Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Navy											Date: March 2024	
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 2023**	**FY 2024**	**FY 2025 Base**	**FY 2025 OCO**	**FY 2025 Total**	**FY 2026**	**FY 2027**	**FY 2028**	**FY 2029**	**Cost To Complete**	**Total Cost**
Total Program Element	0.000	259.356	132.931	131.288	-	131.288	143.123	129.638	129.628	137.350	Continuing	Continuing
1108: *METEOR*	0.000	0.000	0.000	14.441	-	14.441	9.600	0.000	0.000	0.000	0.000	24.041
2731: *High Energy Laser Counter ASCM Project (HELCAP)*	0.000	22.218	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	22.218
3400: *Innovative Naval Prototypes (INP) Adv Tech Dev*	0.000	8.646	4.268	0.000	-	0.000	19.713	21.856	34.824	53.092	Continuing	Continuing
3423: *LOCUST*	0.000	67.120	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	67.120
3450: *AMOS*	0.000	4.344	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	4.344
3451: *CLAWS*	0.000	7.576	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	7.576
3452: *ELEKTRA*	0.000	9.550	4.924	6.022	-	6.022	0.000	0.000	0.000	0.000	0.000	20.496
3455: *MINERVA*	0.000	11.460	6.894	7.031	-	7.031	0.000	0.000	0.000	0.000	0.000	25.385
3456: *Full Spectrum Undersea Warfare*	0.000	8.643	9.900	11.664	-	11.664	17.848	21.408	27.500	21.300	Continuing	Continuing
3457: *Long Range Targeting*	0.000	24.005	44.400	29.300	-	29.300	22.500	0.000	0.000	0.000	0.000	120.205
3459: *Super Swarm (SS)*	0.000	14.402	19.800	19.800	-	19.800	0.000	0.000	0.000	0.000	0.000	54.002
3461: *MASS*	0.000	3.838	4.950	4.950	-	4.950	0.000	0.000	0.000	0.000	0.000	13.738
3462: *DEALRS*	0.000	4.799	5.940	5.940	-	5.940	7.920	7.686	0.000	0.000	0.000	32.285
3463: *MATes*	0.000	3.839	4.950	4.950	-	4.950	13.860	13.451	0.000	0.000	0.000	41.050
3464: *REDCAT*	0.000	11.160	13.500	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	24.660
3507: *Chimera*	0.000	0.000	4.732	16.838	-	16.838	32.162	50.109	67.304	62.958	Continuing	Continuing
5899: *Precision Fire Control*	0.000	0.511	8.673	10.352	-	10.352	19.520	15.128	0.000	0.000	0.000	54.184
9999: *Congressional Adds*	0.000	57.245	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	57.245

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

Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Navy	Date: March 2024
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*

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 2025 Navy	Date: March 2024
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 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
Previous President's Budget	261.903	132.931	127.939	-	127.939
Current President's Budget	259.356	132.931	131.288	-	131.288
Total Adjustments	-2.547	0.000	3.349	-	3.349
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	3.400	0.000			
• SBIR/STTR Transfer	-5.947	0.000			
• Program Adjustments	0.000	0.000	3.349	-	3.349
• Rate/Misc Adjustments	0.000	0.000	0.000	-	0.000

Congressional Add Details ($ in Millions, and Includes General Reductions)	FY 2023	FY 2024
Project: 9999: *Congressional Adds*		
Congressional Add: *Advanced ATRT SBIR enterprise capabilities*	24.423	0.000
Congressional Add: *Group 3 advanced autonomous*	4.827	0.000
Congressional Add: *Combinded fiber laser arrays without wavefront sensing*	23.168	0.000
Congressional Add: *HEL testing and risk reduction*	4.827	0.000
Congressional Add Subtotals for Project: 9999	57.245	0.000
Congressional Add Totals for all Projects	57.245	0.000

Change Summary Explanation

Funding: The FY 2025 funding increase is for High Power Microwave (HPM) Development associated with the METEOR INP to provide a shipboard weapon prototype.

Schedule: not applicable.

