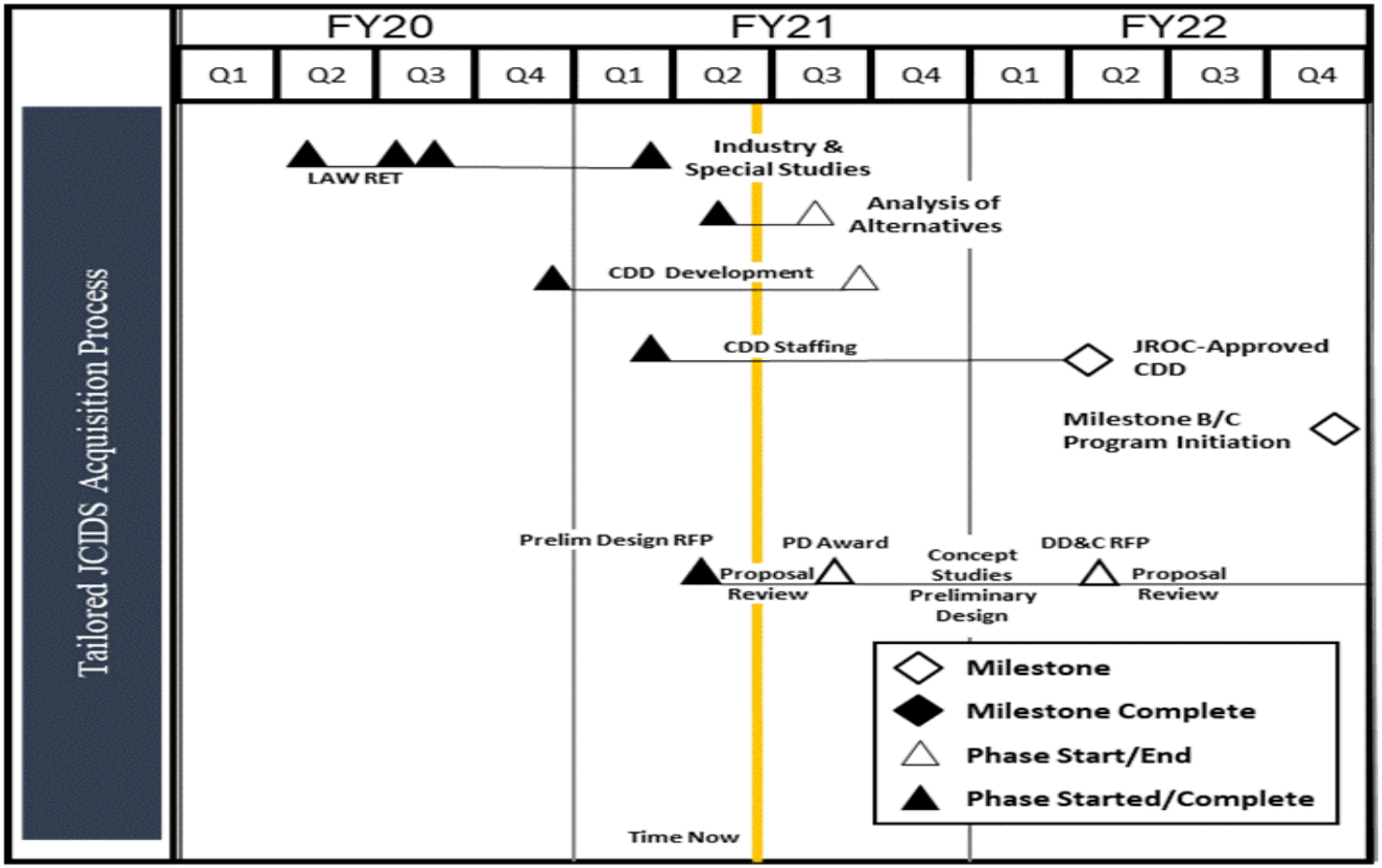


Exhibit R-4A, RDT&E Schedule Details: PB 2022 Navy		Date: May 2021
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603563N / *Ship Concept Advanced Design*	**Project (Number/Name)** 4044 / *Next Generation Medium Amphibious Ship*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 4044				
Industry & Special Studies	3	2020	1	2021
CDD Development	4	2020	3	2021
CDD Staffing	1	2021	2	2022
Preliminary Design RFP	2	2021	2	2021
Analysis of Alternatives	2	2021	3	2021
Concept Studies/Preliminary Design Proposal Review	2	2021	3	2021
Preliminary Design Award	3	2021	3	2021
Preliminary Design Phase	3	2021	2	2022
JROC Approved CDD	2	2022	2	2022
Detail Design & Construction (DD&C) RFP	2	2022	2	2022
DD&C Proposal Review	2	2022	4	2022
Milestone B/C Program Initiation	4	2022	4	2022

Exhibit R-2A, RDT&E Project Justification: PB 2022 Navy			Date: May 2021
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 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
4045: *Next Generation Medium Logistics Ship*	0.000	0.000	23.866	27.785	-	27.785	-	-	-	-	-	-
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Next Generation Logistics Ship (NGLS) is planned to be a new class of ships to augment the current Combat Logistics Force ships, through the use of commercial ship designs tailored for military applications to conduct logistics missions. The NGLS will enable refueling, rearming, and resupply of Naval assets - afloat and ashore - in support of Distributed Maritime Operations, Littoral Operations Contested Environment, and Expeditionary Advanced Base Operations. The NGLS is envisioned to be smaller than existing ships in the Combat Logistics Force, and will operate near contested environments, sustaining afloat (Surface Action Group) and ashore (Expeditionary Advanced Base) requirements. NGLS is
potentially a family of vessels with commercial designs tailored for military applications. RDT&E funding will continue to support requirements trade-off studies, development of indicative designs, specification development, and demonstrations of experimentation and proof-of-concepts focused on the Refuel, Resupply, and Rearm logistics
