Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Navy	Date: February 2018
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*

COST ($ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
Total Program Element	100.205	34.039	107.310	223.344	-	223.344	107.886	46.783	38.561	31.911	Continuing	Continuing
3370: *Railgun*	77.679	21.737	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	99.416
3402: *Surface Navy Laser Weapon System (SNLWS)*	0.000	0.000	63.281	190.237	-	190.237	89.632	44.751	36.558	29.768	Continuing	Continuing
9823: *Lasers for Navy applicat*	22.526	12.302	44.029	33.107	-	33.107	18.254	2.032	2.003	2.143	Continuing	Continuing

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 3370 - Railgun: EMRG provides ship-based program/technical development to produce a standard railgun/mount for use onboard Navy warships. 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). EMRG uses electromagnetic energy, vice traditional chemical propellant (i.e. gun powder), to launch projectiles providing: greatly increased range (110+nm vice 13nm for current 5" chemical propellant [gunpowder] guns); increased ammunition storage capacity; increased ship safety; increased layered point defense; and decreased costs when compared to current weapons. The net effect is an increased capacity against multiple simultaneous threats at a lower operational cost to offset a potential adversary's asymmetric missile strategy. The EMRG will launch the Hyper Velocity Projectile (HVP).

Project 3402 - Surface Navy Laser Weapon System (SNLWS): SNLWS funding was provided for the expedited development and fielding of the SNLWS system to Naval Forces. SNLWS includes the development of advanced prototype laser weapon systems in the 60 kW or higher class. SNLWS leverages mature technology to deliver a proven laser weapon capability to the Fleet. SNLWS development leverages the Office of Naval Research (ONR) efforts on the Solid State Laser (SSL) Quick Reaction Capability (QRC) and Solid State Laser (SSL) Technology Maturation (TM) efforts. SNLWS provides a capability to address existing Anti-Surface Warfare, Integrated Air and Missile Defense and Counter-Intelligence, Surveillance and Reconnaissance (C-ISR) Gaps with the ability to dazzle and destroy Unmanned Aerial Systems (UASs) and Fast Inshore Attack Craft (FIAC).

Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Navy	Date: February 2018
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 funding in PB19 was increased in order to procure two (2) additional SNLWS units for two DDG 51 class ship installations and was based on a certified NAVSEA cost estimate that more accurately predicts actual program costs. This increase provides the requisite level of funding for the system engineering and combat system integration, threat analysis, ship installation/integration/planning/drawings/scheduling, test planning, and maintenance/sustainment engineering/planning for the first two SNLWS units. FY18 efforts are focused on program and system requirements definition, contract proposal development and evaluation, and contract award which will allow procurement of long lead material to maintain the schedule for delivery of the initial SNLWS units.

Project 9823 - Lasers for Navy Applications: Low Power Module (LPM) development will provide near-term, directed energy, shipboard Counter-Intelligence, Surveillance, and Reconnaissance (C-ISR) capabilities to dazzle Unmanned Aerial Systems (UASs) and other platforms that will address urgent operational needs of the Fleet. FY18 is the first year of funding that will support the design, development and procurement of eight standalone units over the FYDP, for deployment on DDG 51 surface combatants. The program will support the non-recurring engineering, development, procurement of long lead material, assembly and checkout, system certification, and platform integration/installation for these eight standalone units.

B. Program Change Summary ($ in Millions)	**FY 2017**	**FY 2018**	**FY 2019 Base**	**FY 2019 OCO**	**FY 2019 Total**
Previous President's Budget	32.700	107.310	117.907	-	117.907
Current President's Budget	34.039	107.310	223.344	-	223.344
Total Adjustments	1.339	0.000	105.437	-	105.437
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	1.800	0.000			
• SBIR/STTR Transfer	-0.461	0.000			
• Program Adjustments	0.000	0.000	109.000	-	109.000
• Rate/Misc Adjustments	0.000	0.000	-3.563	-	-3.563

Change Summary Explanation

The FY19 funding increase in the amount of +$105.437 million reflects the following:

+$109 million Project 3402 - PB19 funding was based on a certified NAVSEA cost estimate that more accurately predicts actual program costs and procures two additional shipboard prototype systems. This increase fully funds SNLWS to the February 2017 cost estimate.

-$3.563 million miscellaneous rate adjustments.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603925N / *Directed Energy and Electric Weapon System*	**Project (Number/Name)** 3370 / *Railgun*	

COST ($ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
3370: *Railgun*	77.679	21.737	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	99.416
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

EMRG provides ship-based program/technical development to produce a standard railgun/mount for use onboard Navy warships. 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). EMRG uses electromagnetic energy, vice traditional chemical propellant (i.e. gun powder), to launch projectiles providing: greatly increased range (110+nm vice 13nm for current 5" chemical propellant [gunpowder] guns); increased ammunition storage capacity; increased ship safety; increased layered point defense; and decreased costs when compared to current weapons. The net effect is an increased capacity against multiple simultaneous threats at a lower operational cost to offset a potential adversary's asymmetric missile strategy. The EMRG will launch the Hyper Velocity Projectile (HVP), currently in development as a Future Naval Capability (FNC).

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Railgun	21.737	0.000	0.000	0.000	0.000
Articles:	-	-	-	-	-
FY 2018 Plans: N/A					
FY 2019 Base Plans: N/A					
FY 2019 OCO Plans: N/A					
Accomplishments/Planned Programs Subtotals	21.737	0.000	0.000	0.000	0.000

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603925N / *Directed Energy and Electric Weapon System*	**Project (Number/Name)** 3370 / *Railgun*