Technical: not applicable

Exhibit R-2A, RDT&E Project Justification: PB 2025 Navy			Date: March 2024
Appropriation/Budget Activity 1319 / 3	R-1 Program Element (Number/Name) PE 0603801N / *Innovative Naval Prototypes (INP) Adv Tec Dev*	Project (Number/Name) 1108 / *METEOR*	

COST ($ in Millions)	Prior Years	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	FY 2026	FY 2027	FY 2028	FY 2029	Cost To Complete	Total Cost
1108: *METEOR*	0.000	0.000	0.000	14.441	-	14.441	9.600	0.000	0.000	0.000	0.000	24.041
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

Note

Proj 1108 METEOR is a rename from Proj 3464 REDCAT to support follow-on prototype development from completed sub-system hardware. This is not a new start.

A. Mission Description and Budget Item Justification

Navy surface combatants have Capability/capacity gaps to defend against high volume attacks in Integrated Air and Missile Defense (IAMD). The objective of METEOR is to demonstrate tactically significant, non-kinetic, High Power Microwave (HPM) payload integration onto Naval platforms to defeat, track, engage and assess operational threats while assessing integrated sensors and weapon control options. The METEOR HPM weapon development will provide capability with low cost-per-shot, deep magazine, tactically significant range, short time engagement for multi-target approach, dual deception and defeat capability. This Innovative Naval Prototype (INP) will assess the military utility of a ship-based Integrated Air and Missile Defense (IAMD) HPM weapon, to develop performance requirements via effects and lethality studies, to evaluate current HPM prototype hardware for those requirements, and to mature promising HPM technologies. To assess military utility as part of layered defense in stressing scenarios, METEOR will quantify effectiveness against priority threats, evaluate Battle Damage Assessment (BDA) techniques, and perform mission modeling.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
Title: METEOR	0.000	0.000	14.441	0.000	14.441
Articles:	-	-	-	-	-
Description: Demonstrate tactically significant, non-kinetic, High-Power Microwave (HPM) payload integration onto Naval platforms to defeat, track, engage and assess operational threats while assessing integrated sensors and weapon control options. Transition prior REDCAT hardware into parallel activities to provide a shipboard weapon prototype for integration in FY26 as well as a test bed for continued technology maturation and evaluation. METEOR is a rename that will leverage previous work completed under Proj 3464 REDCAT to support a prototype build capable of at-sea demonstration after land-based testing.					
FY 2024 Plans: N/A					
FY 2025 Base Plans: Initiate:					

Exhibit R-2A, RDT&E Project Justification: PB 2025 Navy		Date: March 2024
Appropriation/Budget Activity 1319 / 3	**R-1 Program Element (Number/Name)** PE 0603801N / *Innovative Naval Prototypes (INP) Adv Tec Dev*	**Project (Number/Name)** 1108 / *METEOR*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
- Development of emerging technologies for future incremental ship base design to include lower cost and lighter weight antenna designs and compact pulsed power drivers - Design and analysis of automated engagement algorithms to reduce time between engagements - Additional pulsed power and HPM source technology development for future technological assessment in subsystem laboratory level tests, building upon prior REDCAT and earlier applied research efforts - High Power Microwave Test Bed functional checkout at sub system level and system level test series - test bed evaluation in laboratory environment of candidate technologies that provide lighter weight, more compact or lower cost solutions for future increments - Embedded control and weapon console software development and test for future integration into ship combat system - EMI measurements and integrated topside design analysis of candidate ship installation location - Integration of residual REDCAT hardware into METEOR laboratory test bed - Shipboard antenna analysis for integration onto ship - Mission modeling and effects refinement to inform conceptual system design for future increment - System engineering products to support ship installation activities - System reconfiguration into shipboard installation reinforced structure - Prototype ship integration system safety analysis Complete - Open air propagation - test antenna with test bed in a scaled outdoor environment - Ship specific HPM system integration and shipboard shock, vibration and environmental test at the subsystem level -Build of doghouse mechanical enclosure with integrated support structures suitable for shipboard demonstration in maritime environment - Low Power Testing with RF Components and BDA testing with existing sensor capabilities - Electronics effects testing and analysis with expanded parameters that feed into key performance parameters requirements definition for future increments - Full system integration at land-based test site - Full system demonstration at Point Mugu Sea Range against a dynamic surrogate target					
FY 2025 OCO Plans:					

