Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Navy												Date: March 2023
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 3: *Advanced Technology Development (ATD)*					R-1 Program Element (Number/Name) PE 0603801N *I Innovative Naval Prototypes (INP) Adv Tec Dev*							
COST ($ in Millions)	**Prior Years**	**FY 2022**	**FY 2023**	**FY 2024 Base**	**FY 2024 OCO**	**FY 2024 Total**	**FY 2025**	**FY 2026**	**FY 2027**	**FY 2028**	**Cost To Complete**	**Total Cost**
Total Program Element	0.000	165.136	261.903	132.931	-	132.931	127.939	130.496	126.646	129.674	Continuing	Continuing
2731: *High Energy Laser Counter ASCM Project (HELCAP)*	0.000	13.541	22.460	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	36.001
2958: *Cyberspace Activities*	0.000	15.416	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	15.416
3400: *Innovative Naval Prototypes (INP) Adv Tech Dev*	0.000	0.000	9.000	4.268	-	4.268	8.290	22.381	31.398	62.370	Continuing	Continuing
3416: *HIJENKS*	0.000	7.392	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	7.392
3423: *LOCUST*	0.000	12.271	67.300	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	79.571
3450: *AMOS*	0.000	3.268	4.478	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	7.746
3451: *CLAWS*	0.000	13.467	7.810	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	21.277
3452: *ELEKTRA*	0.000	12.345	9.845	4.924	-	4.924	6.022	0.000	0.000	0.000	0.000	33.136
3455: *MINERVA*	0.000	12.489	11.814	6.894	-	6.894	7.031	0.000	0.000	0.000	0.000	38.228
3456: *Full Spectrum Undersea Warfare*	0.000	0.000	8.910	9.900	-	9.900	9.900	9.900	9.608	0.000	0.000	48.218
3457: *Long Range Targeting*	0.000	15.027	24.748	44.400	-	44.400	29.300	22.500	0.000	0.000	0.000	135.975
3458: *Undersea Warfare Efforts*	0.000	6.575	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	6.575
3459: *Super Swarm (SS)*	0.000	9.392	14.848	19.800	-	19.800	19.800	0.000	0.000	0.000	0.000	63.840
3461: *MASS*	0.000	0.883	3.957	4.950	-	4.950	4.950	0.000	0.000	0.000	0.000	14.740
3462: *DEALRS*	0.000	0.837	4.948	5.940	-	5.940	5.940	7.920	7.686	0.000	0.000	33.271
3463: *MATes*	0.000	0.768	3.958	4.950	-	4.950	4.950	13.860	13.451	0.000	0.000	41.937
3464: *REDCAT*	0.000	5.457	8.000	13.500	-	13.500	6.000	0.000	0.000	0.000	0.000	32.957
3507: *Chimera*	0.000	0.000	0.000	4.732	-	4.732	15.404	34.415	50.109	67.304	Continuing	Continuing
5899: *Precision Fire Control*	0.000	0.000	0.527	8.673	-	8.673	10.352	19.520	14.394	0.000	0.000	53.466
9999: *Congressional Adds*	0.000	36.008	59.300	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	95.308

Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Navy	Date: March 2023
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 3: *Advanced Technology Development (ATD)*	**R-1 Program Element (Number/Name)** PE 0603801N *I Innovative Naval Prototypes (INP) Adv Tec Dev*

A. Mission Description and Budget Item Justification

The Office of Naval Research (ONR) portfolio includes efforts that solve problems and respond to mission requirements, as well as, exploratory research for new ideas and breakthrough capabilities. Larger in scope, scale and risk Innovative Naval Prototypes (INP) are selected for their high-payoff and potential to revolutionize operational concepts. The efforts described in this Program Element (PE) continue the Applied Research work in PE 0602792N for promising INPs with Advanced Technology Development activities. INP investments define the future of U.S. naval forces. Due to high technical risk, INPs often have long trial-and-error timeframes to work through challenges, but typically no more than three years between decision points. INP efforts mature technologies from a Technology Readiness Level (TRL) of 2 or 3 to a TRL of 6. As such, INPs require applied and advanced technology development funding to bridge from concept to working prototype. INPs prove technological and capability potential, validate production feasibility, and acquisition potential. ONR demonstrates INPs in relevant environments. Successful experimentation and demonstrations present the Department of the Navy with disruptive capabilities that may lead to a new acquisition programs. INPs are selected by senior leadership in the Department of the Navy.

This Program Element (PE) funds Advanced Technology Development (ATD) that includes development of subsystems and components and efforts to integrate subsystems and components into system prototypes for field experiments and/or tests in a simulated environment. Efforts in this PE generally have Technology Readiness Levels TRL) of 4 (component and/or breadboard validation in laboratory environment.), 5 (component and/or breadboard validation in relevant environment.), or 6 (system/subsystem model or prototype demonstration in a relevant environment).

INP investments represent game changing technologies with the potential to revolutionize operational concepts. They are disruptive in nature, as they would dramatically change the way naval forces fight. Due to high technical risk, INPs typically have long duration but have no more than three years between decision points. INPs do not develop hardware for service use, rather they prove technological and production feasibility, and show naval utility and acquisition potential. The Office of Naval Research (ONR) demonstrates INPs in relevant environments. Successful experimentation and demonstrations present the Department of the Navy with disruptive capabilities that may lead to the obsolescence of existing capabilities and acquisition programs. The Department of the Navy would have to make significant acquisition decisions to integrate the new technological capabilities into naval warfighting systems. INPs are selected by a process that involves senior leadership in the Department of the Navy.

Information security concerns preclude fully detailed descriptions of project efforts, research activities, and technology development plans. Specific information on each project and activity will be provided separately to the Congressional oversight committees.

Due to the number of efforts in this PE, the programs described herein are representative of the work included in this PE.

Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Navy	Date: March 2023
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 3: *Advanced Technology Development (ATD)*	**R-1 Program Element (Number/Name)** PE 0603801N *I Innovative Naval Prototypes (INP) Adv Tec Dev*

B. Program Change Summary ($ in Millions)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Previous President's Budget	161.444	144.122	125.431	-	125.431
Current President's Budget	165.136	261.903	132.931	-	132.931
Total Adjustments	3.692	117.781	7.500	-	7.500
• Congressional General Reductions	-	-0.019			
• Congressional Directed Reductions	-	-2.800			
• Congressional Rescissions	-	-			
• Congressional Adds	-	120.600			
• Congressional Directed Transfers	-	-			
• Reprogrammings	9.000	0.000			
• SBIR/STTR Transfer	-5.308	0.000			
• Program Adjustments	0.000	0.000	7.500	-	7.500
• Rate/Misc Adjustments	0.000	0.000	0.000	-	0.000

Congressional Add Details ($ in Millions, and Includes General Reductions)	FY 2022	FY 2023
Project: 9999: *Congressional Adds*		
Congressional Add: *High speed laser cooling systems*	5.792	0.000
Congressional Add: *Advanced ATRT SBIR enterprise capabilities*	15.735	25.300
Congressional Add: *Energetics renaissance*	9.654	0.000
Congressional Add: *Group 3 advanced autonomous*	4.827	5.000
Congressional Add: *Combinded fiber laser arrays without wavefront sensing*	0.000	24.000
Congressional Add: *HEL testing and risk reduction*	0.000	5.000
Congressional Add Subtotals for Project: 9999	36.008	59.300
Congressional Add Totals for all Projects	36.008	59.300

Change Summary Explanation

Funding: Funding increase of $7,500K supports Accelerating Microwave Effects Testbed for Exploring Operational Requirements (METEOR) effort in the REDCAT INP program.

Schedule: not applicable.

Technical: not applicable

Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy			Date: March 2023
Appropriation/Budget Activity 1319 / 3	R-1 Program Element (Number/Name) PE 0603801N / *Innovative Naval Prototypes (INP) Adv Tec Dev*	Project (Number/Name) 2731 / *High Energy Laser Counter ASCM Project (HELCAP)*	

COST ($ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
2731: *High Energy Laser Counter ASCM Project (HELCAP)*	0.000	13.541	22.460	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	36.001
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

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

HELCAP activities in this project (0603801N) include technology assessments, laser lethality investigations, and advanced beam control. Component and Subsystem level operability is being conducted under this project specifically the Beam Control subsystem including active tracking and advanced atmospheric compensation using Adaptive Optics. The Beam Director subsystem testing will occur in a simulated environment (land based) against surrogate ASCM targets. Other subsystems being developed and tested under this project include the automated engagement sequencing, HEL targets and diagnostics subsystems, and an HEL interface compatible with a range of competing HEL source technologies. This project passes technology to follow on HELCAP activities under Program Element (PE) 0603925N Directed Energy and Electric Weapon Systems.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Title: HELCAP	13.541	22.460	0.000	0.000	0.000
Articles:	-	-	-	-	-
Description: The High Energy Laser Counter ASCM Project (HELCAP) expedites 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 various laser weapon system technologies and methods of implementation required to defeat ASCMs in a crossing engagement.					

Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy		Date: March 2023
Appropriation/Budget Activity 1319 / 3	**R-1 Program Element (Number/Name)** PE 0603801N / *Innovative Naval Prototypes (INP) Adv Tec Dev*	**Project (Number/Name)** 2731 / *High Energy Laser Counter ASCM Project (HELCAP)*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
HELCAP activities conducted in this project (0603801N) include technology assessments, laser lethality investigations, and advanced beam control. Component and Subsystem level operability is being conducted under this project specifically the Beam Control subsystem including active tracking and advanced atmospheric compensation using Adaptive Optics. The Beam Director subsystem tested will occur in a simulated environment (land based) against surrogate ASCM targets. Other subsystems being developed and tested under this project include the automated engagement sequencing, HEL targets and diagnostics subsystems, and an HEL interface compatible with a range of competing HEL source technologies. This project passes technology to follow on HELCAP activities conducted under Program Element (PE) 0603925N Directed Energy and Electric Weapon Systems. ***FY 2023 Plans:*** Continue: - Integration phase of an overall multi-year effort whose objective is to conduct development, experimentation, and demonstration of critical technologies to defeat crossing Anti-Ship Cruise Missiles (ASCM) including laser lethality, advanced beam control, and high energy laser sources. Continue: - Integration phase of an overall multi-year effort whose objective is to conduct development, experimentation, and demonstration of critical technologies to defeat crossing Anti-Ship Cruise Missiles (ASCM) including laser lethality, advanced beam control, and high energy laser sources. Complete: - Laser/materiel component interaction testing and support beam control tracker and adaptive optics verification experimentation. - ASCM defeat analysis and assessments including lethality, engagement modeling, atmospheric propagation characterization, and beam control. Continue: - High Power System Integration and Anti-Ship Cruise Missile Detect to Defeat Demonstration preparations - High power system integration demonstration (Demo 2) at White Sands Missile Range (WSMR). Demo 2 serves to prove the technological feasibility and assessments of subsystem and component operability in a simulated land-based environment.					

Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy		Date: March 2023
Appropriation/Budget Activity 1319 / 3	**R-1 Program Element (Number/Name)** PE 0603801N / *Innovative Naval Prototypes (INP) Adv Tec Dev*	**Project (Number/Name)** 2731 / *High Energy Laser Counter ASCM Project (HELCAP)*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Demo 2 will demonstrate subsystem operability to receive and process target tracking, adherence to range safety protocols and user control, and demonstrate laser deconfliction against space assets in user-defined regions. Testing planned includes static and dynamic ground and air-based targets. ***FY 2024 Base Plans:*** N/A ***FY 2024 OCO Plans:*** N/A ***FY 2023 to FY 2024 Increase/Decrease Statement:*** The decrease in funding from FY 2023 to FY 2024 in Proj: 2731 HELCAP is due to program completion.					
Accomplishments/Planned Programs Subtotals	13.541	22.460	0.000	0.000	0.000

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
• RDTEN/ 0603925N/2731: *High Energy Laser Counter ASCM Project*	25.185	6.598	6.194	-	6.194	4.150	4.047	3.388	3.458	Continuing	Continuing

Remarks

D. Acquisition Strategy

N/A

Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy			Date: March 2023
Appropriation/Budget Activity 1319 / 3	R-1 Program Element (Number/Name) PE 0603801N / *Innovative Naval Prototypes (INP) Adv Tec Dev*	Project (Number/Name) 2958 / *Cyberspace Activities*	

COST ($ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
2958: *Cyberspace Activities*	0.000	15.416	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	15.416
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This Project contains all Advanced Technology Development Innovative Naval Prototype (INP) investments that are developing new technologies for cyber warfare. Potential adversaries are investing in advanced technologies that will challenge our advantages in the critical information domain. Nation states and non-state actors seek to degrade our command and control capabilities, networks and computer systems. Cyber threats continue to grow and rapidly proliferate. Technologies developed in this Project will enable the warfighter to take immediate, appropriate action at any time against any desired adversary, target or network by assuring that autonomous, continuous analyses of intelligence, persistent surveillance and open information sources have, at all times, optimized the possible courses of action based on commander's guidance. Technologies within this activity will foster operational endurance and enable sustained operations and resiliency for warfighters and platforms through enhanced cyber security/protection.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Title: Cyber	15.416	0.000	0.000	0.000	0.000
Articles:	-	-	-	-	-
Description: This R2 Activity contains all Advanced Technology Development Innovative Naval Prototype (INP) investments that are developing new technologies for cyber warfare. Potential adversaries are investing in advanced technologies that will challenge our advantages in the critical information domain. Nation states and non-state actors seek to degrade our command and control capabilities, networks and computer systems. Cyber threats continue to grow and rapidly proliferate. Technologies developed in this R2 Activity will enable the warfighter to take immediate, appropriate action at any time against any desired adversary, target or network by assuring that autonomous, continuous analyses of intelligence, persistent surveillance and open information sources have, at all times, optimized the possible courses of action based on commander's guidance. Technologies within this activity will foster operational endurance and enable sustained operations and resiliency for warfighters and platforms through enhanced cyber security/protection.					
FY 2023 Plans: N/A					
FY 2024 Base Plans: N/A					
FY 2024 OCO Plans:					

Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy		Date: March 2023
Appropriation/Budget Activity 1319 / 3	**R-1 Program Element (Number/Name)** PE 0603801N / *Innovative Naval Prototypes (INP) Adv Tec Dev*	**Project (Number/Name)** 2958 / *Cyberspace Activities*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
N/A					
Accomplishments/Planned Programs Subtotals	15.416	0.000	0.000	0.000	0.000

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
• RDTEN/0602792N/2958: *CYBERSPACE ACTIVITIES*	25.208	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	52.075

Remarks

D. Acquisition Strategy

N/A

Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy			Date: March 2023
Appropriation/Budget Activity 1319 / 3	R-1 Program Element (Number/Name) PE 0603801N / *Innovative Naval Prototypes (INP) Adv Tec Dev*	Project (Number/Name) 3400 / *Innovative Naval Prototypes (INP) Adv Tech Dev*	

COST ($ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
3400: *Innovative Naval Prototypes (INP) Adv Tech Dev*	0.000	0.000	9.000	4.268	-	4.268	8.290	22.381	31.398	62.370	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The efforts described in this Project address the Advanced Technology Development associated with the Innovative Naval Prototypes (INP) Program. These investments represent game-changing technologies with the potential to revolutionize operational concepts. They are disruptive in nature, as they would dramatically change the way naval forces fight. Due to high technical risk, INPs typically have long duration but have no more than three years between decision points. They mature technologies from a Technology Readiness Level (TRL) of 2 or 3 to a TRL of 6. As such, INPs require both Budget Activity (BA) 2 and BA3 funding. The BA3 INP funds are specified in a separate Program Element (PE), 0603801N Innovative Naval Prototypes (INP) Adv Tec Dev. INPs do not develop hardware for service use; rather they provide feeder technology that can be demonstrated in prototypes in the 6.3 portion of the INP program. Developing INPs requires a systematic expansion and application of knowledge to develop useful materials, devices, and systems oriented toward the design and development of prototypes applicable to specific mission area requirements. The efforts funded within this PE is focuses on continuing the technology development from the BA2 efforts in order to develop full-scale technology/ operational demonstrations. The Department of the Navy would have to make significant acquisition decisions to integrate the new technological capabilities into naval warfighting systems. INPs are selected by a process that involves senior leadership in the Department of the Navy.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Title: Innovative Naval Prototypes (INP) Adv Tech Dev	0.000	9.000	4.268	0.000	4.268
Articles:	-	-	-	-	-
Description: The efforts described in this Project address the Advanced Technology Development associated with the Innovative Naval Prototypes (INP) Program. These investments represent game-changing technologies with the potential to revolutionize operational concepts. They are disruptive in nature, as they would dramatically change the way naval forces fight. Due to high technical risk, INPs typically have long duration but have no more than three years between decision points. They mature technologies from a Technology Readiness Level (TRL) of 2 or 3 to a TRL of 6. As such, INPs require both Budget Activity (BA) 2 and BA3 funding. The BA3 INP funds are specified in a separate Program Element (PE), 0603801N Innovative Naval Prototypes (INP) Adv Tec Dev. INPs do not develop hardware for service use; rather they provide feeder technology that can be demonstrated in prototypes in the 6.3 portion of the INP program. Developing INPs requires a systematic expansion and application of knowledge to develop useful materials, devices, and systems oriented toward the design and development of prototypes applicable to specific mission area requirements. The efforts funded within this PE is focuses on continuing the technology development from the BA2 efforts in order to develop full-scale technology/					

Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy		Date: March 2023
Appropriation/Budget Activity 1319 / 3	**R-1 Program Element (Number/Name)** PE 0603801N / *Innovative Naval Prototypes (INP) Adv Tec Dev*	**Project (Number/Name)** 3400 / *Innovative Naval Prototypes (INP) Adv Tech Dev*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
operational demonstrations. The Department of the Navy would have to make significant acquisition decisions to integrate the new technological capabilities into naval warfighting systems. INPs are selected by a process that involves senior leadership in the Department of the Navy. ***FY 2023 Plans:*** Initiate exploring promising advanced technology development efforts and identify the best candidates capable of resulting in full-scale technology/operational demonstrations which will inform future INP investment decisions in this activity. This includes identifying technologies that will provide scalable lethality through enabling multi-domain, integrated, scalable kinetic and non-kinetic systems for offensive of defensive purposes. ***FY 2024 Base Plans:*** Continue to explore promising advanced technology development efforts and identify the best candidates capable of resulting in full-scale technology/operational demonstrations which will inform future INP investment decisions in this activity. This includes identifying technologies that will provide scalable lethality through enabling multi-domain, integrated, scalable kinetic and non-kinetic systems for offensive of defensive purposes. ***FY 2024 OCO Plans:*** N/A ***FY 2023 to FY 2024 Increase/Decrease Statement:*** The decrease in funding from FY 2023 to FY 2024 in Proj 3400 INP Advanced Technology Development is due to the success of advanced technology development efforts in FY 2023, which are resulting in future INP investments, and reducing the need for advanced technology development efforts in FY 2024.					
Accomplishments/Planned Programs Subtotals	0.000	9.000	4.268	0.000	4.268

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy			Date: March 2023
Appropriation/Budget Activity 1319 / 3	R-1 Program Element (Number/Name) PE 0603801N / *Innovative Naval Prototypes (INP) Adv Tec Dev*	Project (Number/Name) 3416 / *HIJENKS*	

COST ($ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
3416: *HIJENKS*	0.000	7.392	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	7.392
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The HIgh-power Joint Electromagnetic Non-Kinetic Strike (HIJENKS) INP effort is a non-kinetic High Power Microwave (HPM) payload integrated on an airborne platform will enable the prosecution of multiple targets with area coverage across each target and open targets previously restricted due to collateral damage. HIJENKS increases operational access by disrupting land-based infrastructure facilities tied to adversary systems, decreases cost exchange ratios through non-kinetic engagement, and addresses targets previously restricted due to collateral damage concerns/moral hardening. It expands the competitive space in the electromagnetic spectrum to disrupt, degrade, and destroy critical electronic targets. The Activity identified in Project Unit 3416 specifically addresses Advanced Technology Development in support of the HIJENKS INP effort.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Title: HIJENKS	7.392	0.000	0.000	0.000	0.000
Articles:	-	-	-	-	-
Description: The High Power Joint Electromagnetic Non-Kinetic Strike (HIJENKS) program is a proof-of-concept demonstration of a multi-target, advanced airborne High Power Microwave (HPM) payload capable of disrupting electronic targets non-kinetically. HIJENKS is capable of disrupting land-based electronic system infrastructure and engaging multiple targets with a single airborne weapon, increasing operational access/ decreasing cost exchange ratios, providing area lethality with increased pulse rate, providing options to address limitations on collateral damage, increasing standoff range and expanding magazine depth. HIJENKS will advance the current state-of-the-art in HPM technology and demonstrate the near-term operational benefits of integrating HPM-based Electronic Warfare/Electronic Attack (EW/EA) into the current force structure.					
FY 2023 Plans: N/A					
FY 2024 Base Plans: N/A					
FY 2024 OCO Plans: N/A					
Accomplishments/Planned Programs Subtotals	7.392	0.000	0.000	0.000	0.000

Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy		Date: March 2023
Appropriation/Budget Activity 1319 / 3	**R-1 Program Element (Number/Name)** PE 0603801N / *Innovative Naval Prototypes (INP) Adv Tec Dev*	**Project (Number/Name)** 3416 / *HIJENKS*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
• RDTEN/0602792N/3416: *HIJENKS*	9.619	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	30.652

Remarks

D. Acquisition Strategy

N/A

Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy			Date: March 2023
Appropriation/Budget Activity 1319 / 3	R-1 Program Element (Number/Name) PE 0603801N / *Innovative Naval Prototypes (INP) Adv Tec Dev*	Project (Number/Name) 3423 / *LOCUST*	

