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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Navy **Date:** April 2022

Appropriation/Budget Activity 1319: <i>Research, Development, Test & Evaluation, Navy / BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 0603925N / <i>Directed Energy and Electric Weapon System</i>
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COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
Total Program Element	371.026	123.403	81.803	65.080	-	65.080	63.719	57.358	37.951	38.114	Continuing	Continuing
2731: <i>High Energy Laser Counter ASCM Project (HELCAP)</i>	6.480	29.847	25.964	6.598	-	6.598	6.853	3.611	3.647	3.270	Continuing	Continuing
3402: <i>Surface Navy Laser Weapon System (SNLWS)</i>	214.118	54.647	46.331	19.124	-	19.124	28.212	29.957	30.465	30.932	Continuing	Continuing
5898: <i>Directed Energy Components for High Energy Lasers</i>	0.000	0.000	0.000	14.040	-	14.040	4.794	0.000	0.000	0.000	0.000	18.834
9823: <i>Lasers for Navy applicat</i>	110.279	34.082	9.508	25.318	-	25.318	23.860	23.790	3.839	3.912	Continuing	Continuing
9999: <i>Congressional Adds</i>	40.149	4.827	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	44.976

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.

The FY23 budget request supports systems engineering, mission analysis, completion of the integration of major components of a HELCAP prototype system, and performance of beam control tracker and adaptive optics experimentation and demonstrations. Planning and preparations for FY23 system experimentation and ASCM

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detect to defeat demonstrations utilizing the prototype system, static and dynamic ground targets, and low-cost unmanned aerial targets will take place. FY23 activities will culminate with this demonstration and preparation for targeting and tracking limited maritime experimentation planned for FY24.

Project 3402 - 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 FY23 budget request supports the execution of at-sea testing following the successful completion and installation of Mk 5 Mod 0 HELIOS on DDG 88 during AEGIS Modernization availability in FY2022, technical engineering services during testing, and maintenance and repair support of the system as necessary, to include procurement and/or production of repair parts, and updates to training materials and associated deliverables for any changes identified during at-sea testing.

Project 5898 - Directed Energy Components for High Energy Lasers: Supports Industrial Base Analysis and Sustainment (IBAS) program efforts for the improvement of the production capability of the industrial base in order to produce Laser Weapon Beam Director (LWBD) components and sub-systems; reduce production lead times of Laser Weapon System Optics; improve quality and reduce production times of Fast Steering Mirror (FSM) and deformable mirrors; and establish industrial sources(s) for Spectral Beam Combining (SBC) diffraction grating production.

The FY23 budget request supports the development of the production capability enhancement of the Laser Weapon Beam Director (LWBD) components and sub-systems, coating chambers for laser weapon optics, Fast Steering Mirrors (FSM) and deformable mirrors, and the diffraction gratings for Spectral Beam Combining (SBC) lasers. This investment is a risk mitigation for manufacturing capability enhancements through the qualification and validation of production equipment and process improvements.

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

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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.

The FY23 budget request supports shipboard technical support, test checkout, training updates, updates to maintenance requirements and shipboard allowance documentation, and Operation & Sustainment (O&S) of Units 1-7; continues procurement, assembly, checkout, integration and T&E of Unit 8; and the development of the technology refresh package and subsystem maturation efforts to improve the reliability, capability and operability of ODIN.

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.

B. Program Change Summary (\$ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Previous President's Budget	126.325	81.803	0.000	-	0.000
Current President's Budget	123.403	81.803	65.080	-	65.080
Total Adjustments	-2.922	0.000	65.080	-	65.080
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-2.921	0.000			
• Program Adjustments	0.000	0.000	0.000	-	0.000
• Rate/Misc Adjustments	-0.001	0.000	0.000	-	0.000
• Adjustments to Budget Year	-	-	65.080	-	65.080

Congressional Add Details (\$ in Millions, and Includes General Reductions)

Project: 9999: *Congressional Adds*

Congressional Add: *High Energy Laser Weapon System for C-UAS Area Defense*

	FY 2021	FY 2022
Congressional Add Subtotals for Project: 9999	4.827	0.000
Congressional Add Totals for all Projects	4.827	0.000

Change Summary Explanation

The FY21 net funding decrease in the amount of \$2.922 million consists of a \$2.921 million SBIR reduction and a \$.001 million rate adjustment.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Navy **Date:** April 2022

Appropriation/Budget Activity
1319: *Research, Development, Test & Evaluation, Navy / BA 4: Advanced Component Development & Prototypes (ACD&P)*

R-1 Program Element (Number/Name)
PE 0603925N / *Directed Energy and Electric Weapon System*

The FY23 funding includes a new PU 5898 for Directed Energy Components for High Energy Lasers

FY 2023 funding increase reflects the fact that the FY 2022 President's Budget request did not include out-year funding.

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Navy										Date: April 2022		
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0603925N / <i>Directed Energy and Electric Weapon System</i>				Project (Number/Name) 2731 / <i>High Energy Laser Counter ASCM Project (HEL CAP)</i>			
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
2731: <i>High Energy Laser Counter ASCM Project (HEL CAP)</i>	6.480	29.847	25.964	6.598	-	6.598	6.853	3.611	3.647	3.270	Continuing	Continuing
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 (HEL CAP) 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 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Title: High Energy Laser Counter ASCM Project (HEL CAP)	29.847	25.964	6.598	0.000	6.598
Articles:	-	-	-	-	-
Description: HELCAP activities under this project (0603925N) include system level testing and verification of the Laser Weapon Testbed (LWT) in a simulated (land based) and maritime environment. Transition of technologies developed under (0603801N) will be integrated into the LWT system. The Beam Control Testbed subsystem will be combined with a HEL source, power/thermal, and weapon control to demonstrate the LWT system level maturity. 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.					
FY 2022 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.					

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Navy		Date: April 2022
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603925N / <i>Directed Energy and Electric Weapon System</i>	Project (Number/Name) 2731 / <i>High Energy Laser Counter ASCM Project (HEL CAP)</i>

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
<ul style="list-style-type: none"> - 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. <p>FY 2023 Base Plans: Continue:</p> <ul style="list-style-type: none"> - ASCM defeat analysis and evaluation including lethality, engagement modeling, atmospheric propagation characterization, and beam control. - Laser/materiel component interaction testing and support beam control tracker and adaptive optics verification experimentation. <p>Complete:</p> <ul style="list-style-type: none"> - BCT Factory Acceptance Testing (FAT) and accepting deliver of this subsystem to the government. - Major integration events including the BCT, high energy laser source, prime power and thermal management systems, weapon control and data acquisition. - Risk reduction activities proving component and subsystem maturity prior to integration. - Beam Control Testbed Tracker and Verification test focused on the beam control, tracking, and adaptive optics subsystems performance. - Full system integration, test, and verification of the LWT at White Sands Missile Range (WSMR). This includes experimentation and LWT system performance in preparation for the follow-on capstone event, ASCM detect to engage experimentation. 					

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Navy		Date: April 2022
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B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
- Conduct ASCM detect to engage experimentation against targets of increasing complexity up to and including static and dynamic ground targets and low-cost unmanned aerial targets. FY 2023 OCO Plans: N/A FY 2022 to FY 2023 Increase/Decrease Statement: The decrease from FY22 to FY23 is due to the planned completion of most major procurements and integration activities. FY23 request continues support for testing against static/dynamic ground targets and low speed aerial targets. Demonstration/experimentation using HELCAP to engage representative Anti-Ship Cruise Missile targets at operational conditions is deferred.					
Accomplishments/Planned Programs Subtotals	29.847	25.964	6.598	0.000	6.598

C. Other Program Funding Summary (\$ in Millions)											
<u>Line Item</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023 Base</u>	<u>FY 2023 OCO</u>	<u>FY 2023 Total</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>FY 2026</u>	<u>FY 2027</u>	<u>Cost To Complete</u>	<u>Total Cost</u>
• RDTE/0603801N/2731: <i>High Energy Laser Counter ASCM Project</i>	27.799	13.960	22.460	-	22.460	0.000	0.000	0.000	0.000	0.000	64.219

