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 2: *Applied Research*					R-1 Program Element (Number/Name) PE 0602750N *I Future Naval Capabilities Applied Research*							
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	173.620	182.662	163.673	-	163.673	173.614	194.567	190.578	192.048	Continuing	Continuing
0000: *Future Naval Capabilities Applied Research*	0.000	170.241	182.662	5.943	-	5.943	5.913	6.039	6.161	6.091	Continuing	Continuing
1385: *Aerospace Sciences*	0.000	0.000	0.000	5.919	-	5.919	7.615	8.418	8.587	8.220	Continuing	Continuing
1386: *Biomedical*	0.000	0.000	0.000	1.148	-	1.148	0.994	0.000	0.000	0.000	0.000	2.142
1388: *Directed Energy*	0.000	0.000	0.000	4.498	-	4.498	6.303	8.257	5.496	9.888	Continuing	Continuing
1389: *Electromagnetic Spectrum*	0.000	0.000	0.000	26.890	-	26.890	24.525	27.111	27.655	26.472	Continuing	Continuing
1391: *Full Spectrum Cyber*	0.000	0.000	0.000	13.525	-	13.525	12.481	14.098	13.398	14.189	Continuing	Continuing
1392: *Human Systems*	0.000	0.000	0.000	18.266	-	18.266	16.281	20.029	18.412	18.367	Continuing	Continuing
1393: *Kinetic Weapons*	0.000	0.000	0.000	17.400	-	17.400	21.866	24.174	24.657	23.603	Continuing	Continuing
1394: *Manufacturing*	0.000	0.000	0.000	6.450	-	6.450	7.291	8.060	8.221	7.870	Continuing	Continuing
1395: *Materials*	0.000	0.000	0.000	1.433	-	1.433	1.620	1.791	1.827	1.749	Continuing	Continuing
1396: *Naval Engineering*	0.000	0.000	0.000	12.900	-	12.900	14.581	16.119	16.443	15.739	Continuing	Continuing
1399: *Ocean Battle Space Applications*	0.000	0.000	0.000	30.095	-	30.095	35.061	39.073	38.878	38.544	Continuing	Continuing
1400: *Power and Energy*	0.000	0.000	0.000	4.300	-	4.300	4.861	5.373	5.481	5.246	Continuing	Continuing
1401: *Undersea Systems Payloads and Weapons*	0.000	0.000	0.000	3.584	-	3.584	4.050	4.478	4.567	4.372	Continuing	Continuing
5893: *Decision Superiority*	0.000	0.000	0.000	11.322	-	11.322	10.172	11.547	10.795	11.698	Continuing	Continuing
9999: *Congressional Adds*	0.000	3.379	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	3.379

A. Mission Description and Budget Item Justification

The Office of Naval Research (ONR) works closely across the Department of the Navy (DON) and Naval Research Enterprise (NRE) to develop warfighting capabilities that address operational force's highest priorities.

While leveraging technology innovation is critical to maintaining a decisive edge, maintaining a pipeline of new capabilities requires balancing flexibility and risk, in order to deliver solutions to known requirements, and experiment with potential game-changing ideas informed by higher DoN and DoD guidance. This PE funds Future Naval Capabilities (FNC) Technology Candidates, which are at lower Technology Readiness Level (TRLs), and is focused on maturing technologies to higher TRLs to reduce

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FNC transition risk. Efforts in this PE are coordinated with related work in the USMC Technology Candidates Activity of PE 0602131M Marine Corps Landing Force Technology.

This Program Element (PE) funds Applied Research, which is the systematic study to understand the means to meet a recognized and specific need. Most of the work in this PE can be classified between TRL 2 (technology concept and/or application formulation) and TRL 4 (component and/or breadboard validation in laboratory environments).

The FNC Program favors a high level of collaboration. PE projects and R-2A planned programs are mostly organized by the Office of Naval Research (ONR) Science and Technology research focus areas. ONR Departments are tasked to collaborate with the acquisition stakeholders and their resource sponsors. A complete accounting of the technology candidates being developed, and a full disposition of each technology development effort funded in this PE is provided annually 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.

B. Program Change Summary ($ in Millions)	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
Previous President's Budget	177.141	182.662	183.064	-	183.064
Current President's Budget	173.620	182.662	163.673	-	163.673
Total Adjustments	-3.521	0.000	-19.391	-	-19.391
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-3.521	0.000			
• Program Adjustments	0.000	0.000	-19.391	-	-19.391
• 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: *Operational readiness via next-generation satellites*	3.379	0.000
Congressional Add Subtotals for Project: 9999	3.379	0.000
Congressional Add Totals for all Projects	3.379	0.000

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Change Summary Explanation

Funding: The funding decrease is due to a reduction in S&T Applied Research, primarily a reduced investment in research efforts focusing on: Surveillance, Sensors, and Phenomenology; Environmental Information Warfare; Platform Design and Engineering; and Kinetic Weapons. This reduction was required in order to comply with the Defense Planning Guidance.

A new project structure was created to promote greater transparency and execution oversight for the 6.2 Future Naval Capabilities in the Department of the Navy's annual budget request. Projects 1385, 1386, 1388, 1389, 1391-1396, 1399-1401 and 5893 were previously funded in this PE, 0603673N, PU 0000 and are not new starts.

Technical: No significant change

Schedule: No significant change

Exhibit R-2A, RDT&E Project Justification: PB 2025 Navy			Date: March 2024
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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
0000: *Future Naval Capabilities Applied Research*	0.000	170.241	182.662	5.943	-	5.943	5.913	6.039	6.161	6.091	Continuing	Continuing

Note

Investments in Project 0000 Future Naval Capabilities Applied Research are now primarily funded in this same PE 0602750N under Projects 1385 Aerospace Sciences, 1386 Biomedical, 1388 Directed Energy, 1389 Electromagnetic Spectrum, 1391 Full Spectrum Cyber, 1392 Human Systems, 1393 Kinetic Weapons, 1394 Manufacturing, 1395 Materials, 1396 Naval Engineering, 1399 Ocean Battle Space Applications, 1400 Power and Energy, 1401 Undersea Systems Payloads and Weapons, 5893 Decision Superiority. This Project remains to promote greater transparency for advanced research investments in the Department of the Navy's annual budget request.

A. Mission Description and Budget Item Justification

Future Naval Capabilities (FNC) budget activity (BA) 2 investments develop candidate FNC technologies in an agile fashion by exploiting technology advances that respond rapidly to Naval needs. This approach facilitates an optimum response when developing and maturing the technology options that can be developed further in Program Element (PE) 0603673N, Future Naval Capabilities Advanced Technology Development.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
Title: FNC Program Management Support	0.000	0.000	2.738	0.000	2.738
FY 2024 Plans: N/A					
FY 2025 Base Plans: Continue FNC Management - Support/Analysis - Conduct warfighter sustainment Applied Research and analysis, including technology management of FNC investments supporting the naval capability focus areas.					
FY 2025 OCO Plans: N/A					
FY 2024 to FY 2025 Increase/Decrease Statement: Investments in this activity were previously funded in this same PE 0602750N under the Naval Air Warfare and Weapons planned program of Project 0000 Future Naval Capabilities Applied Research. This new planned program was created to promote greater transparency for management support and travel related expenses for					

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B. Accomplishments/Planned Programs ($ in Millions)	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
the Technical Candidate and Future Naval Capabilities programs in the Department of the Navy's annual budget request.					
Title: Expeditionary Maneuver Warfare (EMW) and Combating Terrorism	16.274	17.723	0.000	0.000	0.000
Description: The objective of this activity is to develop and mature technologies in asymmetric and irregular warfare, distributed operations, information warfare, survivability and self-defense to a point where they can be proposed and continued as FNCs in PE 0603673N, Future Naval Capabilities Advanced Technology Development. ***FY 2024 Plans:*** Human Performance Education and Training Thrust: Complete: - Research in new training technologies, knowledge products, architectures, and systems. - Research to accelerate mental, emotional and cognitive decision-making skills. - Research to improve human-machine teaming. - Research in the areas of detecting, localizing and neutralization of mines and improvised explosive devices that challenge the ability to operate in contested maritime environments. - Efforts to develop and evaluate modeling and simulation-based capabilities to accelerate performance in training and education settings and increase readiness in the expeditionary environment. This includes the continuation of Warfighter Training research completed in PE 0602131M in FY22. Logistics Thrust: Continue: - Research in the area of advanced manufacturing materials. - Applied research in the area of small scale, energy efficient water purification in support of distributed operations and Expeditionary Advance Base Operations (EABO). Complete: - Research to enhance movement of troops and equipment from ship to inland objectives. - Research to develop higher material readiness and reduce the length of the supply chain for small units. This includes the continuation of New Repair Techniques research completed in PE 0602131M in FY22. - Fleet Vehicle research completed in PE 0602131M in FY22 by continuing research in the area of unmanned platform power systems.					