missions.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
Title: Next Generation Logistics Ship	0.000	23.866	27.785	0.000	27.785
Articles:	-	-	-	-	-
FY 2021 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 2022 Base Plans: FY 2022 funds will continue to support operations research analysis, requirements trade-off studies, development of					

Exhibit R-2A, RDT&E Project Justification: PB 2022 Navy		Date: May 2021
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 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
indicative designs, and specification development. Efforts include systems engineering, naval architecture and marine engineering in support of NGLS indicative design development and on a chartered logistics ship experimentation, demonstration, and proof-of-concepts focused on the Refuel, Resupply, and Rearm logistics missions that NGLS will perform. ***FY 2022 OCO Plans:*** N/A ***FY 2021 to FY 2022 Increase/Decrease Statement:*** The increase in budget from $23.866M in FY21 to $27.785M for FY22 is due to the different efforts that will be performed in each year. The main difference is that Industry Studies will be performed in FY21, and increased support and demonstrations in FY22. The higher level of funding in FY22 is needed to conduct experimentation, demonstrations, and proofs of concept on a chartered logistics ship related to the Refuel, Resupply, and Rearm logistics missions that NGLS will perform. Higher levels of funding are also required to conduct the analysis of alternatives and the increase in work for the design/engineering support, program management support, and warfare center analysis and support to develop concept and indicative designs, aid in requirements development and trade-offs, develop specifications and other program documentation.					
Accomplishments/Planned Programs Subtotals	0.000	23.866	27.785	0.000	27.785