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.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Navy												Date: April 2022			
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 (HEL CAP)							
Product Development (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Prototype System Controls, Target Tracking, and Deconfliction (Government team)	WR	NSWC Dahlgren : Dahlgren VA	2.230	3.613	Oct 2020	4.340	Oct 2021	2.298	Oct 2022	-		2.298	Continuing	Continuing	Continuing
Prototype System Controls, Target Tracking, and Deconfliction (Contractor Team)	C/CPFF	Booz Allen Hamilton : Dahlgren VA	1.750	1.256	Nov 2020	0.810	Nov 2021	0.250	Nov 2022	-		0.250	Continuing	Continuing	Continuing
HEL CAP Mission Analysis	WR	NSWC Dahlgren : Dahlgren VA	1.000	0.966	Oct 2020	0.812	Oct 2021	0.000	Oct 2022	-		0.000	Continuing	Continuing	Continuing
HEL CAP Mission Analysis	C/CPFF	JHU/APL : Laurel MD	0.000	0.966	Nov 2020	1.428	Nov 2021	0.000	Nov 2022	-		0.000	Continuing	Continuing	Continuing
Design government owned interfaces between the OSD Laser Source and Prototype System	WR	NSWC Dahlgren : Dahlgren VA	0.000	0.876	Oct 2020	0.780	Oct 2021	0.000	Oct 2022	-		0.000	Continuing	Continuing	Continuing
Adapt OSD Laser Source for Transport and Interface with Prototype System	C/CPFF	TBD : Not Specified	0.000	1.980	Nov 2020	1.787	Mar 2022	1.000	Mar 2023	-		1.000	Continuing	Continuing	Continuing
Prototype and Support System Integration	WR	NSWC Dahlgren : Dahlgren VA	0.000	4.299	Oct 2020	2.040	Oct 2021	0.000	Oct 2022	-		0.000	Continuing	Continuing	Continuing
Procure and Assemble Prototype System Power and Misc Hardware	C/CPFF	Nutronics : Longmont, CO	0.000	5.796	Nov 2020	1.622	Mar 2022	1.750	Mar 2023	-		1.750	Continuing	Continuing	Continuing
Modeling and Simulations	WR	TBD : Not Specified	0.000	0.000		0.000		0.500	Oct 2022	-		0.500	0.000	0.500	-
Subtotal			4.980	19.752		13.619		5.798		-		5.798	Continuing	Continuing	N/A
Support (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
HEL CAP Systems Engineering, Safety,	WR	NSWC Dahlgren : Dahlgren VA	1.250	3.140	Oct 2020	3.908	Oct 2021	0.000	Oct 2022	-		0.000	Continuing	Continuing	Continuing

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Navy												Date: April 2022			
Appropriation/Budget Activity				R-1 Program Element (Number/Name)						Project (Number/Name)					
1319 / 4				PE 0603925N / Directed Energy and Electric Weapon System						2731 / High Energy Laser Counter ASCM Project (HEL CAP)					
Support (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management (Government team)															
HEL CAP Systems Engineering, Safety, Program Management (Contractor team)	C/CPFF	Multiple : Dahlgren VA	0.000	2.802	Oct 2020	0.140	Nov 2021	0.000	Nov 2022	-		0.000	Continuing	Continuing	Continuing
Subtotal			1.250	5.942		4.048		0.000		-		0.000	Continuing	Continuing	N/A
Test and Evaluation (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	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	1.255	Oct 2020	1.772	Oct 2021	0.500	Oct 2022	-		0.500	Continuing	Continuing	Continuing
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 Sands, NM & San Nicholas Island, CA	0.000	1.449	Jan 2021	1.000	Mar 2022	0.000	Mar 2023	-		0.000	Continuing	Continuing	Continuing
Stand Alone Tracker, Adaptive Optics and Other Experimentation	WR	NSWC Dahlgren : Dahlgren VA	0.000	0.966	Oct 2020	2.550	Jul 2022	0.000	Jul 2023	-		0.000	Continuing	Continuing	Continuing
ASCM Surrogate Targets	C/CPFF	TBD : TBD	0.000	0.000		2.400	Mar 2022	0.000	Mar 2023	-		0.000	Continuing	Continuing	Continuing
Subtotal			0.000	3.670		7.722		0.500		-		0.500	Continuing	Continuing	N/A

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Exhibit R-4, RDT&E Schedule Profile: PB 2023 Navy **Date:** April 2022

Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603925N / <i>Directed Energy and Electric Weapon System</i>	Project (Number/Name) 2731 / <i>High Energy Laser Counter ASCM Project (HEL CAP)</i>
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	FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
experimentation and demo test site assets and preparation																												
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																												
ASCM detect to defeat experimentation - system integration testing: HELCAP: ASCM detect to defeat experimentation - system integration testing																												
ASCM detect to demonstration - defeat of surrogate ASCM in a crossing engagement: HELCAP: ASCM detect to defeat demo - defeat of static and dynamic ground targets and low-cost unmanned aerial targets																												
ASCM detect to defeat demonstration post-test documentation: Limited maritime tracking and adaptive optics performance experimentation																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2023 Navy		Date: April 2022
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603925N / <i>Directed Energy and Electric Weapon System</i>	Project (Number/Name) 2731 / <i>High Energy Laser Counter ASCM Project (HELCAP)</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
High Energy Laser Counter ASCM Project (HELCAP)				
Beam Control Design and Fabricate: HELCAP: Beam Control Design and Fabricate	1	2021	1	2023
Prototype Weapon Control Design and Fabricate: HELCAP: Prototype Weapon Control Design and Fabricate	4	2021	2	2023
Adapt OSD Laser Source for Transport and Interface with Prototype System: HELCAP: Adapt OSD Laser Source for Transport and Interface with Prototype System	3	2022	2	2023
Prime Power and Cooling Design and Fabricate: HELCAP: Prime Power and Cooling Design and Fabricate	4	2021	2	2023
Demonstration 1 Adaptive Optics and Tracking Performance system integration (beam control, prototype weapon control, test support): Demonstration 1 Adaptive Optics and Tracking Performance system inte	1	2021	4	2022
Mission Analysis: HELCAP: Mission Analysis	1	2021	4	2023
ASCM detect to defeat experimentation and demonstration planning: HELCAP: ASCM detect to defeat experimentation and demonstration planning	1	2021	3	2023
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	3	2022	3	2023
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	2	2023
ASCM detect to defeat experimentation - system integration testing: HELCAP: ASCM detect to defeat experimentation - system integration testing	4	2022	3	2023
ASCM detect to demonstration - defeat of surrogate ASCM in a crossing engagement: HELCAP: ASCM detect to defeat demo - defeat of static and dynamic ground targets and low-cost unmanned aerial targets	2	2023	4	2023

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Exhibit R-4A, RDT&E Schedule Details: PB 2023 Navy **Date:** April 2022

Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603925N / <i>Directed Energy and Electric Weapon System</i>	Project (Number/Name) 2731 / <i>High Energy Laser Counter ASCM Project (HELCAAP)</i>
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Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
ASCM detect to defeat demonstration post-test documentation: Limited maritime tracking and adaptive optics performance experimentation	1	2024	4	2026

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Navy										Date: April 2022		
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0603925N / <i>Directed Energy and Electric Weapon System</i>					Project (Number/Name) 3402 / <i>Surface Navy Laser Weapon System (SNLWS)</i>		
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
3402: <i>Surface Navy Laser Weapon System (SNLWS)</i>	214.118	54.647	46.331	19.124	-	19.124	28.212	29.957	30.465	30.932	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Project 3402 - 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 FY23 budget request supports the execution of at-sea testing following the successful completion and installation of Mk 5 Mod 0 HELIOS on DDG 88 during AEGIS Modernization availability in FY2022, technical engineering services during testing, and maintenance and repair support of the system as necessary, to include procurement and/or production of repair parts, and updates to training materials and associated deliverables for any changes identified during at-sea testing.

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Title: SNLWS Prime Contractor Efforts	28.139	15.507	4.800	0.000	4.800
Articles:	-	-	-	-	-
FY 2022 Plans:					
In Support of ongoing Mk 5 Mod 0 system installation in DDG 51 Flight IIA Ship, the Prime Contractor shall:					
- Deliver the HELIOS system pier side.					
- Continue to provide programmatic and engineering support to Integrated Product Teams (IPTs) and Working Groups (WGs).					