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B. Accomplishments/Planned Programs ($ in Millions)	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
Force Protection Thrust: Continue: - Research to improve warfighter effectiveness in command, control, computers and communication, intelligence, surveillance and reconnaissance in the area of electromagnetic spectrum analysis and signature management. This includes the continuation of Flexible Software Development research completed in PE 0602131M in FY22. - Research in the area of increased range and lethality for small form factor weapon systems in support of EABO. Firepower Thrust: - Continue effort to conduct feasibility demonstration of a missile launcher capable of launching multiple calibers of militarily relevant munitions from a single platform. ***FY 2025 Base Plans:*** N/A ***FY 2025 OCO Plans:*** N/A ***FY 2024 to FY 2025 Increase/Decrease Statement:*** Funding decrease from FY24 to FY25 is due to the realignment of requested funding and associated planned programs within this Activity into the new RDTE Projects 1388 Directed Energy, 1389 Electromagnetic Spectrum, 1391 Full Spectrum Cyber, 1393 Kinetic Weapons and 1399 Ocean Battle Space Applications within this PE 0602750N. The funding requested and associated planned programs are distributed across five new R-2A planned programs identified as Expeditionary Directed Energy, Expeditionary Electromagnetic Spectrum, Expeditionary Cyber, Expeditionary Kinetic Weapons and Expeditionary Ocean Battle Space Applications.					
Title: C4ISR and Special Projects ***Description:*** The objective of this activity is to develop and mature technologies in data science, mathematical optimization, computational and information sciences, quantum information sciences, electronics, command and control (C2), combat systems, communications, cyber security, cyber operations, electronic warfare (EW), sensing and surveillance, and precision timing and navigation (PTN), as well as technologies for surface and airborne vehicles, and cruise missile defense weapons to a point where they can be proposed and continued	44.257	46.971	0.000	0.000	0.000

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B. Accomplishments/Planned Programs ($ in Millions)	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
as Future Naval Capabilities (FNC) in program element (PE) 0603673N, Future Naval Capabilities Advanced Technology Development. ***FY 2024 Plans:*** Communications and Networking Thrust Continue: - Analyzing Fifth generation (5G) security and protocol to identify vulnerabilities to close security gaps to increase resiliency and robustness against adversarial attack. - Maturing promising over the horizon communications that include low probability of detection and low probability of intercept features to enable distributed maritime operations. - Continue multi-beam communications for data dissemination and unmanned and autonomous control applications. Complete: - Development of hardware and software routing and applications for resilient networking in contested warfighting scenarios and improving data dissemination across both forward and back fit Joint heterogeneous networks. - Development of promising low-frequency RF and optical technologies for multi-platform communication capabilities. Initiate: - Development of software defined modem technologies for waveform interoperability, low probability of intercept and joint service compatibility. Intelligence, Decision-Making Superiority, C2 and Combat Systems Thrust Continue: - Developing frameworks for cross platform intelligent resource management and data dissemination providing both enhanced Distributed Maritime Operations and system resilience. - Developing capabilities that allow commanders to rapidly and confidently move from data-to-options-to-informed decision both at the Maritime Operations Center and Afloat. - Optimization of machine learning and AI algorithms for planning to execution synchronization of hard kill, cyber and electromagnetic engagements. - Development of advanced computing for machine learning on the tactical edge. Full Spectrum Cyber Thrust					

Exhibit R-2A, RDT&E Project Justification: PB 2025 Navy		Date: March 2024
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B. Accomplishments/Planned Programs ($ in Millions)	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
Continue: - Developing tools for convergence and coordinate cyber and EW effects. - Machine learning for automation of cyber defense approaches. - Efforts to automate identification and leveraging of over-permissioned protocol implementations. Complete: - Maturing innovative cyber approaches to enhance naval platform and warfighting resilience, safety, reliability and efficiency. Initiate: - Efforts to exploit protocol weaknesses for naval applications. Electromagnetic Warfare Thrust Continue: - Developing technologies, techniques and algorithms that degrade, neutralize, or destroy an adversary's C5ISR capabilities. - Developing cross platform technologies to mature electro-magnetic techniques that rely on geographic separation of platform sensors to deliver enhanced operational capabilities. - Developing and maturing the necessary component technologies for spectrum access both in EO and RF that enable defeat of adversarial sensors and systems. - Counter ISR technology to defeat and degrade EO sensor and seekers. Surveillance, Sensors and Phenomenology Thrust Continue: - Developing and implementing novel hardware, algorithms and high speed processing to enable detection of advanced maritime threats in both manmade and natural clutter at stand-off ranges. - Developing and implementing new electro-optic and infrared sensing capabilities including digital readouts for improved passive sensing of difficult threats in cluttered backgrounds. - Providing advanced sensor processing that improve Intelligence, Surveillance, Reconnaissance and Targeting of hard targets. Complete: - Development of key technologies for off-board RF illumination sources to enable Multi-Input Multi-Output and receive-only sensing in a distributed environment. Initiate: - Polarimetric techniques for improving clutter and identification in maritime radars.					

Exhibit R-2A, RDT&E Project Justification: PB 2025 Navy		Date: March 2024
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B. Accomplishments/Planned Programs ($ in Millions)	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
Quantum, Positioning, Navigation, and Timing Thrust - Continue development of quantum gravimetry mapping and navigation techniques. ***FY 2025 Base Plans:*** N/A ***FY 2025 OCO Plans:*** N/A ***FY 2024 to FY 2025 Increase/Decrease Statement:*** Funding decrease from FY24 to FY25 is due to the realignment of requested funding and associated planned programs within this Activity into the new RDTE Project 1389 Electromagnetic Spectrum, 1391 Full Spectrum Cyber and 5893 Decision Superiority within this PE 0602750N. The funding requested and associated planned programs are distributed across six new R-2A planned programs identified as - Communications and Networking, - Intelligence, Decision-Making Superiority, C2 and Combat Systems, - Full Spectrum Cyber, - Electromagnetic Warfare, - Surveillance, Sensors and Phenomenology and Quantum, Positioning, Navigation, and Timing.					
Title: Ocean Battlespace Sensing ***Description:*** The objective of this activity is to enable maritime domain access and distributed operations for Naval forces in contested environments through superior maritime battlespace awareness and threat detection, identification and neutralization. Specifically, activities will develop and mature technologies that ultimately support Mine and Expeditionary Warfare, Undersea Warfare, and Environmental Information Warfare. Activities will also develop and mature methods and technological approaches for environmental sensing and prediction for the maritime battlespace. The desired outcome for efforts in this activity is to mature the applied research results to a point where they can be focused on particular enabling capabilities and proposed to be continued as Future Naval Capabilities (FNC) in program element (PE) 0603673N, Future Naval Capabilities Advanced Technology Development. Additionally, a subset of technologies explored herein are intended to support expeditionary access and will be further matured, focused, and ultimately demonstrated under the USMC's Advanced Technology Demonstration effort in PE 0603640M MC Advanced Technology Demo. ***FY 2024 Plans:*** Mine and Expeditionary Warfare Thrust Continue:	31.351	30.095	0.000	0.000	0.000

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B. Accomplishments/Planned Programs ($ in Millions)	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
- Imitate Development of high area coverage rate mine warfare capability for contested environments to support naval maneuver in Western Pacific; includes development of enabling machine learning algorithms, autonomous behavior, and hardware design. Undersea Warfare Thrust Continue: - In-water comparative analysis/testing of glider towed arrays for detection of ASW threats in the ocean environment; leverage emerging glider technologies for increased endurance and consider novel array fabrication to characterize best fit for variety of ocean environments. - Development of signal processing and displays to improve performance and reduce vulnerability for submarine active sonar. - Development of computational methods to detect very quiet submarine targets by combining evidence from multiple arrays. Complete: - Development of acoustic sources for floating and mobile anti-submarine warfare (ASW) sensing systems. - Development of unmanned undersea vehicle (UUV) navigation concepts that fuse multiple sensing modalities into a single solution to improve performance in long duration complex environments. Initiate: - Development of algorithms and software for making probabilistic USW-related sensor performance forecasts that can be used in strike group and theater anti-submarine warfare mission plans. Environmental Information Warfare Thrust (This thrust was previously named Ocean, Atmosphere and Space Sciences Thrust in the FY2023 plans. The name was changed to more accurately describe the research.) Continue: - Development of algorithms to assess and predict the impact of the atmospheric aerosols and turbulence on the performance of electro-optic and infra-red naval sensors. - Algorithm development for improved cloud visibility assessment by leveraging new government-owed, open architecture paradigm in Space-Based Environmental Monitoring (SBEM) data processing and delivery needed to improve timely, accurate decision making in the maritime battlespace environment. - To apply system learning to tactical environment assessment and prediction in support of aviation applications. - Development of improvements to polar ionosphere sensing and prediction for a regional full-physics model leveraging recently developed sensors and advances in polar space weather science.					

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B. Accomplishments/Planned Programs ($ in Millions)	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
Complete: - New government-owed, open architecture paradigm in Space-Based Environmental Monitoring (SBEM) data processing and delivery needed to improve timely, accurate decision making in the maritime battlespace environment. - Development of a prototype radio frequency (RF) communications and signature management tool for small unit maneuver in the coastal and terrestrial environments to assess the environmental variability spatially and temporally. Initiate: - Development of a fully coupled ionospheric-thermospheric model to permit greatly improved multi-day forecasts for propagation conditions of HF communications and radars. - Characterization of Earth science model error in decision support tools by examining forecast fidelity from short-term (hourly) to sub-climate (monthly) timescales using a hierarchy of data quality, from full coupled dynamical simulations to regional, statistical, and climatological guidance. - Development of the numerical representation of improved tropospheric-stratospheric interaction and mesospheric data assimilation for gravity wave processes leading to extended range prediction of extreme weather events. ***FY 2025 Base Plans:*** N/A ***FY 2025 OCO Plans:*** N/A ***FY 2024 to FY 2025 Increase/Decrease Statement:*** Funding decrease from FY24 to FY25 is due to the realignment of requested funding and associated planned programs within this Activity into the new RDTE Project 1399 Ocean Battle Space Applications within this PE 0602750N. The funding requested and associated planned programs are moved to the new planned programs Mine and Expeditionary Warfare, Undersea Warfare and Environmental Information Warfare.					
Title: Sea Warfare and Weapons ***Description:*** The objective of this activity is to develop and mature technologies that enable superior warfighting capabilities for surface and sub-surface naval platforms and undersea weaponry to a point where they can be proposed and continued as Future Naval Capabilities in program element (PE) 0603673N, Future Naval Capabilities Advanced Technology Development.	30.320	33.368	0.000	0.000	0.000