E. Performance Metrics

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603925N / *Directed Energy and Electric Weapon System*	**Project (Number/Name)** 3370 / *Railgun*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Hardware - Test Stand/Pulsed Power/ Power & Energy/ Platform Requirements/ Development	MIPR	BAE, Merrill, Meggitt, Syntek, IAP, GA, ARDEC, Ray : Picatinny Arsenal, NJ	13.974	7.524	Jul 2017	0.000		0.000		-		0.000	0.000	21.498	-
Hardware - Test Stand/ Platform Requirements/ Development	C/CPFF	GRYPHON, GSA : Washington,D.C., Dahlgren, VA	2.578	0.000		0.000		0.000		-		0.000	0.000	2.578	-
Hardware - Test Stand/ Platform Requirements Development	WR	NSWC DD; NSWC Corona : Dahlgren, VA, Corona, CA	7.309	0.000		0.000		0.000		-		0.000	0.000	7.309	-
Hardware - Power Conversion	C/CPFF	NAVSEA PMS 320 Contract,ROLLS ROYCE : Washington, D.C.	0.085	0.000		0.000		0.000		-		0.000	0.000	0.085	-
Hardware - Power Conversion	WR	NAVSSESS : Philadelphia, PA	1.492	1.000	Jul 2017	0.000		0.000		-		0.000	0.000	2.492	-
Hardware - Pulsed Power Development	WR	NSWC DD; : Dahlgren, VA	2.562	3.626	Jul 2017	0.000		0.000		-		0.000	0.000	6.188	-
Hardware - Pulsed Power Development	C/CPFF	NAVSEA, PMS 320, BAE, RAYTHEON : Washington, D.C.	8.658	0.000		0.000		0.000		-		0.000	0.000	8.658	-
Hardware - Battery and Charging Supply Development/Certification	C/CPFF	NAVSEA PMS 320 Various : Washington, D.C.	4.406	1.950	Jul 2017	0.000		0.000		-		0.000	0.000	6.356	-
Hardware - Battery & Charging Supply Dev/Cert	WR	NAVSSES : Philadelphia, PA	2.100	0.000		0.000		0.000		-		0.000	0.000	2.100	-
Hardware - Projectile Development	C/CPFF	Contractor via AFRL, BAE : Rome, NY, Minneapolis, MN	0.188	0.000		0.000		0.000		-		0.000	0.000	0.188	-
Hardware - HVP EM Compatibility	WR	NSWC/DD : Dahlgren, VA	5.540	1.155	Jul 2017	0.000		0.000		-		0.000	0.000	6.695	-
Hardware - Projectile Development	WR	NSWC/IH : Indian Head, MD	0.386	0.000		0.000		0.000		-		0.000	0.000	0.386	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603925N / *Directed Energy and Electric Weapon System*	**Project (Number/Name)** 3370 / *Railgun*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Software Weapon System	WR	NSWC/DD : Dahlgren, VA	0.000	0.000		0.000		0.000		-		0.000	0.000	0.000	-
Software Weapon System	C/CPFF	MDA : Redstone Arsenal, AL	0.700	0.000		0.000		0.000		-		0.000	0.000	0.700	-
Software Fire Control System	WR	NSWC/DD, NSWC Corona : Dahlgren, VA, Corona, CA	3.610	0.000		0.000		0.000		-		0.000	0.000	3.610	-
Hardware - Pulsed Power Development	C/CPFF	DTI : NAVSEA 05	0.000	0.200	Jul 2017	0.000		0.000		-		0.000	0.000	0.200	-
Advanced Pulsed Power Swap-C	WR	VAR : VAR	0.000	1.004	Jul 2017	0.000		0.000		-		0.000	0.000	1.004	-
Subsystem Technology Assessment	WR	NSWC DD : Dahlgren, VA	0.000	1.125	Jul 2017	0.000		0.000		-		0.000	0.000	1.125	-
Tech Maturation of Core Componenets	WR	NSWC DD : Dahlgren, VA	0.000	0.585	Jul 2017	0.000		0.000		-		0.000	0.000	0.585	-
		Subtotal	53.588	18.169		0.000		0.000		-		0.000	0.000	71.757	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Systems Engineering/ Management	WR	NSWC/DD : Dahlgren, VA	6.762	0.000		0.000		0.000		-		0.000	0.000	6.762	-
System Engineering/ Management	C/CPFF	PSU EOC, BIW, AGS, DTI : Washington, D.C.	1.436	0.000		0.000		0.000		-		0.000	0.000	1.436	-
System Engineering/ Management	WR	NSWC, IH : Indian Head, MD	0.052	0.090	Jul 2017	0.000		0.000		-		0.000	0.000	0.142	-
Hypervelocity Projectile Sys Engr/Mgmt	C/CPFF	JHU/APL : Baltimore, MD	0.780	0.000		0.000		0.000		-		0.000	0.000	0.780	-
Hypervelocity Projectile Sys Engr/Mgmt	WR	NSWC CD : Carderock, MD	0.000	0.370	Jul 2017	0.000		0.000		-		0.000	0.000	0.370	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603925N / *Directed Energy and Electric Weapon System*	Project (Number/Name) 3370 / *Railgun*	

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Systems Engineering/ Management	C/CPFF	Gryphon Technologies : Washington, DC	0.000	0.159	Jul 2017	0.000		0.000		-		0.000	0.000	0.159	-
Systems Engineering/ Management	MIPR	COTF/MCOTEA : Norfolk, VA	0.100	0.000		0.000		0.000		-		0.000	0.000	0.100	-
Systems Engineering/ Management	C/CPFF	Lockheed Martin : Various	0.200	0.000		0.000		0.000		-		0.000	0.000	0.200	-
		Subtotal	9.330	0.619		0.000		0.000		-		0.000	0.000	9.949	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Airframe Analysis	WR	NSWC DD, Eglin AFB, Robins AFB : Dahlgren, VA, Robins AFB GA, Eglin AFB	1.540	0.000		0.000		0.000		-		0.000	0.000	1.540	-
WSMR T&E/GFE	WR	NSWC DD : Dahlgren, VA	1.300	0.545	Jul 2017	0.000		0.000		-		0.000	0.000	1.845	-
Landbased/Seabased Plan/Install/Conduct	WR	NSWC/DD : Dahlgren, VA, Corona, CA	1.000	0.000		0.000		0.000		-		0.000	0.000	1.000	-
Power and Energy Test Bed Development	WR	NAVSSESS; AFRL; Eglin : Philadelphia, PA; Washington, D.C.	2.785	0.345	Jul 2017	0.000		0.000		-		0.000	0.000	3.130	-
Landbased Test Support	WR	NAVFAC : Jacksonville, FL	0.104	0.000	Jul 2017	0.000		0.000		-		0.000	0.000	0.104	-
Landbased Test Support	WR	WSMR : Port Hueneme CA	1.300	0.060	Jul 2017	0.000		0.000		-		0.000	0.000	1.360	-
Hypervelocity Projectile	WR	WSMR : Port Hueneme CA	0.200	0.000		0.000		0.000		-		0.000	0.000	0.200	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603925N / *Directed Energy and Electric Weapon System*	**Project (Number/Name)** 3370 / *Railgun*