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Navy			Date: April 2022		
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603925N / <i>Directed Energy and Electric Weapon System</i>	Project (Number/Name) 3402 / <i>Surface Navy Laser Weapon System (SNLWS)</i>			
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)					
<ul style="list-style-type: none"> - Commence with providing shipboard technical support. - Commence with providing shipboard test and checkout support. - Commence with providing sustainment support and material procurements. - Commence with initial training conduct to include train-the-trainer (ISEA). - Complete Alteration Installation Team (AIT) support. - Complete Combat System (CS) Integration Support. <p>FY 2023 Base Plans:</p> <ul style="list-style-type: none"> - Continue to provide programmatic and engineering support to Integrated Product Teams (IPTs) and Working Groups (WGs). - Continue to provide shipboard technical support. - Continue to provide shipboard test and checkout support. - Continue to provide sustainment support and material procurements. <p>FY 2023 OCO Plans: N/A</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: The decrease in prime contractor funding from FY22 to FY23 is a result of the installation and integration of HELIOS being completed in FY22.</p>					
Title: SNLWS Government and Support Engineering Services					
Articles:					
	26.508	30.824	14.324	0.000	14.324
	-	-	-	-	-
FY 2022 Plans:					
<ul style="list-style-type: none"> - Continue to conduct Technical Interchange Meetings (TIMs) with contractor and government personnel. - Continue to provide programmatic and engineering support. - Complete DDG 51 Flight IIA ship installation, integration, test and checkout. - Continue to provide technical assistance in support of shipboard installation and checkout. - Conduct/complete HELIOS-AEGIS Combat System integration testing. - Continue product support/sustainment management and engineering reviews in support of ship delivery. - Continue to 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. 					

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Navy		Date: April 2022
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603925N / <i>Directed Energy and Electric Weapon System</i>	Project (Number/Name) 3402 / <i>Surface Navy Laser Weapon System (SNLWS)</i>

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
- Conduct Laser and Weapon System Safety reviews.					
<i>FY 2023 Base Plans:</i>					
- Continue to provide systems engineering and sustainment support.					
- Continue to provide shipboard technical support.					
- Commence underway testing and engineering support.					
- Commence sustainment support including material procurements.					
- Deliver updated training documentation to the ship.					
<i>FY 2023 OCO Plans:</i>					
N/A					
<i>FY 2022 to FY 2023 Increase/Decrease Statement:</i>					
The decrease in government funding from FY22 to FY23 is a result of the government oversight being decreased commensurate with the completion of system development, integration and installation.					
Accomplishments/Planned Programs Subtotals	54.647	46.331	19.124	0.000	19.124

C. Other Program Funding Summary (\$ in Millions)

N/A

Remarks

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.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Navy **Date:** April 2022

Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603925N / <i>Directed Energy and Electric Weapon System</i>	Project (Number/Name) 3402 / <i>Surface Navy Laser Weapon System (SNLWS)</i>
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Product Development (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
SNLWS Development	C/CPIF	Lockheed Martin Aculight : Bothell, WA	138.767	10.618	Oct 2020	0.000		0.000		-		0.000	0.000	149.385	-
Subtotal			138.767	10.618		0.000		0.000		-		0.000	0.000	149.385	N/A

Remarks
-Since PB22, FY21 funding was realigned from Support to Product Development as a result of additional support required for the HELIOS system delivery to DDG 88 which shifted from 26 Sep 2021 to 3rd QTR FY22.

Support (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
SNLWS Systems Engineering, Program Management, GFE/GFI	WR	NSWC Dahlgren : Dahlgren, VA	25.813	6.500	Nov 2020	7.224	Nov 2021	3.752	Nov 2022	-		3.752	Continuing	Continuing	Continuing
SNLWS Ship Installation, Integration & Documentation	C/CPAF	BIW : Bath, ME	2.544	0.444	Jan 2021	2.369	Jan 2022	0.000		-		0.000	0.000	5.357	-
SNLWS Combat System Integration/Licenses	C/CPFF	Lockheed Martin : Moorestown, NJ	12.899	0.000		0.000		0.000		-		0.000	0.000	12.899	-
SNLWS Systems Engineering/Security	WR	NSWC Crane : Crane, IN	0.587	0.366	Dec 2020	0.100	Nov 2021	0.361	Nov 2022	-		0.361	Continuing	Continuing	Continuing
SNLWS Systems Engineering/Installation	WR	NSWC PHD : Port Hueneme, CA	0.957	0.000		0.000		0.000		-		0.000	0.000	0.957	-
SNLWS Systems Engineering	WR	NIWC Pacific : San Diego, CA	0.345	0.000		0.000		0.000		-		0.000	0.000	0.345	-
SNLWS Systems Engineering	WR	NPS : Monterey, CA	0.200	0.000		0.000		0.000		-		0.000	0.000	0.200	-
SNLWS Systems Engineering	MIPR	MIT LL : Lexington, MA	0.004	0.000		0.000		0.000		-		0.000	0.000	0.004	-
SNLWS Systems Engineering	C/CPFF	PSU EOC : Freeport, PA	1.000	0.300	Dec 2020	0.400	Dec 2021	0.400	Dec 2022	-		0.400	Continuing	Continuing	Continuing

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Navy												Date: April 2022			
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)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
SNLWS Technical Director	WR	NSWC Crane : Crane, IN	0.889	0.385	Dec 2020	0.330	Dec 2021	0.350	Dec 2022	-		0.350	Continuing	Continuing	Continuing
SNLWS Product Support/ Sys Engr/ISEA/SSA/Doc/ Trng	WR	NSWC PHD : Port Hueneme, CA	1.698	2.094	Nov 2020	3.476	Nov 2021	3.711	Nov 2022	-		3.711	Continuing	Continuing	Continuing
SNLWS Installation APM	WR	NSWC Dahlgren DNA : Dam Neck, VA	0.615	0.400	Nov 2020	0.000		0.000		-		0.000	0.000	1.015	-
SNLWS Radar Cross Section Engineering	WR	NSWC Carderock : Potomac, MD	0.029	0.000		0.000		0.000		-		0.000	0.000	0.029	-
SNLWS Environmental Engineering	WR	NUWC Newport : Newport, RI	0.031	0.000		0.000		0.000		-		0.000	0.000	0.031	-
SNLWS System Installation	C/CPAF	BAE via SWRMC : San Diego, CA	5.691	4.493	Jan 2021	2.500	Jan 2022	0.000		-		0.000	0.000	12.684	-
SNLWS AIT/Engr/Tech/ Sustainment/Material/ Labor	C/CPIF	Lockheed Martin Aculight : Bothell, WA	1.352	16.658	Dec 2020	15.007	Dec 2021	4.800	Jan 2023	-		4.800	Continuing	Continuing	Continuing
SNLWS Installation Engineering	C/CPAF	Third Party Planning (3PP) : Not Specified	0.005	0.000		0.000		0.000		-		0.000	0.000	0.005	-
SNLWS Laser Range Hazard Analysis	WR	NSWC Corona : Corona, CA	0.039	0.000		0.000		0.000		-		0.000	0.000	0.039	-
SNLWS Platform Integration/ILS/Installation Support	C/CPFF	CACI : Washington, DC	0.213	0.072	Jan 2021	0.000		0.000		-		0.000	0.000	0.285	-
SNLWS installation Management & Matereials	C/CPFF	NSWC PHD : Virginia Beach, VA	1.595	3.661	Jan 2021	2.900	Jan 2022	0.000		-		0.000	0.000	8.156	-
SNLWS Installation/ Shipping	WR	NAVFAC : San Diego, CA	0.000	0.001	Mar 2021	0.000		0.000		-		0.000	0.000	0.001	-
SNLWS ILS/PRODUCT SUPPORT	C/FFP	TMS VIA NSWC IH : Indian Head, MD	0.000	0.069	Apr 2021	0.250	Oct 2021	0.200	Dec 2022	-		0.200	Continuing	Continuing	Continuing
SNLWS System Engr/ Procurment Beam Director	C/CPFF	MANTECH : Washington, D.C.	0.000	0.300	Mar 2021	0.000		0.000		-		0.000	0.000	0.300	-
SNLWS Installation	C/CPFF	DTI : Arlington, VA	0.000	0.000		3.250	Dec 2021	0.000		-		0.000	0.000	3.250	-

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Navy **Date:** April 2022

Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603925N / <i>Directed Energy and Electric Weapon System</i>	Project (Number/Name) 3402 / <i>Surface Navy Laser Weapon System (SNLWS)</i>
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Support (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Subtotal			56.506	35.743		37.806		13.574		-		13.574	Continuing	Continuing	N/A

Remarks
 -Since PB22, the FY21 decrease in support consists of a SBIR assessment and funding that was realigned to T&E to cover increased test event costs for PHD, Crane, Dahlgren, SCSC, NASA, Air Force (WEG & AMIC); and to Product Development as a result of additional support required for the HELIOS system delivery to DDG 88 which shifted from 26 Sep 2021 to 3rd Qtr FY22.
 -Since PB22, FY22 funding was realigned under T&E to cover test event requirements and LM Aculight AIT/Sustainment/Material/Labor was realigned within the support category, primarily to DTI and PHD VA Beach to support the installation of HELIOS on DDG 88. As a result of this realignment, the planned procurement of the MIS (simulator) via LM Aculight under the technical engineering service TI will not be accomplished in FY22.