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B. Accomplishments/Planned Programs ($ in Millions)	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
FY 2024 Plans: Naval Power Systems Continue: - COTS Battery Phase II (COTS B II) research to develop and demonstrate a custom battery design that uses automotive industry commercial-off-the-shelf (COTS) battery hardware and lifecycle data-driven reliability approaches to battery management. Complete: - Electrical Ship Asset efforts: aging modelling and Reliability and Condition Assessment (ESARCA) efforts to investigate methods that lead to effective use of electrical insulation materials on ships employing high voltage electrical equipment. - Robust Unmanned Platform Power System (RUPPS) component modeling, system modeling, simulation, and subscale experimentation activities to demonstrate the suitability of modular, high endurance, alternative power system technology for Unmanned Surface Vessel platforms (USV). (Completed in FY23) FY24-start RUPPS FNC proposed. - High Density Kinetic Energy Storage System (HD KESS) efforts to prove the feasibility of a non-battery Energy Magazine. (Initiated in FY23) - Propulsion Gas Turbine Materials Upgrade (GTMAT) efforts to enable sustained higher engine service temperatures to meet increased ship power needs/capabilities and maintain engine life. FY24-start GTMAT FNC proposed. Initiate: - Feasibility studies to explore next generation applications of Naval Power Systems in Navy and Marine Corps environments. Platform Design and Engineering Continue: - Autonomous Determination of Vessel Intent (ID) efforts to develop and test an algorithm that will autonomously determine the intent of another vessel Complete: - Digital Evaluation of Implodable Composite Payloads (DEIComP) effort involves developing a suite of validated digital engineering tools and experimental findings that will improve prediction accuracy and improve speed and affordability of implodable integration with the fleet while increasing deployed technologies and survivability. (Completed in FY23)					

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B. Accomplishments/Planned Programs ($ in Millions)	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
- Low-Observable Communications Mast for Undersea Platforms (LOCM-UP) efforts to reduce the radar cross section (RCS) and overall counterdetection risk of the submarine multifunction mast (MFM) while maintaining or increasing broad spectrum communications capability. - Stern Area System+ (SAS+) efforts to develop and demonstrate, through laboratory and in-water tests, algorithms which allow SAS to perform a new function to replace a legacy system, with enhanced capability, in the VIRGINIA Class. - Own Ship Electro-Magnetic Monitoring (OSEM) efforts to complete external sensor requirements and specifications development, continue sensor design, and develop the sensor qualification test plan. - Flow Induced Machinery Noise Silencing (FIMNS) efforts to develop an increased knowledge base and an improved computational toolset for the design of efficient and reduced acoustic noise submarine machinery system blowers, cooling fans, and treatments; and deliver a prototype quiet cooling fan. - Digital Engineering that creates a digital thread connecting full platform lifecycle will be proposed as FY25 INP New Start. - Autonomous Tactical Behaviors for M/LUSVs (ATBM/L) efforts to develop, integrate and transition mission executive and behaviors capability to USVs, such that the capability can be used on any UMAA-compliant USV. (project terminated prior to initiation) - Autonomic Readiness Management (ARM) efforts to build an onboard hardware/software infrastructure and integration to operational decision support for onboard data acquisition and analysis using AI/ML based models. (project terminated prior to initiation) Initiate: - Feasibility studies to explore next generation applications of Platform Design and Engineering in Navy and Marine Corps environments. Undersea Weapons Continue: N/A Complete: - Efforts associated with rocket-propelled grenade (RPG)-of-the-Sea by transitioning a new and novel undersea weapon concept to the special warfare community. - Efforts associated with Wide Arc Swath Profiler (WASP) to develop, test and assess the viability and utility of a new guidance mode for undersea weapons and vehicles. Initiate: - Feasibility studies to explore next generation applications of Undersea Weapons in Navy and Marine Corps environments.					

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B. Accomplishments/Planned Programs ($ in Millions)	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
Materials, Manufacturing, Sustainment & Logistics Continue: - Corrosion-Informed Materials Section and Design Tool (CIMaD Tool) efforts to develop a DoN corrosion materials database and associated corrosion simulation algorithms, and validate a set of simulation algoritghms using the developed database to predict corrosion damage which is critical to pursue a research to design against corrosion prior to production of DoN assets. Complete: - Flux-Core Additive Manufacturing (FCAM) efforts enable metal additive manufacturing afloat without creating a large logistics burden to carry shielding gas. - Next Generation Structural Steel for Enhanced Platform Capability (10% Ni Steel) efforts to develop processing conditions for adequate NIL-Ductility temperature, crack arrest, and stress-corrosion cracking (SCC) resistance; develop machine-learning process-structure-properties models to predict behavior and development of welding consumables and processes requiring no preheat. (Completed in FY23) Initiate: - Feasibility studies to explore next generation applications of Materials, Manufacturing, Sustainment and Logistics in Navy and Marine Corps environments. ***FY 2025 Base Plans:*** N/A ***FY 2025 OCO Plans:*** N/A ***FY 2024 to FY 2025 Increase/Decrease Statement:*** Funding decrease from FY24 to FY25 is due to the realignment of requested funding and associated planned programs within this Activity into the new RDTE Projects 1394 Manufacturing, 1395 Materials, 1396 Naval Engineering, 1400 Power and Energy and 1401 Undersea Systems Payloads and Weapons within this PE 0602750N. The funding requested and associated planned programs are distributed across five new R-2A Activities identified as -Materials, Manufacturing, Sustainment & Logistics, -Platform Design and Engineering, -Naval Power Systems and -Undersea Weapons.					
Title: Warfighter Performance ***Description:*** The objective of this activity is to conduct research and mature technologies that enhance Naval warfighting effectiveness and efficiency within the Manpower, Personnel, Training and Education to a point	17.984	24.248	3.205	0.000	3.205

Exhibit R-2A, RDT&E Project Justification: PB 2025 Navy		Date: March 2024
Appropriation/Budget Activity 1319 / 2	**R-1 Program Element (Number/Name)** PE 0602750N / *Future Naval Capabilities Applied Research*	**Project (Number/Name)** 0000 / *Future Naval Capabilities Applied Research*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
where they can be proposed and continued as Future Naval Capabilities (FNC) in program element (PE) 0603673N, Future Naval Capabilities Advanced Technology Development. ***FY 2024 Plans:*** Advanced Analytics and Decision Making Thrust Continue: - Investigating capabilities that will define use cases, workflows, outline methods, and algorithms for existing software applications to automatically identify man-made structures in high resolution 3D datasets. - Complete: - Applied research on an information warfare training system that teaches tactics, techniques and procedures for decisive, effective engagement that is suitable for public affairs, information operations, psychological operations, and intelligence operations. Initiate: - Studies on automated planner coordination and optimization tools for mission logistics, increasing combat readiness with actionable information. This includes methodology and proof of concept software to couple mission, logistics, and route planning in SecDevOps environment. - Feasibility studies to explore next generation applications of advanced analytics and decision making in Navy and Marine Corps environments. Autonomy, Artificial Intelligence and Robotics Thrust Complete: - Studies on techniques to manage data sharing requirements to support logistics tools and minimize bandwidth requirement to enable meta-optimization across multiple planners and tactical decision aids. Initiate: - Applied research on a family of robotic autonomous systems with modular sensor and force protection payloads that are interoperable between multiple platform variants. - Feasibility studies to explore next generation applications of autonomy, artificial intelligence, and robotics in Navy and Marine Corps environments. Manpower, Performance, Protection, and Medical Support Thrust Continue: - Expanding models that provide decision support tools during the selection and assignment process of military personnel in order to maximize organizational effectiveness.					

Exhibit R-2A, RDT&E Project Justification: PB 2025 Navy		Date: March 2024
Appropriation/Budget Activity 1319 / 2	**R-1 Program Element (Number/Name)** PE 0602750N / *Future Naval Capabilities Applied Research*	**Project (Number/Name)** 0000 / *Future Naval Capabilities Applied Research*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
- Applied research on a Modular, Live-Virtual-Constructive integrated warfare environment to support training, mission rehearsal, and assessment of Carrier Strike Group and Air Wing forces while at sea. Initiate: - Applied research to develop capabilities that will improve instructor performance and proficiency, leading to enhanced student learning outcomes. - Investigations on adaptive training approaches that include automated assessment and adaptive scenarios to accelerate training of ship handling skills for bridge personnel. - Feasibility studies to explore next generation applications of manpower, performance, protection, and medical support in Navy and Marine Corps environments. Materials Thrust - Initiate feasibility studies to explore next generation applications of materials in Navy and Marine Corps environments. ***FY 2025 Base Plans:*** Initiate: -Conduct novel applied research in support of emerging Naval and Marine Corps Requirements, to include optimization of individual and team performance using manpower, personnel, and training approaches. Complete - Applied research to develop capabilities that will improve instructor performance and proficiency, leading to enhanced student learning outcomes ***FY 2025 OCO Plans:*** N/A ***FY 2024 to FY 2025 Increase/Decrease Statement:*** Funding decrease from FY24 to FY25 is due to the realignment of requested funding and associated planned programs within this Activity into the new RDTE Project 1386 Biomedical and 1392 Human Systems within this PE 0602750N. The funding requested and associated planned programs are moved to the new planned programs -Human Performance and Medical Support, -Advanced Analytics and Decision Making, -Autonomy, Artificial Intelligence and Robotics, -Manpower, Training, and Performance Assessment.					
Title: Naval Air Warfare and Weapons	30.055	30.257	0.000	0.000	0.000

Exhibit R-2A, RDT&E Project Justification: PB 2025 Navy		Date: March 2024
Appropriation/Budget Activity 1319 / 2	**R-1 Program Element (Number/Name)** PE 0602750N / *Future Naval Capabilities Applied Research*	**Project (Number/Name)** 0000 / *Future Naval Capabilities Applied Research*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
Description: The objective of this activity is to develop and mature technologies in directed energy, energetic materials, autonomy, electromagnetic launch, and high speed conventional air and surface weapons to a point where they can be proposed and continued as Future Naval Capabilities in PE 0603673N, Future Naval Capabilities Advanced Technology Development. ***FY 2024 Plans:*** Kinetic Weapons Thrust Continue: - Investigating advanced material and structural capabilities in aerodynamics for high-speed/hypersonic weapons. - Investigation of advanced air-to-surface/ground seeker technologies, focusing largely on efficacy in a hypersonic regime. - Maturing design concepts, fabricating sample components, and performing preliminary testing to inform future system level design trades. - Leveraging ongoing reactive materials initiatives for application to additional munitions and weapons. Establish weight/volume versus range increase potential for conceptual warhead designs. Establish warhead interface constraints for system integration. - Feasibility studies for tactical decision aids that support advanced strike weapons. - Feasibility studies and possible development of terminal defense fire control architectures that support low cost and easy integration onto ships and into expeditionary forces for terminal defense suitable for multiple engagement weapons. Complete: - Developing novel energy/power generation, management and storage technologies applicable to advanced future missile capabilities and requirements. Initiate: - Investigation into varied technologies that could mitigate impacts of adverse navigational environments upon weapon systems employed in denied areas. - Investigation into advanced propulsion techniques for high speed weapons; main focus on air-breathing concepts. Directed Energy / Electric Weapons Thrust Continue:					