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
		Subtotal	8.229	0.950		0.000		0.000		-		0.000	0.000	9.179	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Project Engineering/ Management	MIPR	ARDEC : Picatinny Arsenal, NJ	2.175	0.000		0.000		0.000		-		0.000	0.000	2.175	-
Project Engineering/ Management	WR	NSWC Dahlgren : Dahlgren, VA	2.900	1.200	Jul 2017	0.000		0.000		-		0.000	0.000	4.100	-
Project Engineering/ Management	WR	NPS : Monterey, CA	0.128	0.300	Jul 2017	0.000		0.000		-		0.000	0.000	0.428	-
Project Engineering/ Management	C/CPFF	ALION/CSC : Washington, D.C.	0.554	0.204	Jul 2017	0.000		0.000		-		0.000	0.000	0.758	-
Program Management/ Support	C/CPFF	CACI/ALION : Washington, D.C.	0.775	0.136	Jul 2017	0.000		0.000		-		0.000	0.000	0.911	-
Program Management/ Support	C/CPFF	TMB/Kratos : Arlington, VA	0.000	0.159	Jul 2017	0.000		0.000		-		0.000	0.000	0.159	-
		Subtotal	6.532	1.999		0.000		0.000		-		0.000	0.000	8.531	N/A

	Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	77.679	21.737		0.000		0.000		-		0.000	0.000	99.416	N/A

Remarks

- Award Date reflects month of the most recent contract modification or incremental payment.

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		**Date:** February 2018
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603925N / *Directed Energy and Electric Weapon System*	**Project (Number/Name)** 3370 / *Railgun*

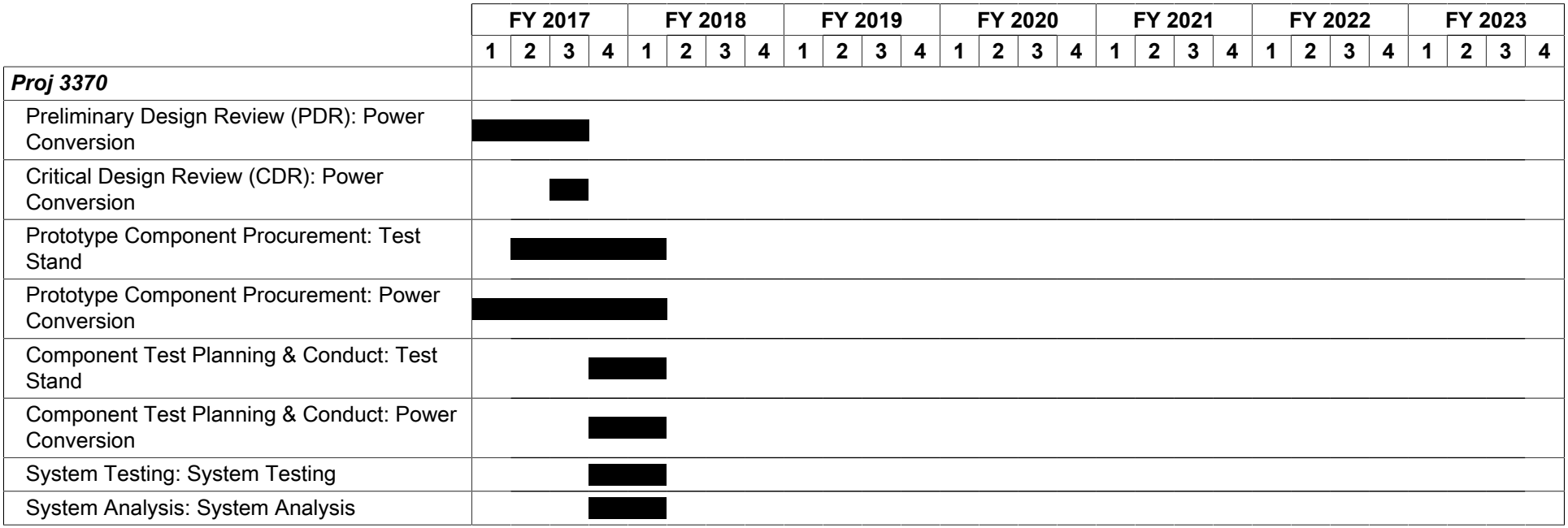

Exhibit R-4A, **RDT&E Schedule Details:** PB 2019 Navy		**Date:** February 2018
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603925N / *Directed Energy and Electric Weapon System*	**Project (Number/Name)** 3370 / *Railgun*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 3370				
Preliminary Design Review (PDR): Power Conversion	1	2017	3	2017
Critical Design Review (CDR): Power Conversion	3	2017	3	2017
Prototype Component Procurement: Test Stand	2	2017	1	2018
Prototype Component Procurement: Power Conversion	1	2017	1	2018
Component Test Planning & Conduct: Test Stand	4	2017	1	2018
Component Test Planning & Conduct: Power Conversion	4	2017	1	2018
System Testing: System Testing	4	2017	1	2018
System Analysis: System Analysis	4	2017	1	2018

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
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 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
3402: *Surface Navy Laser Weapon System (SNLWS)*	0.000	0.000	63.281	190.237	-	190.237	89.632	44.751	36.558	29.768	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Project 3402 - Surface Navy Laser Weapon System (SNLWS): SNLWS funding was provided for the expedited development and fielding of the SNLWS system to Naval Forces. SNLWS includes the development of advanced prototype laser weapon systems in the 60 kW or higher class. SNLWS leverages mature technology to deliver a proven laser weapon capability to the Fleet. SNLWS development leverages the Office of Naval Research (ONR) efforts on the Solid State Laser (SSL) Quick Reaction Capability (QRC) and Solid State Laser (SSL) Technology Maturation (TM) efforts. SNLWS provides a capability to address existing Anti-Surface Warfare, Integrated Air and Missile Defense and Counter-Intelligence, Surveillance and Reconnaissance (C-ISR) Gaps with the ability to dazzle and destroy Unmanned Aerial Systems (UASs) and Fast Inshore Attack Craft (FIAC).