Test and Evaluation (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
SNLWS Test & Evaluation	WR	NIWC Pacific : San Diego, CA	0.122	0.000		0.000		0.000		-		0.000	0.000	0.122	-
SNLWS Test & Evaluation	WR	NSWC PHD : Port Hueneme, CA	1.818	1.826	Nov 2020	2.500	Nov 2021	2.000	Nov 2022	-		2.000	Continuing	Continuing	Continuing
SNLWS Test & Evaluation	WR	NSWC Crane : Crane, IN	1.202	0.970	Nov 2020	0.200	Nov 2021	0.200	Nov 2022	-		0.200	Continuing	Continuing	Continuing
SNLWS Test & Evaluation	WR	NSWC Dahlgren : Dahlgren, VA	0.908	0.157	Nov 2020	1.000	Nov 2021	0.500	Nov 2022	-		0.500	Continuing	Continuing	Continuing
SNLWS Test & Evaluation	C/CPIF	Lockheed Martin Aculight : Bothell, WA	6.361	0.858	Oct 2020	0.500	Dec 2021	0.000		-		0.000	0.000	7.719	-
SNLWS Test & Evaluation	WR	NSWC Dahlgren DNA : Dam Neck, VA	0.100	0.000		0.000		0.000		-		0.000	0.000	0.100	-
SNLWS Test & Evaluation (Targets)	WR	Threat Systems Management office : Redstone Arsenal, AL	0.581	0.000		0.700	Jan 2022	1.000	Jan 2023	-		1.000	Continuing	Continuing	Continuing
SNLWS Test Site Preparation	WR	SCSC Wallops : Wallops Island, VA	1.251	0.800	Nov 2020	0.250	Jan 2022	0.000		-		0.000	0.000	2.301	-

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Navy **Date:** April 2022

Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603925N / <i>Directed Energy and Electric Weapon System</i>	Project (Number/Name) 3402 / <i>Surface Navy Laser Weapon System (SNLWS)</i>
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Test and Evaluation (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
SNLWS Test Site Preparation	WR	NASA Wallops : Wallops Island, VA	0.300	1.052	Jan 2021	0.150	Jan 2022	0.000		-		0.000	0.000	1.502	-
SNLWS Test & Evaluation	WR	NAWC CL : China Lake, AZ	0.269	0.250	Nov 2020	0.000		0.000		-		0.000	0.000	0.519	-
SNLWS Test & Evaluation (Targets)	WR	NAWC AD : Patuxent River, MD	0.289	0.306	Jan 2021	0.400	Jan 2022	0.000		-		0.000	0.000	0.995	-
SNLWS Test & Evaluation (Targets)	WR	NRL : Washington, D.C.	0.277	0.265	Jan 2021	0.400	Jan 2022	0.000		-		0.000	0.000	0.942	-
SNLWS Test & Evaluation	C/CPFF	PSU EOC : Freeport, PA	0.000	0.000		0.100	Dec 2021	0.100	Dec 2022	-		0.100	Continuing	Continuing	Continuing
SNLWS Test & Evaluation HST	WR	NUWC : Newport, RI	0.000	0.029	Jan 2021	0.000		0.000		-		0.000	0.000	0.029	-
SNLWS Test & Evaluation HST	WR	NPS : Monterey, CA	0.000	0.045	Apr 2021	0.000		0.000		-		0.000	0.000	0.045	-
SNLWS Test & Evaluation	C/FFP	ACC AMIC : Langley AFB, VA	0.000	0.273	Aug 2021	0.000		0.000		-		0.000	0.000	0.273	-
SNLWS Test & Evaluation	MIPR	53 WEG FM : Tyndall AFB, FL	0.000	0.108	Jul 2021	0.000		0.000		-		0.000	0.000	0.108	-
Subtotal			13.478	6.939		6.200		3.800		-		3.800	Continuing	Continuing	N/A

Remarks
 -Since PB22, the FY21 increase was due to a funding realignment from Support to T&E to cover increased test event costs for PHD, Crane, Dahlgren, SCSC, NASA, Air Force (WEG & AMIC).
 -Since PB22, the FY22 increase was due to a funding realignment from Support and Management to T&E to primarily cover LM Aculight test event cost.

Management Services (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
SNLWS Program Management/Engineering Support	C/CPFF	GRYPHON Technologies : Washington, DC	0.895	0.141	Aug 2021	0.000		0.000		-		0.000	0.000	1.036	-

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Navy **Date:** April 2022

Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603925N / <i>Directed Energy and Electric Weapon System</i>	Project (Number/Name) 3402 / <i>Surface Navy Laser Weapon System (SNLWS)</i>
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Management Services (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
SNLWS Program Management/Engineering Support	C/CPIF	SPA : Washington, DC	3.258	0.768	Dec 2020	1.250	Dec 2021	0.850	Dec 2022	-		0.850	Continuing	Continuing	Continuing
SNLWS Travel	Sub Allot	NAVSEA : Washington, DC	0.039	0.150	Feb 2021	0.150	Feb 2022	0.150	Feb 2023	-		0.150	Continuing	Continuing	Continuing
SNLWS Program Management	C/BA	TMB : Washington, DC	0.830	0.154	Dec 2020	0.200	Dec 2021	0.250	Dec 2022	-		0.250	Continuing	Continuing	Continuing
SNLWS Program Management	C/BA	PSS : Washington, DC	0.000	0.000		0.550	Jun 2022	0.400	Jun 2023	-		0.400	Continuing	Continuing	Continuing
SNLWS Program Management	C/BA	Strategic Insight : Washington, DC	0.345	0.107	Dec 2020	0.175	Dec 2021	0.100	Dec 2022	-		0.100	Continuing	Continuing	Continuing
SNLWS Program Management	C/BA	BAH : Washington, DC	0.000	0.027	Apr 2021	0.000		0.000		-		0.000	0.000	0.027	-
Subtotal			5.367	1.347		2.325		1.750		-		1.750	Continuing	Continuing	N/A