COST ($ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
3423: *LOCUST*	0.000	12.271	67.300	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	79.571
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Adversary military modernization and increasing contested domains require a shift in approach "...to strike diverse targets inside adversary air and missile defense networks to destroy mobile power-projection platforms. This will include capabilities to enhance close combat lethality in complex terrain." LOCUST will develop and deliver autonomy, C2 architecture, and a series of modular payloads on a robust, scalable, flexible, multifunctional UAV system; employable from surface, sub-surface, airborne, and ground manned and un-manned systems to provide a dispersed, resilient, and adaptive capability to gain a competitive military advantage. LOCUST will provide ISR and precision loitering munitions capable of being launched from air, surface, ground, and sub-surface platforms to conduct both singular and swarm operations across battlespace in conjunction with Joint and manned operations. It will demonstrate multi-domain launch and strike operations, heterogeneous air platform payloads, unmanned from unmanned operations, distributed control of the strike mission, and refined cost elements for critical technologies that have supply chain assurance addressed. The Activity identified in Project Unit 3423 specifically addresses Advanced Technology Development in support of the LOCUST INP effort.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Title: LOCUST	12.271	67.300	0.000	0.000	0.000
Articles:	-	-	-	-	-
Description: Adversary military modernization and increasing contested domains require a shift in approach "...to strike diverse targets inside adversary air and missile defense networks to destroy mobile power-projection platforms. This will include capabilities to enhance close combat lethality in complex terrain." LOCUST will develop and deliver autonomy, C2 architecture, and a series of modular payloads on a robust, scalable, flexible, multifunctional UAV system; employable from surface, sub-surface, airborne, and ground manned and un-manned systems to provide a dispersed, resilient, and adaptive capability to gain a competitive military advantage. LOCUST will provide ISR and precision loitering munitions capable of being launched from air, surface, ground, and sub-surface platforms to conduct both singular and swarm operations across battlespace in conjunction with Joint and manned operations. It will demonstrate multi-domain launch and strike operations, heterogeneous air platform payloads, unmanned from unmanned operations, distributed control of the strike mission, and refined cost elements for critical technologies that have supply chain assurance addressed.					
FY 2023 Plans: Continue advanced technology development in support of the LOCUST INP. Activities will further the development of key enabling technologies supporting the INDOPACOM requested operational need. These					

Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy		Date: March 2023
Appropriation/Budget Activity 1319 / 3	**R-1 Program Element (Number/Name)** PE 0603801N / *Innovative Naval Prototypes (INP) Adv Tec Dev*	**Project (Number/Name)** 3423 / *LOCUST*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
developments maturation of strike weapon and production of quantities to conduct this as well as two major demonstration events. Warhead, lethality analysis, and launcher developments are also a significant advancement contained in the BA3 effort. FY 2023 funds added for Advanced Concept of Operations. Specific efforts include: - Continue Advanced Technology Development activities to support participation live-fire Fleet experimentation venues. - Initiate payload development that is specific to a Fleet requested operational scenario. This payload is being adapted from applied research conducted under a non-LOCUST activity. The utilization of this technology in the LOCUST concept introduces additional technical risk that will be addressed. - Initiate platform design modifications to increase payload capacity, integrate mission specific payload, and conduct live flight testing. ***FY 2024 Base Plans:*** N/A ***FY 2024 OCO Plans:*** N/A ***FY 2023 to FY 2024 Increase/Decrease Statement:*** The decrease in funding from FY 2023 to FY 2024 in Proj: 3423 LOCUST is due to program completion.					
Accomplishments/Planned Programs Subtotals	12.271	67.300	0.000	0.000	0.000

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
• RDTEN/0602792N/3423: *LOCUST*	19.934	25.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	65.710
• RDTEN/0603382N/3423: *LOCUST*	3.270	40.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	50.156

Remarks

D. Acquisition Strategy

N/A

Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy			Date: March 2023
Appropriation/Budget Activity 1319 / 3	R-1 Program Element (Number/Name) PE 0603801N / *Innovative Naval Prototypes (INP) Adv Tec Dev*	Project (Number/Name) 3450 / *AMOS*	

COST ($ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
3450: *AMOS*	0.000	3.268	4.478	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	7.746
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Arctic Mobile Observing System (AMOS) INP effort will develop a prototype mobile sensing system that can be deployed anywhere in the Arctic via the development of a sea ice-based buoy node that will enable the critical infrastructure (power, communication, environmental intelligence) to provide the Navy with a persistent Arctic presence at lower cost than manned platforms. AMOS is a mobile observing system of systems node that enables 2-way communications, under-ice vehicle navigation, and extended-duration autonomy in the complex Arctic environment. AMOS will provide a persistent, mobile, autonomous capability to monitor the operational environment and maritime operations of potential adversaries in the Arctic Ocean. The Activity identified in Project Unit 3450 specifically addresses Advanced Technology Development in support of the AMOS INP effort.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Title: AMOS	3.268	4.478	0.000	0.000	0.000
Articles:	-	-	-	-	-
Description: The Arctic Mobile Observing System (AMOS) INP effort will develop a prototype mobile sensing system that can be deployed anywhere in the Arctic via the development of a sea ice-based buoy node that will enable the critical infrastructure (power, communication, environmental intelligence) to provide the Navy with a persistent Arctic presence at lower cost than manned platforms. AMOS is a mobile observing system of systems node that enables 2-way communications, under-ice vehicle navigation, and extended-duration autonomy in the complex Arctic environment. AMOS will provide a persistent, mobile, autonomous capability to monitor the operational environment and maritime operations of potential adversaries in the Arctic Ocean.					
FY 2023 Plans: Continue advanced technology development efforts: - Demonstration of navigation and 2-way communications of AMOS platforms and vehicles. Complete All AMOS prototype system and subsystem builds in preparation for end of FY23 deployment. This includes: - Complete construction of all ice tethered buoys, navigation buoys, floats, gliders and UUVs that meet the AMOS prototype requirements and operational concept. - Complete construction of prototype AMOS communication node with final meteorological sensors.					

Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy		Date: March 2023
Appropriation/Budget Activity 1319 / 3	**R-1 Program Element (Number/Name)** PE 0603801N / *Innovative Naval Prototypes (INP) Adv Tec Dev*	**Project (Number/Name)** 3450 / *AMOS*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
- Complete the situational awareness/command and control system to monitor prototype performance during final test and evaluation period. - Initiate final Arctic deployment of full AMOS prototype for test and evaluation ***FY 2024 Base Plans:*** N/A ***FY 2024 OCO Plans:*** N/A ***FY 2023 to FY 2024 Increase/Decrease Statement:*** The decrease in funding from FY 2023 to FY 2024 in Proj: 3450 is due to program completion.					
Accomplishments/Planned Programs Subtotals	3.268	4.478	0.000	0.000	0.000

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
• RDTEN/0602792N/3450: *AMOS*	6.253	8.320	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	22.491

Remarks

D. Acquisition Strategy

N/A

Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy			Date: March 2023
Appropriation/Budget Activity 1319 / 3	R-1 Program Element (Number/Name) PE 0603801N / *Innovative Naval Prototypes (INP) Adv Tec Dev*	Project (Number/Name) 3451 / *CLAWS*	

COST ($ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
3451: *CLAWS*	0.000	13.467	7.810	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	21.277
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The CLAWS INP effort will develop an autonomous unmanned undersea weapon system capable of providing offensive effects to the Combatant Commanders beyond Phase 0 inside the first island chain. It will clandestinely extend the reach of large UUVs and increase the mission areas into kinetic effects. CLAWS will deliver algorithms to enable all families of UUVs to operate in complex, dynamic and degraded environments. CLAWS will demonstrate autonomous missions in denied waters, develop and demonstrate autonomous technologies for survivability of large UUVs, and develop autonomy and launch capabilities for special mission payloads. CLAWS will be able to complete missions 1&2 against near peer adversary defenses, maintain critical communication with Navy C2/Fires and provide critical ISR information. The Activity identified in Project Unit 3451 specifically addresses Advanced Technology Development in support of the CLAWS INP effort.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Title: CLAWS	13.467	7.810	0.000	0.000	0.000
Articles:	-	-	-	-	-
Description: The CLAWS INP effort will develop an autonomous unmanned undersea weapon system capable of providing offensive effects to the Combatant Commanders beyond Phase 0 inside the first island chain. It will clandestinely extend the reach of large UUVs and increase the mission areas into kinetic effects. CLAWS will deliver algorithms to enable all families of UUVs to operate in complex, dynamic and degraded environments. CLAWS will demonstrate autonomous missions in denied waters, develop and demonstrate autonomous technologies for survivability of large UUVs, and develop autonomy and launch capabilities for special mission payloads. CLAWS will be able to complete missions 1&2 against near peer adversary defenses, maintain critical communication with Navy C2/Fires and provide critical ISR information.					
FY 2023 Plans: Continue: Continue the advanced development of autonomy for classified payload 2. Develop adaptive mission planning for swarm of payload to create kinetic effects. In FY 23, technical demostrations for Payload 2 will be completed before final demonstration. Complete: Final report and knowedge transfer of technology to navy acquisition					
FY 2024 Base Plans:					

Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy		Date: March 2023
Appropriation/Budget Activity 1319 / 3	**R-1 Program Element (Number/Name)** PE 0603801N / *Innovative Naval Prototypes (INP) Adv Tec Dev*	**Project (Number/Name)** 3451 / *CLAWS*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
N/A ***FY 2024 OCO Plans:*** N/A ***FY 2023 to FY 2024 Increase/Decrease Statement:*** The decrease in funding from FY 2023 to FY 2024 in Proj: 3451 CLAWS is due to program completion.					
Accomplishments/Planned Programs Subtotals	13.467	7.810	0.000	0.000	0.000

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
• RDTEN/0602792N/3451: *CLAWS*	25.095	2.475	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	47.513

Remarks

D. Acquisition Strategy

N/A

Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy			Date: March 2023
Appropriation/Budget Activity 1319 / 3	R-1 Program Element (Number/Name) PE 0603801N / *Innovative Naval Prototypes (INP) Adv Tec Dev*	Project (Number/Name) 3452 / *ELEKTRA*	

COST ($ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
3452: *ELEKTRA*	0.000	12.345	9.845	4.924	-	4.924	6.022	0.000	0.000	0.000	0.000	33.136
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Complex multi-domain threats can overwhelm the operator and individual platforms ability to defend the force. The ELEKTRA INP effort is developing "Human on the Loop" Artificial Intelligence (AI) enabled algorithms to perform force level kinetic/non-kinetic kill chain optimization and coordination across multiple domains at machine to machine speeds to increase the lethality and survivability of the Force. ELEKTRA will demonstrate AI/ML ability to coordinate kinetic/non kinetic effects autonomously with heterogeneous platforms, the ability to operate in degraded environments for hours and the ability to coordinate and execute domain kill chains simultaneously. It will deploy artificial intelligent (AI) and machine learning (ML) architecture, neural networked computing and large data handling to enable real time, force level effects assignment, coordination and resource management. The Activity identified in Project Unit 3452 specifically addresses Advanced Technology Development in support of the ELEKTRA INP effort.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Title: ELEKTRA	12.345	9.845	4.924	0.000	4.924
Articles:	-	-	-	-	-
Description: Complex multi-domain threats can overwhelm the operator and individual platforms ability to defend the force. The ELEKTRA INP effort is developing "Human on the Loop" Artificial Intelligence (AI) enabled algorithms to perform force level kinetic/non-kinetic kill chain optimization and coordination across multiple domains at machine to machine speeds to increase the lethality and survivability of the Force. ELEKTRA will demonstrate AI/ML ability to coordinate kinetic/non kinetic effects autonomously with heterogeneous platforms, the ability to operate in degraded environments for hours and the ability to coordinate and execute domain kill chains simultaneously. It will deploy artificial intelligent (AI) and machine learning (ML) architecture, neural networked computing and large data handling to enable real time, force level effects assignment, coordination and resource management.					
FY 2023 Plans: Continue: - Development and implementation of artificial intelligence/machine learning functionality for surface and air platforms to include commander's intent, threat evaluation, engage ability and effector management.					

Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy		Date: March 2023
Appropriation/Budget Activity 1319 / 3	**R-1 Program Element (Number/Name)** PE 0603801N / *Innovative Naval Prototypes (INP) Adv Tec Dev*	**Project (Number/Name)** 3452 / *ELEKTRA*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
- Implementation of distributed maritime operations warfare concepts, effects coordination techniques and human-machine teaming concepts. - Demonstrations of complex kinetic/non-kinetic kill chains and battle management functionality in a multi-platform live virtual construct/live experiment. Initiate: - Integration of feedback from FY22 experimentation and identify new analytics and decision support functionality based on results. - Development and demonstration of new human machine interface and effector coordination functionality into airborne platforms.					
FY 2024 Base Plans: Continue: - Development of artificial intelligence/machine learning functionality for surface and air platforms to include commander's intent, threat evaluation, engage ability and effector management. - Incorporate lessons learned from demonstrations of complex kinetic/non-kinetic kill chains and battle management functionality in a multi-platform live virtual construct/live experiment. - Demonstration of new human machine interface and effector coordination functionality into airborne Platforms in LVC - Demonstration of new human machine interface and effector coordination functionality during at sea experimentation and in LVC Initiate: - Evaluation of the functionality for complex kinetic/non-kinetic kill chains and battle management functionality in a multi-platform live virtual construct/live experiment. Complete: - Implementation and testing of artificial intelligence/machine learning functionality for surface and air platforms to include commander's intent, threat evaluation, engage ability and effector management.					
FY 2024 OCO Plans:					

Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy		Date: March 2023
Appropriation/Budget Activity 1319 / 3	**R-1 Program Element (Number/Name)** PE 0603801N / *Innovative Naval Prototypes (INP) Adv Tec Dev*	**Project (Number/Name)** 3452 / *ELEKTRA*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
N/A ***FY 2023 to FY 2024 Increase/Decrease Statement:*** The decrease in funding from FY 2023 to FY 2024 in Proj: 3452 ELEKTRA is due to the completion of planned development, testing and validation of Elektra functionality prior to project completion.					
Accomplishments/Planned Programs Subtotals	12.345	9.845	4.924	0.000	4.924

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
• RDTEN/0602792N/3452: *ELEKTRA*	3.848	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	9.534

Remarks

D. Acquisition Strategy

N/A

Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy			Date: March 2023
Appropriation/Budget Activity 1319 / 3	R-1 Program Element (Number/Name) PE 0603801N / *Innovative Naval Prototypes (INP) Adv Tec Dev*	Project (Number/Name) 3455 / *MINERVA*	

COST ($ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
3455: *MINERVA*	0.000	12.489	11.814	6.894	-	6.894	7.031	0.000	0.000	0.000	0.000	38.228
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The need to operate in a multiple domain environment against highly capable peers requires improved decision quality and reduced decision timelines. MINERVA will develop AI and Machine-Learning (ML) capabilities to improve mission planning, intelligence gathering, execution and assessment. Minerva will deliver next-generation decision aids by combining operations research with emerging AI capabilities to create learning, self-adaptive automation that supports Composite Warfare Commander's (CWC) and their staffs at the Fleet, Force and Group echelons. It will establish a DevOps environment that includes warfighter staffs in the development and integration of new capabilities. The Activity identified in Project Unit 3455 specifically addresses Advanced Technology Development in support of the MINERVA INP effort.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Title: MINERVA	12.489	11.814	6.894	0.000	6.894
Articles:	-	-	-	-	-
Description: The need to operate in a multiple domain environment against highly capable peers requires improved decision quality and reduced decision timelines. MINERVA will develop AI and Machine-Learning (ML) capabilities to improve mission planning, intelligence gathering, execution and assessment. Minerva will deliver next-generation decision aids by combining operations research with emerging AI capabilities to create learning, self-adaptive automation that supports Composite Warfare Commander's (CWC) and their staffs at the Fleet, Force and Group echelons. It will establish a DevOps environment that includes warfighter staffs in the development and integration of new capabilities.					
FY 2023 Plans: Continue: - to develop models that exploit intelligence information and tactical contact reporting to generate probabilistic estimates of target location, intended mission, and projected future location even in face of large time gaps between contacts reports and high degrees of uncertainty over intended target mission. - to develop a multi-objective planner (time scale of days, not hours) that optimizes the limited number of Navy and Marine Corps platforms/assets based on an adversary's order of battle.					

Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy		Date: March 2023
Appropriation/Budget Activity 1319 / 3	**R-1 Program Element (Number/Name)** PE 0603801N / *Innovative Naval Prototypes (INP) Adv Tec Dev*	**Project (Number/Name)** 3455 / *MINERVA*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
- to develop a dynamic waterspace "area" planner that enables staff planners to evaluate developing plans across the seven joint operational functions (command and control, information, intelligence, fires, movement and maneuver, protection, and sustainment). - to develop advanced analytics and prototyping for operational level of war staff planners to optimize Navy and Marine - to develop mixed linear integer program model that assigns air, surface, and undersea effects to a grouping of moving defended targets that can shoot down incoming salvos that can't be targeted until, say, a sensor window on day three. - to develop reinforcement learning models that learn from in-situ and historical data in predicting the next location of the adversary platform location. - to develop a multi-objective multi-warfare domain planner for Future Operations (FOPS) planners to generate and share products used to convey operational and tactical plans. - to experiment and test in real world events and training exercises to improve Minerva's analytic tools. Measure effectiveness of mission planning services, mission execution and adjustment services; and human acceptance of artificial intelligence / machine learning decision aid services. Complete: - integration of unit readiness data into Minerva applications. Up-to-date readiness data combined with Minerva's planning analytic algorithms will help staff planners evaluate Risk to Force / Risk to Mission. - optimized negative search algorithm to aid Maritime Operations Center staff in understanding tradeoff between sensor placement and risk of missing threat. - automated analytics tool to monitor, ingest, parse, and exploit naval chat message traffic in real-time with little to no human intervention. The tool extracts and associates events with their arguments and locations from chat messages. The tool monitors chatrooms to answer questions of who/what/when/where from unstructured text (e.g., naval 9-line reports). Initiate: - mission planning tools for Maritime Operations Center (MOC) logistics planning. ***FY 2024 Base Plans:*** Continue: - Develop a multi-objective planner (time scale of days, not hours) that optimizes the limited number of Navy and Marine Corps platforms/assets based on an adversary's order of battle.					

Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy		Date: March 2023
Appropriation/Budget Activity 1319 / 3	**R-1 Program Element (Number/Name)** PE 0603801N / *Innovative Naval Prototypes (INP) Adv Tec Dev*	**Project (Number/Name)** 3455 / *MINERVA*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
- Develop operational level-of-war plan assignments of many kill-chains (sensors, weapons, contested logistics) to many targets over several days in a manner that balances Navy and USMC offensive coverage and defensive posture in accordance with commanders intent while preserving assets and resources. - Development of a multi-objective multi-warfare domain planner for Future Operations (FOPS) planners in the MOC to generate and share products used to convey operational and tactical plans. - Experiments to measure effectiveness of mission planning services, mission execution and adjustment services; and validate human acceptance of artificial intelligence / machine learning decision aid services. - Development of machine workflow learning algorithms for operational level of war staff planning enable Navy and Marine Corps planning efforts. Complete: - Development of models that exploit intelligence information and tactical contact reporting to generate probabilistic estimates of target location, intended mission, and projected future location even in face of large time gaps between contacts reports and high degrees of uncertainty over intended target mission. - Development a dynamic waterspace "area" planner that enables staff planners to evaluate developing plans across the seven joint operational functions (command and control, information, intelligence, fires, movement and maneuver, protection, and sustainment). - Development of reinforcement learning models that learn from in-situ and historical data in predicting the next location of the adversary platform location Initiate: - Develop mixed linear integer program model that assigns air, surface, and undersea effects to a grouping of moving defended targets that can shoot down incoming salvos that can't be targeted until, say, a sensor window on day three. - Develop Service concepts for resilient logistics webs in a contested environment with multiple options for support, to include distribution networks, and multi-domain delivery methods. - Develop and implement contested logistics/supply chain management models combined with operational Commanders intent. - Develop methodologies that automatically learn domain-specific reasoning in adversarial and deceptive operational level-of-war scenarios while also being computationally lightweight enough to scale to large problem instances.					

Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy		Date: March 2023
Appropriation/Budget Activity 1319 / 3	**R-1 Program Element (Number/Name)** PE 0603801N / *Innovative Naval Prototypes (INP) Adv Tec Dev*	**Project (Number/Name)** 3455 / *MINERVA*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
- Develop real-time, adaptive and robust decision-making systems for multi-agents in the blue team to adaptively combat against the red team and be robust even when the blue agents communication network is under attack. ***FY 2024 OCO Plans:*** N/A ***FY 2023 to FY 2024 Increase/Decrease Statement:*** The decrease in funding from FY 2023 to FY 2024 in Proj: 3455 MINERVA is due to last year of project and focused on transitioning products to POR and Undersea Warfare Decision Support System in CD 23.1 where a new framework for visualization layer for GCCS-M and MTC2 will be delivered.					
Accomplishments/Planned Programs Subtotals	12.489	11.814	6.894	0.000	6.894

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
• RDTEN/0602792N/3455: *MINERVA*	3.847	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	9.557

Remarks

D. Acquisition Strategy

N/A

Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy			Date: March 2023
Appropriation/Budget Activity 1319 / 3	R-1 Program Element (Number/Name) PE 0603801N / *Innovative Naval Prototypes (INP) Adv Tec Dev*	Project (Number/Name) 3456 / *Full Spectrum Undersea Warfare*	

COST ($ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
3456: *Full Spectrum Undersea Warfare*	0.000	0.000	8.910	9.900	-	9.900	9.900	9.900	9.608	0.000	0.000	48.218
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Full Spectrum Undersea Warfare (FSUW) Project will develop new technology for offensive and defensive warfare conducted on the seabed, in the sea (i.e. subsea), and from the sea. This INP focuses on Theatre Undersea Warfare (TUSW), Joint Targeting and Strike, and Subsea and Seabed Warfare (SSW). There are five thrust areas of the FSUW INP that are key to enabling Chief of Naval Operations Guidance (CNOG), Distributed Maritime Operations (DMO), and the Commandant's Stand in Force with manned and unmanned warfighting capability. These thrust areas were specifically chosen in direct collaboration with STRATCOM, INDO-PACOM, Fleet and Undersea Warfare Commanders and validated with regular Flag engagements. These advanced technology developments will enable future undersea weapon systems (e.g., Maritime Strike Tomahawk and ADCAP variants), COCOM campaign, and operational plans. FSUW thrust areas include 1) Undersea effectors, 2) Integrated expeditionary subsea system of systems, 3) Multi-Vehicle Torpedo Tube Development System (MVTTDS) for payload A, 4) Undersea UAV for Over-The-Horizon (OTH) effects and 5) Undersea Launched Devices to enable Commanding Officers and Regional Combatant Commander effects. The thrust areas are technically an operational interconnected. Selected concepts from advanced research will be integrated into viable representative prototypes for field experimentation in a relevant environment. Lessons learned from field experimentation will inform continued applied research spirals to remedy technical shortcomings, expand capability, or define an alternate approach. The Activity identified in Full Spectrum Undersea Warfare, Project 3458, specifically addresses Advanced Technology Development in support of the Full Spectrum Undersea Warfare INP effort. The Applied Research Budget Activity (BA) 2 funding is in a separate Program Element (PE) 0602792N FSUW INP, Project 3456.

Information security concerns preclude fully detailed descriptions of project efforts, research activities, and technology development plans. Specific information on each project and activity will be provided separately to the Congressional oversight committees.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Title: Full Spectrum Undersea Warfare (FSUW)	0.000	8.910	9.900	0.000	9.900
Articles:	-	-	-	-	-
FY 2023 Plans: Continue: Advanced Technology Development associated with the Multi-Vehicle Torpedo Tube Deployment System prototype for Virginia Class submarines including - Prototype construction - Full scale prototype testing - Reload scaled testing					

Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy		Date: March 2023
Appropriation/Budget Activity 1319 / 3	**R-1 Program Element (Number/Name)** PE 0603801N / *Innovative Naval Prototypes (INP) Adv Tec Dev*	**Project (Number/Name)** 3456 / *Full Spectrum Undersea Warfare*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Complete: Design Multi-Vehicle Torpedo Tube Deployment System (MVTTDS) prototype for Virginia Class submarines. Initiate: - Reload viability and features of the MVTTDS (Reloader) - Joint undersea surveillance and targeting UUV sensors for autonomously conducting specific undersea tasks - Small autonomous undersea launched devices. ***FY 2024 Base Plans:*** Continue: - Advanced Technology Development associated with the Multi-Vehicle Torpedo Tube Deployment System (MVTTDS) prototype for Virginia Class submarines including. FY24 tasks inlcude: - MVTTDS Revolver full scale prototype testing - MVTTDS Reloader testing Initiate: - Joint undersea surveillance and targeting (JUST) UUV sensors and sub-system integration for autonomously conducting specific undersea tasks Complete: - Spiral one Prototype construction for MVTTDS prototype for Virginia Class submarines Initiate: - MVTTDS objective payloads design spiral - Full scale operational prototype testing of JUST autonomy on large diameter UUV. ***FY 2024 OCO Plans:*** N/A ***FY 2023 to FY 2024 Increase/Decrease Statement:*** The increase in funding from FY 2023 to FY 2024 in Proj: 3456 FSUSW is due to expand the sizes of devices developed and support spiral development and enable an additional spiral development cycle to commence for Multi Vehicle Torpedo Tube Deployment System to address objective device deployment.					
Accomplishments/Planned Programs Subtotals	0.000	8.910	9.900	0.000	9.900

Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy		Date: March 2023
Appropriation/Budget Activity 1319 / 3	**R-1 Program Element (Number/Name)** PE 0603801N / *Innovative Naval Prototypes (INP) Adv Tec Dev*	**Project (Number/Name)** 3456 / *Full Spectrum Undersea Warfare*

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy			Date: March 2023
Appropriation/Budget Activity 1319 / 3	R-1 Program Element (Number/Name) PE 0603801N / *Innovative Naval Prototypes (INP) Adv Tec Dev*	Project (Number/Name) 3457 / *Long Range Targeting*	

COST ($ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
3457: *Long Range Targeting*	0.000	15.027	24.748	44.400	-	44.400	29.300	22.500	0.000	0.000	0.000	135.975
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Long Range Targeting emphasizes the specific naval use of HF Over the Horizon Radar (OTHR) on maritime platforms and forward-based positive identification technologies to fill gaps in long-range fires kill chains. Technologies within this activity will enable integrated long range naval fires. Investments include technologies for OTH radar antennas, HF antenna arrays, signal processing, and electronic surveillance. Activity identified in Project Unit 3457 specifically addresses Advanced Technology Development in support of the LRT INP effort.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Title: Long Range Targeting	15.027	24.748	44.400	0.000	44.400
Articles:	-	-	-	-	-
Description: Long Range Targeting emphasizes the specific naval use of HF Over the Horizon Radar (OTHR) on maritime platforms and forward-based positive identification technologies to fill gaps in long-range fires kill chains. Technologies within this activity will enable integrated long range naval fires. Investments include technologies for OTH radar antennas, HF antenna arrays, signal processing, and electronic surveillance. Activity identified in Project Unit 3457 specifically addresses Advanced Technology Development in support of the LRT INP effort.					
FY 2023 Plans: - Continue development efforts to incorporate methods and develop technology to exploit Over-the-Horizon (OTH) sensors, In-Scene aids, and sense making phenomenology to refine BLOS target detection, track and positive identification. - Continue planning for test, integration, demonstration and experiment activities for Long Range Targeting. - Continue development of technologies to integrate track data with other sources to feed Battle Management Command and Control (BMC2) kill chain algorithms with the objective of supporting live missions. Continue MOTHR software development; Analyze data from recent HF demonstrations. - Complete the refinement of LRT framework/architecture; Initial increment of MOTHR software; and Test planning for In-Scene Aids data collection #2.					

Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy		Date: March 2023
Appropriation/Budget Activity 1319 / 3	**R-1 Program Element (Number/Name)** PE 0603801N / *Innovative Naval Prototypes (INP) Adv Tec Dev*	**Project (Number/Name)** 3457 / *Long Range Targeting*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
- Initiate At-sea HF phenomenology data collection. ***FY 2024 Base Plans:*** - Continue development efforts to incorporate methods and develop technology to exploit Over-the-Horizon (OTH) sensors, In-Scene aids, and sense making phenomenology to refine BLOS target detection, track and positive identification. - Continue planning for test, integration, demonstration and experiment activities for Long Range Targeting. - Continue development of technologies to integrate track data with other sources to feed Battle Management Command and Control (BMC2) kill chain algorithms with the objective of supporting live missions. Continue MOTHR software development; Analyze data from recent HF demonstrations. - Complete an architecture for using In-scene aids for OTH sensors - Initiate development and testing of MOTHR hardware and software. - Initiate testing long range ES systems for afloat platforms and prepare for at-sea testing. - Initiate testing of sensors and integrating into a high altitude payload. - Initiate testing of land-based ES system for ground forces. ***FY 2024 OCO Plans:*** N/A ***FY 2023 to FY 2024 Increase/Decrease Statement:*** The increase in funding from FY 2023 to FY 2024 in Proj: 3457 - LRT is due to procuring hardware components for the MOTHR transmitter and receiver, procuring antenna parts, and preparing platform for at-sea integration/ testing (shelter integration, RF and power cable installation).					
Accomplishments/Planned Programs Subtotals	15.027	24.748	44.400	0.000	44.400

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy			Date: March 2023
Appropriation/Budget Activity 1319 / 3	R-1 Program Element (Number/Name) PE 0603801N / *Innovative Naval Prototypes (INP) Adv Tec Dev*	Project (Number/Name) 3458 / *Undersea Warfare Efforts*	

COST ($ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
3458: *Undersea Warfare Efforts*	0.000	6.575	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	6.575
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Undersea Warfare Efforts Project will develop new technology for offensive and defensive warfare conducted on the seabed, in the sea (i.e. subsea), and from the sea. Undersea Warfare Efforts as part of Full Spectrum Undersea Warfare (FSUSW) focuses on Theatre Undersea Warfare (TUSW), Joint Targeting and Strike, and Subsea and Seabed Warfare (SSW). There are five thrust areas of the Undersea Warfare Efforts that are key to enabling Chief of Naval Operations Guidance (CNOG), Distributed Maritime Operations (DMO), and the Commandant's Stand in Force with manned and unmanned warfighting capability. These thrust areas were specifically chosen in direct collaboration with STRATCOM, INDO-PACOM, Fleet and Undersea Warfare Commanders and validated with regular Flag engagements. These advanced technology developments will enable future undersea weapon systems (e.g., Maritime Strike Tomahawk and ADCAP variants), COCOM campaign, and operational plans. Undersea Warfare Efforts thrust areas include 1) Undersea effectors, 2) Integrated expeditionary subsea system of systems, 3) Multi-Vehicle Torpedo Tube Development System (MVTTDS) for payload A, 4) Undersea UAV for Over-The-Horizon (OTH) effects and 5) Undersea Launched Devices to enable Commanding Officers and Regional Combatant Commander effects. The thrust areas are technically an operational interconnected. Selected concepts from advanced research will be integrated into viable representative prototypes for field experimentation in a relevant environment. Lessons learned from field experimentation will inform continued applied research spirals to remedy technical shortcomings, expand capability, or define an alternate approach. The Activity identified in the Undersea Warfare Efforts, Project 3458, specifically addresses Advanced Technology Development in support of the Full Spectrum Undersea Warfare INP effort. The Applied Research Budget Activity (BA) 2 funding is in a separate Program Element (PE) 060279N FSUSW INP, Project 3456.