Exhibit R-2A, RDT&E Project Justification: PB 2025 Navy		Date: March 2024
Appropriation/Budget Activity 1319 / 2	**R-1 Program Element (Number/Name)** PE 0602750N / *Future Naval Capabilities Applied Research*	**Project (Number/Name)** 0000 / *Future Naval Capabilities Applied Research*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
- Maturing technologies leading to development of directed energy for self-defense of high value, low density aircraft against next generation advanced threats. Includes solid state and pulsed laser systems. - Initial susceptibility testing of Out Board Motor assets utilizing developed waveforms from FY21, modeling potential dynamic engagements matched to Joint Counter UAS operational requirements, and performing scaled demonstration of waveform engagement capability facility. - Development of compact High Power Microwave (HPM) antenna technology with reduced size, weight and cost to enable integration into Marine Corps tactical ground vehicles. - Advancement of HPM tunable source technology to adapt to evolving threats. Complete: - Designing, developing and testing of solid state, High-Power Microwave (HPM) systems for enhanced lethality. - System design, build and testing of solid state High Power Microwave (HPM) Nonlinear Transmission Line (NLTL) power combining and phased array phase control evaluation, and platform integration study, and dynamic swarm CUAS HPM lethality testing. Transition to Joint CUAS Office. - Testing of an ensonification device to determine effects of range and amplitude. - Developing a conceptual RM warhead designs for 40mm grenade configurations. Initiate: - Development of advanced C-ISR disabling and jamming techniques. Aviation Platforms Thrust Continue: - Investigating and maturing system of systems concepts and associated technologies necessary to fully implement manned-unmanned teaming operations. - Maturing technologies leading to development of kinetic kill for self-defense of high value, low density aircraft against next generation advanced threats. Complete: - Investigation and design of a suite of drag reduction concepts for Naval big wing aircraft, in order to improve flight performance. Initiate: - Investigation into concepts and technologies necessary to achieve greater operational capability from unmanned aerial systems.					

Exhibit R-2A, RDT&E Project Justification: PB 2025 Navy		Date: March 2024
Appropriation/Budget Activity 1319 / 2	**R-1 Program Element (Number/Name)** PE 0602750N / *Future Naval Capabilities Applied Research*	**Project (Number/Name)** 0000 / *Future Naval Capabilities Applied Research*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
- Investigation into a suite of technologies leading to more robust shipboard recovery capabilities for air platforms (manned and unmanned). ***FY 2025 Base Plans:*** N/A ***FY 2025 OCO Plans:*** N/A ***FY 2024 to FY 2025 Increase/Decrease Statement:*** Funding decrease from FY24 to FY25 is due to the realignment of requested funding and associated planned programs within this Activity into the new RDTE Project 1385 Aerospace Sciences, 1388 Direct Energy and 1393 Kinetic Weapons within this PE 0602750N. The funding requested and associate planned programs are distributed across three new R-2A Activities identified as Aviation Platforms, Directed Energy and Kinetic Weapons.					
Accomplishments/Planned Programs Subtotals	170.241	182.662	5.943	0.000	5.943

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 / 2	R-1 Program Element (Number/Name) PE 0602750N / *Future Naval Capabilities Applied Research*	Project (Number/Name) 1385 / *Aerospace Sciences*	

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
1385: *Aerospace Sciences*	0.000	0.000	0.000	5.919	-	5.919	7.615	8.418	8.587	8.220	Continuing	Continuing

Note

Investments in Project 1385 Aerospace Sciences were previously funded in this same PE 0602750N under the Naval Air Warfare and Weapons planned programs in Project 0000. This new Project was created to promote greater transparency and execution oversight for Technical Candidate investments in aerospace sciences in the Department of the Navy's annual budget request. This is not a new start.

A. Mission Description and Budget Item Justification

The Aerospace Sciences activity develops technologies for the science and engineering of flight from the land and sea surfaces to the edge of the atmosphere, and as applicable to the utilization of flight for aircraft, missiles, rockets, munitions, and unmanned systems (UxS) employed by the Navy and Marine Corps forces operating from naval platforms or land locations.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
Title: Air Platforms	0.000	0.000	5.919	0.000	5.919
Description: Investigate and mature technologies in support of delivering capabilities or improvements to aviation platforms (manned/unmanned) and air-ship operations; and developing other technologies specific to the air domain or aviation regime.					
FY 2024 Plans: N/A					
FY 2025 Base Plans: Continue: Investigating and maturing system of systems concepts and associated technologies necessary to fully implement manned-unmanned teaming operations. Investigation into concepts and technologies necessary to achieve greater operational capability from unmanned aerial systems. Investigation into a suite of technologies leading to more robust shipboard recovery capabilities for air platforms (manned and unmanned). Efforts will center on technologies to enhance training, to develop advanced cuing and flight control augmentation, and to create higher fidelity launch and recovery envelops.					

Exhibit R-2A, RDT&E Project Justification: PB 2025 Navy		Date: March 2024
Appropriation/Budget Activity 1319 / 2	**R-1 Program Element (Number/Name)** PE 0602750N / *Future Naval Capabilities Applied Research*	**Project (Number/Name)** 1385 / *Aerospace Sciences*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
Complete: Maturing technologies leading to development of kinetic kill for self-defense of high value, low density aircraft against next generation advanced threats. Initiate: Studying all phases of kill chain to determine which set of technologies (from detection through tracking to engagement) would provide most tactically effective, cost effective, and implementable solution for self-defense of high value, low density aircraft against next generation advanced threats. Investigation into processes and techniques to improve production and/or repair of aircraft metals and coatings with emphasis on improvements to corrosion protection and electrical conductivity. ***FY 2025 OCO Plans:*** N/A ***FY 2024 to FY 2025 Increase/Decrease Statement:*** Funding increase from FY24 to FY25 is due to movement of funds from the same PE 0602750N under the Naval Air Warfare and Weapons Activity of Project 0000 Future Naval Capabilities Applied Research. It represents areas previously identified under thrusts Aviation Platforms.					
Accomplishments/Planned Programs Subtotals	0.000	0.000	5.919	0.000	5.919

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 / 2					R-1 Program Element (Number/Name) PE 0602750N / *Future Naval Capabilities Applied Research*				Project (Number/Name) 1386 / *Biomedical*			
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**
1386: *Biomedical*	0.000	0.000	0.000	1.148	-	1.148	0.994	0.000	0.000	0.000	0.000	2.142

Note

Investments in Project 1386 Biomedical were previously funded in this same PE 0602750N under the Warfighter Performance planned programs in Project 0000. This new Project was created to promote greater transparency and execution oversight for Technical Candidate investments in biomedical research in the Department of the Navy's annual budget request. This is not a new start.

A. Mission Description and Budget Item Justification

The objective of this project is to conduct biomedical research and mature technologies that enhance the health, survivability, and recovery of Sailors and Marines operating in austere, distributed, and isolated maritime environments by enabling naval forces to bring biomedical capacity forward, create it on-demand, support prolonged field care, enable casualty evacuation, and provide en route care. Projects translate basic and applied science to meet a specific Naval need and if successful, will continue to advance in program element (PE) 0603673N, Future Naval Capabilities Advanced Technology Development.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
Title: Human Performance and Medical Support	0.000	0.000	1.148	0.000	1.148
Description: The Human Performance and Medical Support research area applies new knowledge gained from the basic and applied science biomedical research portfolio to address Navy specific needs, such as protecting warfighters from operational health threats including medical challenges associated with hypothermal and hyperbaric exposure, developing diagnostic and treatment capabilities for use in operational environments, and prototyping new capabilities to recover injured warfighters.					
FY 2024 Plans: N/A					
FY 2025 Base Plans: Initiate: - Research targeted to the development of plasma Gelsolin as a potential therapeutic, prophylactic and/or screening tool for Decompression Sickness (DCS).					
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 / 2	**R-1 Program Element (Number/Name)** PE 0602750N / *Future Naval Capabilities Applied Research*	**Project (Number/Name)** 1386 / *Biomedical*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
The increase in funding from FY 2024 to FY 2025 is due to the realignment of funding and associated requirements within PE 0602750N from the Warfighter Performance planned programs in Project 0000 to the Human Performance and Medical Support Planned Program under Project 1386 Biomedical.					
Accomplishments/Planned Programs Subtotals	0.000	0.000	1.148	0.000	1.148

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 / 2	R-1 Program Element (Number/Name) PE 0602750N / *Future Naval Capabilities Applied Research*	Project (Number/Name) 1388 / *Directed Energy*	

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
1388: *Directed Energy*	0.000	0.000	0.000	4.498	-	4.498	6.303	8.257	5.496	9.888	Continuing	Continuing

Note

Investments in Project 1388 Directed Energy were previously funded in this same PE 0602750N under the Naval Air Warfare and Weapons and Expeditionary Maneuver Warfare (EMW) and Combating Terrorism planned programs in Project 0000. This new Project was created to promote greater transparency and execution oversight for Technical Candidate investments in Directed Energy in the Department of the Navy's annual budget request. This is not a new start.

A. Mission Description and Budget Item Justification

The Directed Energy (DE) activity develops technologies that enable laser and high-power microwave (HPM) weapon systems, within Navy and Marine Corps size, weight, and power (SWAP) constraints, to strike enemy targets and to defend naval platforms and land bases from threats. Additionally, the DE activity develops technologies that enable defense against adversary DE systems.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
Title: Directed Energy	0.000	0.000	2.853	0.000	2.853
Description: Investigate and mature technologies related to High Power Microwave (HPM) and acoustic energy for use in defensive applications against a wide variety of threats in multiple domains.					
FY 2024 Plans: N/A					
FY 2025 Base Plans: Continue: Development of compact High Power Microwave (HPM) antenna technology with reduced size, weight and cost to enable integration into Marine Corps tactical ground vehicles, and broaden effort for additional platforms. Advancement of HPM tunable source technology to adapt to evolving threats. Complete: Maturing technologies leading to development of directed energy for self-defense of high value, low density aircraft against next generation advanced threats. Includes solid state and pulsed laser systems. Initial susceptibility testing of Out Board Motor assets utilizing developed waveforms from FY21, modeling potential dynamic engagements matched to Joint Counter UAS operational requirements, and performing scaled demonstration of waveform engagement capability facility. Development of advanced C-ISR disabling and jamming techniques.					