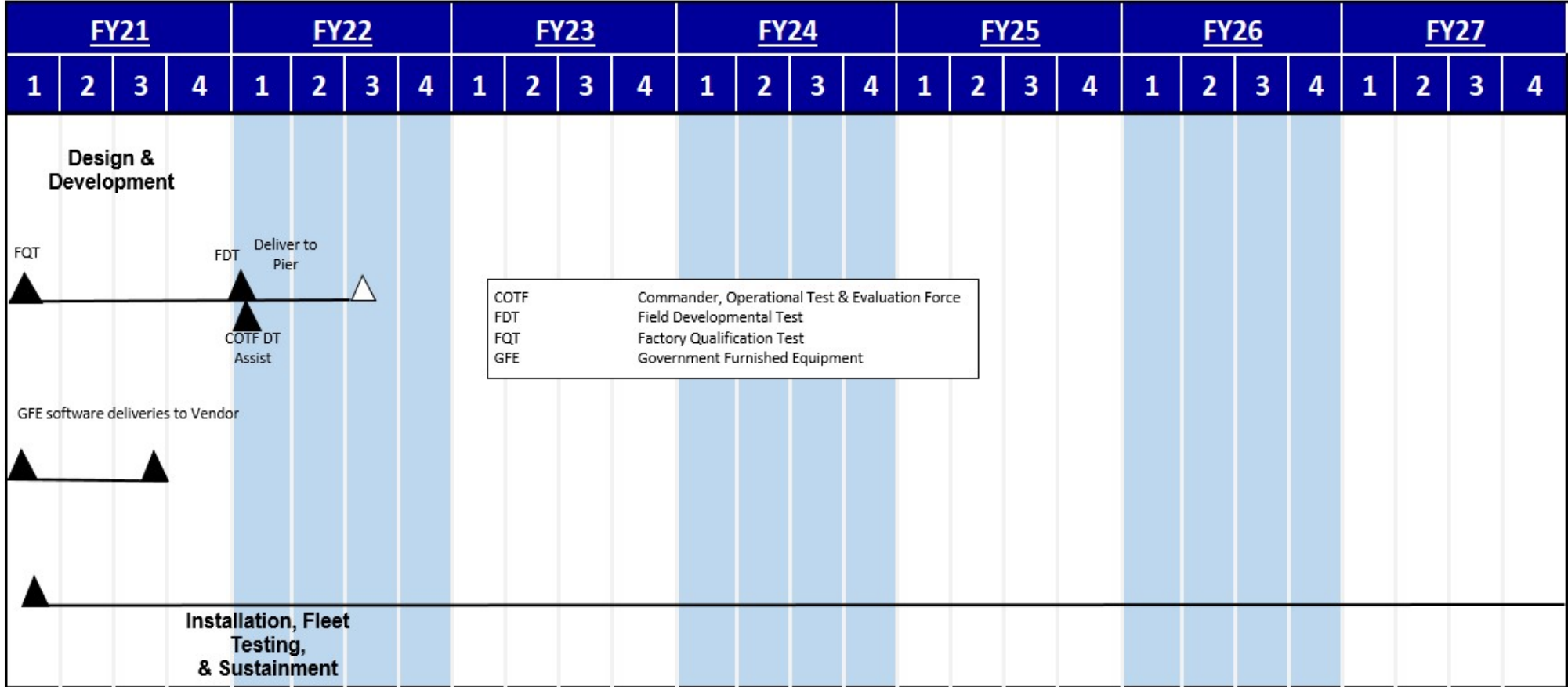
Remarks
 - Since PB22, the FY21 decrease in Management is a result of PSS actual costs coming in lower than planned. Funding was realigned to cover T&E requirements.
 - Since PB22, the FY22 decrease in Management was realigned to cover higher priority T&E requirements for HELIOS.

	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	214.118	54.647	46.331	19.124	-	19.124	Continuing	Continuing	N/A

Remarks
 The decrease in total funding across all cost categories from FY22 to FY23 is a result of the completion of system development, integration and installation; and the majority of T&E efforts being completed.

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Exhibit R-4, RDT&E Schedule Profile: PB 2023 Navy																Date: April 2022					
Appropriation/Budget Activity 1319 / 4										R-1 Program Element (Number/Name) PE 0603925N / <i>Directed Energy and Electric Weapon System</i>						Project (Number/Name) 3402 / <i>Surface Navy Laser Weapon System (SNLWS)</i>					



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.

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Exhibit R-4A, RDT&E Schedule Details: PB 2023 Navy		Date: April 2022
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603925N / <i>Directed Energy and Electric Weapon System</i>	Project (Number/Name) 3402 / <i>Surface Navy Laser Weapon System (SNLWS)</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Proj 3402				
SNLWS: GFE to vendor LWCS, DSS, WDLC	1	2021	3	2021
SNLWS: Factory Qualification Test (FQT)	1	2021	1	2021
SNLWS: Field Developmental Test (DT)	2	2021	1	2022
SNLWS: Deliver to Pier	3	2021	3	2022
SNLWS: Installation, Fleet Testing and Sustainment	1	2021	4	2027

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Navy										Date: April 2022		
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0603925N / <i>Directed Energy and Electric Weapon System</i>				Project (Number/Name) 5898 / <i>Directed Energy Components for High Energy Lasers</i>			
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
5898: <i>Directed Energy Components for High Energy Lasers</i>	0.000	0.000	0.000	14.040	-	14.040	4.794	0.000	0.000	0.000	0.000	18.834
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

Note

This project is a new start in FY23.

A. Mission Description and Budget Item Justification

Project 5898 - Directed Energy Components for High Energy Lasers: Supports Industrial Base Analysis and Sustainment (IBAS) program efforts for the improvement of the production capability of the industrial base in order to produce Laser Weapon Beam Director (LWBD) components and sub-systems; reduce production lead times of Laser Weapon System Optics; improve quality and reduce production times of Fast Steering Mirror (FSM) and deformable mirrors; and establish industrial sources(s) for Spectral Beam Combining (SBC) diffraction grating production.

The FY23 budget request supports the development of the production capability enhancement of the Laser Weapon Beam Director (LWBD) components and sub-systems, coating chambers for laser weapon optics, Fast Steering Mirrors (FSM) and deformable mirrors, and the diffraction gratings for Spectral Beam Combining (SBC) lasers. This investment is a risk mitigation for manufacturing capability enhancements through the qualification and validation of production equipment and process improvements.

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Title: Directed Energy Components for High Energy Lasers	0.000	0.000	14.040	0.000	14.040
Articles:	-	-	-	-	-
FY 2022 Plans: N/A					
FY 2023 Base Plans: - Commence development of an industrial base production capability to produce LWBD components and subsystems. - Commence development of a coating chambers production capability for laser weapon system optics. - Commence development of a production capability for improvement and reduction in lead time for production for Fast Steering & Deformable Mirrors.					

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Navy		Date: April 2022
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603925N / <i>Directed Energy and Electric Weapon System</i>	Project (Number/Name) 5898 / <i>Directed Energy Components for High Energy Lasers</i>

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
- Commence development of a production capability for a diffraction grating vendor for spectral beam combining. FY 2023 OCO Plans: N/A FY 2022 to FY 2023 Increase/Decrease Statement: The FY22 to FY23 increase is the result of the establishment of PU 5898 for production capability enhancements.					
Accomplishments/Planned Programs Subtotals	0.000	0.000	14.040	0.000	14.040

C. Other Program Funding Summary (\$ in Millions)

N/A

Remarks

D. Acquisition Strategy

The effort will utilize Other Transaction Authority (OTA) vehicles in order to obtain personnel with the requisite experience and expertise required to develop the production capability enhancements. The successful OTA contractor(s) could be utilized as supplier(s) for these highly critical, difficult to manufacture components in future laser acquisition contracts.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Navy **Date:** April 2022

Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603925N / Directed Energy and Electric Weapon System	Project (Number/Name) 5898 / Directed Energy Components for High Energy Lasers
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Product Development (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Systems Engineering	C/CPFF	PSU EOC : Freeport, PA	0.000	0.000		0.000		1.300	Dec 2022	-		1.300	0.000	1.300	-
Systems Engineering	WR	NSWC DD : Dahlgren, VA	0.000	0.000		0.000		1.850	Nov 2022	-		1.850	0.000	1.850	-
Production Capability Enhancements	Various	OTA : TBD	0.000	0.000		0.000		10.340	Mar 2023	-		10.340	0.000	10.340	-
Subtotal			0.000	0.000		0.000		13.490		-		13.490	0.000	13.490	N/A

Remarks
The effort will utilize Other Transaction Authority (OTA) vehicles.

Management Services (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Program Management Support	C/CPIF	SPA : Washington, D.C.	0.000	0.000		0.000		0.400	Dec 2022	-		0.400	0.000	0.400	-
Program Management Support	C/CPFF	GRYPHON : Washington, D.C.	0.000	0.000		0.000		0.150	Dec 2022	-		0.150	0.000	0.150	-
Subtotal			0.000	0.000		0.000		0.550		-		0.550	0.000	0.550	N/A

	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract	
Project Cost Totals		0.000	0.000	0.000	14.040	-	14.040	0.000	14.040	N/A

Remarks
The FY22 to FY23 increase is the result of the establishment of PU 5898 for production capability enhancements.

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Exhibit R-4A, RDT&E Schedule Details: PB 2023 Navy		Date: April 2022
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603925N / <i>Directed Energy and Electric Weapon System</i>	Project (Number/Name) 5898 / <i>Directed Energy Components for High Energy Lasers</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Proj 5898				
Laser Weapon Beam Director (LWBD) Components/Subsystems: Production Capability Improvements	1	2023	4	2024
Coating Chambers for Laser Weapon System Optics: Production Capability Improvements	1	2023	4	2024
Fast Steering Mirrors and Deformable Mirrors: Production Capability Improvements	1	2023	4	2024
Diffraction Grating Vendor for Spectral Beam Combining: Production Capability Improvements	1	2023	4	2024

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Navy										Date: April 2022		
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0603925N / <i>Directed Energy and Electric Weapon System</i>				Project (Number/Name) 9823 / <i>Lasers for Navy applicat</i>			
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
9823: <i>Lasers for Navy applicat</i>	110.279	34.082	9.508	25.318	-	25.318	23.860	23.790	3.839	3.912	Continuing	Continuing
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.