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

Industry Studies contracts are planned for award in FY 2021 to examine requirements and cost trade-offs. Current efforts will mature the NGLS design(s) and refine the specifications based on the information obtained from the Industry Studies and the demonstrations and experimentation conducted on the chartered logistics ship, leading to a Detail Design and Construction contract award for the lead ship.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Navy			Date: May 2021
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 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Industry Studies & Design	C/BA	TBD : TBD	0.000	0.000		15.366	Aug 2021	1.000	Nov 2021	-		1.000	-	-	-
		Subtotal	0.000	0.000		15.366		1.000		-		1.000	-	-	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
PM & Engineering Support	C/BA	CACI : Virginia	0.000	0.000		5.000	Feb 2021	6.500	Nov 2021	-		6.500	-	-	-
Special Studies	C/BA	Various : Not Specified	0.000	0.000		2.500	Feb 2021	2.500	Dec 2021	-		2.500	-	-	-
Warfare Center Analysis and Support	C/BA	Various WFC : Various WFC	0.000	0.000		0.000		6.490	Nov 2021	-		6.490	-	-	-
AoA Support	C/BA	CACI/Systems Planning & Analysis : Virginia	0.000	0.000		0.000		2.750	Nov 2021	-		2.750	-	-	-
		Subtotal	0.000	0.000		7.500		18.240		-		18.240	-	-	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Indicative Design	C/BA	NSWC CD : Maryland	0.000	0.000		1.000	Feb 2021	1.024	Nov 2021	-		1.024	-	-	-
Vessel Experimentation and Demonstration	C/BA	Various : Various	0.000	0.000		0.000		7.521	Nov 2021	-		7.521	-	-	-
		Subtotal	0.000	0.000		1.000		8.545		-		8.545	-	-	N/A

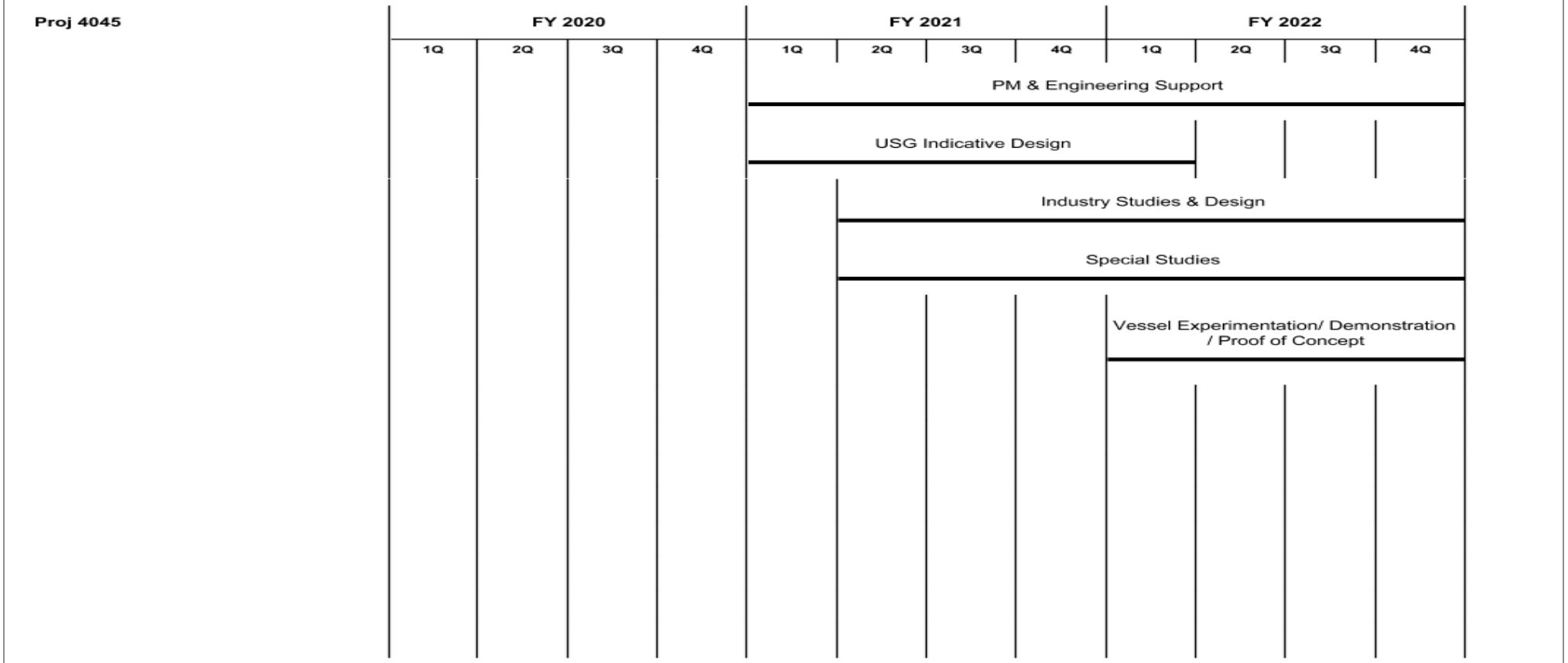
	Prior Years	FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	0.000		23.866		27.785		-		27.785	-	-	N/A