Exhibit R-2A, RDT&E Project Justification: PB 2025 Navy		Date: March 2024
Appropriation/Budget Activity 1319 / 2	**R-1 Program Element (Number/Name)** PE 0602750N / *Future Naval Capabilities Applied Research*	**Project (Number/Name)** 1388 / *Directed Energy*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
Initiate: Development of enabling technologies for accelerated DE weapon engagements in ship based terminal defense, including advanced tracking solutions, automated engagement algorithms and novel battle damage assessment methods Mature and integrate technologies related to distributed arrays of HPM sources, enabled by improved phase control solid state modulators. Investigate short pulsed laser source development, utility and integration studies, propagation and lethality assessments for Naval applications. ***FY 2025 OCO Plans:*** N/A ***FY 2024 to FY 2025 Increase/Decrease Statement:*** Funding increase from FY24 to FY25 is due to movement of funds from the same PE 0602750N under the Naval Air Warfare and Weapons Activity of Project 0000 Future Naval Capabilities Applied Research. It represents areas previously identified under thrusts Directed Energy Weapons.					
Title: Expeditionary Direct Energy ***Description:*** The Expeditionary Directed Energy activity develops laser and high-power microwave weapon systems to defend expeditionary platforms and expeditionary bases from a variety of threats in multiple domains. This can support vulnerability research for expeditionary threats, high energy laser and high powered microwave system architectures, and component and/or breadboard validation in laboratory environments. ***FY 2024 Plans:*** N/A ***FY 2025 Base Plans:*** Continue: - Continue in the area of increased range and lethality for small form factor weapon systems in support of EABO. (Expeditionary Maneuver Warfare (EMW) and Combating Terrorism) Complete: - Complete research in the area of advanced manufacturing materials. (Expeditionary Maneuver Warfare (EMW) and Combating Terrorism)	0.000	0.000	1.645	0.000	1.645

Exhibit R-2A, RDT&E Project Justification: PB 2025 Navy		Date: March 2024
Appropriation/Budget Activity 1319 / 2	**R-1 Program Element (Number/Name)** PE 0602750N / *Future Naval Capabilities Applied Research*	**Project (Number/Name)** 1388 / *Directed Energy*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
- Complete applied research in the area of small scale, energy efficient water purification in support of distributed operations and Expeditionary Advance Base Operations (EABO). (Expeditionary Maneuver Warfare (EMW) and Combating Terrorism) ***FY 2025 OCO Plans:*** N/A ***FY 2024 to FY 2025 Increase/Decrease Statement:*** Funds for this Activity were moved from the same PE 0602750N under the Expeditionary Maneuver Warfare (EMW) and Combating Terrorism Activity of Project 0000 Future Naval Capabilities Applied Research. It represents areas previously identified under the following thrusts: Force Protection and Logistics.					
Accomplishments/Planned Programs Subtotals	0.000	0.000	4.498	0.000	4.498

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 / 2	R-1 Program Element (Number/Name) PE 0602750N / *Future Naval Capabilities Applied Research*	Project (Number/Name) 1389 / *Electromagnetic Spectrum*	

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
1389: *Electromagnetic Spectrum*	0.000	0.000	0.000	26.890	-	26.890	24.525	27.111	27.655	26.472	Continuing	Continuing

Note

Investments in Project 1389 Electromagnetic Spectrum were previously funded in this same PE 0602750N under the C4ISR and Special Projects and Expeditionary Maneuver Warfare (EMW) and Combating Terrorism planned programs of Project 0000 Future Naval Capabilities Applied Research. This new Project was created to promote greater transparency and execution oversight for Technical Candidate investments in Electromagnetic Spectrum in the Department of the Navy's annual budget request. This is not a new start.

A. Mission Description and Budget Item Justification

Electromagnetic Spectrum researches and develops electronics, sensors, electronic warfare, and alternate positioning, navigation, and timing to understand, shape, and operate in the battlespace. This can include system studies, system architecture development, and component and/or breadboard validation in laboratory environments.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
Title: Electromagnetic Warfare	0.000	0.000	8.658	0.000	8.658
Description: Electromagnetic Warfare conducts applied research to mature underlying technologies, techniques, and algorithms that degrade, neutralize, or destroy an adversary's C4ISR capabilities.					
FY 2024 Plans: N/A					
FY 2025 Base Plans: Electromagnetic Warfare: Continue: - Developing technologies, techniques and algorithms that degrade, neutralize, or destroy an adversary's C5ISRT capabilities. - Developing cross platform technologies to mature electro-magnetic techniques that rely on geographic separation of platform sensors to deliver enhanced operational capabilities. - Developing and maturing the necessary component technologies for spectrum access both in EO and RF that enable defeat of adversarial sensors and systems. - Developing Counter ISR technology to defeat and degrade EO sensor and seekers. Initiate:					

Exhibit R-2A, RDT&E Project Justification: PB 2025 Navy		Date: March 2024
Appropriation/Budget Activity 1319 / 2	**R-1 Program Element (Number/Name)** PE 0602750N / *Future Naval Capabilities Applied Research*	**Project (Number/Name)** 1389 / *Electromagnetic Spectrum*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
- Research and development of integrated electronic warfare and cyber effects. ***FY 2025 OCO Plans:*** N/A ***FY 2024 to FY 2025 Increase/Decrease Statement:*** Funding increase from FY 2024 to FY 2025 is due to a realignment of funds from the same PE 0602750N under the C4ISR and Special Projects planned programs of Project 0000 Future Naval Capabilities Applied Research.					
Title: Surveillance, Sensors and Phenomenology ***Description:*** Surveillance, Sensors and Phenomenology conducts applied research to mature sensing and systems technologies to deliver Intelligence, Surveillance, Reconnaissance and Targeting (ISR&T) data. ***FY 2024 Plans:*** N/A ***FY 2025 Base Plans:*** Surveillance, Sensors and Phenomenology: Continue: - Developing and implementing novel hardware, algorithms and high-speed processing to enable detection of advanced maritime threats in both manmade and natural clutter at stand-off ranges. - Developing and implementing new electro-optic and infrared sensing capabilities including digital readouts for improved passive sensing of difficult threats in cluttered backgrounds. - Developing advanced sensor processing that improve Intelligence, Surveillance, Reconnaissance and Targeting of hard targets. - Developing polarimetric techniques for improving clutter and identification in maritime radars. Initiate: - Development of multi-platform surveillance techniques and algorithms. ***FY 2025 OCO Plans:*** N/A ***FY 2024 to FY 2025 Increase/Decrease Statement:***	0.000	0.000	11.798	0.000	11.798

Exhibit R-2A, RDT&E Project Justification: PB 2025 Navy		Date: March 2024
Appropriation/Budget Activity 1319 / 2	**R-1 Program Element (Number/Name)** PE 0602750N / *Future Naval Capabilities Applied Research*	**Project (Number/Name)** 1389 / *Electromagnetic Spectrum*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
Funding increase from FY 2024 to FY 2025 is due to a realignment of funds from the same PE 0602750N under the C4ISR and Special Projects planned programs of Project 0000 Future Naval Capabilities Applied Research.					
Title: Quantum, Positioning, Navigation, and Timing ***Description:*** Quantum, Positioning, Navigation, and Timing develops technologies and techniques to improve Positioning, Navigation and Timing systems in a Global Positioning System-denied environment. ***FY 2024 Plans:*** N/A ***FY 2025 Base Plans:*** Quantum, Positioning, Navigation, and Timing: Continue: - Development of quantum gravimetry mapping and navigation techniques. Initiate: - Development of magnetic mapping and navigation techniques. ***FY 2025 OCO Plans:*** N/A ***FY 2024 to FY 2025 Increase/Decrease Statement:*** Funding increase from FY 2024 to FY 2025 is due to a realignment of funds from the same PE 0602750N under the C4ISR and Special Projects planned programs of Project 0000 Future Naval Capabilities Applied Research.	0.000	0.000	1.106	0.000	1.106
Title: Expeditionary Electromagnetic Spectrum ***Description:*** Electromagnetic Spectrum researches and develops electronics, sensors, electronic warfare, and alternate positioning, navigation, and timing to understand, shape, and operate in austere and contested expeditionary environments in support of naval expeditionary forces. This can include system studies, system architecture development, and component and/or breadboard validation in laboratory environments. ***FY 2024 Plans:*** N/A ***FY 2025 Base Plans:*** Initiate:	0.000	0.000	5.328	0.000	5.328

Exhibit R-2A, RDT&E Project Justification: PB 2025 Navy		Date: March 2024
Appropriation/Budget Activity 1319 / 2	**R-1 Program Element (Number/Name)** PE 0602750N / *Future Naval Capabilities Applied Research*	**Project (Number/Name)** 1389 / *Electromagnetic Spectrum*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
-Initiate development of enabling sensor technologies to support targeting to counter unmanned aerial systems and future swarms, tailored to expeditionary on-the-move design reference missions, using scalable/low-cost approaches. (Expeditionary Maneuver Warfare (EMW) and Combating Terrorism) - Initiate research to develop correlation / fusion Artificial Intelligence/Machine Learning engines to fuse feeds from up to six austere and expeditionary maritime domain awareness nodes. (Expeditionary Maneuver Warfare (EMW) and Combating Terrorism) ***FY 2025 OCO Plans:*** N/A ***FY 2024 to FY 2025 Increase/Decrease Statement:*** Funds for this Activity were moved from the same PE 0602750N under the Expeditionary Maneuver Warfare (EMW) and Combating Terrorism Activity of Project 0000 Future Naval Capabilities Applied Research.					
Accomplishments/Planned Programs Subtotals	0.000	0.000	26.890	0.000	26.890

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 / 2	R-1 Program Element (Number/Name) PE 0602750N / *Future Naval Capabilities Applied Research*	Project (Number/Name) 1391 / *Full Spectrum Cyber*	

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
1391: *Full Spectrum Cyber*	0.000	0.000	0.000	13.525	-	13.525	12.481	14.098	13.398	14.189	Continuing	Continuing

Note

Investments in Project 1391 Full Spectrum Cyber were previously funded in this same PE 0602750N under the C4ISR and Special Projects and Expeditionary Maneuver Warfare (EMW) and Combating Terrorism planned programs of Project 0000 Future Naval Capabilities Applied Research. This new Project was created to promote greater transparency and execution oversight for Technical Candidate investments in Full Spectrum Cyber in the Department of the Navy's annual budget request. This is not a new start.