Exhibit R-2A, RDT&E Project Justification: PB 2025 Navy		Date: March 2024
Appropriation/Budget Activity 1319 / 3	**R-1 Program Element (Number/Name)** PE 0603801N / *Innovative Naval Prototypes (INP) Adv Tec Dev*	**Project (Number/Name)** 1108 / *METEOR*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
N/A ***FY 2024 to FY 2025 Increase/Decrease Statement:*** The increase in funding from FY 2024 to FY 2025 in Proj 1108 METEOR is due to program follow-on prototype development from completed sub-system hardware in Proj 3464 REDCAT.					
Accomplishments/Planned Programs Subtotals	0.000	0.000	14.441	0.000	14.441

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

Exhibit R-2A, RDT&E Project Justification: PB 2025 Navy			Date: March 2024
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 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	FY 2026	FY 2027	FY 2028	FY 2029	Cost To Complete	Total Cost
2731: *High Energy Laser Counter ASCM Project (HELCAP)*	0.000	22.218	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	22.218
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 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
Title: HELCAP	22.218	0.000	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 2025 Navy		Date: March 2024
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 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 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 testing will occur in a lab-based simulated environment against surrogate ASCM target materials. 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 2024 Plans:*** N/A ***FY 2025 Base Plans:*** N/A ***FY 2025 OCO Plans:*** N/A					
Accomplishments/Planned Programs Subtotals	22.218	0.000	0.000	0.000	0.000

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	FY 2026	FY 2027	FY 2028	FY 2029	Cost To Complete	Total Cost
• RDTEN/ 0603925N/2731: *High Energy Laser Counter ASCM Project*	6.400	6.194	4.137	-	4.137	0.000	0.000	0.000	0.000	0.000	78.243

Remarks

D. Acquisition Strategy

N/A

Exhibit R-2A, RDT&E Project Justification: PB 2025 Navy											Date: March 2024	
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 2023**	**FY 2024**	**FY 2025 Base**	**FY 2025 OCO**	**FY 2025 Total**	**FY 2026**	**FY 2027**	**FY 2028**	**FY 2029**	**Cost To Complete**	**Total Cost**
3400: *Innovative Naval Prototypes (INP) Adv Tech Dev*	0.000	8.646	4.268	0.000	-	0.000	19.713	21.856	34.824	53.092	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 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
Title: Innovative Naval Prototypes (INP) Adv Tech Dev	8.646	4.268	0.000	0.000	0.000
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 2025 Navy		Date: March 2024
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 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 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 2024 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 2025 Base Plans:*** N/A ***FY 2025 OCO Plans:*** N/A ***FY 2024 to FY 2025 Increase/Decrease Statement:*** The decrease in funding from FY 2024 to FY 2025 in Proj: 3400 INP Advanced Technology Development is due to the allocation of funding to specific full-scale INP demonstrations.					
Accomplishments/Planned Programs Subtotals	8.646	4.268	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 2025 Navy			Date: March 2024
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 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	FY 2026	FY 2027	FY 2028	FY 2029	Cost To Complete	Total Cost
3423: *LOCUST*	0.000	67.120	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	67.120
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 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
Title: LOCUST	67.120	0.000	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 2024 Plans: N/A					
FY 2025 Base Plans:					

Exhibit R-2A, RDT&E Project Justification: PB 2025 Navy		Date: March 2024
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 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
N/A ***FY 2025 OCO Plans:*** N/A					
Accomplishments/Planned Programs Subtotals	67.120	0.000	0.000	0.000	0.000

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	FY 2026	FY 2027	FY 2028	FY 2029	Cost To Complete	Total Cost
• RDTEN/0602792N/3423: *LOCUST*	25.000	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	65.710
• RDTEN/0603382N/3423: *LOCUST*	40.000	0.000	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 2025 Navy			Date: March 2024
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 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	FY 2026	FY 2027	FY 2028	FY 2029	Cost To Complete	Total Cost
3450: *AMOS*	0.000	4.344	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	4.344
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 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
Title: AMOS	4.344	0.000	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 2024 Plans:*** N/A ***FY 2025 Base Plans:*** N/A ***FY 2025 OCO Plans:*** N/A					
Accomplishments/Planned Programs Subtotals	4.344	0.000	0.000	0.000	0.000