The funding in PB19 was increased in order to procure two (2) additional SNLWS units for two DDG 51 class ship installations and was based on a certified NAVSEA cost estimate that more accurately predicts actual program costs. This increase provides the requisite level of funding for the system engineering and combat system integration, threat analysis, ship installation/integration/planning/drawings/scheduling, test planning, and maintenance/sustainment engineering/planning for the first two SNLWS units. FY18 efforts are focused on program and system requirements definition, contract proposal development and evaluation, and contract award which will allow procurement of long lead material to maintain the schedule for delivery of the initial SNLWS units.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: SNLWS Development	0.000	36.104	160.783	0.000	160.783
Articles:	-	-	-	-	-
FY 2018 Plans: - Initiate SNLWS development. This includes system hardware and software design and documentation development; non-recurring system/sub-system/component engineering and management; and component/sub-system procurement, assembly, and testing. - Conduct systems engineering efforts for laser, mount, beam transport, power and cooling, and systems/ship integration. Perform functional decomposition of the system level documentation into sub-system level requirements for the laser, weapon mount, beams control architecture and transport system, power and cooling sub system and ship interface requirements, and conduct review - Conduct System Requirements Review of system design and interfaces - Conduct System Functional Review of system/subsystem specifications and interfaces					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
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 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
- Initiate development of Preliminary Design Data/Package - 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). - Initiate procurement of the following long lead material for two systems: Lasers/Mirrors which includes Lasers, Fiber Amplifiers, Tracking Illuminator, Mirrors (primary & secondary); and Beam Director/Optics which includes Beam Director, Exit Windows, Optics/Optical Bench. - Develop and deliver required contract deliverables/documentation.					
FY 2019 Base Plans: - Continue SNLWS development. This includes creating an A-Specification which meets the requirements in the System Scope Document (SSD); conducting systems engineering efforts for laser, mount, beam transport, power and cooling, and systems/ship integration; initiating system design that meets the A-Specification and Government furnished external (Mechanical, Electrical, and Logical) interface requirements and ship integration study requirements; initiating functional decomposition of the system level documentation into sub-system level requirements for the laser, weapon mount, beams control architecture and transport system, power and cooling sub system and ship interface requirements. - Develop Interface Functional Descriptions (IFDs) for the combat system baseline. - Develop system level control and combat system interface software. - Continue development of Preliminary Design/Technical Data Package consisting of: design documentation; non-recurring system/sub-system/component engineering and management; and component/sub-system procurement, assembly, and testing. - 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 Preliminary Design Review to provide a technical assessment of the system architecture and preliminary system design and establish the allocated baseline. - Continue procurement of materials as for the first two systems to include: Mount, Computer Systems, Cables/ Connectors, Cameras/Illuminators, Laser Structure/Foundation, Power/Cooling Mod Kits, and Platform Mod Kits. - Receive and integrate Laser Weapon Control System (LWCS) and Laser Fire Control System (LFCS) GFE into final system design. - Conduct Critical Design Review to assess the system detailed design prior to fabrication of hardware and coding of software.					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
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 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
- Conduct Production Readiness Review to determine if the design is ready for production and if the contractor has accomplished adequate production planning. - Prepare for conduct of system Test Readiness Review to determine if SNLWS is ready to proceed into formal testing by verifying test procedures are complete and are in compliance with approved test plans. - Continue fabrication of two units, each consisting of a High Energy Laser Weapon System combined with a C-ISR capability for countering UAS-mounted sensors. - Initiate procurement of long lead material for two additional units: Lasers/Mirrors which includes Lasers, Fiber Amplifiers, Tracking Illuminator, Mirrors (primary & secondary); and Beam Director/Optics which includes Beam Director, Exit Windows, Optics/Optical Bench. - Develop and deliver required contract deliverables/documentation. ***FY 2019 OCO Plans:*** N/A. ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Funding increased in FY19 to procure two (2) additional SNLWS units for two DDG 51 class ship installations based on a certified NAVSEA cost estimate that more accurately predicts actual program costs. The FY19 increase provides the requisite level of funding for the system engineering and combat system integration, threat analysis, ship installation/integration planning/drawings/scheduling, test planning, and maintenance/sustainment engineering/planning for the first two SNLWS units as well as the additional two SNLWS units in accordance with the adjudicated/approved NAVSEA cost estimates. FY18 efforts are focused on program and system requirements definition, contract proposal development and evaluation, and a 3rd quarter contract award which will allow procurement of long lead material to maintain the schedule for delivery of the initial SNLWS units.					
Title: SNLWS Government and Support Engineering Services	0.000	27.177	29.454	0.000	29.454
Articles:	-	-	-	-	-
FY 2018 Plans: - Conduct reviews of Requests For Proposals received from industry and conduct Source Selection. - Develop and award SNLWS Increment 1 contract. - Support System Requirements Review conducted by the prime contractor of system/subsystem specifications and interfaces. - Support System Functional Review conducted by the prime contractor of system design and interfaces. - Support Preliminary Design Review (PDR) engineering and analysis efforts leading up to conduct of the formal PDR.					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
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 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
- Initiate AEGIS Combat System software development and integration planning, trade studies and engineering. - Initiate DDG 51 Flight IIA Ship Integration & Installation requirements, trade studies and engineering. - Provide engineering support of the contractor development of Interface Functional Descriptions (IFDs) for the appropriate combat system baseline. - Initiate test planning, test facility scheduling, provision of test assets, and test procedure scoping/development to ensure traceability to system requirements to support requisite system testing upon receipt of system from the contractor. - Initiate hardware/software development/build of Laser Weapon Control System (LWCS) and Laser Fire Control System (LFCS) to be provided as government furnished equipment (GFE). - Review, comment, approve all contractor developed and delivered contract cost, schedule, and performance related documentation.					
FY 2019 Base Plans: - Support all management/technical efforts required in support of Preliminary Design Review (PDR) efforts leading up to and conducting the formal PDR. - Support all management/technical efforts required in support of Critical Design Review (CDR) efforts leading up to and conducting the formal CDR. - Continue review of all contractor provided engineering, design, production readiness, and test documentation. - 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). - Conduct Production Readiness Review for contractor developed components/subsystems/system. - Complete hardware/software build of LWCS and provide to contractor as GFE. - Complete build of the LFCS and provide to contractor as GFE. - Exercise contract option for provision of two additional units. - Continue AEGIS Combat System software engineering, development, and integration; conduct Levels 1-5 integration and testing. - Continue DDG 51 Flight IIA Ship Integration and Installation engineering ship data package development, review, and approval. - Finalize test plans, procedures, and schedules that ensure traceability to system requirements as part of required contractor testing. - Support efforts leading up to the Test Readiness Review for contractor developed components/subsystems/ systems.					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
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 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
- Review/comment/approve deliverables provided by the contractor. - Develop and deliver programmatic and technical documentation to support the Rapid Prototyping, Experimentation, and Demonstration (RPED) initiative and all requisite cost, schedule, and performance reporting requirements. ***FY 2019 OCO Plans:*** N/A. ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Increased funding in FY19 funds the government to provide oversight of the prime contractor, validate the contractor's design to meet technical and performance requirements, ensure production readiness, and to incrementally integrate the laser capability into the AEGIS Combat System to include threat analysis, modeling and simulation, and planning of test assets and target assets for verification of system capabilities by the contractor.					
Accomplishments/Planned Programs Subtotals	0.000	63.281	190.237	0.000	190.237

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

The SNLWS is an initiative that provides for industry-developed and government integrated capability to the Fleet in as short a timeframe as possible. Competition is utilized for system development and prototype production efforts. The acquisition strategy permits accelerated fielding of laser weapon systems in the Fleet.