The FY23 budget request supports shipboard technical support, test checkout, training updates, updates to maintenance requirements and shipboard allowance documentation, and Operation & Sustainment (O&S) of Units 1-7; continues procurement, assembly, checkout, integration and T&E of Unit 8; and the development of the technology refresh package and subsystem maturation efforts to improve the reliability, capability and operability of ODIN.

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Title: Optical Dazzling Interdictor, Navy (ODIN)	34.082	9.508	25.318	0.000	25.318
Articles:	-	-	-	-	-
FY 2022 Plans:					
- Complete installation, shipboard test and checkout, conduct system turnover, and support shipboard operations of Units 4, 5, and 6					
- Initiate/complete shipboard installation and checkout of Unit 7					
- Continue system integration, test and certification, system operability, and safety for 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.					
OCO:					
N/A.					
FY 2023 Base Plans:					
- Continue shipboard technical support for Units 1-7					
- Continue shipboard test and checkout support of Units 1-7					

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Navy		Date: April 2022
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603925N / <i>Directed Energy and Electric Weapon System</i>	Project (Number/Name) 9823 / <i>Lasers for Navy applicat</i>

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
<ul style="list-style-type: none"> - Continue sustainment support and material procurements for Units 1-7 - Continue training updates, updates to maintenance requirements and shipboard allowance documentation - Continue system integration, test and certification, system operability and safety for Unit 8 - Initiate subsystem maturation efforts, analysis and documentation - Initiate technical refresh package to include material and assembly drawings - Initiate system engineering for software/hardware updates <p>FY 2023 OCO Plans: N/A</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: The increase from FY22 to FY23 is to develop a technology refresh package and subsystem maturation efforts to improve the reliability, capability and operability of ODIN.</p>					
Accomplishments/Planned Programs Subtotals	34.082	9.508	25.318	0.000	25.318

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.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Navy **Date:** April 2022

Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603925N / <i>Directed Energy and Electric Weapon System</i>	Project (Number/Name) 9823 / <i>Lasers for Navy applicat</i>
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Product Development (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Hardware & Software - Material Buys	C/FFP	NSWC Dahlgren : Dahlgren, VA	40.059	5.107	Dec 2020	1.149	Dec 2021	0.250	Dec 2022	-		0.250	Continuing	Continuing	Continuing
Engineering/Development/ Assembly, Tech Refresh	WR	NSWC Dahlgren : Dahlgren, VA	13.981	4.991	Nov 2020	1.748	Nov 2021	12.981	Nov 2022	-		12.981	Continuing	Continuing	Continuing
Software Development/ System Rqmts & Design	WR	NSWC Dahlgren : Dahlgren, VA	4.848	0.737	Nov 2020	0.000		0.600	Nov 2022	-		0.600	Continuing	Continuing	Continuing
Engineering Development, HW and SW	C/CPFF	PSU EOC : Freeport, PA	7.471	2.735	Dec 2020	0.400	Dec 2021	1.500	Jan 2023	-		1.500	Continuing	Continuing	Continuing
Engineering/Development/ Material/DMSMS Analysis/ Design	WR	NSWC PHD : Port Hueneme, CA	0.952	0.410	Oct 2020	0.000		0.300	Nov 2022	-		0.300	Continuing	Continuing	Continuing
Engineering/Development	WR	NSWC Crane : Crane, IN	0.320	0.000		0.000		0.000		-		0.000	0.000	0.320	-
Engineering/Development	WR	NRL : Washington, D.C.	0.320	0.000		0.000		0.400	Nov 2022	-		0.400	Continuing	Continuing	Continuing
Subsystem Maturation	Various	OTA : TBD	0.000	0.000		0.000		5.000	Mar 2023	-		5.000	Continuing	Continuing	Continuing
Test Unit Development & Design	WR	NIWC Pacific : San Diego, CA	0.000	0.000		0.000		0.150	Nov 2022	-		0.150	Continuing	Continuing	Continuing
Subtotal			67.951	13.980		3.297		21.181		-		21.181	Continuing	Continuing	N/A

Remarks
-Since PB22, the FY21 Product Development decrease consists of a SBIR assessment and a realignment to Support, T&E and Program Management to support higher priority efforts.

Support (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Platform Integration/ ILS/ Installation	C/CPFF	CACI : Washington, D.C.	0.341	0.000		0.000		0.000		-		0.000	0.000	0.341	-
Platform Integration/ILS/ Installation	C/CPFF	SWRMC : San Diego, CA	0.932	0.260	Mar 2021	0.150	Mar 2022	0.100	Mar 2023	-		0.100	Continuing	Continuing	Continuing

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Navy												Date: April 2022			
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 Application							
Support (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Systems Engineering/Mgmt	C/CPFF	NAVFAC : Washington, D.C.	0.125	0.000		0.000		0.000		-		0.000	0.000	0.125	-
Safety, Product Support, Security & Operations	WR	AFRL : Wright-Patterson AFB, OH	0.160	0.000		0.000		0.000		-		0.000	0.000	0.160	-
Installation Engineering	C/CPAF	Third Party Planning (3PP) : Not Specified	0.007	0.000		0.005	Dec 2021	0.000		-		0.000	Continuing	Continuing	Continuing
Spares	WR	NSWC Dahlgren : Dahlgren, VA	0.711	3.397	Sep 2021	0.075	Oct 2021	0.000		-		0.000	0.000	4.183	-
Platform Integration/ILS/Installation	WR	NSWC Dahlgren : Dahlgren, VA	10.361	1.703	Oct 2020	0.485	Oct 2021	0.000		-		0.000	0.000	12.549	-
Platform Integration	C/CPAF	BIW : Bath, ME	1.054	0.414	Jan 2021	0.100	Jan 2022	0.100	Jan 2023	-		0.100	Continuing	Continuing	Continuing
Platform Integration	C/CPFF	Lockheed Martin : Moorestown, NJ	0.266	0.066	Apr 2021	0.000		0.000		-		0.000	0.000	0.332	-
Systems Engineering/Platform Integration	WR	NIWC Pacific : San Diego, CA	1.168	0.052	Aug 2021	0.040	Dec 2021	0.000		-		0.000	0.000	1.260	-
Safety, Product Support, Security & Operations	WR	NSWC Dahlgren : Dahlgren, VA	3.744	0.250	Oct 2020	0.400	Oct 2021	0.000		-		0.000	0.000	4.394	-
Platform Integration	WR	NSWC Crane : Crane, IN	0.156	0.000		0.000		0.000		-		0.000	0.000	0.156	-
Platform Integration/Integrated Logistic Support/Installation & Spares	WR	NSWC PHD : Port Hueneme, CA	6.079	1.335	Oct 2020	0.750	Oct 2021	0.500	Oct 2022	-		0.500	Continuing	Continuing	Continuing
Packaging, Handling, Storage & Transportation, De-Install, Refurbishment	WR	NSWC Dahlgren : Dahlgren, VA	1.374	0.040	Nov 2020	0.040	Oct 2021	0.000		-		0.000	0.000	1.454	-
Platform Integration/ILS/Installation	C/CPFF	HRMC : Pearl Harbor, HI	0.021	0.000		0.000		0.000		-		0.000	0.000	0.021	-
Platform Integration/ILS/Installation & Spares	C/CPFF	NSWC PHD : Port Hueneme, CA	6.008	9.526	Apr 2021	2.950	Dec 2021	2.187	Dec 2022	-		2.187	Continuing	Continuing	Continuing
Packaging, Handling, Storage & Transportation	C/CPFF	PSU EOC : Freeport, PA	0.425	0.000		0.000		0.000		-		0.000	0.000	0.425	-

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Navy **Date:** April 2022

Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603925N / <i>Directed Energy and Electric Weapon System</i>	Project (Number/Name) 9823 / <i>Lasers for Navy applicat</i>
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Support (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Systems Engineering	C/CPFF	PSU EOC : Freeport, PA	0.700	0.000		0.000		0.000		-		0.000	0.000	0.700	-
Systems Engineering/ Mgmt	WR	Pax Partnership : Patuxent, MD	0.142	0.000		0.000		0.000		-		0.000	0.000	0.142	-
Platform Integration/ILS/ Installation	C/FFP	TMS via NSWC IH : Indian Head, MD	0.000	0.069	Apr 2021	0.100	Dec 2021	0.050	Dec 2022	-		0.050	0.000	0.219	-
Platform Integration/ILS/ Installation	C/CPFF	NWRMC Puget Sound Naval Shipyard : Bremerton, WA	0.000	0.200	Aug 2021	0.000		0.000		-		0.000	0.000	0.200	-
Subtotal			33.774	17.312		5.095		2.937		-		2.937	Continuing	Continuing	N/A

Remarks
 -Since PB22, FY21 funding was realigned within the support category to procure the requisite Spares required as a result of a SBIR withhold reimbursement and the AIT/ Installation contract awarding for less than estimated.

