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 0603123N *I Force Protection Advanced Technology*

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	57.934	29.512	31.556	-	31.556	31.356	29.844	20.323	20.750	Continuing	Continuing
2912: *Force Protection Advanced Technology*	0.000	13.942	26.912	31.556	-	31.556	31.356	29.844	20.323	20.750	Continuing	Continuing
3049: *Force Protection*	0.000	2.482	2.600	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	5.082
9999: *Congressional Adds*	0.000	41.510	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	41.510

A. Mission Description and Budget Item Justification

This PE addresses advanced technology development associated with providing the capability of Platform and Force Protection for the U.S. Navy. This program supports the development of technologies associated with mission capable, persistent and survivable Naval platforms (surface, subsurface, terrestrial and air) in the areas of Platform Design & Engineering, Power, Energy & Propulsion, and Materials. The program develops technologies for enhanced capability of Naval aviation aircraft platforms in terms of mission effectiveness, platform range, responsiveness, survivability, observability, readiness, safety and life cycle cost. It also develops new Naval air vehicle concepts and high impact, scalable Naval air vehicle technologies. The program also develops advanced technologies, critical to protecting naval installations, to provide seamless full spectrum protection against asymmetric attack by improving the ability to: detect and identify developing and immediate threats; shape our responses through improved situational awareness and decision making; shield personnel, mission critical facilities, infrastructure, and operating fleet assets; maintain essential functions; and sustain and restore critical services in the aftermath of an incident.

Today's Sailors and Marines are enabled by naval Science and Technology (S&T). Since 1946, the Office of Naval Research (ONR) has fostered scientific research related to the maintenance of maritime superiority and national defense. ONR manages the Department of the Navy's (DON) portfolio of naval Basic and Applied research, and Advanced Technology Development investments to ensure naval forces can effectively deter conflict, but when called upon, fight, win and come home safe. Current investments hedge against uncertainty, providing solutions to commanders today, and options for the future. The Naval S&T budget supports higher guidance defined by the National Defense Strategy, and responds to requirements identified by the Secretary of the Navy through research priorities set by the Chief of Naval Research, coordinated across the Naval Research Enterprise (NRE), and outlined in the Naval R&D Framework.

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).

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 0603123N *I Force Protection Advanced Technology*

B. Program Change Summary ($ in Millions)	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
Previous President's Budget	59.933	29.512	29.721	-	29.721
Current President's Budget	57.934	29.512	31.556	-	31.556
Total Adjustments	-1.999	0.000	1.835	-	1.835
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-1.999	0.000			
• Program Adjustments	0.000	0.000	1.835	-	1.835
• 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: *Power electronics building block*	5.792	0.000
Congressional Add: *Laser peening of jet engines*	4.827	0.000
Congressional Add: *High-energy & high power density i-ion battery magazines (HEBM) in defense appl.*	7.722	0.000
Congressional Add: *Ultra-efficient power gen. & energy storage tech. for next gen. USV*	9.654	0.000
Congressional Add: *Design and simulation for additive technologies*	9.653	0.000
Congressional Add: *Deployable additive manufacturing of composite UUVs*	3.862	0.000
Congressional Add Subtotals for Project: 9999	41.510	0.000
Congressional Add Totals for all Projects	41.510	0.000

Change Summary Explanation

Funding: FY 2025 increase is due to realignment of the Next Strategic Technology Evaluation Program (NextSTEP) from PE 0603758N (Navy Warfighting Experimentation & Demonstration) to this PE/PU 2912.

