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 0603925N *I Directed Energy and Electric Weapon System*							
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	235.289	136.535	126.325	81.803	-	81.803	-	-	-	-	-	-
2731: *High Energy Laser Counter ASCM Project (HELCAP)*	0.000	6.480	30.897	25.964	-	25.964	-	-	-	-	-	-
3402: *Surface Navy Laser Weapon System (SNLWS)*	128.475	85.643	56.015	46.331	-	46.331	-	-	-	-	-	-
9823: *Lasers for Navy applicat*	85.966	25.111	34.413	9.508	-	9.508	-	-	-	-	-	-
9999: *Congressional Adds*	20.848	19.301	5.000	0.000	-	0.000	-	-	-	-	-	-

A. Mission Description and Budget Item Justification

This program element will transition Directed Energy and Electric Weapon Systems (DE&EWS) technology from Science and Technology (S&T) research to the Technology Maturation and Risk Reduction phase, ultimately leading to acquisition initiation for the Surface/Subsurface Navy.

DE&EWS consist of multiple breakthrough technologies including: laser weapons that provide for speed-of-light engagements at tactically significant ranges resulting in savings realized by minimizing the use of defensive missiles and projectiles; electromagnetic launch of projectiles that will significantly increase firing ranges imposing greater cost to adversaries of ballistic and air defense missile engagements; enhance the land attack mission; and fielding of high power radio frequency systems for non-kinetic electronic attack and active denial technology, allowing for non-lethal determination of threat intent beyond small arms fire ranges.

Development of DE&EWS includes: Weapons Grade High Energy Lasers, Electromagnetic Railgun (EMRG) Weapon Systems, High Power Radio Frequency Weapon/ Sensor Systems, and other systems/capabilities.

Project 2731 - High Energy Laser Counter ASCM Project (HELCAP): Defeating Anti-Ship Cruise Missiles (ASCMs) with a laser weapon system presents several technical challenges (e.g. high atmospheric turbulence, target acquisition and identification, target tracking, aim point maintenance, automatic aim point placement, jitter control). The High Energy Laser Counter ASCM Project (HELCAP) will assess, develop, experiment, and demonstrate the various laser weapon system technologies and methods of implementation (e.g. laser sources, mission analysis, lethality, advanced beam control with atmospheric mitigation, target and tracking sensors, control systems) required to defeat ASCMs in a crossing engagement.

FY2022 funding will provide for systems engineering, mission analysis, complete integration of major components of a HELCAP prototype system, and perform beam control tracker and adaptive optics experimentation and demonstrations. Planning and preparations for FY2023 system experimentation and ASCM detect to defeat demonstrations utilizing the prototype system will also continue.

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 0603925N *I Directed Energy and Electric Weapon System*

Project 3402 - The Surface Navy Laser Weapon System (SNLWS) program supports the National Defense Strategy of building a more lethal force by leveraging mature technology to deliver proven laser weapon capability to the Fleet as part of the Navy Laser Family of Systems (NLFoS) initiative with the objective of providing the fleet with near-term laser weapon capabilities. Additionally, accelerated learning through incorporation of laser weapon Concept of Operations (CONOPs), employment, and maintenance will enable the rapid development and integration of these capabilities with the Navys existing weapon systems. This NLFoS initiative will also develop and validate warfighting requirements for laser weapons to address a variety of threats and to mature technologies and system integration readiness. High Energy Laser with Integrated Optical-Dazzler System (HELIOS) provides a low cost-per-shot capability to address Anti-Surface Warfare and Counter-Intelligence, Surveillance and Reconnaissance (C-ISR) gaps with the ability to dazzle and destroy Unmanned Aerial Systems (UAS) and defeat Fast Inshore Attack Craft (FIAC) while integrated into the AEGIS Combat System on a Flt IIA Destroyer. SNLWS provides industry-developed and government integrated capability to the Fleet in as short a timeframe as possible, thereby addressing the National Defense Strategy direction to foster a culture of innovation. SNLWS includes the development of a laser weapon system in the 60 kW or higher class. Competition was utilized for system development and production efforts. SNLWS leverages mature technology that will deliver a mature laser weapon system capability to the Fleet. SNLWS development leverages the Laser Weapon System (LaWS)/Solid State Laser Quick Reaction Capability (SSL QRC) and Solid State Laser Technology Maturation (SSL TM)/Laser Weapon System Demonstrator (LWSD) efforts.

The FY 2022 budget provides funding for the executing shipyard and the Alteration Installation Team (AIT) for completion of Mk 5 Mod 0 HELIOS installation and checkout on DDG 88 during AEGIS Modification (AMOD) availability; technical engineering services support during HELIOS installation and checkout, procurement of Installation and Checkout (INCO) spares required during Stages 1-7 testing during AMOD availability; procurement/completion of technical manuals; conduct of operations and maintenance, and operator training; provision of On-Board Repair Parts (OBRPs); shipping/storage of HELIOS; system repairs during INCO; development of Maintenance Requirement Cards/Maintenance Index Pages (MRCs/MIPs) and the Allowance Parts List (APL).

Project 9823 - Lasers for Navy Applications: Optical Dazzler Interdictor Navy (ODIN) development provides near-term, directed energy, shipboard Counter-Intelligence, Surveillance, and Reconnaissance (C-ISR) capabilities to dazzle Unmanned Aerial Systems (UASs) and other platforms that address urgent operational needs of the Fleet. FY 2018 was the first year of funding which supports the design, development, procurement and installation of 8 ODIN standalone units over the FYDP, for deployment on DDG 51 Flt IIA surface combatants. The program supports the non-recurring engineering, development, procurement of long lead material, assembly and checkout, system certification, platform integration/installation and sustainment for these ODIN standalone units.

FY22 funds procurement, assembly, checkout, integration, T&E and installation through Unit 6; continues procurement, assembly, checkout, integration and T&E of Units 7 and 8; and provides Operation & Sustainment (O&S) of Units 1-6.

Project 9999 (PU C453) - Congressional Add - Surface Navy Laser Weapon System (SNLWS) Program Re-phasing: Congress added funding in FY 2019 for re-phasing of the SNLWS development and fielding effort. This funding supports procurement of HELIOS long lead materials in FY 2019 related to early award of the contract to Lockheed Martin Aculight.

Project 9999 (PU C547) - Congressional Adds - Railgun Program: Congress added funding in FY2020 for ship-based program/technical development and ship integration related risk reduction. Electromagnetic railgun provides increased capability for the following mission sets: Naval Surface Fire Support (NSFS), Integrated Air and Missile Defense (IAMD), Fast Attack Craft and Fast Inshore Attack Craft (FAC/FIAC), and future potential for Anti-Surface Warfare (ASuW). This funding supports

Exhibit R-2, RDT&E Budget Item Justification: PB 2022 Navy	Date: May 2021
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the testing and refinement of pulse current transfer, mount, and hypervelocity projectile component development. In addition, this project supports the continuing effort to define and evolve requirements related to mount and platform interface management and maturations of specifications for tactical railgun weapon system.

Project 9999 (PU C516) - Congressional Add - High Energy Laser (HEL) Weapon System for Counter-Unmanned Ariel System (C-UAS) Area defense is a Congressionally directed effort to develop/build a minimized footprint, laser-agonistic beam director and beam control system (M-BD/BCS) to support Commercial Off The Shelf (COTS) lasers >10KW for possible application to Joint Light Tactical Vehicle (JLTV) sized vehicles.

FY2020 funding will provide for systems engineering, design, and fabrication of this M-BD/BCS.

B. Program Change Summary ($ in Millions)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
Previous President's Budget	135.919	128.845	87.011	-	87.011
Current President's Budget	136.535	126.325	81.803	-	81.803
Total Adjustments	0.616	-2.520	-5.208	-	-5.208
• Congressional General Reductions	-	-0.570			
• Congressional Directed Reductions	-	-6.950			
• Congressional Rescissions	-	-			
• Congressional Adds	-	5.000			
• Congressional Directed Transfers	-	-			
• Reprogrammings	5.862	0.000			
• SBIR/STTR Transfer	-5.245	0.000			
• Program Adjustments	0.000	0.000	-3.738	-	-3.738
• Rate/Misc Adjustments	-0.001	0.000	-1.470	-	-1.470

Congressional Add Details ($ in Millions, and Includes General Reductions)	FY 2020	FY 2021
Project: 9999: *Congressional Adds*		
Congressional Add: *High Energy Laser Weapon System for C-UAS Area Defense*	9.654	5.000
Congressional Add: *Railgun*	9.647	0.000
Congressional Add Subtotals for Project: 9999	19.301	5.000
Congressional Add Totals for all Projects	19.301	5.000

Change Summary Explanation

The FY22 net funding decrease in the amount of $5.208 million consists of a $3.738 million HELCAP PU 2731 reduction to fund a higher Navy priority and $1.470 million in rate adjustments.

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 0603925N *I Directed Energy and Electric Weapon System*

9823 Lasers for Navy Applications - A PB21 Program Adjustment in the amount of $28.95 million in FY21 and $3.5 million in FY22 was provided to Lasers for Navy Applications for PU 9823 in support of the procurement, assembly, checkout, integration, T&E, installation and sustainment of 8 units as a result of realized cost growth. It should be noted that in order to fully fund the procurement, assembly, checkout, integration, T&E, installation and sustainment of 8 units (7 Block 1 and 1 Block 1A), additional funding is required. An additional $9.975 million was requested/required. To date, $7.2M has been provided and $2.775M is remaining which will require a BTR.

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 0603925N / *Directed Energy and Electric Weapon System*	Project (Number/Name) 2731 / *High Energy Laser Counter ASCM Project (HELCAP)*	

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
2731: *High Energy Laser Counter ASCM Project (HELCAP)*	0.000	6.480	30.897	25.964	-	25.964	-	-	-	-	-	-
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

Note

Due to technology maturation, a portion of HELCAP program efforts now fall into BA04.