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

	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract

Remarks

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



2022PB - 0603563N - 4045

Exhibit R-4A, RDT&E Schedule Details: PB 2022 Navy		Date: May 2021
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	2022
USG Indicative Design	1	2021	1	2022
Industry Studies & Design	2	2021	4	2022
Special Studies	2	2021	4	2022
Vessel Experimentation/ Demonstration / Proof of Concept	1	2022	4	2022

Exhibit R-2A, RDT&E Project Justification: PB 2022 Navy			Date: May 2021
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603563N / *Ship Concept Advanced Design*	Project (Number/Name) 5010 / *AS(X) Submarine Tender*	

COST ($ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
5010: *AS(X) Submarine Tender*	0.000	0.000	0.000	16.357	-	16.357	-	-	-	-	-	-
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

AS(X) will conduct steady state and wartime sustained, forward-based tending, resupply, depot and intermediate level repair operations on submarines and ships while anchored or pier side. In steady state, AS(X) will provide pier side support in a forward deployed submarine homeport, providing sustained repair, supply, weapons handling, and tending operations for submarines

AS(X) is being specifically designed to support deployed VIRGINIA class (VCS), COLUMBIA class (CLB), OHIO Class SSGNs and future generation submarines in the 21st century. AS(X) is required to support all aspects of I-level maintenance and support to deliver expeditionary tending operations to VCS block V (and later) submarines.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
Title: AS(X) Submarine Tender Design and Total Ship Integration	0.000	0.000	16.357	0.000	16.357
Articles:	-	-	-	-	-
FY 2021 Plans: None					
FY 2022 Base Plans: Continue Submarine Tender (Sub Tender) program documentation, RFP for Preliminary Design (PD) execution, CDD development, MDA assignment, tailoring letter from MDA,and Sub Tender and Sub Tender Nuclear Support Facility Planning Yard specification development. Award PD Contract for Sub Tender to provide the preliminary design, Ship Specification Analysis, and final draft ship specification in support of the preparation and release of the RFP and Source Selection for DD&C for the first Sub Tender.					
FY 2022 OCO Plans: N/A					
FY 2021 to FY 2022 Increase/Decrease Statement: Increase of funds from FY 2021 to FY 2022 is due to FY 2022 and Out Year funding associated with AS(X) Submarine Tender being shifted from PE 0603563N Proj 4037 to PE 0603563N Proj 5010 for Preliminary					

Exhibit R-2A, RDT&E Project Justification: PB 2022 Navy		Date: May 2021
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603563N / *Ship Concept Advanced Design*	**Project (Number/Name)** 5010 / *AS(X) Submarine Tender*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
Design (PD) proposal evaluation, PD Award and the start of design as well as the start of AS(X) DD&C RFP development.					
Accomplishments/Planned Programs Subtotals	0.000	0.000	16.357	0.000	16.357