Test and Evaluation (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Test Planning & Execution	WR	NAWC AD : Patuxent River, MD	0.160	0.000		0.000		0.000		-		0.000	0.000	0.160	-
Test Planning & Execution	WR	NSWC PHD : Port Hueneme, CA	1.404	0.255	Oct 2020	0.100	Oct 2021	0.000		-		0.000	0.000	1.759	-
Test Planning/Execution & Certification	WR	NSWC Dahlgren : Dahlgren, VA	3.599	1.848	Oct 2020	0.300	Oct 2021	0.000		-		0.000	0.000	5.747	-
Test Planning & Execution	WR	NSWC Crane : Crane, IN	0.650	0.000		0.000		0.000		-		0.000	0.000	0.650	-
Test Planning & Execution	WR	NIWC Pacific : San Diego, CA	0.504	0.000		0.000		0.000		-		0.000	0.000	0.504	-
Test Planning & Execution	MIPR	NSMA, COTF : JBAB, D.C.	0.000	0.040	Aug 2021	0.000		0.000		-		0.000	0.000	0.040	-

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Navy **Date:** April 2022

Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603925N / <i>Directed Energy and Electric Weapon System</i>	Project (Number/Name) 9823 / <i>Lasers for Navy Application</i>
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Test and Evaluation (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Subtotal			6.317	2.143		0.400		0.000		-		0.000	0.000	8.860	N/A

Remarks
 Since PB22, FY21 funding was increased due to testing of newly developed capabilities requiring a higher quality and quantity of aircraft and targets for testing and subsequent data analysis to validate requisite system capabilities.

Management Services (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Program Mgmt/Support	C/CPIF	PSS : Washington, D.C.	0.000	0.063	Sep 2021	0.250	Dec 2021	0.250	Dec 2022	-		0.250	Continuing	Continuing	Continuing
Program Mgmt/Support	C/CPIF	Strategic Insight : Washington, D.C.	0.076	0.077	Dec 2020	0.075	Dec 2021	0.075	Dec 2022	-		0.075	0.000	0.303	-
Program Mgmt/Support	C/CPIF	TMB : Washington, D.C.	0.200	0.141	Apr 2021	0.141	Dec 2021	0.141	Dec 2022	-		0.141	Continuing	Continuing	Continuing
Program Mgmt/Support	C/CPFF	GRYPHON Technologies : Washington, D.C.	0.950	0.142	Aug 2021	0.000		0.000		-		0.000	0.000	1.092	-
Travel	Allot	NAVSEA : Washington, D.C.	0.085	0.050	Apr 2021	0.050	Feb 2022	0.050	Feb 2023	-		0.050	Continuing	Continuing	Continuing
Program Mgmt/Support	C/CPIF	SPA : Washington, D.C.	0.926	0.082	Feb 2021	0.200	Feb 2022	0.684	Dec 2022	-		0.684	0.000	1.892	-
Program Mgmt/Support	C/CPIF	BAH : Washington, D.C.	0.000	0.092	Apr 2021	0.000		0.000		-		0.000	0.000	0.092	-
Subtotal			2.237	0.647		0.716		1.200		-		1.200	Continuing	Continuing	N/A

	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	110.279	34.082	9.508	25.318	-	25.318	Continuing	Continuing	N/A

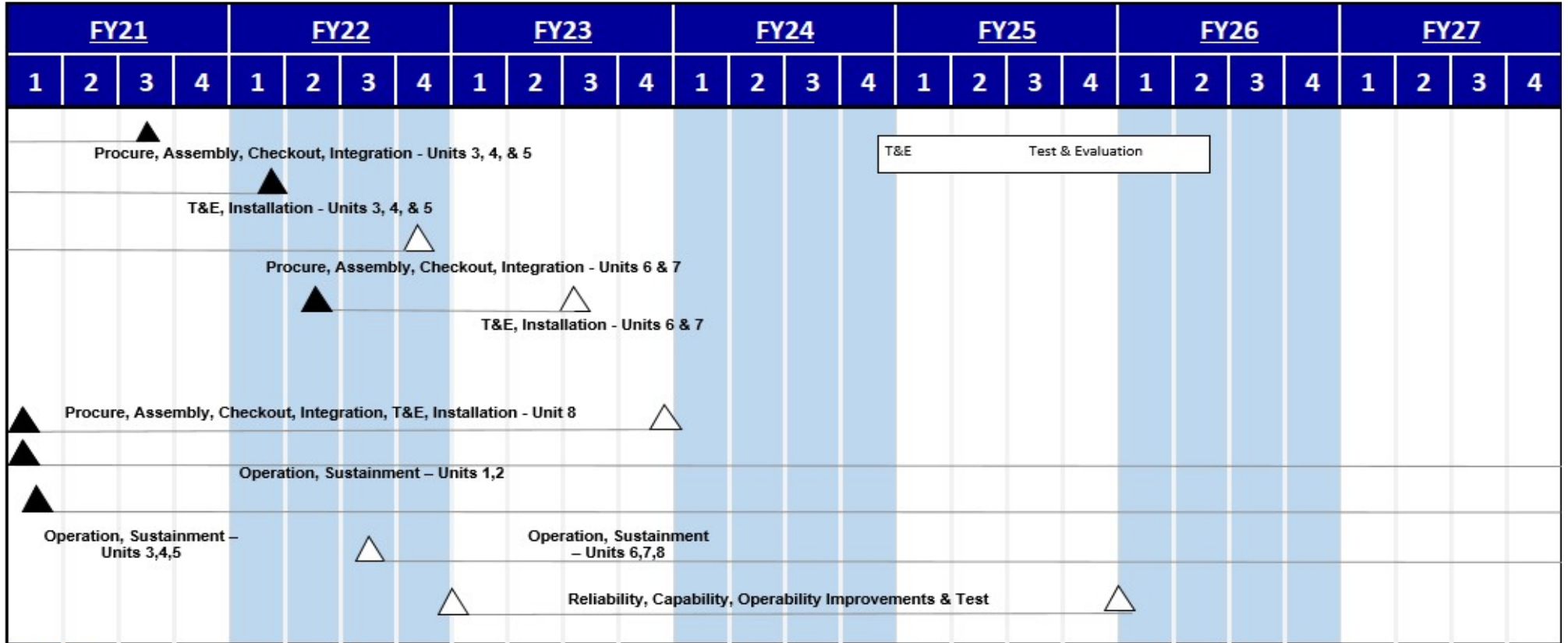
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Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Navy							Date: April 2022		
Appropriation/Budget Activity 1319 / 4			R-1 Program Element (Number/Name) PE 0603925N / <i>Directed Energy and Electric Weapon System</i>			Project (Number/Name) 9823 / <i>Lasers for Navy applicat</i>			
	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract

Remarks
 The increase in funding from FY22 to FY23 is to develop the technology refresh package and subsystem maturation efforts to improve the reliability, capability and operability of ODIN.

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Exhibit R-4, RDT&E Schedule Profile: PB 2023 Navy																	Date: April 2022				
Appropriation/Budget Activity 1319 / 4										R-1 Program Element (Number/Name) PE 0603925N / <i>Directed Energy and Electric Weapon System</i>							Project (Number/Name) 9823 / <i>Lasers for Navy applicat</i>				



- 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 FY22 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.