A. Mission Description and Budget Item Justification

Full Spectrum Cyber explores and develops technologies necessary to conduct successful offensive and defensive naval and expeditionary force operations in the information age. This can include system studies, system architecture development, and component and/or breadboard validation in laboratory environments.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
Title: Full Spectrum Cyber	0.000	0.000	11.323	0.000	11.323
Description: Full Spectrum Cyber develops innovative cyber technologies to enhance the resilience, safety, and efficiency of cyber systems in naval warfighting platforms.					
FY 2024 Plans: N/A					
FY 2025 Base Plans: Full Spectrum Cyber: Continue: - Developing tools for coordinating cyber and EW effects. - Machine learning for autonomous cyber defense approaches. - Efforts to automate leveraging of over-permissioned protocol implementations. - Efforts to exploit protocol weaknesses for naval applications. Initiate: - Efforts in protocol dialecting for resilience and threat identification.					
FY 2025 OCO Plans:					

Exhibit R-2A, RDT&E Project Justification: PB 2025 Navy		Date: March 2024
Appropriation/Budget Activity 1319 / 2	**R-1 Program Element (Number/Name)** PE 0602750N / *Future Naval Capabilities Applied Research*	**Project (Number/Name)** 1391 / *Full Spectrum Cyber*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
N/A ***FY 2024 to FY 2025 Increase/Decrease Statement:*** Funding increase from FY 2024 to FY 2025 is due to a realignment of funds from the same PE 0602750N under the C4ISR and Special Projects planned programs of Project 0000 Future Naval Capabilities Applied Research.					
Title: Expeditionary Cyber ***Description:*** Expeditionary Cyber explores and develops technologies necessary to conduct successful offensive and defensive in contested environment tailored to naval expeditionary forces. This can include system studies, system architecture development, and component and/or breadboard validation in laboratory environments. ***FY 2024 Plans:*** N/A ***FY 2025 Base Plans:*** Initiate: - Initiate research to improve warfighter effectiveness in contested command, control, computers and communication, intelligence, surveillance and reconnaissance environments using electromagnetic spectrum analysis, signature management, and by enhancing expeditionary platform cyber/spectrum resilience. (Expeditionary Maneuver Warfare (EMW) and Combating Terrorism) ***FY 2025 OCO Plans:*** N/A ***FY 2024 to FY 2025 Increase/Decrease Statement:*** Funds for this Activity were moved from the same PE 0602750N under the Expeditionary Maneuver Warfare (EMW) and Combating Terrorism Activity of Project 0000 Future Naval Capabilities Applied Research.	0.000	0.000	2.202	0.000	2.202
Accomplishments/Planned Programs Subtotals	0.000	0.000	13.525	0.000	13.525

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 / 2	**R-1 Program Element (Number/Name)** PE 0602750N / *Future Naval Capabilities Applied Research*	**Project (Number/Name)** 1391 / *Full Spectrum Cyber*

D. Acquisition Strategy

N/A

Exhibit R-2A, RDT&E Project Justification: PB 2025 Navy			Date: March 2024
Appropriation/Budget Activity 1319 / 2	R-1 Program Element (Number/Name) PE 0602750N / *Future Naval Capabilities Applied Research*	Project (Number/Name) 1392 / *Human Systems*	

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
1392: *Human Systems*	0.000	0.000	0.000	18.266	-	18.266	16.281	20.029	18.412	18.367	Continuing	Continuing

Note

Investments in Project 1392 Human Systems were previously funded in this same PE 0602750N under the Warfighter Performance planned programs in Project 0000. This new Project was created to promote greater transparency and execution oversight for Technical Candidate investments in human systems in the Department of the Navy's annual budget request. This is not a new start.

A. Mission Description and Budget Item Justification

The objective of this project is to conduct human systems research and mature technologies that enhance Naval warfighting effectiveness and efficiency within the broad array of Warfighter Performance science and technology domains (Decision Sciences, Information Warfare and Future Conflict, Manpower, Personnel, Training and Education, Intelligent and Autonomous Systems) to a point where they can be proposed and continued as Future Naval Capabilities (FNC) in program element (PE) 0603673N, Future Naval Capabilities Advanced Technology Development.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
Title: Advanced Analytics and Decision Making	0.000	0.000	4.195	0.000	4.195
Description: The Advanced Analytics and Decision Making research area applies new knowledge gained from the basic and applied research portfolio to address Navy specific needs through the development of technologies that improve the decision making process, enhance performance modeling, assessment, and After Action Reporting tools, and enable the use of cyber-technical and cyber-social capabilities in the information environment. ***FY 2024 Plans:*** N/A ***FY 2025 Base Plans:*** Continue: - Design and start development of algorithms to integrate into existing software applications to automatically identify man-made structures in high resolution 3D datasets. - Studies on automated planner coordination and optimization tools for mission logistics, increasing combat readiness with actionable information. This includes methodology and proof of concept software to couple mission, logistics, and route planning in SecDevOps environment.					

Exhibit R-2A, RDT&E Project Justification: PB 2025 Navy		Date: March 2024
Appropriation/Budget Activity 1319 / 2	**R-1 Program Element (Number/Name)** PE 0602750N / *Future Naval Capabilities Applied Research*	**Project (Number/Name)** 1392 / *Human Systems*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
Initiate: -Applied research into modular mission planning tools that can be used with coalition and non-government organizations (NGOs). -Applied research into the application of large language model AI into creating generative text tools for filling in forms. -Development of advanced analytics, analytic support capabilities, models and simulation capabilities to improve warfighter operational designs to conduct operations in the information environment more effectively against new and emerging threats to mission narratives. -Investigation of new modalities and capabilities to counter disinformation and propaganda threats in Internet-mediated information environments. -Feasibility studies to explore next generation applications of advanced analytics and decision making in Navy and Marine Corps environments. ***FY 2025 OCO Plans:*** N/A ***FY 2024 to FY 2025 Increase/Decrease Statement:*** The increase in funding from FY 2024 to FY 2025 is due to the realignment of funding and associated requirements within PE 0602750N from the Warfighter Performance planned program in Project 0000 to the Advanced Analytics and Decision Making planned Program under Project 1392 Human Systems.					
Title: Autonomy, Artificial Intelligence, and Robotics ***Description:*** The Autonomy, Artificial Intelligence, and Robotics research area leverages emerging artificial intelligence techniques gained from the basic and applied research portfolio to develop technologies that address Navy specific needs such as enabling dynamic and unplanned sharing of resources for unmanned systems (platforms, payloads, data), increasing the capacity and resilience of logistics networks, and providing faster collaborative planning capabilities across competing missions, objectives, and warfighter needs. ***FY 2024 Plans:*** N/A ***FY 2025 Base Plans:*** Continue: - Applied research on a family of robotic autonomous systems with modular sensor and force protection payloads that are interoperable between multiple platform variants.	0.000	0.000	3.586	0.000	3.586

Exhibit R-2A, RDT&E Project Justification: PB 2025 Navy		Date: March 2024
Appropriation/Budget Activity 1319 / 2	**R-1 Program Element (Number/Name)** PE 0602750N / *Future Naval Capabilities Applied Research*	**Project (Number/Name)** 1392 / *Human Systems*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
Initiate: - Investigation of the effectiveness of robotic/AI-assisted methods as an alternative to traditional behavior modification in the training of animal partners for military roles and expeditionary support. - Research on the utilization of terrestrial (non-cloud based) Large Language Models to improve effectiveness of small commands in dense tactical environments by enabling voice commands to selectively filter or enhance large amounts of automated/AI-based situational data. -Applied research on a profiling buoy that can be deployed by multiple means, capable of seabed loiter, surfacing when triggered, and capable of conducting ISR tactical data collections and communications at the surface. - Feasibility studies to explore next generation applications of autonomy, artificial intelligence, and robotics in Navy and Marine Corps environments. ***FY 2025 OCO Plans:*** N/A ***FY 2024 to FY 2025 Increase/Decrease Statement:*** The increase in funding from FY 2024 to FY 2025 is due to the realignment of funding and associated requirements within PE 0602750N from the Warfighter Performance planned program in Project 0000 to the Autonomy, Artificial Intelligence, and Robotics planned program under Project 1392 Human Systems.					
Title: Manpower, Training, and Performance Assessment ***Description:*** The Manpower, Training, and Performance Assessment research area applies new knowledge gained from the basic and applied research portfolio to develop technologies that enhance Fleet and Force readiness and lethality by: increasing the understanding and application of learning sciences; enhancing and preserving military members' capabilities to execute essential tasks under any conditions and environment; maintaining warfighting proficiency and readiness by providing mentoring, mission readiness assessment, and long-term trend and data analysis. ***FY 2024 Plans:*** N/A ***FY 2025 Base Plans:*** Complete	0.000	0.000	10.485	0.000	10.485