A. Mission Description and Budget Item Justification

The High Energy Laser Counter ASCM Project (HELCAP) will expedite the development, experimentation, integration and demonstration of critical technologies to defeat crossing Anti-Ship Cruise Missiles (ASCM) by addressing the remaining technical challenges, e.g.: atmospheric turbulence, automatic target identification and aim point selection, precision target tracking with low jitter in high clutter conditions, advanced beam control, and higher power HEL development. HELCAP will assess, develop, experiment, and demonstrate the various laser weapon system technologies and methods of implementation required to defeat ASCMs in a crossing engagement.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
Title: High Energy Laser Counter ASCM Project (HELCAP)	6.480	30.897	25.964	0.000	25.964
Articles:	-	-	-	-	-
Description: The High Energy Laser Counter ASCM Project (HELCAP) will expedite the development, experimentation, integration and demonstration of critical technologies to defeat crossing Anti-Ship Cruise Missiles (ASCM) by addressing the remaining technical challenges, e.g.: atmospheric turbulence, automatic target identification and aim point selection, precision target tracking with low jitter in high clutter conditions, advanced beam control, and higher power HEL development. HELCAP will assess, develop, experiment, and demonstrate the various laser weapon system technologies and methods of implementation required to defeat ASCMs in a crossing engagement. HELCAP will leverage the knowledge gained in the Navy Laser Family of Systems (NLFoS) efforts: - Alternative Laser Sources for higher powers, also known as the Ruggedized High Energy Laser (RHEL) activities; - Solid State Laser Tech Maturation activities that provides initial key enabling technical solutions in high power lasers and beam control, and will provide opportunities for single ship operational and sustainment learning;					

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 0603925N / *Directed Energy and Electric Weapon System*	**Project (Number/Name)** 2731 / *High Energy Laser Counter ASCM Project (HELCAP)*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
- Surface Navy Laser Weapon System Increment 1 (SNLWS Inc. 1) project that provides the initial combat system integration and installation knowledge for Aegis platforms, and multi-ship battle force operations knowledge; - Optical Dazzling Interdictor Navy (ODIN) that provides Counter-ISR technical and fleet operational knowledge. This leveraged knowledge and new HELCAP technical solutions to the C-ASCM problem will enable a fully informed decision to rapidly field an integrated, fleet ready, HEL Weapon. HELCAP activities being conducted with advanced technology development (BA 03) funds under PE 0603801N Innovative Naval Prototypes (INP) include technology assessments, laser lethality investigations, and advanced beam control. HELCAP activities being conducted within this program element (PE) include: the laser weapon control system; test site auxiliary prime power and cooling; adapting an OSD 300 kW+ class laser source for transport and integration with the prototype system; integrating the beam control testbed from the BA 03 effort; integrating all remaining prototype system elements; and performing experimentation and detect-to-defeat demos conducted within this program element (PE). ***FY 2021 Plans:*** FY2021 funding will provide for systems engineering, mission analysis, and the design completion, fabrication, and integration of major components of a HELCAP prototype system. Planning and preparations for FY2022-FY2023 system experimentation and demonstrations utilizing the prototype system will also continue. FY2021 tasks include: - Perform additional mission analysis to ensure counter ASCM detect to defeat demos are representative of future concepts of operations - Continue to perform Systems Engineering activities to ensure that all elements of the prototype system meet interface and performance requirements for planned counter ASCM detect to defeat experimentation and demonstrations. Prototype system elements include the beam control testbed, 300 kW+ laser source, prototype control system, and auxiliary prime power and cooling. - Complete design and fabricate laser weapon control, prime power, and cooling hardware. - Select one of the laser sources being developed under an OSD laser scaling initiative and adapt it for transport and interface with the other elements of the prototype system - Integrate all prototype system and auxiliary elements including beam control, laser source, laser weapon control, prime power, and cooling.					

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 0603925N / *Directed Energy and Electric Weapon System*	**Project (Number/Name)** 2731 / *High Energy Laser Counter ASCM Project (HELCAP)*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
- Continue T&E planning to enable FY22-23 counter ASCM detect to defeat experimentation and demonstrations. This may include requirements development, draft integrated test plans, safety, initial approvals, and identification of long lead test articles. - Continue test asset procurements and site preparation to enable FY22-23 counter ASCM detect to defeat experimentation and demonstrations.					
FY 2022 Base Plans: FY2022 funding will provide for systems engineering, mission analysis, complete integration of major components of a HELCAP prototype system, and perform beam control tracker and adaptive optics experimentation and demonstrations. Planning and preparations for FY2023 system experimentation and ASCM detect to defeat demonstrations utilizing the prototype system will also continue. FY2022 tasks include: - Continue mission analysis to ensure counter ASCM detect to defeat demos are representative of future concepts of operations - Continue to perform systems engineering activities to ensure that all elements of the prototype system meet interface and performance requirements for planned counter ASCM experimentation and demonstrations. Prototype system elements include the beam control testbed, 300 kW class laser source, prototype weapon control system, auxiliary prime power and cooling, and test support diagnostics and data collection. - Perform factory acceptance test of beam control testbed. - Perform beam control testbed tracker and adaptive optics performance verification experimentation at test range. - Complete integration of all prototype system elements including beam control testbed, surrogate high power laser source, prototype weapon control system, auxiliary prime power and cooling, and test support diagnostics and data collection. - Continue T&E planning to enable FY22-23 counter ASCM detect to defeat experimentation and demonstrations. This may include requirements development, draft integrated test plans, safety, initial approvals, and identification of long lead test articles. - Initiate integrated prototype system verification experimentation at test range. - Continue test asset procurements and site preparation to enable FY23 counter ASCM detect to defeat demonstrations.					
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 0603925N / *Directed Energy and Electric Weapon System*	**Project (Number/Name)** 2731 / *High Energy Laser Counter ASCM Project (HELCAP)*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
Funding for HELCAP efforts decreases because major long lead prototype hardware procurements were made in FY21. FY22 funding supports integration of prototype system components, perform prototype system experimentation, and continue prototype system demonstration planning.					
Accomplishments/Planned Programs Subtotals	6.480	30.897	25.964	0.000	25.964

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
• RDTE/0603801N/2731: *High Energy Laser Counter ASCM Project*	0.000	29.372	13.960	-	13.960	-	-	-	-	-	-

Remarks

D. Acquisition Strategy

The HELCAP is an initiative that provides a flexible prototype system for government experimentation and demonstration of a high-energy laser system capable of defeating an anti- ship cruise missile. Key elements of the prototype system include the beam control testbed, 300 kW+ class laser source, prototype control system, and auxiliary prime power and cooling. The industry provider of the beam control testbed (developed under PE 0603801N) was selected through a competitive process and is being designed to accept technology insertion from other industry providers. The 300+ kW class laser source will be acquired by selecting one of the laser sources being developed under an OSD laser scaling initiative and adapting it for transport and interface with the other elements of the prototype system. The Naval Surface Warfare Center Dahlgren (NSWCDD) will design and fabricate the control system and
auxiliary prime power and cooling systems. NSWCDD government and contractor engineers will then integrate all above elements that make up the prototype and auxiliary systems and perform FY22-23 counter ASCM detect to defeat experimentation and demonstrations at government test sites.

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 0603925N / *Directed Energy and Electric Weapon System*	**Project (Number/Name)** 2731 / *High Energy Laser Counter ASCM Project (HELCAP)*	

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
Prototype System Controls, Target Tracking, and Deconfliction (Government team)	WR	NSWC Dahlgren : Dahlgren VA	0.000	2.230	Oct 2019	3.740	Oct 2020	4.340	Oct 2021	-		4.340	-	-	-
Prototype System Controls, Target Tracking, and Deconfliction (Contractor Team)	C/CPFF	Booz Allen Hamilton : Dahlgren VA	0.000	1.750	Dec 2019	1.300	Nov 2020	0.810	Nov 2021	-		0.810	-	-	-
HELCAP Mission Analysis	WR	NSWC Dahlgren : Dahlgren VA	0.000	1.000	Oct 2019	1.000	Oct 2020	0.812	Oct 2021	-		0.812	-	-	-
HELCAP Mission Analysis	C/CPFF	JHU/APL : Laurel MD	0.000	0.000		1.000	Nov 2020	1.428	Nov 2021	-		1.428	-	-	-
Design government owned interfaces between the OSD Laser Source and Prototype System	WR	NSWC Dahlgren : Dahlgren VA	0.000	0.000		0.907	Oct 2020	0.780	Oct 2021	-		0.780	-	-	-
Adapt OSD Laser Source for Transport and Interface with Prototype System	C/CPFF	TBD : Not Specified	0.000	0.000		2.050	Nov 2020	1.787	Mar 2022	-		1.787	-	-	-
Prototype and Support System Integration	WR	NSWC Dahlgren : Dahlgren VA	0.000	0.000		4.450	Oct 2020	2.040	Oct 2021	-		2.040	-	-	-
Procure and Assemble Prototype System Power and Misc Hardware	C/CPFF	TBD : Not Specified	0.000	0.000		6.000	Nov 2020	1.622	Mar 2022	-		1.622	-	-	-
		Subtotal	0.000	4.980		20.447		13.619		-		13.619	-	-	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
HELCAP Systems Engineering, Safety,	WR	NSWC Dahlgren : Dahlgren VA	0.000	1.250	Oct 2019	3.250	Oct 2020	3.908	Oct 2021	-		3.908	-	-	-

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 0603925N / *Directed Energy and Electric Weapon System*	Project (Number/Name) 2731 / *High Energy Laser Counter ASCM Project (HELCAP)*	

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 (Government team)															
HELCAP Systems Engineering, Safety, Program Management (Contractor team)	C/CPFF	Multiple : Dahlgren VA	0.000	0.000		2.900	Oct 2020	0.140	Nov 2021	-		0.140	-	-	-
		Subtotal	0.000	1.250		6.150		4.048		-		4.048	-	-	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
Planning for FY22-23 experimentation and ASCM detect to defeat demonstrations	WR	NSWC Port Hueneme/Point Mugu/Dahlgren : Port Hueneme, CA, Point Mugu , CA & Dahlgren, VA	0.000	0.000	Oct 2019	1.300	Oct 2020	1.772	Oct 2021	-		1.772	-	-	-
Test site long lead assets and preparations for FY22-23 experimentation ASCM detect to defeat demonstration	C/CPFF	White Sands Missile Range, & Point Mugu Test Range : White Sannds, NM & San Nicholas Island, CA	0.000	0.000	Oct 2019	1.500	Jan 2021	1.000	Mar 2022	-		1.000	-	-	-
Stand Alone Tracker, Adaptive Optics and Other Experimentation	WR	NSWC Dahlgren : Dahlgren VA	0.000	0.000		1.000	Oct 2020	2.550	Jul 2022	-		2.550	-	-	-
ASCM Surrogate Targets	C/CPFF	TBD : TBD	0.000	0.000		0.000		2.400	Mar 2022	-		2.400	-	-	-
		Subtotal	0.000	0.000		3.800		7.722		-		7.722	-	-	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 0603925N / *Directed Energy and Electric Weapon System*	Project (Number/Name) 2731 / *High Energy Laser Counter ASCM Project (HELCAP)*	