Exhibit R-2A, RDT&E Project Justification: PB 2025 Navy		Date: March 2024
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*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	FY 2026	FY 2027	FY 2028	FY 2029	Cost To Complete	Total Cost
• RDTEN/0602792N/3450: *AMOS*	8.320	0.000	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 2025 Navy			Date: March 2024
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 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	FY 2026	FY 2027	FY 2028	FY 2029	Cost To Complete	Total Cost
3451: *CLAWS*	0.000	7.576	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	7.576
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 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
Title: CLAWS	7.576	0.000	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 2024 Plans: N/A					
FY 2025 Base Plans: N/A					
FY 2025 OCO Plans: N/A					
Accomplishments/Planned Programs Subtotals	7.576	0.000	0.000	0.000	0.000

Exhibit R-2A, RDT&E Project Justification: PB 2025 Navy		Date: March 2024
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*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	FY 2026	FY 2027	FY 2028	FY 2029	Cost To Complete	Total Cost
• RDTEN/0602792N/3451: *CLAWS*	2.475	0.000	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 2025 Navy			Date: March 2024
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 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	FY 2026	FY 2027	FY 2028	FY 2029	Cost To Complete	Total Cost
3452: *ELEKTRA*	0.000	9.550	4.924	6.022	-	6.022	0.000	0.000	0.000	0.000	0.000	20.496
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 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
Title: ELEKTRA	9.550	4.924	6.022	0.000	6.022
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 2024 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.					

Exhibit R-2A, RDT&E Project Justification: PB 2025 Navy		Date: March 2024
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 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
- 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 2025 Base Plans: Complete: - Development of artificial intelligence/machine learning functionality for surface and air platforms to include commander's intent, threat evaluation, engage ability and effector management. - 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. - Demonstration of 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 - Evaluation of the functionality for complex kinetic/non-kinetic kill chains and battle management functionality in a multi-platform live virtual construct/live experiment. - Final demonstration in LVC/At-sea event.					
FY 2025 OCO Plans: N/A					
FY 2024 to FY 2025 Increase/Decrease Statement:					

Exhibit R-2A, RDT&E Project Justification: PB 2025 Navy		Date: March 2024
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 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
The increase in funding from FY 2024 to FY 2025 in Proj: 3452 ELEKTRA is required for virtual and at-sea testing, demonstration, and validation of Elektra functionality prior to project completion.					
Accomplishments/Planned Programs Subtotals	9.550	4.924	6.022	0.000	6.022

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

Exhibit R-2A, RDT&E Project Justification: PB 2025 Navy			Date: March 2024
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 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	FY 2026	FY 2027	FY 2028	FY 2029	Cost To Complete	Total Cost
3455: *MINERVA*	0.000	11.460	6.894	7.031	-	7.031	0.000	0.000	0.000	0.000	0.000	25.385
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 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
Title: MINERVA	11.460	6.894	7.031	0.000	7.031
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 2024 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. - 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.					

Exhibit R-2A, RDT&E Project Justification: PB 2025 Navy		Date: March 2024
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 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
- 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. - 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 2025 Base Plans: Complete:					

Exhibit R-2A, RDT&E Project Justification: PB 2025 Navy		Date: March 2024
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 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
- Multi-objective planner (time scale of days, not hours) that optimizes the limited number of Navy and Marine Corps platform or assets based on an adversary's order of battle. - Development and demonstration of operational level-of-war plan assignments of many kill-chains (sensors, weapons, and 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 and demonstration 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 and assessment of machine workflow learning algorithms for operational level of war staff planning enable Navy and Marine Corps planning efforts. - Complete and demonstrate mixed integer program model that assigns air, maritime, land, and undersea effects to a grouping of moving or static defended targets. - Complete integration and demonstration of undersea waterspace assignments with multi-objective planner to enable Joint Force Maritime Component Commander's staff to assign U.S. submarine forces weapons effects against adversary targets. Capability enables staff to generate holistic theater asset-target assignments by including undersea weapons with other warfighting domain weapons. - Complete and demonstrate machine-to-machine management for classes of supplies and readiness data interfaces that enhance operational level-of-war Future Operations planning to optimize blue force laydown against red's order of battle. Continue: - Demonstrate multi-objective planner at PAC Northwest 2025 exercise. The planner will enable Joint Force Maritime Component Commanders staff to generate lots of interesting "what if" scenarios to understand the relationship between fires, contested logistics, and maneuver. - Demonstrate Joint Force Maritime Component Commander staff using Minervas multi-objective planner improves Future Operations (FOPS) plans, enables staff critical thinking, quantifies risk to force or risk to mission compared to legacy staff planning tools. - 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.					