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

The AS(X) Program is pursuing a full and open contract for Preliminary Design, and a streamline tailored acquisition approach with Acquisition Category (ACAT) II designation and tailoring of acquisition required documentation. The program will be a single step to full capability, competitive contract, recapitalizing the existing 2 Submarine Tenders, and not an incremental procurement. AS(X) Preliminary Design contracts in FY 2022 will finalize the ship specification, NSF Interface Control Document (which will then be used to finalize the NSF specification), ship cost estimate, and ship construction schedule.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Navy		Date: May 2021
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603563N / *Ship Concept Advanced Design*	**Project (Number/Name)** 5010 / *AS(X) Submarine Tender*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Submarine Tender Preliminary Design	Various	Various : Various	0.000	0.000		0.000		12.000	Jan 2022	-		12.000	-	-	-
		Subtotal	0.000	0.000		0.000		12.000		-		12.000	-	-	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program and Engineering Support	Various	Various : Various	0.000	0.000		0.000		3.900	Jan 2022	-		3.900	-	-	-
		Subtotal	0.000	0.000		0.000		3.900		-		3.900	-	-	N/A

Remarks

1. Award dates reflect initial award of incremental execution.

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Acquisition Document Development	Various	Various : Various	0.000	0.000		0.000		0.457	Jan 2022	-		0.457	-	-	-
		Subtotal	0.000	0.000		0.000		0.457		-		0.457	-	-	N/A

Remarks

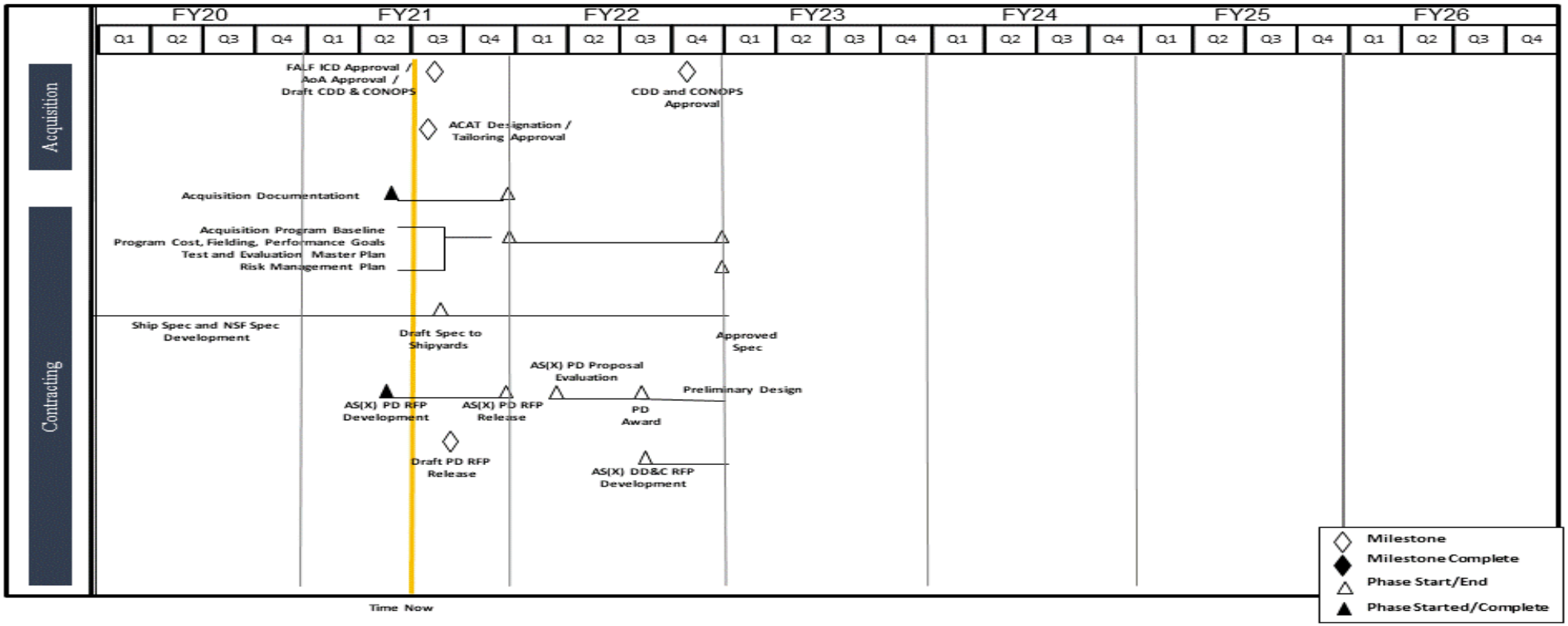
1. Award dates reflect initial award of incremental execution.