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
HELCAP Program Management /Engineering Support	C/CPFF	Booz Allen Hamilton : Dahlgren, VA	0.000	0.250	Oct 2019	0.500	Nov 2020	0.575	Nov 2021	-		0.575	-	-	-
		Subtotal	0.000	0.250		0.500		0.575		-		0.575	-	-	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	6.480		30.897		25.964		-		25.964	-	-	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 0603925N / *Directed Energy and Electric Weapon System*	**Project (Number/Name)** 2731 / *High Energy Laser Counter ASCM Project (HELCAP)*

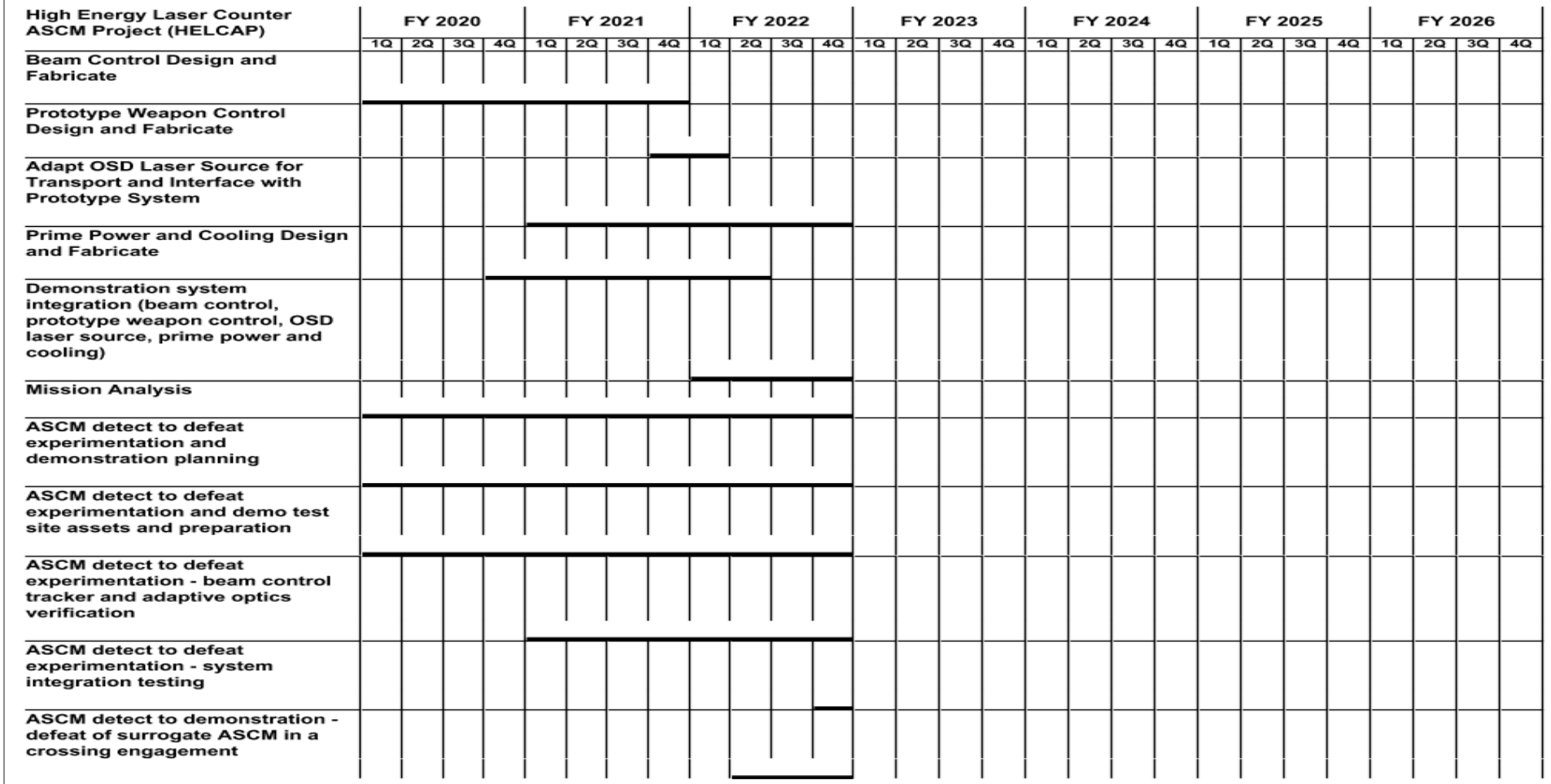

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Navy		Date: May 2021
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603925N / *Directed Energy and Electric Weapon System*	**Project (Number/Name)** 2731 / *High Energy Laser Counter ASCM Project (HELCAP)*

ASCM detect to defeat demonstration post-test documentation

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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 0603925N / *Directed Energy and Electric Weapon System*	**Project (Number/Name)** 2731 / *High Energy Laser Counter ASCM Project (HELCAP)*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
High Energy Laser Counter ASCM Project (HELCAP)				
Beam Control Design and Fabricate: HELCAP: Beam Control Design and Fabricate	1	2020	4	2021
Prototype Weapon Control Design and Fabricate: HELCAP: Prototype Weapon Control Design and Fabricate	4	2021	1	2022
Adapt OSD Laser Source for Transport and Interface with Prototype System: HELCAP: Adapt OSD Laser Source for Transport and Interface with Prototype System	1	2021	4	2022
Prime Power and Cooling Design and Fabricate: HELCAP: Prime Power and Cooling Design and Fabricate	4	2020	2	2022
Demonstration system integration (beam control, prototype weapon control, OSD laser source, prime power and cooling): HELCAP: Demonstration system integration (beam control, prototype weapon control,	1	2022	4	2022
Mission Analysis: HELCAP: Mission Analysis	1	2020	4	2022
ASCM detect to defeat experimentation and demonstration planning: HELCAP: ASCM detect to defeat experimentation and demonstration planning	1	2020	4	2022
ASCM detect to defeat experimentation and demo test site assets and preparation: HELCAP: ASCM detect to defeat experimentation and demo test site assets and preparation	1	2020	4	2022
ASCM detect to defeat experimentation - beam control tracker and adaptive optics verification: HELCAP: ASCM detect to defeat experimentation - beam control tracker and adaptive optics verification	1	2021	4	2022
ASCM detect to defeat experimentation - system integration testing: HELCAP: ASCM detect to defeat experimentation - system integration testing	4	2022	4	2022
ASCM detect to demonstration - defeat of surrogate ASCM in a crossing engagement: HELCAP: ASCM detect to demonstration - defeat of surrogate ASCM in a crossing engagement	2	2022	4	2022

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 0603925N / *Directed Energy and Electric Weapon System*	**Project (Number/Name)** 2731 / *High Energy Laser Counter ASCM Project (HELCAP)*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
ASCM detect to defeat demonstration post-test documentation: ASCM detect to defeat demonstration post-test documentation	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 0603925N / *Directed Energy and Electric Weapon System*	Project (Number/Name) 3402 / *Surface Navy Laser Weapon System (SNLWS)*	

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
3402: *Surface Navy Laser Weapon System (SNLWS)*	128.475	85.643	56.015	46.331	-	46.331	-	-	-	-	-	-
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Project 3402 - The Surface Navy Laser Weapon System (SNLWS) program supports the National Defense Strategy of building a more lethal force by leveraging mature technology to deliver proven laser weapon capability to the Fleet as part of the Navy Laser Family of Systems (NLFoS) initiative with the objective of providing the fleet with near-term laser weapon capabilities. Additionally, accelerated learning through incorporation of laser weapon Concept of Operations (CONOPs), employment, and maintenance will enable the rapid development and integration of these capabilities with the Navy's existing weapon systems. This NLFoS initiative will also develop and validate warfighting requirements for laser weapons to address a variety of threats and to mature technologies and system integration readiness. HELIOS provides a low cost-per-shot capability to address Anti-Surface Warfare and Counter-Intelligence, Surveillance and Reconnaissance (C-ISR) gaps with the ability to dazzle and destroy Unmanned Aerial Systems (UAS) and defeat Fast Inshore Attack Craft (FIAC) while integrated into the AEGIS Combat System on a Flt IIA Destroyer. SNLWS provides industry-developed and government integrated capability to the Fleet in as short a timeframe as possible, thereby addressing the National Defense Strategy direction to foster a culture of innovation. SNLWS includes the development of a laser weapon system in the 60 kW or higher class. Competition was utilized for system development and production efforts. SNLWS leverages mature technology that will deliver a mature laser weapon system capability to the Fleet. SNLWS development leverages the Laser Weapon System (LaWS)/Solid State Laser Quick Reaction Capability (SSL QRC) and Solid State Laser Technology Maturation (SSL TM)/Laser Weapon System Demonstrator (LWSD) efforts.

The FY 2022 budget provides funding for the executing shipyard and the Alteration Installation Team (AIT) for completion of Mk 5 Mod 0 HELIOS installation and checkout in DDG 88 during AEGIS Modification (AMOD) availability; technical engineering services support during HELIOS installation and checkout, procurement of Installation and Checkout (INCO) spares required during Stages 1-7 testing during AMOD availability; procurement/completion of technical manuals; conduct of operations and maintenance, and operator training; provision of On-Board Repair Parts (OBRPs); shipping/storage of HELIOS; system repairs during INCO; development of Maintenance Requirement Cards/Maintenance Index Pages (MRCs/MIPs) and the Allowance Parts List (APL).

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
Title: SNLWS Prime Contractor Efforts	54.752	28.661	21.567	0.000	21.567
Articles:	-	-	-	-	-
FY 2021 Plans: - Conduct Factory Qualification Test (FQT). - Complete integration of sub-systems to include High Energy Laser Weapon System combined with a C-ISR capability for countering UAS-mounted sensors.					