Exhibit R-2A, RDT&E Project Justification: PB 2025 Navy		Date: March 2024
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 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
- Develop and implement contested logistics/supply chain management models combined with operational Commanders intent. ***FY 2025 OCO Plans:*** N/A ***FY 2024 to FY 2025 Increase/Decrease Statement:*** There is no significant change in funding from FY 2024 to FY 2025 in Proj: 3455 Minerva.					
Accomplishments/Planned Programs Subtotals	11.460	6.894	7.031	0.000	7.031

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

Exhibit R-2A, RDT&E Project Justification: PB 2025 Navy			Date: March 2024
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 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	FY 2026	FY 2027	FY 2028	FY 2029	Cost To Complete	Total Cost
3456: *Full Spectrum Undersea Warfare*	0.000	8.643	9.900	11.664	-	11.664	17.848	21.408	27.500	21.300	Continuing	Continuing
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 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
Title: Full Spectrum Undersea Warfare (FSUW)	8.643	9.900	11.664	0.000	11.664
Articles:	-	-	-	-	-
FY 2024 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					

Exhibit R-2A, RDT&E Project Justification: PB 2025 Navy		Date: March 2024
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 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
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 2025 Base Plans:*** Continue: - Advanced Technology Development associated with the Multi-Vehicle Torpedo Tube Deployment System (MVTTDS) prototype for Virginia Class submarines, which includes Revolver and Reloader including at sea (on a submarine) Revolver prototype testing and model validation Complete - Validation of submarine/revolver models with at sea data - Joint Undersea Surveillance and Targeting (JUST) operational demonstration on large diameter UUV for autonomously conducting specific undersea tasks for USSTRATCOM and USNORTHCOM Initiate: - Spiral development build of next generation Revolver, incorporating capability improvements for objective payloads - Advanced development of components and system for at sea operations, including resiliency and reliability of Submarine Launched UAV hardware and software for select missions. ***FY 2025 OCO Plans:*** N/A ***FY 2024 to FY 2025 Increase/Decrease Statement:*** The increase in funding from FY 2024 to FY 2025 in Proj: 3456 Full Spectrum Undersea Warfare is due to the funds required to do unplanned advanced technology development for hardware resiliency on the 3-inch					

Exhibit R-2A, RDT&E Project Justification: PB 2025 Navy		Date: March 2024
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 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
submarine launched UAV, which is outside of the planned applied research programmed for intelligence and constrained space, weight, power development.					
Accomplishments/Planned Programs Subtotals	8.643	9.900	11.664	0.000	11.664

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

Exhibit R-2A, RDT&E Project Justification: PB 2025 Navy			Date: March 2024
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 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	FY 2026	FY 2027	FY 2028	FY 2029	Cost To Complete	Total Cost
3457: *Long Range Targeting*	0.000	24.005	44.400	29.300	-	29.300	22.500	0.000	0.000	0.000	0.000	120.205
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 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
Title: Long Range Targeting	24.005	44.400	29.300	0.000	29.300
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 2024 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.					

Exhibit R-2A, RDT&E Project Justification: PB 2025 Navy		Date: March 2024
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 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
- 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 2025 Base Plans:*** Continue: -Development efforts to investigate HF technologoes for Over-the-Horizon (OTH) sensors to enable target detection, tracking, and identification -Design, build, and test the prototype Maritime Over-the-Horizon Radar (MOTHR) -Developing long range passive systems for long range target ID -Developing technologies to integrate various radar tracks and HF radar targets Initiate: -System level testing and demonstration for Long Range Targeting using OTHR -System-level testing of prototype passive systems -Planning for final LRT Final Demonstration ***FY 2025 OCO Plans:*** N/A ***FY 2024 to FY 2025 Increase/Decrease Statement:*** The decrease in funding from FY 2024 to FY 2025 in Proj: 3457 LRT reflects the completion of initial development and testing of Maritime Over-the-Horizon Radar (MOTHR) hardware and software.					
Accomplishments/Planned Programs Subtotals	24.005	44.400	29.300	0.000	29.300