	Prior Years	FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	0.000		0.000		16.357		-		16.357	-	-	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Navy		Date: May 2021
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603563N / *Ship Concept Advanced Design*	**Project (Number/Name)** 5010 / *AS(X) Submarine Tender*

AS(X) *PB22* Schedule



AS(X) Acquisition Strategy - April 2021 1

Exhibit R-4A, RDT&E Schedule Details: PB 2022 Navy		Date: May 2021
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603563N / *Ship Concept Advanced Design*	**Project (Number/Name)** 5010 / *AS(X) Submarine Tender*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 5010				
Submarine Tender Program Documentation, CDD Development, and Planning Yard Facility	2	2020	4	2022
Submarine Tender Specification Development	3	2020	4	2022
Submarine Tender Industry Design Maturation/Special Studies	1	2021	2	2022

Exhibit R-2A, RDT&E Project Justification: PB 2022 Navy			Date: May 2021
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 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
9999: *Congressional Adds*	0.000	14.471	30.000	0.000	-	0.000	-	-	-	-	-	-
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Project C439 - Advanced Manufacturing of Critical Scale Materials
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
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.

Project C602 - Defense Industrial Skills and Technology Training (DISTT)
Funding will support leading the coordinated transformation of the workforce in industry and in the government (both civilian and military sectors) and ensure that the training and capability of skilled personnel in the government sector (both uniformed and civilian) are able to adapt and keep pace with the accelerated rate of change in advanced and additive manufacturing practices.

Project C634 - Polymorphic Build Farm for Open Source Technologies
Funding will establish two Polymorphic Build Farms (PBFs) for distribution of polymorphic operating systems for NAVSEA use. This includes the engineering, set up, delivery, implementation, and support for 2 GovCloud PBFs. The build farm includes technologies such as the Point in Time Cache that allows for faithful and accurate builds of operating systems, both current and legacy/end-of-life. This includes the ability to lock down a specific version and configuration if needed for compliance/ accreditation etc. This project will adapt Polyverse's PBF technologies to the unique environments needed by NAVSEA. The PBF will provide complete, end-to-end source code with the ability to create and update those operating systems as needed. The build out of 2 PBFs facilitates the critical distribution of software to the fleet by providing scalability, redundancy and ensures availability of resources.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021
Congressional Add: Additive Manufacturing	4.824	5.000

Exhibit R-2A, RDT&E Project Justification: PB 2022 Navy		Date: May 2021
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 2020	FY 2021
FY 2020 Accomplishments: N/A ***FY 2021 Plans:*** The Navy will continue its work to develop and execute testing and qualification procedures for additive manufacturing in order to ensure that its weapons systems are able to be maintained at the highest level of readiness by utilizing this rapidly growing technology.		
Congressional Add: High pressure cold spray system ***FY 2020 Accomplishments:*** N/A ***FY 2021 Plans:*** N/A	9.647	0.000
Congressional Add: Defense industrial Skills and Technology Training ***FY 2020 Accomplishments:*** N/A ***FY 2021 Plans:*** Lead the coordinated transformation of the workforce in industry and in the government (both civilian and military sectors) and ensure that the training and capability of skilled personnel in the government sector (both uniformed and civilian) are able to adapt and keep pace with the accelerated rate of change in advanced and additive manufacturing practices.	0.000	5.000
Congressional Add: Polymorphic Build Farm for Open Source Technologies ***FY 2020 Accomplishments:*** N/A ***FY 2021 Plans:*** The FY 2021 plans will provide an engineering implementation plan. Develop a calculation tool that will project GovCloud consumption costs based on activity and operating systems in the PBFs. Set-up 2 PBFs in the AWS GovCloud environment. Build and serve a scrambled repository.	0.000	10.000
Congressional Add: Portable High Pressure Cold Spray System ***FY 2020 Accomplishments:*** N/A ***FY 2021 Plans:*** The Navy will continue 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.	0.000	10.000
Congressional Adds Subtotals	14.471	30.000