E. Performance Metrics

- Conduct SNLWS Source Selection.
- Award SNLWS contract.
- Conduct System Requirements Review.
- Conduct System Functional Review.
- Develop/deliver Laser Weapon Control System (LWCS) as GFE.
- Conduct Preliminary Design Review.
- Conduct Final Design Review.
- Develop/deliver Laser Fire Control System (LFCS) as GFE.
- Conduct Production Readiness Review.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
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)*

- Conduct T&E review for Contractor Test.
- Conduct Contractor Test.
- Deliver Test Units.
- Install, Develop, Test & Operate delivered system.
- Sustain delivered systems.
- Initiate Combat System Integration & DDG 51 Flight IIA Integration/Installation Engineering.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
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 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
SNLWS Development	C/CPIF	Contractor TBD : TBD	0.000	0.000		36.104	Apr 2018	160.783	Apr 2019	-		160.783	Continuing	Continuing	Continuing
		Subtotal	0.000	0.000		36.104		160.783		-		160.783	Continuing	Continuing	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
SNLWS Systems Engineering, Program Management, GFE/GFI	WR	NSWC Dahlgren : Dahlgren, VA	0.000	0.000		15.561	Nov 2017	13.586	Nov 2018	-		13.586	Continuing	Continuing	Continuing
SNLWS Ship Installation Documentation	C/CPAF	BIW : Bath, ME	0.000	0.000		1.171	Feb 2018	2.311	Feb 2019	-		2.311	Continuing	Continuing	Continuing
SNLWS Combat System Integration	C/CPFF	Lockheed Martin : Moorestown, NJ	0.000	0.000		2.813	Oct 2017	2.870	Feb 2019	-		2.870	Continuing	Continuing	Continuing
SNLWS Systems Engineering	WR	NSWC Crane : Crane, IN	0.000	0.000		0.597	Nov 2017	0.984	Nov 2018	-		0.984	Continuing	Continuing	Continuing
SNLWS Systems Engineering	WR	NSWC PHD : Port Hueneme, CA	0.000	0.000		0.733	Nov 2017	1.038	Nov 2018	-		1.038	Continuing	Continuing	Continuing
SNLWS Systems Engineering	WR	SSC PAC : San Diego, CA	0.000	0.000		0.146	Nov 2017	0.150	Nov 2018	-		0.150	Continuing	Continuing	Continuing
SNLWS Systems Engineering	WR	NPS : Monetrey, CA	0.000	0.000		0.200	Nov 2017	0.210	Nov 2018	-		0.210	Continuing	Continuing	Continuing
SNLWS Systems Engineering	MIPR	MIT LL : Lexington, MA	0.000	0.000		0.150	Jan 2018	0.160	Dec 2018	-		0.160	Continuing	Continuing	Continuing
SNLWS Systems Engineering	C/CPFF	PSU EOC : Freeport, PA	0.000	0.000		0.500	Feb 2018	1.421	Dec 2018	-		1.421	Continuing	Continuing	Continuing
SNLWS Technical Director	WR	NSWC Crane : Crane, IN	0.000	0.000		0.280	Nov 2017	0.300	Nov 2018	-		0.300	Continuing	Continuing	Continuing
SNLWS Product Support	WR	NSWC PHD : Port Hueneme, CA	0.000	0.000		0.182	Nov 2017	0.600	Nov 2018	-		0.600	Continuing	Continuing	Continuing
		Subtotal	0.000	0.000		22.333		23.630		-		23.630	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
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 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
SNLWS Test & Evaluation	WR	SSC PAC : San Diego, CA	0.000	0.000		0.354	Nov 2017	0.424	Nov 2018	-		0.424	Continuing	Continuing	Continuing
SNLWS Test & Evaluation	WR	NSWC PHD : Port Hueneme, CA	0.000	0.000		0.522	Nov 2017	0.506	Nov 2018	-		0.506	Continuing	Continuing	Continuing
SNLWS Test & Evaluation	WR	NSWC Crane : Crane, IN	0.000	0.000		0.250	Nov 2017	0.415	Nov 2018	-		0.415	Continuing	Continuing	Continuing
SNLWS Test & Evaluation	WR	NSWC Dahlgren : Dahlgren, VA	0.000	0.000		1.329	Nov 2017	1.381	Nov 2018	-		1.381	Continuing	Continuing	Continuing
		Subtotal	0.000	0.000		2.455		2.726		-		2.726	Continuing	Continuing	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
SNLWS Program Management/Engineering Support	C/CPFF	GRYPHON Technologies : Washington, D.C.	0.000	0.000		0.927	Feb 2018	1.378	Dec 2018	-		1.378	Continuing	Continuing	Continuing
SNLWS Program Management/Engineering Support	C/CPIF	SPA : Washington, D.C.	0.000	0.000		0.950	Dec 2017	1.020	Dec 2018	-		1.020	Continuing	Continuing	Continuing
SNLWS Travel	Various	NAVSEA : Washington, D.C.	0.000	0.000		0.150	Feb 2018	0.200	Feb 2019	-		0.200	Continuing	Continuing	Continuing
SNLWS Program Management	C/CPFF	TMB : Washington, D.C.	0.000	0.000		0.162	Dec 2017	0.300	Dec 2018	-		0.300	Continuing	Continuing	Continuing
SNLWS Program Management	C/CPFF	Strategic Insight : Washington, D.C.	0.000	0.000		0.200	Feb 2018	0.200	Dec 2018	-		0.200	Continuing	Continuing	Continuing
		Subtotal	0.000	0.000		2.389		3.098		-		3.098	Continuing	Continuing	N/A

	Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	0.000		63.281		190.237		-		190.237	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			**Date:** February 2018
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)*	

	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		**Date:** February 2018
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)*