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

Exhibit R-2A, RDT&E Project Justification: PB 2025 Navy			Date: March 2024
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 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	FY 2026	FY 2027	FY 2028	FY 2029	Cost To Complete	Total Cost
3459: *Super Swarm (SS)*	0.000	14.402	19.800	19.800	-	19.800	0.000	0.000	0.000	0.000	0.000	54.002
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 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
Title: Super Swarm (SS)	14.402	19.800	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 2024 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.					

Exhibit R-2A, RDT&E Project Justification: PB 2025 Navy		Date: March 2024
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 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
- 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 2025 Base Plans:*** Complete all activities from FY24 to include 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. - Dynamic and reactive swarm optimization for complex, highly defended target scenarios. - Heterogeneous platform launch integration onto objective Deployment and Employment of Autonomous Long Range Systems (DEALRS) (PRJ 3642) platforms. - Full-scale force-on-force experimentation for validation of platforms and techniques and defense against relevant target scenarios. ***FY 2025 OCO Plans:*** N/A ***FY 2024 to FY 2025 Increase/Decrease Statement:*** There is no change in funding from FY 2024 to FY 2025 in Proj: 3459 Super Swarm.					
Accomplishments/Planned Programs Subtotals	14.402	19.800	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 2025 Navy										Date: March 2024		
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 2023**	**FY 2024**	**FY 2025 Base**	**FY 2025 OCO**	**FY 2025 Total**	**FY 2026**	**FY 2027**	**FY 2028**	**FY 2029**	**Cost To Complete**	**Total Cost**
3461: *MASS*	0.000	3.838	4.950	4.950	-	4.950	0.000	0.000	0.000	0.000	0.000	13.738
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 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
Title: Manufacture of Autonomous Systems at Scale (MASS)	3.838	4.950	4.950	0.000	4.950
Articles:	-	-	-	-	-
FY 2024 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.					

Exhibit R-2A, RDT&E Project Justification: PB 2025 Navy		Date: March 2024
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 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
- 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 2025 Base Plans:*** Complete all efforts from FY24 to include those focused on: - Utilizing advanced manufacturing methods (additive manufacturing, composite tooling, etc) based on design for affordable attritability. - 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. - Manufacturing challenges associated with Super Swarm (Project 3459) and Deployment and Employment of Autonomous Long Range Systems (DEALRS) (Project 3462) platforms of interest. - Low-rate expeditionary batch manufacturing of large-scale platforms (>20ft) - Experimentation of large scale platforms for validation of manufacturing repeatability and reliability ***FY 2025 OCO Plans:*** N/A ***FY 2024 to FY 2025 Increase/Decrease Statement:*** There is no change in funding from FY 2024 to FY 2025 in Proj: 3461 MASS.					
Accomplishments/Planned Programs Subtotals	3.838	4.950	4.950	0.000	4.950

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	FY 2026	FY 2027	FY 2028	FY 2029	Cost To Complete	Total Cost
• RDTEN/0602792N/3461: *MASS*	4.950	7.920	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	17.222

Remarks

Exhibit R-2A, RDT&E Project Justification: PB 2025 Navy		Date: March 2024
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*

D. Acquisition Strategy

N/A

Exhibit R-2A, RDT&E Project Justification: PB 2025 Navy											Date: March 2024	
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 2023**	**FY 2024**	**FY 2025 Base**	**FY 2025 OCO**	**FY 2025 Total**	**FY 2026**	**FY 2027**	**FY 2028**	**FY 2029**	**Cost To Complete**	**Total Cost**
3462: *DEALRS*	0.000	4.799	5.940	5.940	-	5.940	7.920	7.686	0.000	0.000	0.000	32.285
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 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
Title: Deployment & Employment of Autonomous Long Range Systems (DEALRS)	4.799	5.940	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 2025 Navy		Date: March 2024
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 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
Project Unit 3462 DEALRS specifically addresses Advanced Technology Development in support of the INP effort. ***FY 2024 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. 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 2025 Base Plans:*** Continue - Scaling up promising concepts to demonstrate trans-Oceanic deployment of low-cost attritable swarm agents and platforms. Complete - Experimentation with intermediate scale concept. Initiate - Experimentation in large scale concept platforms for marsupial swarm delivery. ***FY 2025 OCO Plans:***					