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 0603925N / *Directed Energy and Electric Weapon System*	**Project (Number/Name)** 3402 / *Surface Navy Laser Weapon System (SNLWS)*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
- Conduct test events associated with land based test and installation and checkout of HELIOS Shipboard. - Develop and deliver required contract deliverables/documentation, including life cycle support and training documentation. - Conduct SNLWS Technical Interchange Meetings (TIMs) with PEO IWS and designated field activities. - Provide programmatic and engineering support to SNLWS Integrated Product Teams (IPTs) and Working Groups (WGs). - Conduct Field Developmental Test (FDT). ***FY 2022 Base Plans:*** In Support of ongoing Mk 5 Mod 0 system installation in DDG 51 Flight IIA Ship, the Prime Contractor shall: - System Delivery pier side - Provide system engineering support. - Provide shipboard technical support. - Provide shipboard test and checkout support. - Provide sustainment support and material procurement. - Provide Alteration Installation Team support. - Provide Combat System Integration Support. ***FY 2022 OCO Plans:*** N/A ***FY 2021 to FY 2022 Increase/Decrease Statement:*** The decrease in prime contractor funding from FY21 to FY22 is a result of the end of the period of performance for CLIN 0001 development efforts.					
Title: SNLWS Government and Support Engineering Services	30.891	27.354	24.764	0.000	24.764
Articles:	-	-	-	-	-
FY 2021 Plans: - Continue review of all contractor provided engineering, design, production readiness, and test documentation. - Conduct Technical Interchange Meetings (TIMs) with contractor and government personnel. - Support conduct of FQT. - Provide programmatic and engineering support to government-led Integrated Product Teams (IPTs) and Working Groups (WGs). - Continue AEGIS Combat System software engineering, development, and integration; conduct levels 1-7 integration and testing.					

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 0603925N / *Directed Energy and Electric Weapon System*	**Project (Number/Name)** 3402 / *Surface Navy Laser Weapon System (SNLWS)*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
- Provide insight and oversight for development of life cycle support material and training documentation. - Initiate DDG 51 Flight IIA Ship Integration and Installation. - Provide support for contractor led land based test events and provide analysis of results for verification and validation of requirements. - Support conduct of Field Developmental Test (FDT). - Complete final delivery of baseline Government Furnished Equipment (GFE) software to vendor. ***FY 2022 Base Plans:*** FY 2022 Base Plans: - Conduct Technical Interchange Meetings (TIMs) with contractor and government personnel. - Provide programmatic and engineering support to government-led Integrated Product Teams (IPTs) and Working Groups (WGs). - Continue DDG 51 Flight IIA ship installation, integration, test and checkout. - Provide technical assistance in support of shipboard installation and checkout. - Conduct HELIOS-AEGIS Combat System integration testing. - Conduct product support/sustainment management and engineering. - Procure life cycle products, including documentation and material required for shipboard use. - Maintain and deliver installation, integration, and test data related to shipboard SNLWS installation. - Develop and deliver required contract cost, schedule, and performance related documentation. - Conduct Laser and Weapon System Safety reviews. ***FY 2022 OCO Plans:*** N/A. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** The decrease in government funding from FY21 to FY22 is a result of the government oversight being decreased commensurate with the completion of system development.					
Accomplishments/Planned Programs Subtotals	85.643	56.015	46.331	0.000	46.331

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

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 0603925N / *Directed Energy and Electric Weapon System*	**Project (Number/Name)** 3402 / *Surface Navy Laser Weapon System (SNLWS)*

D. Acquisition Strategy

The acquisition strategy permits accelerated fielding of laser weapon systems in the Fleet and provides a demand signal for the industrial base to expand the capacity to develop and manufacture this advanced technology. The acquisition strategy consists of the baseline development and production of one unit followed by options to acquire system quantities at firm fixed price that will address operational needs of the Fleet in the requisite timeframe to offset future threats and maintain technological superiority over potential adversaries. SNLWS provides for industry-developed and government integrated capability to the Fleet in as short a timeframe as possible, thereby addressing the National Defense Strategy direction to foster a culture of affordability. SNLWS includes the development of an advanced laser weapon system in the 60 kW or higher class. Competition was utilized for system development and production 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 0603925N / *Directed Energy and Electric Weapon System*	Project (Number/Name) 3402 / *Surface Navy Laser Weapon System (SNLWS)*	

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
SNLWS Development	C/CPIF	Lockheed Martin Aculight : Bothell, WA	90.272	47.084	Oct 2019	10.000	Oct 2020	0.000		-		0.000	-	-	-
		Subtotal	90.272	47.084		10.000		0.000		-		0.000	-	-	N/A

Remarks

The base product development was scheduled to complete in FY20, but the contractor has realized a program cost growth. Funding was reallocated from Support and T&E to address this cost growth in FY20 and FY21.

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
SNLWS Systems Engineering, Program Management, GFE/GFI	WR	NSWC Dahlgren : Dahlgren, VA	18.712	7.686	Nov 2019	5.287	Nov 2020	6.804	Nov 2021	-		6.804	-	-	-
SNLWS Ship Installation, Integration & Documentation	C/CPAF	BIW : Bath, ME	1.179	1.379	Jan 2020	2.000	Jan 2021	1.369	Jan 2022	-		1.369	-	-	-
SNLWS Combat System Integration/Licenses	C/CPFF	Lockheed Martin : Moorestown, NJ	8.143	4.756	Oct 2019	1.000	Oct 2020	1.000	Oct 2021	-		1.000	-	-	-
SNLWS Systems Engineering/Security	WR	NSWC Crane : Crane, IN	0.432	0.155	Dec 2019	0.169	Dec 2020	0.170	Dec 2021	-		0.170	-	-	-
SNLWS Systems Engineering/Installation	WR	NSWC PHD : Port Hueneme, CA	0.757	0.200	Nov 2019	0.000		0.000		-		0.000	-	-	-
SNLWS Systems Engineering	WR	NIWC Pacific : San Diego, CA	0.345	0.000		0.000		0.000		-		0.000	-	-	-
SNLWS Systems Engineering	WR	NPS : Monterey, CA	0.200	0.000		0.000		0.000		-		0.000	-	-	-
SNLWS Systems Engineering	MIPR	MIT LL : Lexington, MA	0.004	0.000		0.000		0.000		-		0.000	-	-	-
SNLWS Systems Engineering	C/CPFF	PSU EOC : Freeport, PA	0.800	0.200	Feb 2020	0.300	Dec 2020	0.400	Dec 2021	-		0.400	-	-	-

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 0603925N / *Directed Energy and Electric Weapon System*	Project (Number/Name) 3402 / *Surface Navy Laser Weapon System (SNLWS)*	

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
SNLWS Technical Director	WR	NSWC Crane : Crane, IN	0.604	0.285	Dec 2019	0.285	Dec 2020	0.330	Dec 2021	-		0.330	-	-	-
SNLWS Product Support	WR	NSWC PHD : Port Hueneme, CA	0.678	1.020	Nov 2019	1.242	Nov 2020	3.000	Nov 2021	-		3.000	-	-	-
SNLWS Installation APM	WR	NSWC Dahlgren DNA : Dam Neck, VA	0.256	0.359	Nov 2019	0.400	Nov 2020	0.400	Nov 2021	-		0.400	-	-	-
SNLWS Radar Cross Section Engineering	WR	NSWC Carderock : Potomac, MD	0.029	0.000		0.000		0.000		-		0.000	-	-	-
SNLWS Environmental Engineering	WR	NUWC Newport : Newport, RI	0.031	0.000		0.000		0.000		-		0.000	-	-	-
SNLWS System Installation	C/CPAF	BAE via SWRMC : San Diego, CA	0.000	5.726	Sep 2020	5.000	Jan 2021	2.500	Jan 2022	-		2.500	-	-	-
SNLWS AIT/Engr/Tech/ Sustainment/Material/ Labor	C/CPIF	Lockheed Martin Aculight : Bothell, WA	0.000	0.249	Jul 2020	17.661	Dec 2020	21.567	Dec 2021	-		21.567	-	-	-
SNLWS Installation Engineering	C/CPAF	Third Party Planning (3PP) : Not Specified	0.005	0.000		0.000		0.000		-		0.000	-	-	-
SNLWS Laser Range Hazard Analysis	WR	NSWC Corona : Corona, CA	0.021	0.018	Jul 2020	0.000		0.000		-		0.000	-	-	-
SNLWS Platform Integration/ILS/Installation Support	C/CPFF	CACI : Washington, DC	0.000	0.213	Jul 2020	0.072	Jan 2021	0.000		-		0.000	-	-	-
SNLWS installation Management & Matereials	C/CPFF	NSWC PHD : Virginia Beach, VA	0.000	1.595	Apr 2020	5.061	Jan 2021	0.600	Jan 2022	-		0.600	-	-	-
SNLWS Installation/ Shipping	WR	NAVFAC : San Diego, CA	0.000	0.000		0.003	Mar 2021	0.000		-		0.000	-	-	-
SNLWS ILS/PRODUCT SUPPORT	C/FFP	TMS VIA NSWC IH : Indian Head, MD	0.000	0.000		0.069	Apr 2021	0.150	Oct 2021	-		0.150	-	-	-
		Subtotal	32.196	23.841		38.549		38.290		-		38.290	-	-	N/A

Remarks

Executing shipyard contract awarded August 2020 to BAE via SWRMC.
Support funding in FY20 and FY21 was reallocated to Product Development in order to accommodate the LM Aculight CLIN 0001 cost growth.

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 0603925N / *Directed Energy and Electric Weapon System*	**Project (Number/Name)** 3402 / *Surface Navy Laser Weapon System (SNLWS)*	

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
In FY20, funding also had to be reallocated within Support to accommodate an additional requirement from Lockheed Martin in order for HELIOS to be integrated with AEGIS baseline 9.2.3.															

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
SNLWS Test & Evaluation	WR	NIWC Pacific : San Diego, CA	0.122	0.000		0.000		0.000		-		0.000	-	-	-
SNLWS Test & Evaluation	WR	NSWC PHD : Port Hueneme, CA	0.769	1.049	Nov 2019	0.988	Nov 2020	2.850	Nov 2021	-		2.850	-	-	-
SNLWS Test & Evaluation	WR	NSWC Crane : Crane, IN	0.150	1.051	Dec 2019	0.693	Nov 2020	0.226	Nov 2021	-		0.226	-	-	-
SNLWS Test & Evaluation	WR	NSWC Dahlgren : Dahlgren, VA	0.641	0.267	Nov 2019	0.303	Nov 2020	1.000	Nov 2021	-		1.000	-	-	-
SNLWS Test & Evaluation	C/CPIF	Lockheed Martin Aculight : Bothell, WA	0.822	7.419	Oct 2019	1.000	Oct 2020	0.000		-		0.000	-	-	-
SNLWS Test & Evaluation	WR	NSWC Dahlgren DNA : Dam Neck, VA	0.000	0.100	Nov 2019	0.000		0.000		-		0.000	-	-	-
SNLWS Test & Evaluation (Targets)	WR	Threat Systems Management office : Redstone Arsenal, AL	0.000	0.581	Jul 2020	0.800	Jan 2021	0.700	Jan 2022	-		0.700	-	-	-
SNLWS Test Site Preparation	WR	SCSC Wallops : Wallops Island, VA	0.030	1.221	Nov 2019	0.624	Nov 2020	0.000		-		0.000	-	-	-
SNLWS Test Site Preparation	WR	NASA Wallops : Wallops Island, VA	0.020	0.281	Jan 2020	0.200	Jan 2021	0.000		-		0.000	-	-	-
SNLWS Test & Evaluation	WR	NAWC CL : China Lake, AZ	0.000	0.269	Nov 2019	0.150	Nov 2020	0.000		-		0.000	-	-	-
SNLWS Test & Evaluation (Targets)	WR	NAWC AD : Patuxent River, MD	0.000	0.289	Aug 2020	0.500	Jan 2021	0.400	Jan 2022	-		0.400	-	-	-