Exhibit R-2A, RDT&E Project Justification: PB 2025 Navy		Date: March 2024
Appropriation/Budget Activity 1319 / 2	**R-1 Program Element (Number/Name)** PE 0602750N / *Future Naval Capabilities Applied Research*	**Project (Number/Name)** 1392 / *Human Systems*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
- Applied research to develop capabilities that will improve instructor performance and proficiency, leading to enhanced student learning outcomes. Continue: - Expanding models that provide decision support tools during the selection and assignment process of military personnel in order to maximize organizational effectiveness. - Applied research on a Modular, Live-Virtual-Constructive integrated warfare environment to support training, mission rehearsal, and assessment of Carrier Strike Group and Air Wing forces while at sea. - Investigations on adaptive training approaches that include automated assessment and adaptive scenarios to accelerate training of ship handling skills for bridge personnel. Initiate: - Conduct novel applied research in support of emerging Naval and Marine Corps Requirements, to include optimization of individual and team performance using manpower, personnel, and training approaches. - Studies and begin development of next generation human performance applications focused on operational risk management processes for fatigue. - Feasibility studies to explore next generation applications of manpower, performance, protection, and medical support in Navy and Marine Corps environments. ***FY 2025 OCO Plans:*** N/A ***FY 2024 to FY 2025 Increase/Decrease Statement:*** The increase in funding from FY 2024 to FY 2025 is due to the realignment of funding and associated requirements within PE 0602750N from the Warfighter Performance planned program in Project 0000 to the Manpower, Training, and Performance Assessment planned program under Project 1392 Human Systems.					
Accomplishments/Planned Programs Subtotals	0.000	0.000	18.266	0.000	18.266

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 / 2	**R-1 Program Element (Number/Name)** PE 0602750N / *Future Naval Capabilities Applied Research*	**Project (Number/Name)** 1392 / *Human Systems*

D. Acquisition Strategy

N/A

Exhibit R-2A, RDT&E Project Justification: PB 2025 Navy			Date: March 2024
Appropriation/Budget Activity 1319 / 2	R-1 Program Element (Number/Name) PE 0602750N / *Future Naval Capabilities Applied Research*	Project (Number/Name) 1393 / *Kinetic Weapons*	

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
1393: *Kinetic Weapons*	0.000	0.000	0.000	17.400	-	17.400	21.866	24.174	24.657	23.603	Continuing	Continuing

Note

Investments in Project 1393 Kinetic Weapons were previously funded in this same PE 0602750N under the Naval Air Warfare and Weapons and Expeditionary Maneuver Warfare (EMW) and Combating Terrorism planned programs in Project 0000. This new Project was created to promote greater transparency and execution oversight for Technical Candidate investments in kinetic weapons in the Department of the Navy's annual budget request. This is not a new start.

A. Mission Description and Budget Item Justification

The Kinetic Weapons activity develops technologies to address the Navy and Marine Corps fires requirements for extended range, increased precision, decreased weapons fly-out times, greater destructive power, novel weapons effects, autonomy, human-machine teaming, reduced weapons costs, mission planning, and mass-producible swarming munitions.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
Title: Kinetic Weapons	0.000	0.000	15.225	0.000	15.225
Description: Investigate and mature technologies in support of sub-systems applicable to current and/or future kinetic weapons systems, i.e., missiles, rockets, projectiles, bombs and mortars. Developmental areas include, but not limited to: propulsion, seekers, guidance, navigation and control; warheads, and related targeting, networking, and command and control systems.					
FY 2024 Plans: N/A					
FY 2025 Base Plans: Continue: Investigating advanced material and structural capabilities in aerodynamics for high-speed/hypersonic weapons. Feasibility studies and possible development of terminal defense fire control architectures that support low cost and easy integration onto ships and into expeditionary forces for terminal defense suitable for multiple engagement weapons. Investigation into varied technologies that could mitigate impacts of adverse navigational environments upon weapon systems employed in denied areas. Investigation into advanced propulsion techniques for high speed weapons; main focus on air-breathing concepts.					

Exhibit R-2A, RDT&E Project Justification: PB 2025 Navy		Date: March 2024
Appropriation/Budget Activity 1319 / 2	**R-1 Program Element (Number/Name)** PE 0602750N / *Future Naval Capabilities Applied Research*	**Project (Number/Name)** 1393 / *Kinetic Weapons*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
Complete: Investigation of advanced air-to-surface/ground seeker technologies, focusing largely on efficacy in a hypersonic regime. Maturing design concepts, fabricating sample components, and performing preliminary testing to inform future system level design trades. Leveraging ongoing reactive materials initiatives for application to additional munitions and weapons. Establish weight/volume versus range increase potential for conceptual warhead designs. Establish warhead interface constraints for system integration. Feasibility studies for tactical decision aids that support advanced strike weapons. Initiate: Study and development of air-launched missile concepts in response to evolving requirements for both anti-air and anti-surface applications. Define the key component technologies and associated maturation roadmaps required to enable the transition of these weapon concepts to meet planned future weapons development. Development and maturation of key enabling missile component technologies that are necessary to meet the Fleet's requirement to: engage both air and surface targets at greater ranges, reduce weapon size to increase launch platform carriage capacity, and introduce affordability to meet the need for weapon quantity. Investigation of technologies needed for delivering autonomous weapons with complete kill chain coverage to both manned and unmanned surface vessels. Emphasis will be on developing containerized, modular, and platform agnostic systems. Investigation of technologies needed to increase capacity of shipboard launch systems in both numbers and types of weapons. Also, investigate possible application of industrial automation techniques to weapon handling and loading. ***FY 2025 OCO Plans:*** N/A ***FY 2024 to FY 2025 Increase/Decrease Statement:*** Funds for this Activity were moved from the same PE 0602750N under the Naval Air Warfare and Weapons of Project 0000 Future Naval Capabilities Applied Research. It represents areas previously identified under the following thrusts: Kinetic Weapons.					
Title: Expeditionary Kinetic Weapons	0.000	0.000	2.175	0.000	2.175

Exhibit R-2A, RDT&E Project Justification: PB 2025 Navy		Date: March 2024
Appropriation/Budget Activity 1319 / 2	**R-1 Program Element (Number/Name)** PE 0602750N / *Future Naval Capabilities Applied Research*	**Project (Number/Name)** 1393 / *Kinetic Weapons*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
Description: The Expeditionary Kinetic Weapons activity enhances the ability of naval expeditionary forces to strike at longer ranges, with greater precision, and using scalable weapons effects. This can also include new developments in weapon autonomy; new seekers for expeditionary weapons; next-generation precision, navigation, and timing in contested environments; human-machine teaming; decreasing the time to the target; collaboration of multiple kinetic weapons; and reducing overall weapon size, weight, power and cost. This can include system studies, system architecture development, and component and/or breadboard validation in laboratory environments. ***FY 2024 Plans:*** N/A ***FY 2025 Base Plans:*** Continue: - Continue research to improve warfighter effectiveness in command, control, computers and communication, intelligence, surveillance and reconnaissance in the area of electromagnetic spectrum analysis and signature management. (Expeditionary Maneuver Warfare (EMW) and Combating Terrorism) Complete: - Complete effort to conduct feasibility demonstration of a missile launcher capable of launching multiple calibers of militarily relevant munitions from a single platform. (Expeditionary Maneuver Warfare (EMW) and Combating Terrorism) ***FY 2025 OCO Plans:*** N/A ***FY 2024 to FY 2025 Increase/Decrease Statement:*** Funds for this Activity were moved from the same PE 0602750N under the Expeditionary Maneuver Warfare (EMW) and Combating Terrorism Activity of Project 0000 Future Naval Capabilities Applied Research. It represents areas previously identified under the following thrusts: Force Protection and Firepower.					
Accomplishments/Planned Programs Subtotals	0.000	0.000	17.400	0.000	17.400

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 / 2	**R-1 Program Element (Number/Name)** PE 0602750N / *Future Naval Capabilities Applied Research*	**Project (Number/Name)** 1393 / *Kinetic Weapons*

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 / 2	R-1 Program Element (Number/Name) PE 0602750N / *Future Naval Capabilities Applied Research*	Project (Number/Name) 1394 / *Manufacturing*	

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
1394: *Manufacturing*	0.000	0.000	0.000	6.450	-	6.450	7.291	8.060	8.221	7.870	Continuing	Continuing

Note

Investments in this new Project were previously funded in this same PE 0602750N under the Sea Warfare Planned Programs of Project 0000 Future Naval Capabilities Applied Research. This new Project was created to promote greater transparency and execution oversight for Technical Candidate investments in the Manufacturing Focus Area. This is not a new start.

A. Mission Description and Budget Item Justification

This project develops and matures technologies that enable superior warfighting capabilities for surface and sub-surface naval platforms, undersea weapons and countermeasures, and Marine Corps technologies to a point where they can be proposed and continued as Future Naval Capabilities in program element (PE) 0603673N, Future Naval Capabilities Advanced Technology Development.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
Title: Manufacturing, Sustainment & Logistics	0.000	0.000	6.450	0.000	6.450
Description: The Manufacturing activity develops technologies that advance the design, fabrication, construction, repair, and sustainment of naval platforms. It represents the manufacturing, sustainment, and logistics areas previously identified under the Materials, Manufacturing, Sustainment, and Logistics Thrust.					
FY 2024 Plans: N/A					
FY 2025 Base Plans: Continue: N/A Complete: - Corrosion-Informed Materials Section and Design Tool (CIMaD Tool) efforts to develop a DoN corrosion materials database and associated corrosion simulation algorithms and validate a set of simulation algorithms using the developed database to predict corrosion damage which is critical to pursue research to design against corrosion prior to production of DoN assets. Initiate:					

Exhibit R-2A, RDT&E Project Justification: PB 2025 Navy		Date: March 2024
Appropriation/Budget Activity 1319 / 2	**R-1 Program Element (Number/Name)** PE 0602750N / *Future Naval Capabilities Applied Research*	**Project (Number/Name)** 1394 / *Manufacturing*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
- Feasibility studies and technology development to explore next generation applications of manufacturing and sustainment in Navy and Marine Corps environments. ***FY 2025 OCO Plans:*** N/A ***FY 2024 to FY 2025 Increase/Decrease Statement:*** Funding increase from FY2024 to FY2025 is due to movement of funds from the same PE 0602750N under the Sea Warfare and Weapons Activity of Project 0000 Future Naval Capabilities Applied Research. It represents a portion of the funding previously identified under Manufacturing, Sustainment & Logistics Thrust.					
Accomplishments/Planned Programs Subtotals	0.000	0.000	6.450	0.000	6.450

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 / 2	R-1 Program Element (Number/Name) PE 0602750N / *Future Naval Capabilities Applied Research*	Project (Number/Name) 1395 / *Materials*	

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
1395: *Materials*	0.000	0.000	0.000	1.433	-	1.433	1.620	1.791	1.827	1.749	Continuing	Continuing

Note

Investments in this new Project were previously funded in this same PE 0602750N under the Sea Warfare Planned Programs of Project 0000 Future Naval Capabilities Applied Research. This Project was created to promote greater transparency and execution oversight for Technical Candidate investments in the Materials Focus Area. This is not a new start.