Technical: no significant change

Schedule: no significant change

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 0603123N / *Force Protection Advanced Technology*	Project (Number/Name) 2912 / *Force Protection Advanced Technology*	

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
2912: *Force Protection Advanced Technology*	0.000	13.942	26.912	31.556	-	31.556	31.356	29.844	20.323	20.750	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This project addresses advanced technology development associated with providing the capability of Platform and Force Protection for the U.S. Navy. This project supports the development of technologies associated with mission capable, persistent and survivable Naval platforms (surface, subsurface, terrestrial, and air) in the areas of Platform Design & Engineering, Power, Energy & Propulsion, and Materials. This project develops technologies for enhanced capability of Naval aviation aircraft platforms in terms of mission effectiveness, platform range, responsiveness, survivability, observability, readiness, safety and life cycle cost. It also develops new Naval air vehicle concepts and high impact, scalable Naval air vehicle technologies.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
Title: Surface Ship and Submarine Hull Mechanical and Electrical (HM&E)	7.819	20.462	25.012	0.000	25.012
Articles:	-	-	-	-	-
Description: This project addresses advanced technology development associated with providing the capability of Platform and Force Protection for the U.S. Navy. This project supports the development of technologies associated with mission capable, persistent and survivable manned/unmanned naval platforms (surface, subsurface and terrestrial) in the areas of Platform Design & Engineering, Power, Energy & Propulsion and Materials. The primary research efforts within this activity are focused on Development of Advanced Manufacturing & Sustainment Technologies, Advanced Naval Power Systems Development, and Advanced Platform Development. Also funded in this activity is the Next Strategic Technology Evaluation Program (NextSTEP) (formerly Energy System Technology Evaluation Program (ESTEP)), which promotes innovation and entrepreneurial opportunities for naval personnel and student veterans through advanced technology development and demonstration projects at naval facilities and laboratories. ***FY 2024 Plans:*** - Continue development of Advanced Naval Power Systems: Crewed and Uncrewed Naval Platforms demand high power/energy density, integrated modular power systems that require very low maintenance (people					

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 0603123N / *Force Protection Advanced Technology*	**Project (Number/Name)** 2912 / *Force Protection Advanced Technology*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
and cost), low fuel consumption, and highly resilient operation for extended mission duration. Cross-platform application is of interest, and forward-fit/back-fit application of the technology will be addressed. - Continue development of Advanced Platforms: This effort focuses on developing a framework and integrating component technologies into a mature platform design capability and subsystems for next generation fully autonomous platforms and reduced crew size to reduce the logistics burden and increase warfighting capability. - Continue development of Advanced Manufacturing & Sustainment Technologies: Next-Gen Naval Platforms will require new materials, at a high manufacturing readiness level, to meet the required platform performance requirements and power and energy density for advanced systems, as well as cost, manufacturability, resiliency, and to reduce the sustainment burden. - Initiate efforts on Advanced Platform Autonomy focusing on the integration of Hull, Mechanical, & Electrical and Autonomous Systems and component technologies designed to improve warfighter and platform performance and efficiencies. - Initiate effort on Advanced Platform Resiliency focusing on the integration of technologies necessary to improve the efficiency and resiliency of manned and unmanned naval platforms. ***FY 2025 Base Plans:*** - Continue development of Advanced Naval Power Systems: Crewed and Uncrewed Naval Platforms demand high power/energy density, integrated modular power systems that require very low maintenance (people and cost), low fuel consumption, and highly resilient operation for extended mission duration. Cross-platform application is of interest, and forward-fit/back-fit application of the technology will be addressed. - Continue development of Advanced Platforms: This effort focuses on developing a framework and integrating component technologies into a mature platform design capability and subsystems for next generation autonomous platforms and reduced crew size manned platforms to reduce the logistics burden and increase warfighting capability. - Continue development of Advanced Manufacturing Technologies: Next-Gen Naval Platforms will require new materials, at a high manufacturing readiness level, to meet the required platform performance requirements and					