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 0603925N / *Directed Energy and Electric Weapon System*	Project (Number/Name) 3402 / *Surface Navy Laser Weapon System (SNLWS)*	

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
SNLWS Test & Evaluation (Targets)	WR	NRL : Washington, D.C.	0.000	0.277	Aug 2020	0.455	Jan 2021	0.400	Jan 2022	-		0.400	-	-	-
SNLWS Test & Evaluation	C/CPFF	PSU EOC : Freeport, PA	0.000	0.000		0.000		0.100	Dec 2021	-		0.100	-	-	-
SNLWS Test & Evaluation HST	WR	NUWC : Newport, RI	0.000	0.000		0.029	Jan 2021	0.000		-		0.000	-	-	-
SNLWS Test & Evaluation HST	WR	NPS : Monterey, CA	0.000	0.000		0.045	Apr 2021	0.000		-		0.000	-	-	-
		Subtotal	2.554	12.804		5.787		5.676		-		5.676	-	-	N/A

Remarks

T&E funding in FY20 was reallocated to Product Development in order to accommodate the LM Aculight CLIN 0001 cost growth and to Support to accommodate an additional requirement from Lockheed Martin in order for HELIOS to be integrated with AEGIS baseline 9.2.3.

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
SNLWS Program Management/Engineering Support	C/CPFF	GRYPHON Technologies : Washington, D.C.	0.765	0.130	Aug 2020	0.000		0.000		-		0.000	-	-	-
SNLWS Program Management/Engineering Support	C/CPIF	SPA : Washington, D.C.	1.962	1.296	Apr 2020	0.768	Dec 2020	1.290	Dec 2021	-		1.290	-	-	-
SNLWS Travel	Sub Allot	NAVSEA : Washington, D.C.	0.034	0.005	Aug 2020	0.150	Feb 2021	0.150	Feb 2022	-		0.150	-	-	-
SNLWS Program Management	C/CPFF	TMB : Washington, D.C.	0.414	0.416	Jun 2020	0.154	Dec 2020	0.200	Dec 2021	-		0.200	-	-	-
SNLWS Program Management	C/CPFF	PSS : Washington, D.C.	0.000	0.000		0.473	Jun 2021	0.550	Dec 2021	-		0.550	-	-	-
SNLWS Program Management	C/CPFF	Strategic Insight : Washington, D.C.	0.278	0.067	Jun 2020	0.107	Dec 2020	0.175	Dec 2021	-		0.175	-	-	-

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 0603925N / *Directed Energy and Electric Weapon System*	Project (Number/Name) 3402 / *Surface Navy Laser Weapon System (SNLWS)*	

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
SNLWS Program Management	C/CPFF	BAH : Washington, D.C.	0.000	0.000		0.027	Apr 2021	0.000		-		0.000	-	-	-
		Subtotal	3.453	1.914		1.679		2.365		-		2.365	-	-	N/A

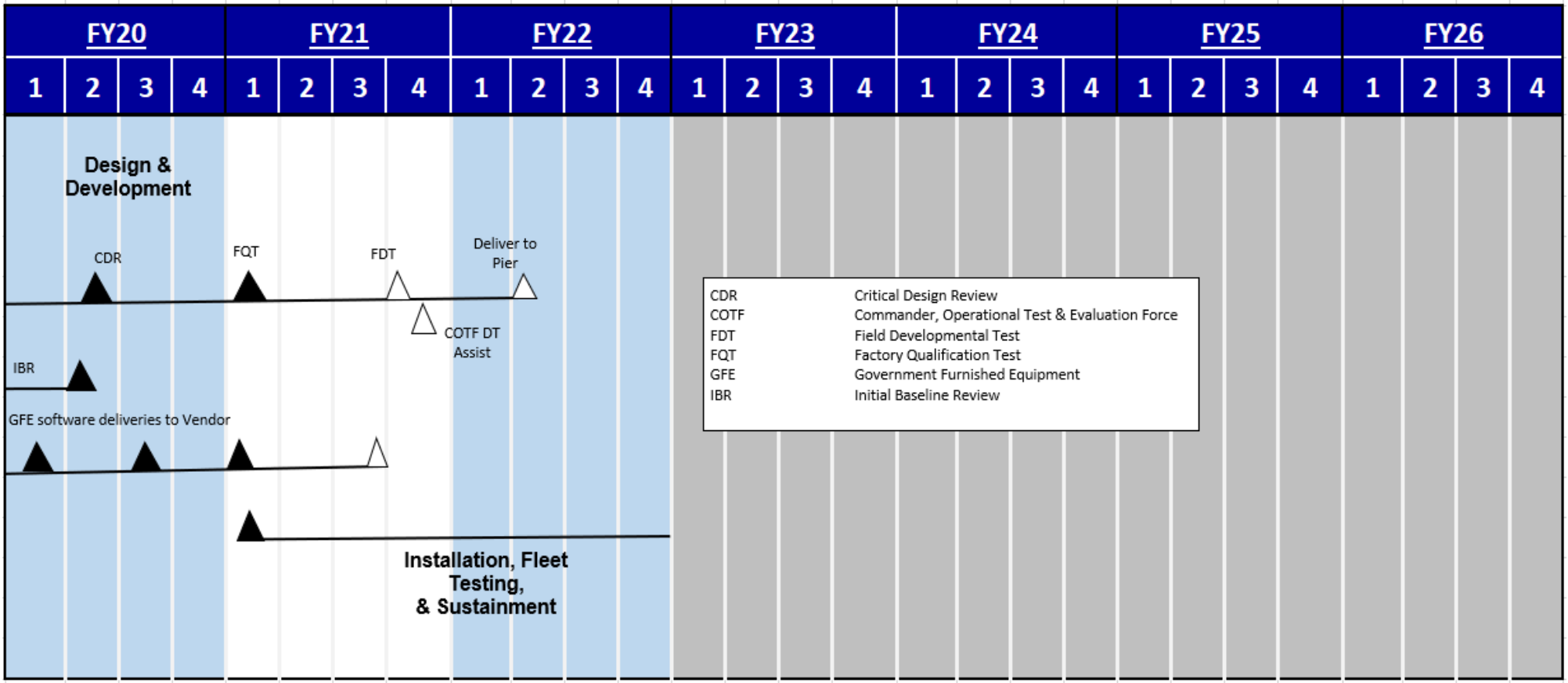
Remarks

In FY20 and FY21 Management Services funding not required due to actual bills and timing of option year requirements was reallocated to cover higher priority requirements in Product Development and Support categories.

	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	128.475	85.643		56.015		46.331		-		46.331	-	-	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 0603925N / *Directed Energy and Electric Weapon System*	**Project (Number/Name)** 3402 / *Surface Navy Laser Weapon System (SNLWS)*



Note: System development and software integration testing extended due to externally imposed and unplanned delays to include system availability and range conflicts with Congressionally-mandated beach replenishment project at Wallops Island, as well as shipboard installation contract award and shipyard installation schedule delays.

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 0603925N / *Directed Energy and Electric Weapon System*	**Project (Number/Name)** 3402 / *Surface Navy Laser Weapon System (SNLWS)*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 3402				
SNLWS: Initial Baseline Review (IBR)	1	2020	2	2020
SNLWS: GFE to vendor LWCS, DSS, WDLC	1	2020	3	2021
SNLWS: Critical Design Review (CDR)	2	2020	2	2020
SNLWS: Factory Qualification Test (FQT)	1	2021	1	2021
SNLWS: Developmental Test (DT)	2	2021	4	2021
SNLWS: Deliver to Pier	3	2021	2	2022
SNLWS: Installation, Fleet Testing and Sustainment	1	2021	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 0603925N / *Directed Energy and Electric Weapon System*	Project (Number/Name) 9823 / *Lasers for Navy applicat*	

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
9823: *Lasers for Navy applicat*	85.966	25.111	34.413	9.508	-	9.508	-	-	-	-	-	-
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Project 9823 - Lasers for Navy Applications: Optical Dazzler Interdictor Navy (ODIN) development provides near-term, directed energy, shipboard Counter-Intelligence, Surveillance, and Reconnaissance (C-ISR) capabilities to dazzle Unmanned Aerial Systems (UASs) and other platforms that address urgent operational needs of the Fleet. FY 2018 was the first year of funding which supports the design, development, procurement and installation of ODIN standalone units over the FYDP, for deployment on DDG 51 Flt IIA surface combatants. The program supports the non-recurring engineering, development, procurement of long lead material, assembly and checkout, system certification, platform integration/installation and sustainment for these ODIN standalone units.