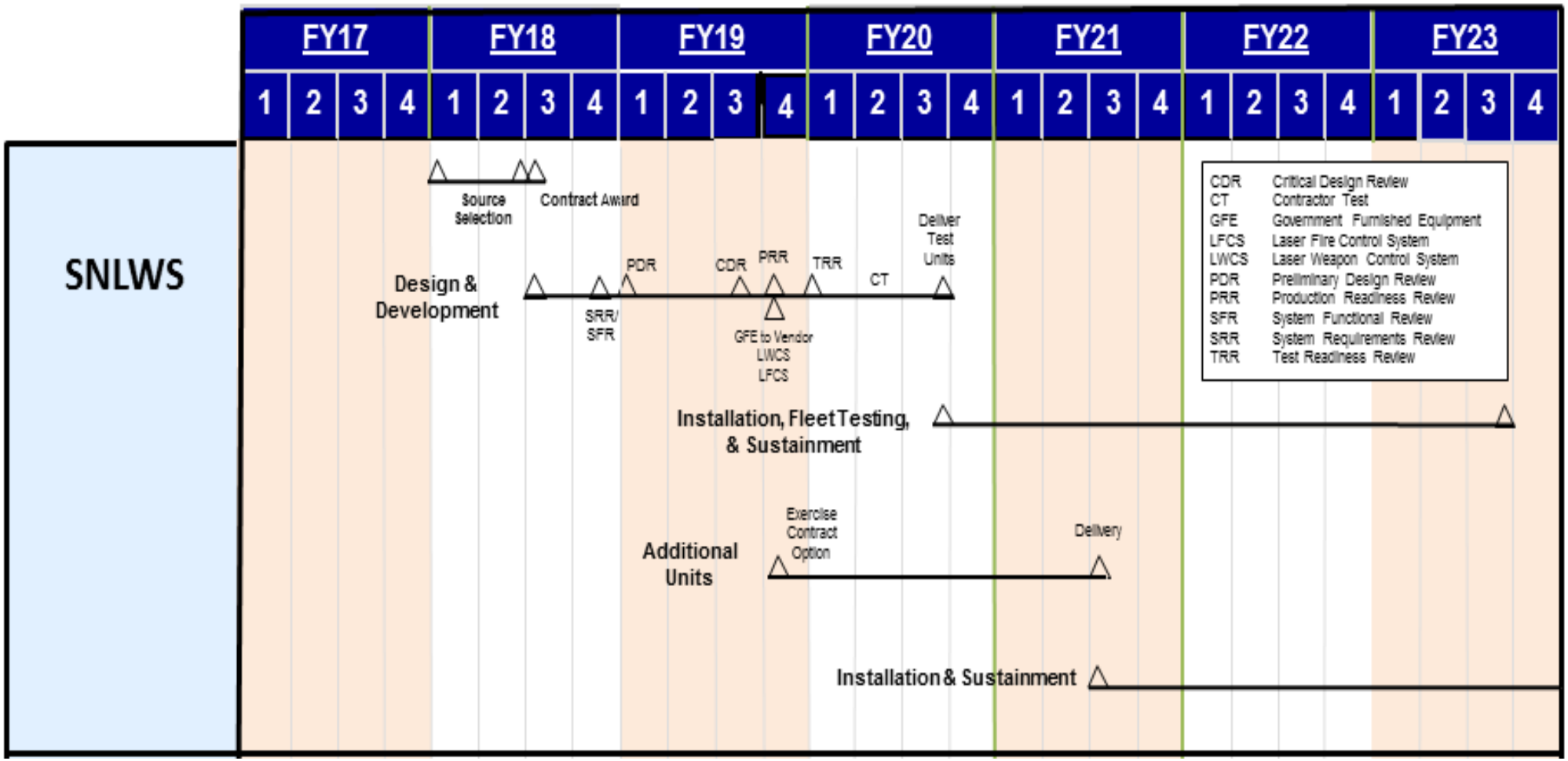

Exhibit R-4A, **RDT&E Schedule Details:** PB 2019 Navy		**Date:** February 2018
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603925N / *Directed Energy and Electric Weapon System*	**Project (Number/Name)** 3402 / *Surface Navy Laser Weapon System (SNLWS)*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 3402				
SNLWS: Conduct SNLWS Source Selection	1	2018	2	2018
SNLWS: Contract Award	3	2018	3	2018
SNLWS: Conduct System Requirements Review/System Functional Review	4	2018	4	2018
SNLWS: Preliminary Design Review	1	2019	1	2019
SNLWS: Critical Design Review	3	2019	3	2019
SNLWS: Laser Weapon Control System (LWCS) GFE to Vendor	4	2019	4	2019
SNLWS: Laser Fire Control System (LFCS) GFE to Vendor	4	2019	4	2019
SNLWS: Production Readiness Review (PDR)	4	2019	4	2019
SNLWS: Exercise Contract Option	4	2019	4	2019
SNLWS: Test Readiness Review	1	2020	1	2020
SNLWS: Contractor Test	1	2020	3	2020
SNLWS: Deliver Test Units	3	2020	3	2020
SNLWS: Installation, Fleet Testing and Sustainment	3	2020	3	2023
SNLWS: Deliver Option Units	3	2021	3	2021
SNLWS: Installation and Sustainment	3	2021	4	2023

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy												Date: February 2018
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 2017**	**FY 2018**	**FY 2019 Base**	**FY 2019 OCO**	**FY 2019 Total**	**FY 2020**	**FY 2021**	**FY 2022**	**FY 2023**	**Cost To Complete**	**Total Cost**
9823: *Lasers for Navy applicat*	22.526	12.302	44.029	33.107	-	33.107	18.254	2.032	2.003	2.143	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Project 9823 - Lasers for Navy Applications: Low Power Module (LPM) development will provide near-term, directed energy, shipboard Counter-Intelligence, Surveillance, and Reconnaissance (C-ISR) capabilities to dazzle Unmanned Aerial Systems (UASs) and other platforms that will address urgent operational needs of the Fleet. FY18 is the first year of funding that will support the design, development and procurement of eight standalone units over the FYDP, for deployment on DDG 51 surface combatants. The program will support the non-recurring engineering, development, procurement of long lead material, assembly and checkout, system certification, and platform integration/installation for these eight standalone units.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	**FY 2017**	**FY 2018**	**FY 2019 Base**	**FY 2019 OCO**	**FY 2019 Total**
Title: Low Power Module (LPM) Development	12.302	44.029	33.107	0.000	33.107
Articles:	-	-	-	-	-
Description: Beginning in FY 2018, Low Power Module (LPM) development efforts are being renamed Optical Dazzling Interdictor, Navy (ODIN).					
FY 2018 Plans: - Complete System Engineering of initial design and initiate the detailed design of a train and elevation capability, pointing/tracking mount and associated hardware/software, and beam control software. - Conduct Technical Design Reviews for system subassemblies. - Procure/integrate sensor components (track illumination laser and Battle Damage Assessment (BDA) laser) for Units 1 and 2. - Procure and initiate build Units 3, 4, 5. - Conduct shipboard integration/installation engineering/documentation for DDG 51 class ships. - Perform Assembly and Checkout of Units 1 and 2. - 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; and an Operator Laptop.					
FY 2019 Base Plans: - Complete system integration, test and certifications, including electromagnetic interference, system operability, and safety. - Complete shipboard documentation and training for ships' crew.					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
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*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
- Install Units 1 and 2 onboard designated DDG 51 class ships, conduct system turnover, and support shipboard operations. - Complete procurement and build of Units 3, 4, 5. - Perform Assembly and Checkout, and integration of Units 3, 4, 5. - Install Units 3, 4, and 5 onboard designated DDG 51 class ships and initiate shipboard test and checkout. - Procure and initiate build of Units 6, 7, 8. - 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; and an Operator Laptop. ***FY 2019 OCO Plans:*** N/A. ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Funding decreased in FY19 as the majority of the engineering development and initiation of material procurement for production of the initial five (5) systems is accomplished in FY18.					
Accomplishments/Planned Programs Subtotals	12.302	44.029	33.107	0.000	33.107