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Exhibit R-4A, RDT&E Schedule Details: PB 2023 Navy		Date: April 2022
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603925N / <i>Directed Energy and Electric Weapon System</i>	Project (Number/Name) 9823 / <i>Lasers for Navy applicat</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Proj 9823				
Component Procurement, Assembly, Checkout, Integration Units 3, 4 and 5	1	2021	3	2021
Operation and Sustainment Units 1 and 2	1	2021	4	2027
Component Procurement, Assembly, Checkout, Integration Units 6 and 7	1	2021	4	2022
Test & Evaluation, Installation Unit's 3, 4 and 5	1	2021	1	2022
Operation and Sustainment Units 3, 4, 5	1	2021	4	2027
Component Procurement, Assembly, Checkout, Integration, T&E & Installation Unit 8	1	2021	4	2023
Test & Evaluation, Installation Units 6 and 7	2	2022	3	2023
Operation and Sustainment Units 6, 7 and 8	3	2022	4	2027
Capability, Operability Improvements & Test	1	2023	4	2025

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Navy **Date:** April 2022

Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603925N / <i>Directed Energy and Electric Weapon System</i>	Project (Number/Name) 9999 / <i>Congressional Adds</i>
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COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
9999: <i>Congressional Adds</i>	40.149	4.827	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	44.976
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

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.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2021	FY 2022
Congressional Add: High Energy Laser Weapon System for C-UAS Area Defense	4.827	0.000
FY 2021 Accomplishments: Continued Systems Engineering, design, and fabrication of minimized footprint, laser-agnostic beam director and beam control system (M-BD/BCS) and start field testing.		
FY 2022 Plans: N/A		
Congressional Adds Subtotals	4.827	0.000

C. Other Program Funding Summary (\$ in Millions)

N/A

Remarks

D. Acquisition Strategy

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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Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Navy **Date:** April 2022

Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603925N / <i>Directed Energy and Electric Weapon System</i>	Project (Number/Name) 9999 / <i>Congressional Adds</i>
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Product Development (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
C453- SNLWS Development	C/CPIF	Lockheed Martin Aculight : Bothell, WA	14.990	0.000		0.000		0.000		-		0.000	0.000	14.990	-
C440-HVP/RGS Interface Development	WR	NSWC Dahlgren : Dahlgren, VA	0.850	0.000		0.000		0.000		-		0.000	0.000	0.850	-
C440- APCT Hardware Fabrication	MIPR	DOTC : DOTC	0.860	0.000		0.000		0.000		-		0.000	0.000	0.860	-
C440- PCT/Breech Interface and Blowback Mitigation Fabrication	WR	NSWC Dahlgren : Dahlgren, VA	0.200	0.000		0.000		0.000		-		0.000	0.000	0.200	-
C547- Health Monitoring Sensor Development	FFRDC	Virginia Tech : Virginia Tech	0.100	0.000		0.000		0.000		-		0.000	0.000	0.100	-
C516 - Minimized Beam Director/Beam Control Sys	C/CPFF	MZA : Dayton, OH	9.654	4.827	Jun 2022	0.000		0.000		-		0.000	0.000	14.481	-
Subtotal			26.654	4.827		0.000		0.000		-		0.000	0.000	31.481	N/A

Support (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
C453- Support SNLWS Development	WR	NSWC Dahlgren : Dahlgren, VA	0.349	0.000		0.000		0.000		-		0.000	0.000	0.349	-
C440-APCT Development Support and Oversight	WR	NSWC Dahlgren : Dahlgren, VA	1.800	0.000		0.000		0.000		-		0.000	0.000	1.800	-
C440-Mount Component Development, SE Support, and Technical Oversight	WR	NSWC Dahlgren : Dahlgren, VA	0.625	0.000		0.000		0.000		-		0.000	0.000	0.625	-
C440-Blowback Mitigation	FFRDC	APL : Laurel, MD	0.200	0.000		0.000		0.000		-		0.000	0.000	0.200	-
C440-Mount Platform Interface Development,	WR	NSWC Dahlgren : Dahlgren, VA	0.442	0.000		0.000		0.000		-		0.000	0.000	0.442	-

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Navy												Date: April 2022			
Appropriation/Budget Activity				R-1 Program Element (Number/Name)				Project (Number/Name)							
1319 / 4				PE 0603925N / Directed Energy and Electric Weapon System				9999 / Congressional Adds							
Support (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	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	0.000	0.266	-
C440- System Trade Studies	WR	NSWC Dahlgren : Dahlgren, VA	0.266	0.000		0.000		0.000		-		0.000	0.000	0.266	-
C547- Advanced Armature and Muzzle Design and Development, SE Support, and Technical Oversight	WR	NSWC Dahlgren : Dahlgren, VA	1.000	0.000		0.000		0.000		-		0.000	0.000	1.000	-
C547- Mount and Controls Development, SE Support, and Technical Oversight	WR	NSWC Dahlgren : Dahlgren, VA	1.450	0.000		0.000		0.000		-		0.000	0.000	1.450	-
C547- Pulse Power Ship Integration Development, SE Support, and Technical Oversight	WR	NSWC Dahlgren : Dahlgren, VA	0.900	0.000		0.000		0.000		-		0.000	0.000	0.900	-
C547- System Trade Studies	WR	NSWC Dahlgren : Dahlgren, VA	0.250	0.000		0.000		0.000		-		0.000	0.000	0.250	-
C547 - Railgun and HVP Interface Development Risk Reduction and Technical Oversight	WR	NSWC Dahlgren : Dahlgren, VA	1.207	0.000		0.000		0.000		-		0.000	0.000	1.207	-
C547 - Program Technical Oversight	WR	NSWC Dahlgren : Dahlgren, VA	0.500	0.000		0.000		0.000		-		0.000	0.000	0.500	-
C547 - Railgun and HVP Interface	FFRDC	Sandia National Laboratories : Ibuquerque, NM	0.790	0.000		0.000		0.000		-		0.000	0.000	0.790	-
Subtotal			10.045	0.000		0.000		0.000		-		0.000	0.000	10.045	N/A

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Exhibit R-4, RDT&E Schedule Profile: PB 2023 Navy **Date:** April 2022

Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603925N / <i>Directed Energy and Electric Weapon System</i>	Project (Number/Name) 9999 / <i>Congressional Adds</i>
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	FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4

Proj 9999																												
Electromagnetic Railgun: PCT Dev/Testing	██████████																											
Electromagnetic Railgun: Topside Integration/ Platform Studies	██████████																											
Electromagnetic Railgun: System Trade Studies	██████████																											
Railgun: Railgun Barrel and Mount System Rep-Rate Risk Reduction	██████████																											
Railgun: Controls Integration	██████████																											
Railgun: HVP Railgun Integration	██████████																											
Railgun: Pulsed Power Integration Studies	██████████																											
Railgun: System Trade Studies	██████████																											
Railgun: Pulse Current Transfer (PCT) maturation and risk reduction	██████████																											
Railgun: Naval Post Graduate School Railgun Materials Testing	██████████																											
Minimized-Beam Director/Beam Control System (M-BD/BCS): Component Procurement	████																											
Minimized-Beam Director/Beam Control System (M-BD/BCS): Prototype Beam Director and Beam Control Sub-System	████																											
Minimized-Beam Director/Beam Control System (M-BD/BCS): Laser Integration	████																											
Minimized-Beam Director/Beam Control System (M-BD/BCS): Prototype Subsystem Test & Evaluation	████████████████████																											

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Exhibit R-4A, RDT&E Schedule Details: PB 2023 Navy		Date: April 2022
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603925N / <i>Directed Energy and Electric Weapon System</i>	Project (Number/Name) 9999 / <i>Congressional Adds</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Proj 9999				
Electromagnetic Railgun: PCT Dev/Testing	1	2021	2	2021
Electromagnetic Railgun: Topside Integration/Platform Studies	1	2021	2	2021
Electromagnetic Railgun: System Trade Studies	1	2021	3	2021
Railgun: Railgun Barrel and Mount System Rep-Rate Risk Reduction	2	2021	4	2021
Railgun: Controls Integration	2	2021	4	2021
Railgun: HVP Railgun Integration	2	2021	4	2021
Railgun: Pulsed Power Integration Studies	2	2021	4	2021
Railgun: System Trade Studies	2	2021	4	2021
Railgun: Pulse Current Transfer (PCT) maturation and risk reduction	2	2021	4	2021
Railgun: Naval Post Graduate School Railgun Materials Testing	1	2021	4	2021
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
Minimized-Beam Director/Beam Control System (M-BD/BCS): Prototype Subsystem Test & Evaluation	1	2022	4	2022