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 0603123N / *Force Protection Advanced Technology*	**Project (Number/Name)** 2912 / *Force Protection Advanced Technology*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
power and energy density for advanced systems, as well as cost, manufacturability, resiliency, and to reduce the sustainment burden. - Continue efforts on Advanced Platform Autonomy focusing on the integration of Hull, Mechanical, & Electrical and Autonomous Systems and component technologies designed to improve warfighter and platform performance and efficiencies. - Continue effort on Advanced Platform Resiliency focusing on the integration of technologies necessary to improve the efficiency, performance, and resiliency of manned and unmanned naval platforms. - Continue efforts associated with Next Strategic Technology Evaluation Program (NextSTEP) (formerly Energy Systems Technology Evaluation Program (ESTEP)), a prototype viability assessment program at naval facilities that promotes adoption, scaling and deployment to the warfighter of defense and dual-use technologies with the following goals: conduct advanced technology demonstrations to evaluate emerging technologies using Navy and Marine Corps operations as test beds; evaluate and de-risk new prototype technologies to help enable their acquisition and adoption; and provide opportunities for professional development for DON personnel. - Initiate efforts associated with undersea systems. ***FY 2025 OCO Plans:*** N/A ***FY 2024 to FY 2025 Increase/Decrease Statement:*** The funding increase from FY 2024 to FY 2025 is due to realignment of the Next Strategic Technology Evaluation Program (NextSTEP) from PE 0603758N (Navy Warfighting Experimentation & Demonstration) to this PE.					
Title: Aircraft Technology	6.123	6.450	6.544	0.000	6.544
Articles:	-	-	-	-	-
Description: The Aircraft Technology activity develops technologies for enhanced capability of Naval aviation aircraft platforms in terms of mission effectiveness, platform range, responsiveness, survivability, observability, readiness, safety and life cycle cost. It also develops new Naval air vehicle concepts and high impact, scalable Naval air vehicle technologies, such as helicopter and tiltrotor rotor drive systems, aerodynamics, propulsion					

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 0603123N / *Force Protection Advanced Technology*	**Project (Number/Name)** 2912 / *Force Protection Advanced Technology*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
systems, materials and structures for future and legacy air vehicles. This activity directly supports the Naval Research and Development Framework Priorities of Operational Endurance and Scalable Lethality. ***FY 2024 Plans:*** Continue: Conduct technology development and maturation through Next Generation Propulsion Enablers (NGP-E) with major engine manufacturers on the highest priority, long lead propulsion, power and thermal management technologies, including: - Advanced, adaptive and modular controls. - Advanced casing treatments and compression systems for increased operability and efficiency. - More thermally efficient variable displacement fuel pumps. Complete: - More compact combustion and augmentation systems, utilizing rotating detonation combustion. - Enable "hot" fuels as an additional heat sink and provide improved energy. ***FY 2025 Base Plans:*** Next Generation Air Dominance Enablers Initiate: -Naval Electrical Systems EMI Mitigation -Evaluation of additively manufactured turbine components Continue: -Conduct technology development and maturation through Next Generation Propulsion Enablers (NGP-E) with major engine manufacturers on the highest priority, long lead propulsion, power and thermal management technologies, including: -Advanced, adaptive and modular controls. -Advanced casing treatments -More thermally efficient variable displacement fuel pumps. Complete: -Advanced compression systems for increased flow, operability and efficiency. ***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 0603123N / *Force Protection Advanced Technology*	**Project (Number/Name)** 2912 / *Force Protection Advanced Technology*

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 significant funding change from FY2024 to FY2025.					
Accomplishments/Planned Programs Subtotals	13.942	26.912	31.556	0.000	31.556

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 0603123N / *Force Protection Advanced Technology*				Project (Number/Name) 3049 / *Force Protection*			
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**
3049: *Force Protection*	0.000	2.482	2.600	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	5.082
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Develop advanced technologies, critical to protecting naval installations, to provide seamless full spectrum protection against asymmetric attack by improving the ability to: detect and identify developing and immediate threats; shape our responses through improved situational awareness and decision making; shield personnel, mission critical facilities, infrastructure, and operating fleet assets; maintain essential functions; and sustain and restore critical services in the aftermath of an incident. Technologies developed will also seek to reduce the required manpower and skill levels devoted to the force protection mission, improving performance and reducing costs for 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: Emerging Threats	2.482	2.600	0.000	0.000	0.000
Articles:	-	-	-	-	-
Description: Naval Installations are a critical component in support of Navy global force projection. These installations, and the Navy ships, submarines, and aircraft located on them, are under increasing risk from asymmetric attack, including from new threat vectors such as unmanned air, surface, and subsurface vehicles. This project is focused on the development advanced technologies necessary for the protection of Naval Installations. Technical efforts address the detect -to-engage-to-assess requirements for Naval Installations by improving the ability to: sense and identify threats; support improved situational awareness and decision making; and develop effective countermeasures. Technologies developed will also seek to reduce the required manpower and skill levels devoted to the force protection mission.					
FY 2024 Plans: - Complete Autonomous Maritime Asset Protection System (AMAPS). - Complete development and demonstration of day/night all weather sensors designed to detect, track, and identify small air and surface threats to Naval Installations. - Continue Automated Target Recognition algorithms for small air, surface, and subsurface threats.					