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

The LPM Stand Alone is a government designed, developed, and produced system that will provide eight units for use on DDG 51 class ships. This effort will transition the developed LPM capabilities to the Fleet, while informing the development of future prototyping capabilities and program of record efforts.

E. Performance Metrics

- Conduct Systems Requirements Review
- Conduct Engineering/Program Review
- Conduct Design Review
- Conduct Prototype Testing/Analysis Review
- Conduct Test Plan Review
- Conduct Integration & Testing Review
- Conduct Analysis and Final Report Review
- Produce and install eight units (2 to be installed in FY19, 3 in FY20, and 3 in FY21)

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
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 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
LPM Development	WR	NSWC DD : Dahlgren, VA	4.840	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
LPM Development	WR	SSC PAC : San Diego, CA	1.088	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
LPM Development	WR	NSWC CRANE : Crane, IN	1.520	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
LPM Development	WR	NRL : Washington, D.C.	0.470	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
LPM Development	C/CPFF	BOEING : San Diego, CA	1.349	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Testbed	WR	NSWC DD : Dahlgren, VA	2.727	0.952	May 2017	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Testbed	C/CPFF	PSU EOC : Freeport, PA	1.000	0.500	Jul 2017	1.560	Feb 2018	0.000		-		0.000	Continuing	Continuing	Continuing
Hardware & Software - Material Buys	C/FFP	NSWC DD : Dahlgren, VA	0.000	0.000		20.836	Dec 2017	14.461	Dec 2018	-		14.461	Continuing	Continuing	Continuing
Engineering/Development	WR	NSWC DD : Dahlgren, VA	0.274	2.748	May 2017	7.037	Nov 2017	4.362	Nov 2018	-		4.362	Continuing	Continuing	Continuing
Software Development	WR	NSWC DD : Dahlgren, VA	0.000	0.000		4.294	Nov 2017	3.958	Nov 2018	-		3.958	Continuing	Continuing	Continuing
Engineering Development	C/CPFF	PSU EOC : Freeport, PA	0.000	0.000		0.780	Feb 2018	0.350	Dec 2018	-		0.350	Continuing	Continuing	Continuing
Engineering/Development	WR	NSWC PHD : Port Hueneme, CA	0.000	0.155	Jul 2017	0.330	Nov 2017	0.200	Nov 2018	-		0.200	Continuing	Continuing	Continuing
Engineering/Development	WR	NSWC Crane : Crane, IN	0.000	0.000		0.500	Nov 2017	0.200	Nov 2018	-		0.200	Continuing	Continuing	Continuing
		Subtotal	13.268	4.355		35.337		23.531		-		23.531	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
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 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Systems/Mgmt Engineering	C/CPFF	PSU EOC : Freeport, PA	1.724	0.700	May 2017	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Modeling & Simulation	WR	NSWC DD : Dahlgren, VA	0.399	0.560	May 2017	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Systems/Mgmt Engineering	WR	PATUXENT PARTNERSHIP : Lexington Park, MD	0.202	0.142	Jul 2017	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Systems/Mgmt Engineering	C/CPFF	CSC : Washington, D.C.	0.080	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Systems/Mgmt Engineering	C/CPFF	NAVFAC : Washington, D.C.	0.000	0.125	Sep 2017	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Spares	WR	NSWC DD : Dalhgren, VA	0.000	0.000		0.711	Nov 2017	0.811	Nov 2018	-		0.811	Continuing	Continuing	Continuing
Platform Integration/ILS	WR	NSWC DD : Dahlgren, VA	0.519	1.495	May 2017	2.328	Nov 2017	1.771	Nov 2018	-		1.771	Continuing	Continuing	Continuing
Platform Integration	C/CPAF	BIW : Bath, ME	0.000	0.030	Jan 2018	0.107	Feb 2018	0.155	Feb 2019	-		0.155	Continuing	Continuing	Continuing
Platform Integration	WR	NSWC CARDEROCK : Bethesda, MD	0.240	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Platform Integration	C/CPFF	Huntington, Ingalls : Newport News, VA	0.012	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Platform Integration	C/CPFF	Lockheed Martin : Moorestown, NJ	0.000	0.000		0.265	Feb 2018	0.270	Feb 2019	-		0.270	Continuing	Continuing	Continuing
Systems Engineering	WR	SSC PAC : San Diego, CA	0.000	0.140	Jul 2017	0.770	Nov 2017	0.550	Nov 2018	-		0.550	Continuing	Continuing	Continuing
Safety, Product Support, Security & Operations	WR	NSWC Dahlgren : Dahlgren, VA	2.514	1.098	May 2017	1.615	Nov 2017	2.300	Nov 2018	-		2.300	Continuing	Continuing	Continuing
Platform Integration	WR	NSWC Crane : Crane, IN	0.000	0.000		0.220	Nov 2017	0.250	Nov 2018	-		0.250	Continuing	Continuing	Continuing
Packaging, Handling, Storage & Transportation, De-Install, Refurbishment	C/FFP	PSU EOC : Freeport, PA	0.000	0.425	Nov 2017	0.000		0.000		-		0.000	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
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 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Platform Integration/ILS	WR	NSWC PHD : Port Hueneme, CA	0.000	0.000		1.430	Nov 2017	0.450	Nov 2018	-		0.450	Continuing	Continuing	Continuing
Packaging, Handling, Storage & Transportation, De-Install, Refurbishment	WR	NSWC DD : Dahlgren, VA	0.000	1.155	Aug 2017	0.088	Nov 2017	0.091	Nov 2018	-		0.091	Continuing	Continuing	Continuing
		Subtotal	5.690	5.870		7.534		6.648		-		6.648	Continuing	Continuing	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Test Planning & Execution	WR	PHD NSWC : Port Hueneme, CA	0.455	0.150	May 2017	0.275	Nov 2017	0.998	Nov 2018	-		0.998	Continuing	Continuing	Continuing
Test Planning & Execution	WR	NSWC DD : Dahlgren, VA	1.347	0.750	May 2017	0.370	Nov 2017	1.098	Nov 2018	-		1.098	Continuing	Continuing	Continuing
Test Planning & Execution	WR	NSWC Crane : Crane, IN	0.292	0.330	Feb 2017	0.000		0.250	Nov 2018	-		0.250	Continuing	Continuing	Continuing
Test Planning & Execution	MIPR	Kirtland AFB : Albuquerque, NM	0.045	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Test Planning & Execution	WR	SSC PAC : San Diego, CA	0.000	0.000		0.000		0.100	Nov 2018	-		0.100	Continuing	Continuing	Continuing
		Subtotal	2.139	1.230		0.645		2.446		-		2.446	Continuing	Continuing	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Mgmt/Support	C/CPFF	GRYPHON Technologies : Washington, D.C.	0.178	0.320	Jul 2017	0.250	Mar 2018	0.250	Mar 2019	-		0.250	Continuing	Continuing	Continuing
Program Mgmt/Support	MIPR	ARDEC : Picatinny Arsenal, NJ	0.822	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
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*