Exhibit R-2A, RDT&E Project Justification: PB 2025 Navy		Date: March 2024
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 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
N/A ***FY 2024 to FY 2025 Increase/Decrease Statement:*** There is no change in funding from FY 2024 to FY 2025 in Proj: 3462 DEALRS.					
Accomplishments/Planned Programs Subtotals	4.799	5.940	5.940	0.000	5.940

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	FY 2026	FY 2027	FY 2028	FY 2029	Cost To Complete	Total Cost
• RDTEN/0602792N/3462: *DEALRS*	6.930	10.890	6.930	-	6.930	0.000	0.000	0.000	0.000	0.000	30.554

Remarks

D. Acquisition Strategy

N/A

Exhibit R-2A, RDT&E Project Justification: PB 2025 Navy			Date: March 2024
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 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	FY 2026	FY 2027	FY 2028	FY 2029	Cost To Complete	Total Cost
3463: *MATes*	0.000	3.839	4.950	4.950	-	4.950	13.860	13.451	0.000	0.000	0.000	41.050
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 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
Title: Manned and Autonomous Teams (MATes)	3.839	4.950	4.950	0.000	4.950
Articles:	-	-	-	-	-
FY 2024 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.					

Exhibit R-2A, RDT&E Project Justification: PB 2025 Navy		Date: March 2024
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 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
- 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 2025 Base Plans:*** Continue all activities from FY24 to include those focused on: - 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. - 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. - 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. - Experiments to validate command and control with different levels of human oversight and trust. ***FY 2025 OCO Plans:*** N/A ***FY 2024 to FY 2025 Increase/Decrease Statement:*** There is no change in funding from FY 2024 to FY 2025 in Proj: 3463 MATes.					
Accomplishments/Planned Programs Subtotals	3.839	4.950	4.950	0.000	4.950

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	FY 2026	FY 2027	FY 2028	FY 2029	Cost To Complete	Total Cost
• RDTEN/0602792N/3463: *MATes*	6.435	9.900	9.900	-	9.900	4.950	4.804	0.000	0.000	Continuing	Continuing

Remarks

D. Acquisition Strategy

N/A

Exhibit R-2A, RDT&E Project Justification: PB 2025 Navy			Date: March 2024
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 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	FY 2026	FY 2027	FY 2028	FY 2029	Cost To Complete	Total Cost
3464: *REDCAT*	0.000	11.160	13.500	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	24.660
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 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
Title: REDCAT HPM Test Bed	11.160	13.500	0.000	0.000	0.000
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 2025 Navy		Date: March 2024
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 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 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 2024 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 2025 Base Plans:*** Complete - Subsystem laboratory level testing of prototype pulsed power driver and HPM sources to transfer to METEOR test bed for future experimentation - Development of REDCAT subsystem hardware of pulsed power driver and HPM sources for integration into the METEOR shipboard prototype weapon - Integrate prototype pulsed power with ship power converter surrogate - Mechanical prototype HPM weapon system integration of HPM source and pulsed power driver - Electronics effects work with expanded parameters that feed into key Navy requirements definition - Low Power Weapon Effects and Lethality Testing of critical components - Mission modeling and effects refinement to inform conceptual system design for future METEOR increments ***FY 2025 OCO Plans:***					

Exhibit R-2A, RDT&E Project Justification: PB 2025 Navy		Date: March 2024
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 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
N/A ***FY 2024 to FY 2025 Increase/Decrease Statement:*** The decrease in funding from FY 2024 to FY 2025 in Proj: 3464 REDCAT is due to a large portions of hardware build completed and moving into the testing phase.					
Accomplishments/Planned Programs Subtotals	11.160	13.500	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 2025 Navy											Date: March 2024	
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 2023**	**FY 2024**	**FY 2025 Base**	**FY 2025 OCO**	**FY 2025 Total**	**FY 2026**	**FY 2027**	**FY 2028**	**FY 2029**	**Cost To Complete**	**Total Cost**
3507: *Chimera*	0.000	0.000	4.732	16.838	-	16.838	32.162	50.109	67.304	62.958	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Details at a higher classification