FY 2022 funds procurement, assembly, checkout, integration, T&E and installation of Unit 6; continues procurement, assembly, checkout, integration and T&E of Units 7 and 8; and provide Operation & Sustainment (O&S) of Units 1-6.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
Title: Optical Dazzling Interdictor, Navy (ODIN)	25.111	34.413	9.508	0.000	9.508
Articles:	-	-	-	-	-
FY 2021 Plans: - Commence Installation of Unit 5 - Initiate Operation and Sustainment of Unit 3 - Continue system integration, test and certifications, system operability, and safety for Units 6, 7 and 8 - Initiate shipboard documentation and training development for Units 6, 7 and 8 - Conduct installation, shipboard test and checkout, conduct system turnover, and support shipboard operations of unit 4 - Complete procurement of Units 6 and 7 - Initiate assembly, integration and checkout of unit 8 - Complete assembly, checkout, integration, and testing of Units 6 and 7. Each unit consists of: Beam Director (Telescope, Optics, Fast Steering Mirrors); Lower Power Lasers (2); Sensors (Coarse Track, Fine Track, ISR Imaging); Computer Rack, Network Switches; Cables; and Operator Laptop. - Operate and sustain Units 1-5.					
FY 2022 Base Plans: - Complete Installation and checkout of Units 4, 5, and 6					

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
- Initiate/complete shipboard installation and checkout of Unit 7 - Continue system integration, test and certifications, system operability, and safety for Unit 8 - Initiate installation and checkout of Unit 8 - Provide In-Service Engineering Agent (ISEA) support to include Operator and Maintainer Training, and Operation and Maintenance Manuals - Operate and sustain Units 1-7. ***FY 2022 OCO Plans:*** N/A. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** The decrease of $24.905 million from FY2021 to FY2022 is due to the majority of the procurement, assembly, checkout, integration, T&E, and installation of units 1-8 being either complete or in process. Funding in FY22 is primarily for the Operation & Sustainment (O&S) of installed ODIN Units.					
Accomplishments/Planned Programs Subtotals	25.111	34.413	9.508	0.000	9.508

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

The ODIN is a government designed, developed, and produced system that will provide stand alone units for use on DDG 51 class ships. This effort will transition the developed ODIN capabilities to the Fleet, while informing the development of future prototyping capabilities and program of record 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 0603925N / *Directed Energy and Electric Weapon System*	**Project (Number/Name)** 9823 / *Lasers for Navy applicat*

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
Hardware & Software - Material Buys	C/FFP	NSWC Dahlgren : Dahlgren, VA	32.508	9.168	Nov 2019	5.234	Dec 2020	1.149	Dec 2021	-		1.149	-	-	-
Engineering/Development/ Assembly	WR	NSWC Dahlgren : Dahlgren, VA	11.586	2.395	Oct 2019	6.249	Nov 2020	1.748	Nov 2021	-		1.748	-	-	-
Software Development/ System Rqmts & Design	WR	NSWC Dahlgren : Dahlgren, VA	4.678	0.170	Oct 2019	0.250	Nov 2020	0.000		-		0.000	-	-	-
Engineering Development	C/CPFF	PSU EOC : Freeport, PA	5.472	1.999	Nov 2019	2.485	Dec 2020	0.400	Dec 2021	-		0.400	-	-	-
Engineering/Development/ Material	WR	NSWC PHD : Port Hueneme, CA	0.952	0.000		0.410	Oct 2020	0.000		-		0.000	-	-	-
Engineering/Development	WR	NSWC Crane : Crane, IN	0.320	0.000		0.000		0.000		-		0.000	-	-	-
Engineering/Development	WR	NRL : Washington, D.C.	0.320	0.000		0.000		0.000		-		0.000	-	-	-
		Subtotal	55.836	13.732		14.628		3.297		-		3.297	-	-	N/A

Remarks

Due to increased installation costs realized in FY20, material procurements, assembly and testing have been delayed and funding has been reallocated from Product Development to Support in FY21.

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
Platform Integration/ ILS/ Installation	C/CPFF	CACI : Washington, D.C.	0.295	0.046	Jul 2020	0.000		0.000		-		0.000	-	-	-
Platform Integration/ILS/ Installation	C/CPFF	SWRMC : San Diego, CA	0.295	0.611	May 2020	0.430	Mar 2021	0.150	Mar 2022	-		0.150	-	-	-
Systems Engineering/ Mgmt	C/CPFF	NAVFAC : Washington, D.C.	0.125	0.000		0.000		0.000		-		0.000	-	-	-
Safety, Product Support, Security & Operations	WR	AFRL : Wright-Patterson AFB, OH	0.160	0.000		0.000		0.000		-		0.000	-	-	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Navy			Date: May 2021
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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
Installation Engineering	C/CPAF	Third Party Planning (3PP) : Not Specified	0.007	0.000		0.000		0.005	Dec 2021	-		0.005	-	-	-
Spares	WR	NSWC Dahlgren : Dahlgren, VA	0.711	0.000		0.075	Oct 2020	0.075	Oct 2021	-		0.075	-	-	-
Platform Integration/ILS/ Installation	WR	NSWC Dahlgren : Dahlgren, VA	7.570	0.950	Oct 2019	2.195	Oct 2020	0.485	Oct 2021	-		0.485	-	-	-
Platform Integration	C/CPAF	BIW : Bath, ME	0.684	0.370	Mar 2020	0.250	Jan 2021	0.100	Jan 2022	-		0.100	-	-	-
Platform Integration	C/CPFF	Lockheed Martin : Moorestown, NJ	0.266	0.000		0.066	Apr 2021	0.000		-		0.000	-	-	-
Systems Engineering/ Platform Integration	WR	NIWC Pacific : San Diego, CA	1.131	0.037	Apr 2020	0.052	Dec 2020	0.040	Dec 2021	-		0.040	-	-	-
Safety, Product Support, Security & Operations	WR	NSWC Dahlgren : Dahlgren, VA	3.594	0.150	Oct 2019	0.250	Oct 2020	0.400	Oct 2021	-		0.400	-	-	-
Platform Integration	WR	NSWC Crane : Crane, IN	0.156	0.000		0.000		0.000		-		0.000	-	-	-
Platform Integration/ ntegrated Logistic Support/ Installation & Spares	WR	NSWC PHD : Port Hueneme, CA	4.601	2.215	Oct 2019	2.985	Oct 2020	0.850	Oct 2021	-		0.850	-	-	-
Packaging, Handling, Storage & Transportation, De-Install, Refurbishment	WR	NSWC Dahlgren : Dahlgren, VA	1.334	0.040	Oct 2019	0.040	Nov 2020	0.040	Oct 2021	-		0.040	-	-	-
Platform Integration/ILS/ Installation	C/CPFF	HRMC : Pearl Harbor, HI	0.000	0.021	Feb 2020	0.000		0.000		-		0.000	-	-	-
Platform Integration/ILS/ Installation & Spares	C/CPFF	NSWC PHD VA GROUP : Port Hueneme, CA	0.000	6.241	Jan 2020	10.825	Apr 2021	2.950	Dec 2021	-		2.950	-	-	-
Packaging, Handling, Storage & Transportation	C/CPFF	PSU EOC : Freeport, PA	0.425	0.000		0.000		0.000		-		0.000	-	-	-
Systems Engineering/ Mgmt	C/CPFF	PSU EOC : Freeport, PA	0.700	0.000		0.000		0.000		-		0.000	-	-	-
Systems Engineering/ Mgmt	WR	Pax Partnership : Patuxent, MD	0.142	0.000		0.000		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 0603925N / *Directed Energy and Electric Weapon System*	**Project (Number/Name)** 9823 / *Lasers for Navy applicat*

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
Platform Integration/ILS/ Installation	C/FFP	TMS via NSWC IH : Indian Head, MD	0.000	0.000		0.069	Apr 2021	0.000		-		0.000	-	-	-
		Subtotal	22.196	10.681		17.237		5.095		-		5.095	-	-	N/A

Remarks

Funding was reallocated from Product Development to Support in FY20 and FY21 to support the realized costs of platform integration including Installation Control Drawings (ICDs), Ship Installation Drawings (SIDs) and system installation being higher than originally estimated.

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 Planning & Execution	WR	NAWC AD : Patuxent River, MD	0.160	0.000		0.000		0.000		-		0.000	-	-	-
Test Planning & Execution	WR	NSWC PHD : Port Hueneme, CA	1.304	0.163	Oct 2019	0.601	Oct 2020	0.100	Oct 2021	-		0.100	-	-	-
Test Planning/Execution & Certification	WR	NSWC Dahlgren : Dahlgren, VA	3.414	0.200	Oct 2019	1.348	Oct 2020	0.300	Oct 2021	-		0.300	-	-	-
Test Planning & Execution	WR	NSWC Crane : Crane, IN	0.650	0.000		0.000		0.000		-		0.000	-	-	-
Test Planning & Execution	WR	NIWC Pacific : San Diego, CA	0.504	0.000		0.000		0.000		-		0.000	-	-	-
		Subtotal	6.032	0.363		1.949		0.400		-		0.400	-	-	N/A

Remarks

FY20 funding was reallocated from T&E to Support to accommodate increased installation costs.

FY21 funding was increased due to testing of newly developed capabilities requiring a higher quantity and quality of aircraft and targets for testing and subsequent data analysis to validate requisite system capabilities.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Navy		Date: May 2021
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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
Program Mgmt/Support	C/CPFF	PSS : Washington, D.C.	0.000	0.000		0.158	Jun 2021	0.250	Dec 2021	-		0.250	-	-	-
Program Mgmt/Supportt	C/BA	Strategic Insight : Washington, D.C.	0.076	0.000		0.077	Dec 2020	0.075	Dec 2021	-		0.075	-	-	-
Program Mgmt/Support	C/CPFF	TMB : Washington, D.C.	0.175	0.025	Jun 2020	0.141	Apr 2021	0.141	Dec 2021	-		0.141	-	-	-
Program Mgmt/Support	C/CPFF	GRYPHON Technologies : Washington, D.C.	0.820	0.130	Aug 2020	0.000		0.000		-		0.000	-	-	-
Travel	Allot	NAVSEA : Washington, D.C.	0.085	0.000		0.050	Apr 2021	0.050	Feb 2022	-		0.050	-	-	-
Program Mgmt/Support	C/CPIF	SPA : Washington, D.C.	0.746	0.180	Apr 2020	0.081	Feb 2021	0.200	Feb 2022	-		0.200	-	-	-
Program Mgmt/Support	C/CPFF	BAH : Washington, D.C.	0.000	0.000		0.092	Apr 2021	0.000		-		0.000	-	-	-
		Subtotal	1.902	0.335		0.599		0.716		-		0.716	-	-	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	85.966	25.111		34.413		9.508		-		9.508	-	-	N/A

Remarks

It should be noted that in order to fully fund the procurement, assembly, checkout, integration, T&E, installation and sustainment of 8 units (7 Block 1 and 1 Block 1A), additional funding is required.