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Safety, Product Support, Security, Operations	WR	NAVFACENG : San Diego, CA	0.030	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Travel	Various	NAVSEA : Washington, D.C.	0.052	0.022	Aug 2017	0.052	Feb 2018	0.052	Feb 2019	-		0.052	Continuing	Continuing	Continuing
Program Mgmt/Support	SS/CPFF	SPA Bridge : Washington, D.C.	0.347	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Program Mgmt/Support	C/CPIF	SPA : Washington, D.C.	0.000	0.355	Jul 2017	0.211	Feb 2018	0.180	Dec 2018	-		0.180	Continuing	Continuing	Continuing
Program Mgmt/Support	C/CPFF	TMB : Washington, D.C.	0.000	0.150	Aug 2017	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
		Subtotal	1.429	0.847		0.513		0.482		-		0.482	Continuing	Continuing	N/A

	Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	22.526	12.302		44.029		33.107		-		33.107	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		**Date:** February 2018
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*

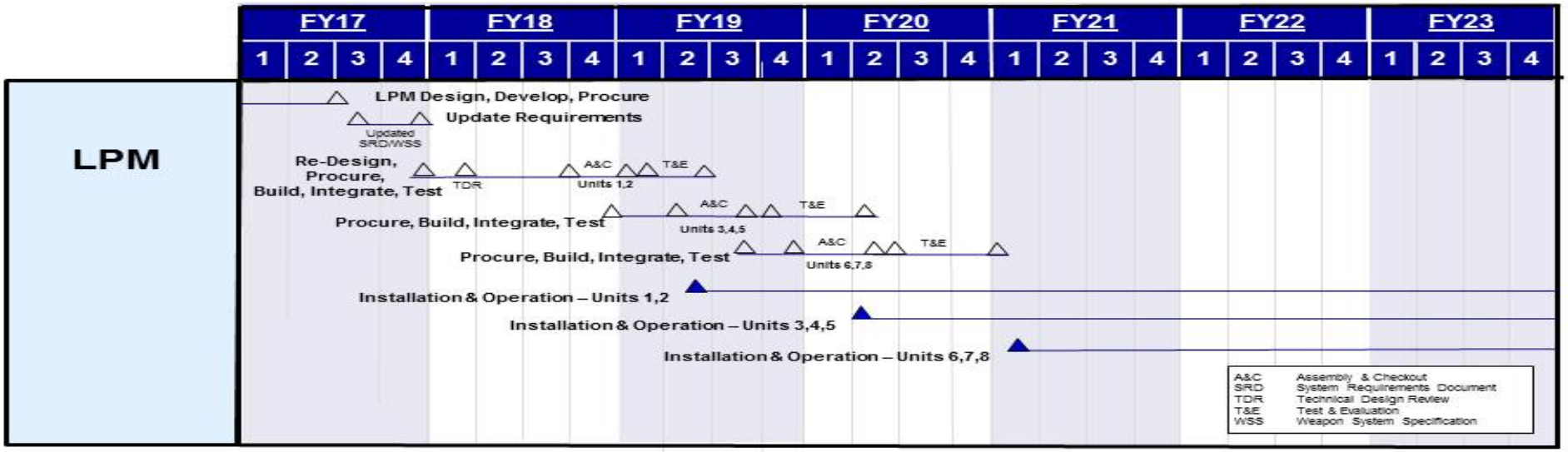

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603925N / *Directed Energy and Electric Weapon System*	**Project (Number/Name)** 9823 / *Lasers for Navy applicat*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 9823				
Engineering	1	2017	4	2020
Design/Develop Operational System	1	2017	4	2020
Initial Component Procurement	1	2017	3	2017
Update Requirements Design	3	2017	4	2017
Technical Design Review (TDR)	1	2018	1	2018
Component Procurement Units 1 and 2	1	2018	4	2018
Assembly & Checkout Units 1 and 2	4	2018	1	2019
Component Procurement Units 3, 4 and 5	4	2018	2	2019
Integration Units 1 and 2	1	2019	1	2019
Test and Evaluation Units 1 and 2	1	2019	3	2019
Installation and Operation Units 1 and 2	2	2019	4	2023
Assembly & Checkout Unit's 3, 4 and 5	2	2019	3	2019
Integration Units 3, 4 and 5	3	2019	3	2019
Component Procurement Units 6, 7 and 8	3	2019	4	2019
Test & Evaluation Unit's 3, 4 and 5	4	2019	2	2020
Assembly & Checkout Unit's 6, 7 and 8	4	2019	2	2020
Integration Units 6, 7 and 8	2	2020	2	2020
Installation and Operation Units 3, 4 and 5	2	2020	4	2023
Test and Evaluation Units 6, 7 and 8	3	2020	1	2021
Installation and Operation Units 6, 7 and 8	1	2021	4	2023