C. Other Program Funding Summary ($ in Millions)

N/A

Exhibit R-2A, RDT&E Project Justification: PB 2022 Navy		Date: May 2021
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603563N / *Ship Concept Advanced Design*	**Project (Number/Name)** 9999 / *Congressional Adds*

C. Other Program Funding Summary ($ in Millions)

Remarks

D. Acquisition Strategy

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Navy		Date: May 2021
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 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Advanced Manufacturing of Critical Scale Materials	TBD	Various : Various	0.000	0.988	May 2020	0.000		0.000		-		0.000	-	-	-
Battery Prototype	TBD	Various : Various	0.000	1.482	Apr 2020	0.000		0.000		-		0.000	-	-	-
Defense Inudstrial Skills	MIPR	Various : Not Specified	0.000	0.000		7.400	Sep 2021	0.000		-		0.000	-	-	-
C439 Additive Manufacturing (AM)	MIPR	AFRL : WPAFB, OH	0.000	0.000		2.210	Apr 2021	0.000		-		0.000	-	-	-
C439 Additive Manufacturing (AM)	WR	NSWC CD : Bethesda, MD	0.000	0.000		2.185	Apr 2021	0.000		-		0.000	-	-	-
C439 Additive Manufacturing (AM)	WR	NSWC : Various	0.000	0.000		1.000	Jun 2021	0.000		-		0.000	-	-	-
C439 Additive Manufacturing (AM)	C/CPFF	Contracts : Various	0.000	0.000		1.635	Jul 2021	0.000		-		0.000	-	-	-
		Subtotal	0.000	2.470		14.430		0.000		-		0.000	-	-	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Support	WR	Various : Various	0.000	0.494	Jan 2020	0.000		0.000		-		0.000	-	-	-
		Subtotal	0.000	0.494		0.000		0.000		-		0.000	-	-	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Battery T&E	TBD	Various : Various	0.000	9.531	Apr 2020	0.000		0.000		-		0.000	-	-	-
Advanced Manufacturing of Critical Scale Materials	TBD	Various : Various	0.000	1.976	May 2020	0.000		0.000		-		0.000	-	-	-
AM to include Cold Spray	MIPR	GSA : Various	0.000	0.000		13.400	Jun 2021	0.000		-		0.000	-	-	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Navy		Date: May 2021
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603563N / *Ship Concept Advanced Design*	**Project (Number/Name)** 9999 / *Congressional Adds*

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Need Item Text	C/BA	Not Specified : Not Specified	0.000	0.000		0.000		0.000		-		0.000	-	-	-
		Subtotal	0.000	11.507		13.400		0.000		-		0.000	-	-	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Project Support	WR	NUWC : Keyort	0.000	0.000		2.170	Jun 2021	0.000		-		0.000	-	-	-
		Subtotal	0.000	0.000		2.170		0.000		-		0.000	-	-	N/A

	Prior Years	FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	14.471		30.000		0.000		-		0.000	-	-	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Navy		Date: May 2021
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603563N / *Ship Concept Advanced Design*	**Project (Number/Name)** 9999 / *Congressional Adds*