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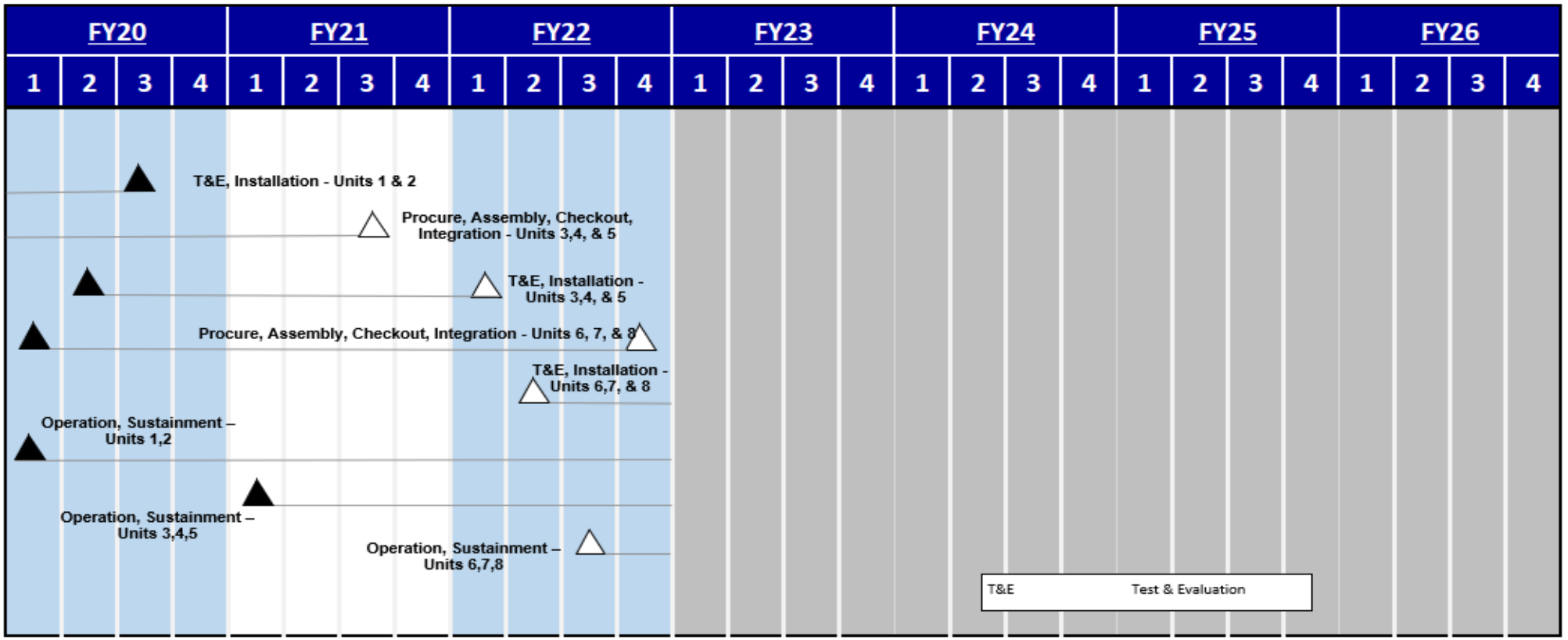

NOTES:

1. T&E includes shore-based testing during assembly through shipboard testing after installation.
2. Above schedule addresses ship availability changes that have occurred since the FY21 President's Budget submission.
3. System Development, integration and installations delayed as a result of cost growth associated with funding delays, material availability, parts obsolescence, ship availability and installation costs, and COVID-19 cost and schedule impacts.

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 9823				
Test & Evaluation, Installation Units 1 and 2	1	2020	3	2020
Component Procurement, Assembly, Checkout, Integration Units 3, 4 and 5	1	2020	3	2021
Operation and Sustainment Units 1 and 2	1	2020	4	2022
Component Procurement, Assembly, Checkout, Integration Units 6, 7 and 8	1	2020	4	2022
Test & Evaluation, Installation Unit's 3, 4 and 5	2	2020	1	2022
Operation and Sustainment Units 3, 4, 5	1	2021	4	2022
Test & Evaluation, Installation Units 6, 7 and 8	2	2022	4	2022
Operation and Sustainment Units 6, 7 and 8	3	2022	4	2022

Exhibit R-2A, RDT&E Project Justification: PB 2022 Navy			Date: May 2021
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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*	20.848	19.301	5.000	0.000	-	0.000	-	-	-	-	-	-
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Project 9999 (PU C453) - Surface Navy Laser Weapon System (SNLWS) Program Re-phasing: Congress added funding in FY19 for re-phasing of the SNLWS development and fielding effort. This fielding supports procurement of HELIOS long lead materials related to early award of the contract to Lockheed Martin Aculight.

Project 9999 (PU C547) - Congressional Adds - Railgun Program: Congress added funding in FY20 for ship-based program/technical development and ship integration related risk reduction. Electromagnetic railgun provides increased capability for the following mission sets: Naval Surface Fire Support (NSFS), Integrated Air and Missile Defense (IAMD), Fast Attack Craft and Fast Inshore Attack Craft (FAC/FIAC), and future potential for Anti-Surface Warfare (ASuW). This funding supports the testing and refinement of pulse current transfer, mount, and hypervelocity projectile component development. In addition, this project supports the continuing effort to define and evolve requirements related to mount and platform interface management and maturations of specifications for tactical railgun weapon system.

Project 9999 (PU C516) - Congressional Add - High Energy Laser (HEL) Weapon System for Counter-Unmanned Ariel System (C-UAS) Area defense is a Congressionally directed effort to develop/build a minimized footprint, laser-agonistic beam director and beam control system (M-BD/BCS) to support Commercial Off The Shelf (COTS) lasers >10KW for possible application to Joint Light Tactical Vehicle (JLTV) sized vehicles.

FY2020 funding will provide for systems engineering, design, and fabrication of this M-BD/BCS.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021
Congressional Add: High Energy Laser Weapon System for C-UAS Area Defense ***FY 2020 Accomplishments:*** N/A ***FY 2021 Plans:*** Continue Systems Engineering, design, and fabrication of minimized footprint, laser-agnostic beam director and beam control system (M-BD/BCS) and start field testing.	9.654	5.000
Congressional Add: Railgun ***FY 2020 Accomplishments:*** N/A ***FY 2021 Plans:*** N/A	9.647	0.000
Congressional Adds Subtotals	19.301	5.000

Exhibit R-2A, RDT&E Project Justification: PB 2022 Navy		Date: May 2021
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C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

Project 9999 (PU C453) - The SNLWS program supports the National Defense Strategy of building a more lethal force by leveraging mature technology to deliver proven laser weapon capability to the Fleet as part of the Navy Laser Family of Systems (NLFoS) initiative with the objective of providing the fleet with near-term laser weapon capabilities. Additionally, accelerated learning through incorporation of laser weapon CONOPS, employment, and maintenance will enable the rapid development and integration of these capabilities with the Navy's existing weapons systems. This NLFoS initiative will also develop and validate warfighting requirements for laser weapons to address a variety of threats and to mature technologies and system integration readiness. HELIOS provides a low cost-per-shot capability to address Anti-Surface Warfare and Counter-Intelligence, Surveillance and Reconnaissance (C-ISR) gaps with the ability to dazzle and destroy Unmanned Aerial Systems (UAS) and defeat Fast Inshore Attack Craft (FIAC) while integrated into a Flt IIA Destroyer, to include AEGIS integration. SNLWS provides industry-developed and government integrated capability to the Fleet in as short a timeframe as possible, thereby addressing the National Defense Strategy direction to foster a culture of affordability. SNLWS includes the development of an advanced laser weapon system in the 60 kW or higher class. Competition was utilized for system development and production efforts. The acquisition strategy permits accelerated fielding of laser weapon systems in the Fleet and provides a demand signal for the industrial base to expand the capacity to develop and manufacture this advanced technology. The acquisition strategy consists of the baseline development and production of one unit followed by options to acquire system quantities at firm fixed price that will address operational needs of the Fleet in the requisite timeframe to offset future threats and maintain technological superiority over potential adversaries.

Project 9999 (PU C547) - Leverage Naval Surface Warfare Center and UARC resources and competencies to support electromagnetic railgun system engineering activities to mature technologies in support of transition to a Program of Record. These study and prototype activities provide influence on prototype design and test to optimize readiness and capability for transition to a Navy tactical application.

Project 9999 (PU C516) - The High Energy Laser Weapon System for C-UAS Area Defense is an initiative that provides a flexible prototype sub-system for government experimentation and demonstration of a minimized footprint, laser-agonistic beam director and beam control system. MZA of Dayton, OH is the industry provider of this capability.

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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
C453- SNLWS Development	C/CPIF	Lockheed Martin Aculight : Bothell, WA	14.990	0.000		0.000		0.000		-		0.000	-	-	-
C440-HVP/RGS Interface Development	WR	NSWC Dahlgren : Dahlgren, VA	0.850	0.000		0.000		0.000		-		0.000	-	-	-
C440- APCT Hardware Fabrication	MIPR	DOTC : DOTC	0.860	0.000		0.000		0.000		-		0.000	-	-	-
C440- PCT/Breech Interface and Blowback Mitigation Fabrication	WR	NSWC Dahlgren : Dahlgren, VA	0.200	0.000		0.000		0.000		-		0.000	-	-	-
C547- Health Monitoring Sensor Development	FFRDC	Virginia Tech : Virginia Tech	0.000	0.100	May 2020	0.000		0.000		-		0.000	-	-	-
C516 - Minimized Beam Directorr/Beam Control Sys	C/CPFF	MZA : Dayton, OH	0.000	9.654	Jun 2020	5.000	Jun 2022	0.000		-		0.000	-	-	-
		Subtotal	16.900	9.754		5.000		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
C453- Support SNLWS Development	WR	NSWC Dahlgren : Dahlgren, VA	0.349	0.000		0.000		0.000		-		0.000	-	-	-
C440-APCT Development Support and Oversight	WR	NSWC Dahlgren : Dahlgren, VA	1.800	0.000		0.000		0.000		-		0.000	-	-	-
C440-Mount Component Development, SE Support, and Technical Oversight	WR	NSWC Dahlgren : Dahlgren, VA	0.625	0.000		0.000		0.000		-		0.000	-	-	-
C440-Blowback Mitigation	FFRDC	APL : Laurel, MD	0.200	0.000		0.000		0.000		-		0.000	-	-	-
C440-Mount Platform Interface Development,	WR	NSWC Dahlgren : Dahlgren, VA	0.442	0.000		0.000		0.000		-		0.000	-	-	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Navy			Date: May 2021
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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
Requirements and Specification Management															
C440-Topside Integration / Platform Studies, SE Support, and Technical Oversight	WR	NSWC Dahlgren : Dahlgren, VA	0.266	0.000		0.000		0.000		-		0.000	-	-	-
C440- System Trade Studies	WR	NSWC Dahlgren : Dahlgren, VA	0.266	0.000		0.000		0.000		-		0.000	-	-	-
C547- Advanced Armature and Muzzle Design and Development, SE Support, and Technical Oversight	WR	NSWC Dahlgren : Dahlgren, VA	0.000	1.000	Mar 2020	0.000		0.000		-		0.000	-	-	-
C547- Mount and Controls Development, SE Support, and Technical Oversight	WR	NSWC Dahlgren : Dahlgren, VA	0.000	1.450	Mar 2020	0.000		0.000		-		0.000	-	-	-
C547- Pulse Power Ship Integration Development, SE Support, and Technical Oversight	WR	NSWC Dahlgren : Dahlgren, VA	0.000	0.900	Mar 2020	0.000		0.000		-		0.000	-	-	-
C547- System Trade Studies	WR	NSWC Dahlgren : Dahlgren, VA	0.000	0.250	Mar 2020	0.000		0.000		-		0.000	-	-	-
C547 - Railgun and HVP Interface Development Risk Reduction and Technical Oversight	WR	NSWC Dahlgren : Dahlgren, VA	0.000	1.207	Mar 2020	0.000		0.000		-		0.000	-	-	-
C547 - Program Technical Oversight	WR	NSWC Dahlgren : Dahlgren, VA	0.000	0.500	Mar 2020	0.000		0.000		-		0.000	-	-	-
C547 - Railgun and HVP Interface	FFRDC	Sandia National Laboratories : Ibuquerque, NM	0.000	0.790	Feb 2020	0.000		0.000		-		0.000	-	-	-
		Subtotal	3.948	6.097		0.000		0.000		-		0.000	-	-	N/A