Information security concerns preclude fully detailed descriptions of project efforts, research activities, and technology development plans. Specific information on each project and activity will be provided separately to the Congressional oversight committees.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Title: Undersea Warfare Efforts	6.575	0.000	0.000	0.000	0.000
Articles:	-	-	-	-	-
Description: The Undersea Warfare Efforts Project will develop new technology for offensive and defensive warfare conducted on the seabed, in the sea (i.e. subsea), and from the sea. Undersea Warfare Efforts as part of Full Spectrum Undersea Warfare (FSUSW) focuses on Theatre Undersea Warfare (TUSW), Joint Targeting and Strike, and Subsea and Seabed Warfare (SSW). There are five thrust areas of the Undersea Warfare Efforts that are key to enabling Chief of Naval Operations Guidance (CNOG), Distributed Maritime Operations (DMO), and the Commandant's Stand in Force with manned and unmanned warfighting capability. These thrust areas were specifically chosen in direct collaboration with STRATCOM, INDO-PACOM, Fleet and Undersea Warfare					

Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy		Date: March 2023
Appropriation/Budget Activity 1319 / 3	**R-1 Program Element (Number/Name)** PE 0603801N / *Innovative Naval Prototypes (INP) Adv Tec Dev*	**Project (Number/Name)** 3458 / *Undersea Warfare Efforts*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Commanders and validated with regular Flag engagements. These advanced technology developments will enable future undersea weapon systems (e.g., Maritime Strike Tomahawk and ADCAP variants), COCOM campaign, and operational plans. Undersea Warfare Efforts thrust areas include 1) Undersea effectors, 2) Integrated expeditionary subsea system of systems, 3) Multi-Vehicle Torpedo Tube Development System (MVTTDS) for payload A, 4) Undersea UAV for Over-The-Horizon (OTH) effects and 5) Undersea Launched Devices to enable Commanding Officers and Regional Combatant Commander effects. The thrust areas are technically an operational interconnected. Selected concepts from advanced research will be integrated into viable representative prototypes for field experimentation in a relevant environment. Lessons learned from field experimentation will inform continued applied research spirals to remedy technical shortcomings, expand capability, or define an alternate approach. The Activity identified in the Undersea Warfare Efforts, Project 3458, specifically addresses Advanced Technology Development in support of the Full Spectrum Undersea Warfare INP effort. The Applied Research Budget Activity (BA) 2 funding is in a separate Program Element (PE) 060279N FSUSW INP, Project 3456. Information security concerns preclude fully detailed descriptions of project efforts, research activities, and technology development plans. Specific information on each project and activity will be provided separately to the Congressional oversight committees. ***FY 2023 Plans:*** N/A ***FY 2024 Base Plans:*** N/A ***FY 2024 OCO Plans:*** N/A					
Accomplishments/Planned Programs Subtotals	6.575	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 2024 Navy			Date: March 2023
Appropriation/Budget Activity 1319 / 3	R-1 Program Element (Number/Name) PE 0603801N / *Innovative Naval Prototypes (INP) Adv Tec Dev*	Project (Number/Name) 3459 / *Super Swarm (SS)*	

COST ($ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
3459: *Super Swarm (SS)*	0.000	9.392	14.848	19.800	-	19.800	19.800	0.000	0.000	0.000	0.000	63.840
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Swarming is a concept that allows for multi-domain, heterogeneous swarms of unmanned systems capable of rendering the counter's ability to scale either inadequate or irrelevant and includes offensive and defensive operations, own and adversarial employment, and a physical battlespace ranging from open ocean to ashore. The Super Swarm (SS) INP effort will develop an autonomous control system for multiple USV's consisting of cooperative task allocation, cooperative route planning/behaviors and shared situational awareness. The Swarm autonomy technology is leveraged by other programs including the Medium Displacement Unmanned Surface Vehicle (MDUSV) and the Autonomous USV FNC program. It will consist of the employment of sustainable large-scale robotic swarm warfare across all domains ahead of our adversaries to obviate costly and vulnerable legacy platforms and to gain a competitive advantage. The Activity identified in Project Unit 3459 specifically addresses Advanced Technology Development in support of the Super Swarm INP effort.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Title: Super Swarm (SS)	9.392	14.848	19.800	0.000	19.800
Articles:	-	-	-	-	-
Description: Swarming is a concept that allows for multi-domain, heterogeneous swarms of unmanned systems capable of rendering the counter's ability to scale either inadequate or irrelevant and includes offensive and defensive operations, own and adversarial employment, and a physical battlespace ranging from open ocean to ashore. The Super Swarm (SS) INP effort will develop an autonomous control system for multiple USV's consisting of cooperative task allocation, cooperative route planning/behaviors and shared situational awareness. The Swarm autonomy technology is leveraged by other programs including the Medium Displacement Unmanned Surface Vehicle (MDUSV) and the Autonomous USV FNC program. It will consist of the employment of sustainable large-scale robotic swarm warfare across all domains ahead of our adversaries to obviate costly and vulnerable legacy platforms and to gain a competitive advantage.					
FY 2023 Plans: Continue efforts focused on interaction of multiple autonomy architectures across multiple domains and platforms to generate coordinated and optimized behaviors for the delivery of effects on target. Initiate efforts in dynamic and reactive swarm optimization for complex, highly defended target scenarios.					

Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy		Date: March 2023
Appropriation/Budget Activity 1319 / 3	**R-1 Program Element (Number/Name)** PE 0603801N / *Innovative Naval Prototypes (INP) Adv Tec Dev*	**Project (Number/Name)** 3459 / *Super Swarm (SS)*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Initiate efforts for heterogeneous platform launch integration onto objective Deployment and Employment of Autonomous Long Range Systems (DEALRS) (Project 3462) swarm delivery marsupial host platform. ***FY 2024 Base Plans:*** - Continue efforts focused on interaction of multiple autonomy architectures across multiple domains and platforms to generate coordinated and optimized behaviors for the delivery of effects on target. - Continue dynamic and reactive swarm optimization for complex, highly defended target scenarios. - Complete efforts for heterogeneous platform launch integration onto objective Deployment and Employment of Autonomous Long Range Systems (DEALRS) (PRJ 3642) platforms. - Initiate effort to conduct full-scale force-on-force experimentation for validation of platforms and techniques and defense against relevant target scenarios. ***FY 2024 OCO Plans:*** N/A ***FY 2023 to FY 2024 Increase/Decrease Statement:*** The increase in funding from FY 2023 to FY 2024 in Proj: 3459 Super Swarm is due to increase in number of swarm agents utilized for live testing.					
Accomplishments/Planned Programs Subtotals	9.392	14.848	19.800	0.000	19.800

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy			Date: March 2023
Appropriation/Budget Activity 1319 / 3	R-1 Program Element (Number/Name) PE 0603801N / *Innovative Naval Prototypes (INP) Adv Tec Dev*	Project (Number/Name) 3461 / *MASS*	

COST ($ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
3461: *MASS*	0.000	0.883	3.957	4.950	-	4.950	4.950	0.000	0.000	0.000	0.000	14.740
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

Note

This activity is being broken out from Project Unit 3459 Super Swarm to provide increased visibility and focus on this technical challenge area at the BA3 level.

A. Mission Description and Budget Item Justification

The rising use of air, surface, and sub-surface unmanned and autonomous systems requires a paradigm shift in the development, production, and life-cycle management of these systems in order to gain a competitive advantage against adversarial capabilities as well as allow for fielding of significant numbers (1000's to 10,000's) in an increasingly budget-constrained acquisition environment. The growth in rapid prototyping and additive manufacturing technologies presents an opportunity to capitalize on these advances though technical development and demonstration efforts focused on scale-up both in terms of rapid production of relevant quantities as well as greatly increasing the physical size of platforms produced far beyond what is currently achievable. Manufacturing of Autonomous Systems at Scale (MASS) efforts will utilize wide range of advanced manufacturing methods combined with adaptive digital design processes with "Design for Low-Cost Platform Attriteability" as a major attribute to avoid the platform cost growths normally associated with exquisite systems development. This also represents the ability to rapidly modify platform attributes based on evolving operational needs and quickly insert into build process without costly retooling. Secondary goals focus on increasing commonality of critical components across platforms and design of these in modular fashion in order to manage supply chain vulnerability. Lastly, the project will look at ability to place manufacturing capability as far forward/afloat as possible to reduce the logistics tail and speed delivery of capability at-scale into the fleet. The activity identified in Project Unit 3461 MASS specifically addresses Advanced Technology Development in support of the MASS effort.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Title: Manufacture of Autonomous Systems at Scale (MASS)	0.883	3.957	4.950	0.000	4.950
Articles:	-	-	-	-	-
FY 2023 Plans: Continue Manufacturing of Autonomous Systems at Scale (MASS) efforts to utilize wide range of advanced manufacturing methods based on design for affordable attritability. Continue MASS digital design efforts to couple rapid adaptive processes focused on large scale (both size and quantity) Super Swarm (Project 3459) and Deployment and Employment of Autonomous Long Range Systems (DEALRS) (Project 3462) platforms of interest. Complete MASS experimentation and demonstration efforts of sub/small scale platform concept demonstrators.					

Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy		Date: March 2023
Appropriation/Budget Activity 1319 / 3	**R-1 Program Element (Number/Name)** PE 0603801N / *Innovative Naval Prototypes (INP) Adv Tec Dev*	**Project (Number/Name)** 3461 / *MASS*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Initiate rapidly reconfigurable tooling for large scale structures to enable rapid design iteration / evolution in response to threats. Initiate low-rate batch manufacturing of small-scale platforms in field environments. Initiate initial exploration of application of methodologies to larger-scale structures, components, and platforms across all domains. ***FY 2024 Base Plans:*** - Continue utilizing advanced manufacturing methods (additive manufacturing, composite tooling, etc) based on design for affordable attritability. - Continue MASS digital design efforts to couple rapid adaptive processes focused on large scale (both size and quantity) Super Swarm (Project 3459) and Deployment and Employment of Autonomous Long Range Systems (DEALRS) (Project 3462) platforms of interest. - Continue Super Swarm (Project 3459) and Deployment and Employment of Autonomous Long Range Systems (DEALRS) (Project 3462) platforms of interest. BA3 efforts will focus on swarm agent size/capability enhancements beyond the BA2 level. - Complete low-rate batch manufacturing of small-scale (<5ft) platforms in field environments. - Complete application of rapid manufacturing methodologies to larger-scale structures/platforms for surface platforms. - Initiate low-rate batch manufacturing of large-scale platforms (>20ft) - Initiate experimentation of large scale platforms for validation of manufacturing repeatability and reliability ***FY 2024 OCO Plans:*** N/A ***FY 2023 to FY 2024 Increase/Decrease Statement:*** The increase in funding from FY 2023 to FY 2024 in Proj: MASS is due to manufacturing of full-scale platform concepts.					
Accomplishments/Planned Programs Subtotals	0.883	3.957	4.950	0.000	4.950

Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy		Date: March 2023
Appropriation/Budget Activity 1319 / 3	**R-1 Program Element (Number/Name)** PE 0603801N / *Innovative Naval Prototypes (INP) Adv Tec Dev*	**Project (Number/Name)** 3461 / *MASS*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
• RDTEN/0602792N/3461: *MASS*	4.352	4.950	7.920	-	7.920	0.000	0.000	0.000	0.000	0.000	17.222

Remarks

D. Acquisition Strategy

N/A

Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy			Date: March 2023
Appropriation/Budget Activity 1319 / 3	R-1 Program Element (Number/Name) PE 0603801N / *Innovative Naval Prototypes (INP) Adv Tec Dev*	Project (Number/Name) 3462 / *DEALRS*	

COST ($ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
3462: *DEALRS*	0.000	0.837	4.948	5.940	-	5.940	5.940	7.920	7.686	0.000	0.000	33.271
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

Note

This activity is being broken out from Project Unit 3459 Super Swarm to provide increased visibility and focus on this technical challenge area at the BA3 level.