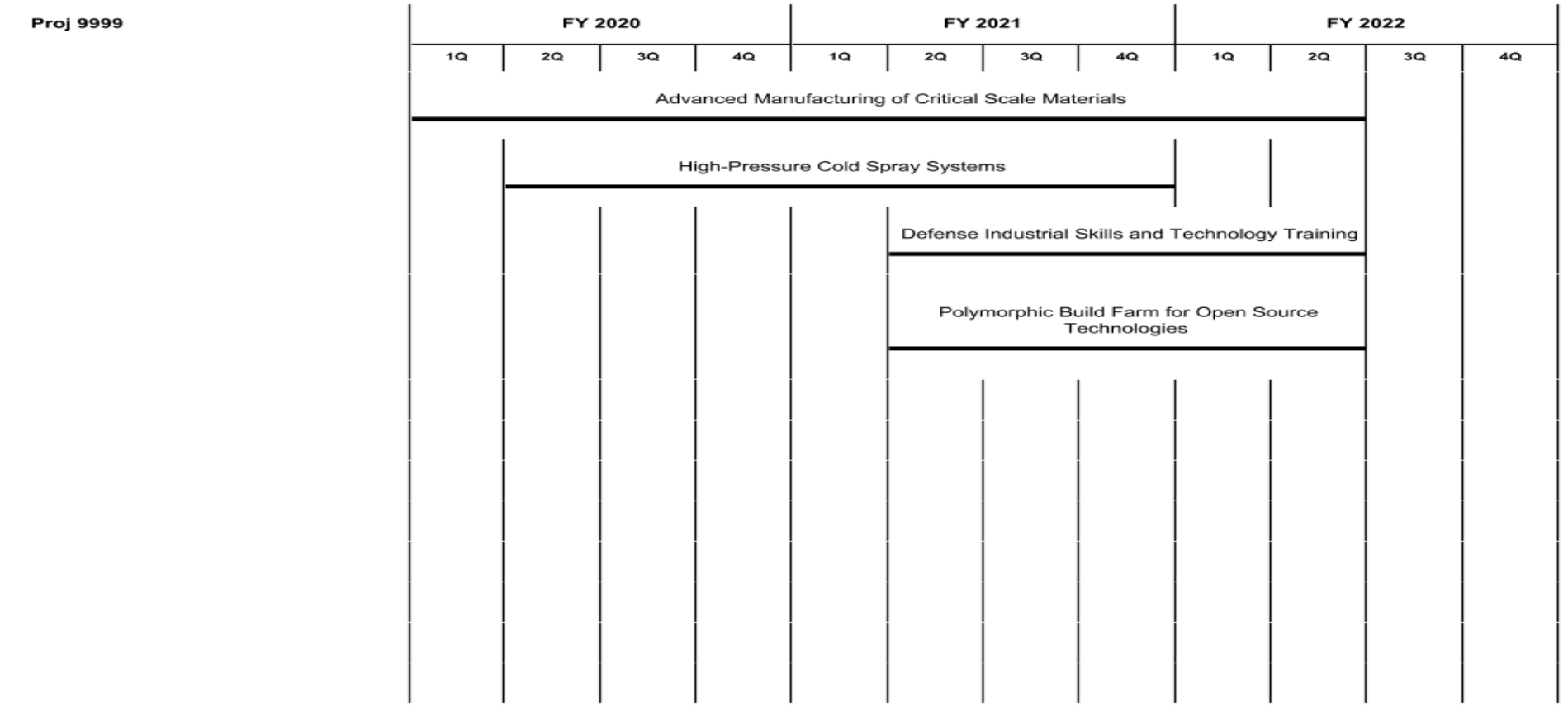


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Exhibit R-4A, RDT&E Schedule Details: PB 2022 Navy		Date: May 2021
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603563N / *Ship Concept Advanced Design*	**Project (Number/Name)** 9999 / *Congressional Adds*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 9999				
Advanced Manufacturing of Critical Scale Materials	1	2020	2	2022
High-Pressure Cold Spray Systems	2	2020	4	2021
Defense Industrial Skills and Technology Training	2	2021	2	2022
Polymorphic Build Farm for Open Source Technologies	2	2021	2	2022