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Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603925N / *Directed Energy and Electric Weapon System*	**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
C547 - PCT and Pulse Power Test Execution	WR	NSWC Dahlgren : Dahlgren, VA	0.000	1.150	Mar 2020	0.000		0.000		-		0.000	-	-	-
C547 - HVP Risk Reduction and Railgun Testing	WR	NSWC Dahlgren : Dahlgren, VA	0.000	1.400	Mar 2020	0.000		0.000		-		0.000	-	-	-
C547 - Railgun Testing Materials	WR	NSWC Dahlgren : Dahlgren, VA	0.000	0.450	Mar 2020	0.000		0.000		-		0.000	-	-	-
C547 - HVP Risk Reduction and Railgun Testing	FFRDC	Sandia National Laboratories : Ibuquerque, NM	0.000	0.250	Oct 2020	0.000		0.000		-		0.000	-	-	-
C547 - Corrosion Prevention	WR	NSWC Dahlgren : Dahlgren, VA	0.000	0.200	Mar 2020	0.000		0.000		-		0.000	-	-	-
		Subtotal	0.000	3.450		0.000		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	20.848	19.301		5.000		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 0603925N / *Directed Energy and Electric Weapon System*	**Project (Number/Name)** 9999 / *Congressional Adds*

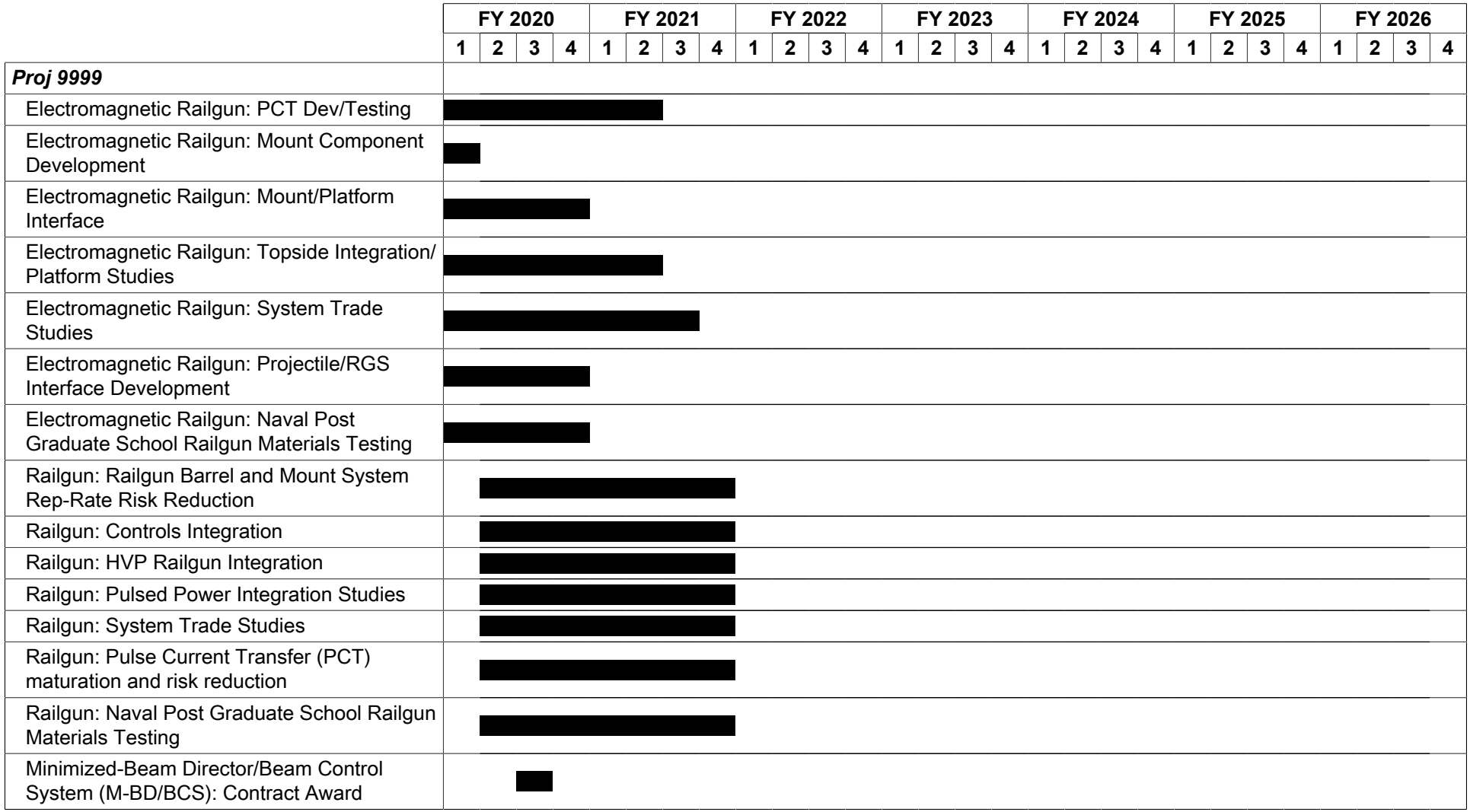

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Navy		Date: May 2021
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603925N / *Directed Energy and Electric Weapon System*	**Project (Number/Name)** 9999 / *Congressional Adds*

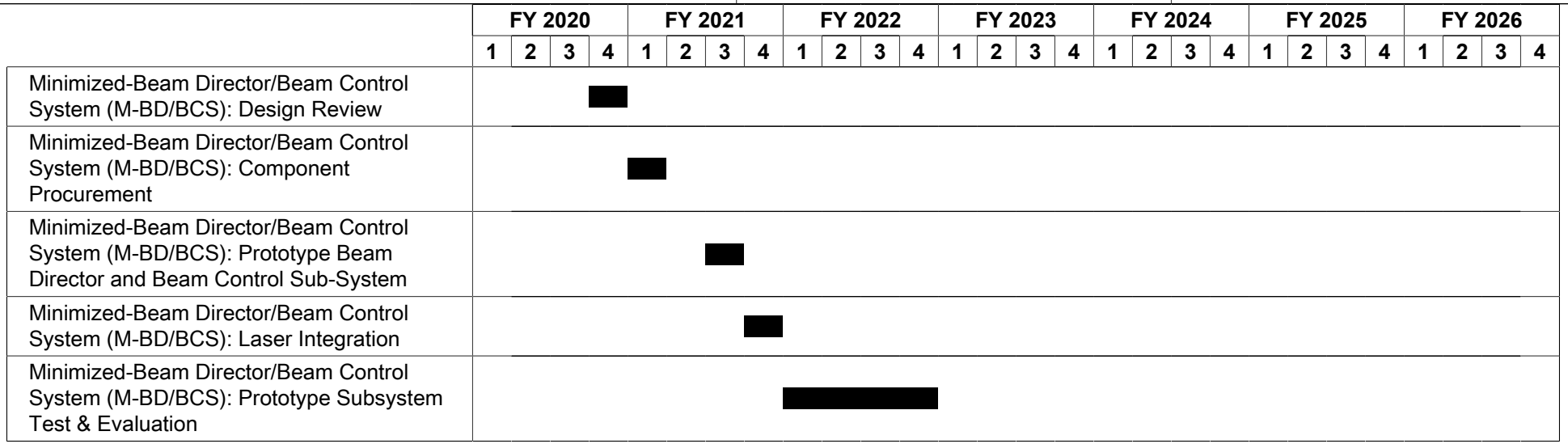

Exhibit R-4A, RDT&E Schedule Details: PB 2022 Navy		Date: May 2021
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603925N / *Directed Energy and Electric Weapon System*	**Project (Number/Name)** 9999 / *Congressional Adds*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 9999				
Electromagnetic Railgun: PCT Dev/Testing	1	2020	2	2021
Electromagnetic Railgun: Mount Component Development	1	2020	1	2020
Electromagnetic Railgun: Mount/Platform Interface	1	2020	4	2020
Electromagnetic Railgun: Topside Integration/Platform Studies	1	2020	2	2021
Electromagnetic Railgun: System Trade Studies	1	2020	3	2021
Electromagnetic Railgun: Projectile/RGS Interface Development	1	2020	4	2020
Electromagnetic Railgun: Naval Post Graduate School Railgun Materials Testing	1	2020	4	2020
Railgun: Railgun Barrel and Mount System Rep-Rate Risk Reduction	2	2020	4	2021
Railgun: Controls Integration	2	2020	4	2021
Railgun: HVP Railgun Integration	2	2020	4	2021
Railgun: Pulsed Power Integration Studies	2	2020	4	2021
Railgun: System Trade Studies	2	2020	4	2021
Railgun: Pulse Current Transfer (PCT) maturation and risk reduction	2	2020	4	2021
Railgun: Naval Post Graduate School Railgun Materials Testing	2	2020	4	2021
Minimized-Beam Director/Beam Control System (M-BD/BCS): Contract Award	3	2020	3	2020
Minimized-Beam Director/Beam Control System (M-BD/BCS): Design Review	4	2020	4	2020
Minimized-Beam Director/Beam Control System (M-BD/BCS): Component Procurement	1	2021	1	2021
Minimized-Beam Director/Beam Control System (M-BD/BCS): Prototype Beam Director and Beam Control Sub-System	3	2021	3	2021
Minimized-Beam Director/Beam Control System (M-BD/BCS): Laser Integration	4	2021	4	2021

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 0603925N / *Directed Energy and Electric Weapon System*	**Project (Number/Name)** 9999 / *Congressional Adds*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Minimized-Beam Director/Beam Control System (M-BD/BCS): Prototype Subsystem Test & Evaluation	1	2022	4	2022