A. Mission Description and Budget Item Justification

Adversary Anti-Access and Area Denial (A2/AD) capabilities continue to improve but remain focused on targeting specific US and joint force capabilities. The Deployment and Employment of Autonomous Long Range Systems (DEALRS) project will develop technologies that sidestep, operate below the threshold, or deplete adversary A2/AD capabilities. DEALRS will specifically develop technologies to enable low-cost unmanned systems that can maneuver across theater-level ranges to penetrate, operate within, and launch strikes from within adversary A2/AD system coverage. This project will develop technologies to increase the range and endurance of autonomous systems while maintaining tactically relevant speeds, loiter times, and signatures with low cost. It will also address technologies that enable the marsupial launch of terminal engagement autonomous unmanned systems across all domains from larger and/or longer-range host systems that bring them to the launch area and the associated technologies needed to ensure roboticized and autonomous startup and launch of the marsupial systems without human intervention. The Activity identified in Project Unit 3462 DEALRS specifically addresses Advanced Technology Development in support of the INP effort.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Title: Deployment & Employment of Autonomous Long Range Systems (DEALRS)	0.837	4.948	5.940	0.000	5.940
Articles:	-	-	-	-	-
Description: Adversary Anti-Access and Area Denial (A2/AD) capabilities continue to improve but remain focused on targeting specific US and joint force capabilities. The Deployment and Employment of Autonomous Long Range Systems (DEALRS) project will develop technologies that sidestep, operate below the threshold, or deplete adversary A2/AD capabilities. DEALRS will specifically develop technologies to enable low-cost unmanned systems that can maneuver across theater-level ranges to penetrate, operate within, and launch strikes from within adversary A2/AD system coverage. This project will develop technologies to increase the range and endurance of autonomous systems while maintaining tactically relevant speeds, loiter times, and signatures with low cost. It will also address technologies that enable the marsupial launch of terminal engagement autonomous unmanned systems across all domains from larger and/or longer-range host systems that bring them to the launch area and the associated technologies needed to ensure roboticized and autonomous startup and launch of the marsupial systems without human intervention. The Activity identified in					

Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy		Date: March 2023
Appropriation/Budget Activity 1319 / 3	**R-1 Program Element (Number/Name)** PE 0603801N / *Innovative Naval Prototypes (INP) Adv Tec Dev*	**Project (Number/Name)** 3462 / *DEALRS*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Project Unit 3462 DEALRS specifically addresses Advanced Technology Development in support of the INP effort. ***FY 2023 Plans:*** - Continue efforts to explore concepts for the Deployment and Employment of Autonomous Long Range Systems (DEALRS) across all domains. Efforts will focus on platforms enhancements as well as marsupial concepts to allow extremely large numbers of systems to traverse long distances with minimal human intervention to bring them into the operations area. - Continue efforts to demonstrate concepts for DEALRS across all domains. Efforts will focus on scaling up promising concepts to demonstrate trans-Oceanic deployment and employment of large numbers of unmanned systems to deliver desired effects in the areas of operation. - Initiate efforts on scaling up promising concepts to demonstrate trans-Oceanic deployment of low-cost attritable swarm agents and platforms. This will be informed by FY22 and early FY23 Super Swarm (Project 3459), Manufacture of Autonomous Systems at Scale (MASS) (Project 3461) and Manned / Autonomous Teams (MATes) (Project 3463) activities. BA3 efforts will focus on swarm agent range/ endurance enhancements and swarm delivery marsupial host platform development beyond the BA2 level. ***FY 2024 Base Plans:*** - Continue exploring concepts for the Deployment and Employment of Autonomous Long Range Systems (DEALRS) across all domains. Efforts will focus on platforms enhancements as well as marsupial concepts to allow extremely large numbers of systems to traverse long distances with minimal human intervention to bring them into the operations area. - Continue efforts to demonstrate concepts for DEALRS across all domains. Efforts will focus on scaling up promising concepts to demonstrate trans-Oceanic deployment and employment of large numbers of unmanned systems to deliver desired effects in the areas of operation. - Continue scaling up promising concepts to demonstrate trans-Oceanic deployment of low-cost attritable swarm agents and platforms. This will be informed by Super Swarm (Project 3459), Manufacture of Autonomous Systems at Scale (MASS) (Project 3461) and Manned / Autonomous Teams (MATes) (Project 3463) activities.					

Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy		Date: March 2023
Appropriation/Budget Activity 1319 / 3	**R-1 Program Element (Number/Name)** PE 0603801N / *Innovative Naval Prototypes (INP) Adv Tec Dev*	**Project (Number/Name)** 3462 / *DEALRS*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
BA3 efforts will focus on swarm agent range/ endurance enhancements and swarm delivery marsupial host platform development beyond the BA2 level. - Initiate experimentation with intermediate scale concepts for mission specific scenarios. Efforts include integration and at-sea testing of payloads developed under Super Swarm (PRJ 3459). ***FY 2024 OCO Plans:*** N/A ***FY 2023 to FY 2024 Increase/Decrease Statement:*** The increase in funding from FY 2023 to FY 2024 increase is due to increase in on-water testing of full-scale platform concepts.					
Accomplishments/Planned Programs Subtotals	0.837	4.948	5.940	0.000	5.940

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
• RDTEN/0602792N/3462: *DEALRS*	5.804	6.930	10.890	-	10.890	6.930	0.000	0.000	0.000	0.000	30.554

Remarks

D. Acquisition Strategy

N/A

Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy			Date: March 2023
Appropriation/Budget Activity 1319 / 3	R-1 Program Element (Number/Name) PE 0603801N / *Innovative Naval Prototypes (INP) Adv Tec Dev*	Project (Number/Name) 3463 / *MATes*	

COST ($ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
3463: *MATes*	0.000	0.768	3.958	4.950	-	4.950	4.950	13.860	13.451	0.000	0.000	41.937
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

Note

This activity is being broken out from Project Unit 3459 Super Swarm to provide increased visibility and focus on this technical challenge area at the BA3 level.

A. Mission Description and Budget Item Justification

Traditionally, the utilization of autonomous systems is either operationally segregated from manned operations or requires a significant amount of human oversight when operating in conjunction with manned assets, which mitigates some of the advantage from using them. The goal of the Manned and Autonomous Teams (MATes) project is to develop autonomic robotic technology and collaborative autonomous behaviors that seamlessly operate across all domains in conjunction with manned units, allowing for real-time adaptation and optimization in a manner that streamlines the element of human interaction needed to share mission goals. This technology will monitor human or manned system teammate state, behavior, mission, and adversary threat status to anticipate and act in a tactically appropriate manner that is predictable, communicable, and trusted by the human/manned teammates and which enables autonomous system optimization in coordination with the human/manned teammate and mission objectives. Intuitive human/autonomous system interfaces will be developed to allow focus on higher-order decision-making tasks by the operators allowing for large numbers of autonomous systems (100's or 1000's) to be managed in support of manned operations. The activity identified in Project Unit 3463 MAtes specifically addresses Advanced Technology Development in support of the MATes effort.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Title: Manned and Autonomous Teams (MATes)	0.768	3.958	4.950	0.000	4.950
Articles:	-	-	-	-	-
FY 2023 Plans: Continue efforts to explore autonomy, perception, and command and control (C2) concepts for Manned and Autonomous Teams (MATES) conducting complex multi-domain operations in proximity to each other along a spectrum of missions. Missions range from fully autonomous to highly supervised requiring an agile optimization as real-world factors change. Continue efforts to explore autonomy, perception, and command and control (C2) concepts for MATES conducting complex multi-domain operations in proximity to each other along a spectrum of missions.					

Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy		Date: March 2023
Appropriation/Budget Activity 1319 / 3	**R-1 Program Element (Number/Name)** PE 0603801N / *Innovative Naval Prototypes (INP) Adv Tec Dev*	**Project (Number/Name)** 3463 / *MATes*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Initiate demonstration of multiple autonomy architectures across multiple domains conducting re-optimizing behaviors based on changing mission parameters and perception data. Agents will be Super Swarm (Project 3459) agents, and efforts will mutually inform tactical behavior, perception, and autonomy schemas. Initiate experiments to validate command and control with different levels of human oversight and trust. ***FY 2024 Base Plans:*** - Continue exploring autonomy, perception, and command and control (C2) concepts for Manned and Autonomous Teams (MATES) conducting complex multi-domain operations in proximity to each other along a spectrum of missions. Missions range from fully autonomous to highly supervised requiring an agile optimization as real-world factors change. - Continue efforts to explore autonomy, perception, and command and control (C2) concepts for MATES conducting complex multi-domain operations in proximity to each other along a spectrum of missions. - Continue demonstration of multiple autonomy architectures across multiple domains conducting re-optimizing behaviors based on changing mission parameters and perception data. Agents will be Super Swarm (PRJ 3459) agents, and efforts will mutually inform tactical behavior, perception, and autonomy schemas. - Continue experiments to validate command and control with different levels of human oversight and trust. ***FY 2024 OCO Plans:*** N/A ***FY 2023 to FY 2024 Increase/Decrease Statement:*** The increase in funding from FY 2023 to FY 2024 in Proj: 3463 MATes is due to rapid experimentation cycles (monthly) to demonstrate and validate behaviors.					
Accomplishments/Planned Programs Subtotals	0.768	3.958	4.950	0.000	4.950

Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy		Date: March 2023
Appropriation/Budget Activity 1319 / 3	**R-1 Program Element (Number/Name)** PE 0603801N / *Innovative Naval Prototypes (INP) Adv Tec Dev*	**Project (Number/Name)** 3463 / *MATes*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
• RDTEN/0602792N/3463: *MATes*	4.836	6.435	9.900	-	9.900	9.900	4.950	4.804	0.000	Continuing	Continuing

Remarks

D. Acquisition Strategy

N/A

Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy			Date: March 2023
Appropriation/Budget Activity 1319 / 3	R-1 Program Element (Number/Name) PE 0603801N / *Innovative Naval Prototypes (INP) Adv Tec Dev*	Project (Number/Name) 3464 / *REDCAT*	