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
Title: Chimera	0.000	4.732	16.838	0.000	16.838
Articles:	-	-	-	-	-
Description: Details at a higher classification ***FY 2024 Plans:*** Details at a higher classification ***FY 2025 Base Plans:*** Continue: - Development of Information Warfare advanced technology research efforts. - Deliver initial capabilities. Details at a higher classification ***FY 2025 OCO Plans:*** N/A ***FY 2024 to FY 2025 Increase/Decrease Statement:*** The increase in funding from FY 2024 to FY 2025 in Proj 3507 Chimera is to support demonstration and delivery of software capabilities to Programs of Record while continuing development of software capabilities and development of hardware. Additional details can be provided at a higher classification.					
Accomplishments/Planned Programs Subtotals	0.000	4.732	16.838	0.000	16.838

C. Other Program Funding Summary ($ in Millions)

N/A

Exhibit R-2A, RDT&E Project Justification: PB 2025 Navy		Date: March 2024
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*

C. Other Program Funding Summary ($ in Millions)

Remarks

D. Acquisition Strategy

N/A

Exhibit R-2A, RDT&E Project Justification: PB 2025 Navy			Date: March 2024
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 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	FY 2026	FY 2027	FY 2028	FY 2029	Cost To Complete	Total Cost
5899: *Precision Fire Control*	0.000	0.511	8.673	10.352	-	10.352	19.520	15.128	0.000	0.000	0.000	54.184
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 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
Title: Precision Fire Control	0.511	8.673	10.352	0.000	10.352
Articles:	-	-	-	-	-
FY 2024 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 2025 Base Plans: Continue - Design and Prototyping of PFC Increment 2 fire control elements - Procurement of 2-3 Hyper Velocity Projectile (HVP) and 15 Low Cost Terminal Defense Missile (LCTDM) flight test units. - Interceptor guidance testing with HVP and LCTDM. - Combat systems integration studies. Complete - Ship integration studies					

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B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
- Design and Prototyping of Precision Fire-Control (PFC) Increment 1 fire control elements. ***FY 2025 OCO Plans:*** N/A ***FY 2024 to FY 2025 Increase/Decrease Statement:*** The increase in funding from FY 2024 to FY 2025 in Proj 5899 Precision Fire Control is due to fabrication of the prototype multi-function data link (MFDL) fire control element and procurement of test articles.					
Accomplishments/Planned Programs Subtotals	0.511	8.673	10.352	0.000	10.352

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

Exhibit R-2A, RDT&E Project Justification: PB 2025 Navy			Date: March 2024
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 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	FY 2026	FY 2027	FY 2028	FY 2029	Cost To Complete	Total Cost
9999: *Congressional Adds*	0.000	57.245	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	57.245
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 2023	FY 2024
Congressional Add: Advanced ATRT SBIR enterprise capabilities ***FY 2023 Accomplishments:*** 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. ***FY 2024 Plans:*** N/A	24.423	0.000
Congressional Add: Group 3 advanced autonomous ***FY 2023 Accomplishments:*** Conduct advanced technology development supporting group 3 advanced autonomous efforts. ***FY 2024 Plans:*** N/A	4.827	0.000
Congressional Add: Combinded fiber laser arrays without wavefront sensing ***FY 2023 Accomplishments:*** Conduct combined fiber laser arrays without wavefront sensing research. ***FY 2024 Plans:*** N/A	23.168	0.000
Congressional Add: HEL testing and risk reduction ***FY 2023 Accomplishments:*** Conduct high-energy laser (HEL) testing/risk reduction effort. ***FY 2024 Plans:*** N/A	4.827	0.000
Congressional Adds Subtotals	57.245	0.000

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

Exhibit R-2A, RDT&E Project Justification: PB 2025 Navy		Date: March 2024
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*

D. Acquisition Strategy

N/A