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 0603123N / *Force Protection Advanced Technology*	**Project (Number/Name)** 3049 / *Force Protection*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
- Continue harbor security sonar capability improvements to detect Unmanned Underwater Vehicles (UUVs) to include; increased volumetric coverage, passive detection and tracking algorithms, and new classification algorithms to address more capable threats. - Continue development of the capability to track, assess, and mitigate multiple simultaneous threat UUVs in harbors and approach channels. - Initiate an expeditionary demonstration of capabilities in an operational environment. Completed in FY 2024: - Automated Target Recognition algorithms for small air, surface, and subsurface threats. - Harbor security sonar capability improvements to detect Unmanned Underwater Vehicles (UUVs) to include; increased volumetric coverage, passive detection and tracking algorithms, and new classification algorithms to address more capable threats. - Development of the capability to track, assess, and mitigate multiple simultaneous threat UUVs in harbors and approach channels. - An expeditionary demonstration of capabilities in an operational environment. ***FY 2025 Base Plans:*** N/A ***FY 2025 OCO Plans:*** N/A ***FY 2024 to FY 2025 Increase/Decrease Statement:*** The funding decrease from FY 2024 to FY 2025 is due to divestment of the emerging threats effort to balance higher priority requirements.					
Accomplishments/Planned Programs Subtotals	2.482	2.600	0.000	0.000	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 0603123N / *Force Protection Advanced Technology*	**Project (Number/Name)** 3049 / *Force Protection*

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 0603123N / *Force Protection Advanced Technology*	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	41.510	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	41.510
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: Power electronics building block ***FY 2023 Accomplishments:*** Conduct power electronics building block advanced technology development. ***FY 2024 Plans:*** N/A	5.792	0.000
Congressional Add: Laser peening of jet engines ***FY 2023 Accomplishments:*** Conduct Laser peening of jet engines advanced technology development. ***FY 2024 Plans:*** N/A	4.827	0.000
Congressional Add: High-energy & high power density i-ion battery magazines (HEBM) in defense appl. ***FY 2023 Accomplishments:*** Conduct high-energy & high-power density i-ion battery magazines (HEBM) in defense applications research. ***FY 2024 Plans:*** N/A	7.722	0.000
Congressional Add: Ultra-efficient power gen. & energy storage tech. for next gen. USV ***FY 2023 Accomplishments:*** Conduct ultra-efficient power generation and energy storage technology for next generation Unmanned Surface Vehicles (USV) research. ***FY 2024 Plans:*** N/A	9.654	0.000
Congressional Add: Design and simulation for additive technologies ***FY 2023 Accomplishments:*** Conduct design and simulation for additive technologies research. ***FY 2024 Plans:*** N/A	9.653	0.000
Congressional Add: Deployable additive manufacturing of composite UUVs	3.862	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 0603123N / *Force Protection Advanced Technology*	**Project (Number/Name)** 9999 / *Congressional Adds*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2023	FY 2024
FY 2023 Accomplishments: Conduct deployable additive manufacturing of composite Unmanned Underwater Vehicles (UUV) research. ***FY 2024 Plans:*** N/A		
Congressional Adds Subtotals	41.510	0.000

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A