COST ($ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
3464: *REDCAT*	0.000	5.457	8.000	13.500	-	13.500	6.000	0.000	0.000	0.000	0.000	32.957
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Remote Electromagnetic Disruption of Critical Advanced Threats (REDCAT) will demonstrate High Power Microwave (HPM) integration onto Naval platforms for air defense missions. The objective of the REDCAT rapid prototyping effort is to demonstrate that the REDCAT system is able to detect, track, engage, defeat and assess advanced threats to the ship in a maritime environment. This HPM payload capability will supplement and conserve the ships kinetic defensive weapons. In addition to advancing the HPM source and antenna technologies, this program will also enhance sensor systems well as common weapon console with ongoing laser programs. REDCAT will also develop novel Radio Frequency (RF) waveforms to improve HPM effectiveness. When combined with other non-kinetic capabilities and integrated with the ship's command and control (C2), REDCAT will provide a low cost-per-shot, deep magazine capability for significantly expanding the self-defense capabilities of US Navy platforms. Rapid engagement of targets for large threat raid defeat is a major feature of the system. The system will demonstrate full kill chain integration from find to assess. The payoffs for the REDCAT program include integrated non-kinetic air defense systems to improve the layered defense, optimized use of defensive kinetic weapons and improved sensor and control systems.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Title: REDCAT HPM Test Bed	5.457	8.000	13.500	0.000	13.500
Articles:	-	-	-	-	-
Description: Remote Electromagnetic Disruption of Critical Advanced Threats (REDCAT) will demonstrate High Power Microwave (HPM) integration onto Naval platforms for air defense missions. The objective of the REDCAT rapid prototyping effort is to demonstrate that the REDCAT system is able to detect, track, engage, defeat and assess advanced threats to the ship in a maritime environment. This HPM payload capability will supplement and conserve the ships kinetic defensive weapons. In addition to advancing the HPM source and antenna technologies, this program will also enhance sensor systems well as common weapon console with ongoing laser programs. REDCAT will also develop novel Radio Frequency (RF) waveforms to improve HPM effectiveness. When combined with other non-kinetic capabilities and integrated with the ship's command and control (C2), REDCAT will provide a low cost-per-shot, deep magazine capability for significantly expanding the self-defense capabilities of US Navy platforms. Rapid engagement of targets for large threat raid defeat is a major feature of the system. The system will demonstrate full kill chain integration from find to assess. The payoffs for the REDCAT program include integrated non-kinetic air defense systems to improve the layered defense, optimized use of defensive kinetic weapons and improved sensor and control systems. This effort will also develop and HPM test bed and perform capability demonstrations to fill gaps in effects and mission					

Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy		Date: March 2023
Appropriation/Budget Activity 1319 / 3	**R-1 Program Element (Number/Name)** PE 0603801N / *Innovative Naval Prototypes (INP) Adv Tec Dev*	**Project (Number/Name)** 3464 / *REDCAT*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
modeling of HPM weapons. This includes providing specific measurable data to inform the Terminal Defense NIF gap assessment & closure plans. The goal of the government-developed HPM test bed is to: - Evaluate existing REDCAT prototype hardware for performance and suitability evaluation - Develop detailed effects understanding of HPM lethality capability and thresholds - Inform HPM system requirements and a ship deployable HPM system design ***FY 2023 Plans:*** Continue advanced technology development in support of the REDCAT INP. Specific efforts include the following: - Complete the HPM test bed - Begin integration testing for HPM/EW effects based requirements development. - Contract for antenna completion. - Effects testing initiation and analysis across Navy labs, JHU-APL, and Raytheon. Key Deliverables: Test bed hardware and drawings, Pulsed power assessment test report, EW techniques test report, Mission modeling analysis report, Effects based modeling framework ***FY 2024 Base Plans:*** Continue advanced technology development in support of the REDCAT HPM Testbed effort referred to as Microwave Effects Testbed for Exploring Operational Requirements (METEOR). Specific efforts include the following: Continue -Mission modelling and effects refinement to inform conceptual system design -Electronics effects work with expanded parameters that feed into key Navy requirements definition -Low Power Testing with RF Components and BDA testing with existing sensor capabilities Initiate -Open air propagation - test antenna with test bed in a scaled outdoor environment -Hardware equipment development and testing for candidate alternative subsystems -EMI measurements and shipboard environmental design requirements analysis for integration ***FY 2024 OCO Plans:***					

Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy		Date: March 2023
Appropriation/Budget Activity 1319 / 3	**R-1 Program Element (Number/Name)** PE 0603801N / *Innovative Naval Prototypes (INP) Adv Tec Dev*	**Project (Number/Name)** 3464 / *REDCAT*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
N/A ***FY 2023 to FY 2024 Increase/Decrease Statement:*** The increase in funding from FY 2023 to FY 2024 in Proj: 3464 REDCAT is due to a Navy Terminal Defense directed research focus on accelerated testing for electronic effects under the REDCAT effort that was originally limited to existing hardware only at laboratory level instead of scaled system level. This testing is linked to support data development and mission modelling in support of Navy Integrated Air and Missile Defense (IAMD) layered ship defense. Additional investment is planned for hardware development and evaluation in government and contracted industry efforts that will allow added assessment and understanding across candidate HPM system technologies in this new developmental regime. These systems will also include added focus on assessment towards Naval shipboard requirements in EMI and Environmental considerations beyond a lab only focused testing program to include testing in an operationally relevant environment.					
Accomplishments/Planned Programs Subtotals	5.457	8.000	13.500	0.000	13.500

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy											Date: March 2023	
Appropriation/Budget Activity 1319 / 3					R-1 Program Element (Number/Name) PE 0603801N / *Innovative Naval Prototypes (INP) Adv Tec Dev*				Project (Number/Name) 3507 / *Chimera*			
COST ($ in Millions)	**Prior Years**	**FY 2022**	**FY 2023**	**FY 2024 Base**	**FY 2024 OCO**	**FY 2024 Total**	**FY 2025**	**FY 2026**	**FY 2027**	**FY 2028**	**Cost To Complete**	**Total Cost**
3507: *Chimera*	0.000	0.000	0.000	4.732	-	4.732	15.404	34.415	50.109	67.304	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

Note

Project 3507 is a new start in FY 2024 for the Chimera INP

A. Mission Description and Budget Item Justification

Details at a higher classification

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Title: Chimera	0.000	0.000	4.732	0.000	4.732
Articles:	-	-	-	-	-
Description: Details at a higher classification ***FY 2023 Plans:*** N/A ***FY 2024 Base Plans:*** Details at a higher classification ***FY 2024 OCO Plans:*** N/A ***FY 2023 to FY 2024 Increase/Decrease Statement:*** The increase in funding from FY 2023 to FY 2024 in Proj: 3507 Chimera is due to the initiation of the program.					
Accomplishments/Planned Programs Subtotals	0.000	0.000	4.732	0.000	4.732

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy			Date: March 2023
Appropriation/Budget Activity 1319 / 3	R-1 Program Element (Number/Name) PE 0603801N / *Innovative Naval Prototypes (INP) Adv Tec Dev*	Project (Number/Name) 5899 / *Precision Fire Control*	

COST ($ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
5899: *Precision Fire Control*	0.000	0.000	0.527	8.673	-	8.673	10.352	19.520	14.394	0.000	0.000	53.466
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Precision Fire Control (PFC) effort will develop a fire control architecture that delivers high precision, high update rate guidance solutions to enable cruise missile defense with small, low-cost interceptors and dramatically increase number of interceptors per ship or Expeditionary Advanced Base. It will develop fire control capability for multiple interceptors (missiles and gun projectiles) that contribute to layered defense of surface combatants, expeditionary forces, and homeland protection. Develop PFC-enabled low-cost missile (LCM) based on existing 2.75" rocket components.

The Activity identified in Proj: 5899 Precision Fire Control (PFC) specifically addresses Advanced Technology Development in support of the PFC INP effort.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Title: Precision Fire Control	0.000	0.527	8.673	0.000	8.673
Articles:	-	-	-	-	-
FY 2023 Plans: Initiate Advanced Technology Development in support of the Precision Fire Control (PFC)INP. Specific efforts include the following: - Begin prototyping of PFC fire control elements and Hyper Velocity Projectile (HPV) flight test units.					
FY 2024 Base Plans: - Continue prototyping of Precision Fire-Control (PFC) fire control elements and Hyper Velocity Projectile (HVP) flight test units. - Initiate interceptor guidance testing with HVP and Low Cost Terminal Defense Missile (LCTDM).					
FY 2024 OCO Plans: N/A					
FY 2023 to FY 2024 Increase/Decrease Statement:					

Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy		Date: March 2023
Appropriation/Budget Activity 1319 / 3	**R-1 Program Element (Number/Name)** PE 0603801N / *Innovative Naval Prototypes (INP) Adv Tec Dev*	**Project (Number/Name)** 5899 / *Precision Fire Control*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
The increase in funding from FY 2023 to FY 2024 in Proj: 5899 Precision Fire Control (PFC) is due to the prototyping of PFC fire control elements, fabrication of test articles, and execution of interceptor guidance testing with Hyper Velocity Projectiles and Low Cost Terminal Defense Missiles.					
Accomplishments/Planned Programs Subtotals	0.000	0.527	8.673	0.000	8.673

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy			Date: March 2023
Appropriation/Budget Activity 1319 / 3	R-1 Program Element (Number/Name) PE 0603801N / *Innovative Naval Prototypes (INP) Adv Tec Dev*	Project (Number/Name) 9999 / *Congressional Adds*	

COST ($ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
9999: *Congressional Adds*	0.000	36.008	59.300	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	95.308
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Congressional Interest Items not included in other Projects.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2022	FY 2023
Congressional Add: High speed laser cooling systems ***FY 2022 Accomplishments:*** Conduct high speed laser cooling systems advanced technology development ***FY 2023 Plans:*** N/A	5.792	0.000
Congressional Add: Advanced ATRT SBIR enterprise capabilities ***FY 2022 Accomplishments:*** Conduct advanced ATRT SBIR enterprise capabilities advanced technology development ***FY 2023 Plans:*** Conduct effort to advance prior SBIR Automated Test and Re-Test efforts to address enterprise level: multi-level of security, digital authentication, zero trust and other technologies to ensure supply chain reliability and cyber resiliency.	15.735	25.300
Congressional Add: Energetics renaissance ***FY 2022 Accomplishments:*** Conduct energetics renaissance advanced technology development ***FY 2023 Plans:*** N/A	9.654	0.000
Congressional Add: Group 3 advanced autonomous ***FY 2022 Accomplishments:*** Conduct advanced technology development supporting group 3 advanced autonomous efforts ***FY 2023 Plans:*** Conduct advanced technology development supporting group 3 advanced autonomous efforts.	4.827	5.000
Congressional Add: Combinded fiber laser arrays without wavefront sensing	0.000	24.000

Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy		Date: March 2023
Appropriation/Budget Activity 1319 / 3	**R-1 Program Element (Number/Name)** PE 0603801N / *Innovative Naval Prototypes (INP) Adv Tec Dev*	**Project (Number/Name)** 9999 / *Congressional Adds*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2022	FY 2023
FY 2022 Accomplishments: N/A ***FY 2023 Plans:*** Conduct combined fiber laser arrays without wavefront sensing research.		
Congressional Add: HEL testing and risk reduction ***FY 2022 Accomplishments:*** N/A ***FY 2023 Plans:*** Conduct high-energy laser (HEL) testing/risk reduction effort.	0.000	5.000
Congressional Adds Subtotals	36.008	59.300

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A