A. Mission Description and Budget Item Justification

This project develops and matures technologies that enable superior warfighting capabilities for surface and sub-surface naval platforms, undersea weapons and countermeasures, and Marine Corps technologies to a point where they can be proposed and continued as Future Naval Capabilities in program element (PE) 0603673N, Future Naval Capabilities Advanced Technology Development.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
Title: Materials	0.000	0.000	1.433	0.000	1.433
Description: The Materials activity invests in applied research of new materials that enhance the performance, affordability, survivability, and reliability of Navy and Marine Corps platforms and systems.					
FY 2024 Plans: N/A					
FY 2025 Base Plans: Continue: - Developing protective topcoat materials that meet military specifications and are selectively removed with environmentally friendly chemical strippers. (Initiated in FY24) Complete: N/A Initiate: - Feasibility studies and technology development to explore next generation applications of materials in Navy and Marine Corps environments.					
FY 2025 OCO Plans:					

Exhibit R-2A, RDT&E Project Justification: PB 2025 Navy		Date: March 2024
Appropriation/Budget Activity 1319 / 2	**R-1 Program Element (Number/Name)** PE 0602750N / *Future Naval Capabilities Applied Research*	**Project (Number/Name)** 1395 / *Materials*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
N/A ***FY 2024 to FY 2025 Increase/Decrease Statement:*** Funding increase from FY2024 to FY2025 is due to movement of funds from the same PE 0602750N under the Sea Warfare and Weapons Activity of Project 0000 Future Naval Capabilities Applied Research. It represents a portion of the funding previously identified under the Materials Thrust.					
Accomplishments/Planned Programs Subtotals	0.000	0.000	1.433	0.000	1.433

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 / 2					R-1 Program Element (Number/Name) PE 0602750N / *Future Naval Capabilities Applied Research*				Project (Number/Name) 1396 / *Naval Engineering*			
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**
1396: *Naval Engineering*	0.000	0.000	0.000	12.900	-	12.900	14.581	16.119	16.443	15.739	Continuing	Continuing

Note

-Investments in this Project were previously funded in this same PE 0602750N under the Sea Warfare Planned Programs of Project 0000 Future Naval Capabilities Applied Research. This Project was created to promote greater transparency and execution oversight for Technical Candidate investments in the Naval Engineering Focus Area. This is not a new start.

A. Mission Description and Budget Item Justification

This project develops and matures technologies that enable superior warfighting capabilities for surface and sub-surface naval platforms, undersea weapons and countermeasures, and Marine Corps technologies to a point where they can be proposed and continued as Future Naval Capabilities in program element (PE) 0603673N, Future Naval Capabilities Advanced Technology Development.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
Title: Platform Design and Engineering	0.000	0.000	12.900	0.000	12.900
Description: The Naval Engineering activity improves design, fabrication, integration, and operation of ground and sea naval warfare platforms, sensors, weapons, networks, and countermeasures to maximize their operational availability and effectiveness. It represents areas previously identified under the Platform Design and Engineering Thrust.					
FY 2024 Plans: N/A					
FY 2025 Base Plans: Continue: - Identify alternative undersea advanced material hull concepts that have an enhanced resistance to weapon effects and develop a high-fidelity predictive capabilities. (Initiated in FY24) - Develop technologies that provide real-time electric field signature measurement and control. (Initiated in FY24) . - Applied research in environmental measurement and monitoring to assess infrared detectability in real-time. (Initiated in FY24) - Applied research in artificial intelligence for optimized design of naval systems. (Initiated in FY24)					

Exhibit R-2A, RDT&E Project Justification: PB 2025 Navy		Date: March 2024
Appropriation/Budget Activity 1319 / 2	**R-1 Program Element (Number/Name)** PE 0602750N / *Future Naval Capabilities Applied Research*	**Project (Number/Name)** 1396 / *Naval Engineering*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
Complete: - Autonomous Determination of Vessel Intent (ID) efforts to develop and test an algorithm that will autonomously determine the intent of another vessel. - Low-Observable Communications Mast for Undersea Platforms (LOCM-UP) efforts to reduce the radar cross section (RCS) and overall counter detection risk of the submarine multifunction mast (MFM) while maintaining or increasing broad spectrum communications capability. - Own Ship Electro-Magnetic Monitoring (OSEM) efforts to complete external sensor requirements and specifications development, continue sensor design, and develop the sensor qualification test plan. - Feasibility and utility studies for next generation undersea submersibles (Initiated in FY23) Initiate: - Feasibility studies and technology development to explore next generation applications of Naval Engineering in Navy and Marine Corps environments. ***FY 2025 OCO Plans:*** N/A ***FY 2024 to FY 2025 Increase/Decrease Statement:*** Funding increase from FY2024 to FY2205 is due to movement of funds from the same PE 0602750N under the Sea Warfare and Weapons Activity of Project 0000 Future Naval Capabilities Applied Research. It represents areas previously identified under Platform Design and Engineering Thrust.					
Accomplishments/Planned Programs Subtotals	0.000	0.000	12.900	0.000	12.900

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 / 2					R-1 Program Element (Number/Name) PE 0602750N / *Future Naval Capabilities Applied Research*				Project (Number/Name) 1399 / *Ocean Battle Space Applications*			
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**
1399: *Ocean Battle Space Applications*	0.000	0.000	0.000	30.095	-	30.095	35.061	39.073	38.878	38.544	Continuing	Continuing

Note

Investments in Project 1399 Ocean Battle Space Applications were previously funded in this same PE 0602750N under the Ocean Battlespace Sensing and Expeditionary Maneuver Warfare (EMW) and Combating Terrorism planned programs of Project 0000 Future Naval Capabilities Applied Research. This Project was created to promote greater transparency and execution oversight for Technical Candidate investments in Ocean Battle Space Applications in the Department of the Navy's annual budget request. This is not a new start.

A. Mission Description and Budget Item Justification

The objective of this project is to enable maritime domain access and distributed operations for Naval forces in contested environments through superior maritime battlespace awareness and threat detection, identification and neutralization. Specifically, activities will develop and mature technologies that ultimately support Mine and Expeditionary Warfare, Undersea Warfare, and Environmental Information Warfare. Activities will also develop and mature methods and technological approaches for environmental sensing and prediction for the maritime battlespace. The desired outcome for efforts in this activity is to mature the applied research results to a point where they can be focused on particular enabling capabilities and proposed to be continued as Future Naval Capabilities (FNC) in program element (PE) 0603673N, Future Naval Capabilities Advanced Technology Development. Additionally, a subset of technologies explored herein are intended to support expeditionary access and will be further matured, focused, and ultimately demonstrated under the USMC's Advanced Technology Demonstration effort in PE 0603640M MC Advanced Technology Demo.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
Title: Mine and Expeditionary Warfare	0.000	0.000	3.474	0.000	3.474
Description: To enable operational maritime maneuver and amphibious assault by driving down timelines to detect, identify, and neutralize mines and explosive hazards. To shape the undersea battlespace and restrict the maneuver of enemy maritime forces via advanced mining technologies.					
FY 2024 Plans: N/A					
FY 2025 Base Plans: Mine and Expeditionary Warfare -Continue development of high area coverage rate mine warfare capability for contested environments to support naval maneuver in Western Pacific; this includes development of enabling machine learning algorithms,					

Exhibit R-2A, RDT&E Project Justification: PB 2025 Navy		Date: March 2024
Appropriation/Budget Activity 1319 / 2	**R-1 Program Element (Number/Name)** PE 0602750N / *Future Naval Capabilities Applied Research*	**Project (Number/Name)** 1399 / *Ocean Battle Space Applications*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
autonomous behavior, and hardware which enables autonomous systems to conduct long-duration, low-observable seabed surveys. -Continue development of a common encapsulation system supporting a variety of effectors; this includes technical development of effector capability, technical modification to support modular encapsulation, and technical investigation options associated with integrated delivery. -Initiate development of advanced diagnostics, communications, endurance, and neutralization technologies to improve access, range, C2, sensing, localization and lethal effects of the Navy EOD Expeditionary Stand-off Response System. ***FY 2025 OCO Plans:*** N/A ***FY 2024 to FY 2025 Increase/Decrease Statement:*** Funds for this Activity were moved from the same PE 0602750N under the Ocean Battlespace Sensing Activity of Project 0000 Future Naval Capabilities Applied Research.					
Title: Expeditionary Ocean & Battle Space Applications ***Description:*** This activity invests in the research related to the ability to conduct military operations in expeditionary and maritime environments is support of naval expeditionary forces. This can include antisubmarine warfare in the littorals and maritime choke points, mine warfare and explosive hazard defeat applications, and remote sensing. Research may span system studies, system architecture development, and component and/or breadboard validation in laboratory environments. ***FY 2024 Plans:*** N/A ***FY 2025 Base Plans:*** - Initiate development of acoustic and non-acoustic sensors and transduction systems as a means to provide next-generation sensing technologies to provide undersea monitoring and tracking in the littorals by expeditionary forces. (Expeditionary Maneuver Warfare (EMW) and Combating Terrorism) - Initiate development of automated sonar processing, sensor command and control, sensor networks, and data exfiltration in order to enable expeditionary Antisubmarine Warfare/Undersea Warfare systems in the littorals and maritime choke points. (Expeditionary Maneuver Warfare (EMW) and Combating Terrorism)	0.000	0.000	4.979	0.000	4.979

Exhibit R-2A, RDT&E Project Justification: PB 2025 Navy		Date: March 2024
Appropriation/Budget Activity 1319 / 2	**R-1 Program Element (Number/Name)** PE 0602750N / *Future Naval Capabilities Applied Research*	**Project (Number/Name)** 1399 / *Ocean Battle Space Applications*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
- Initiate development of night-time and low-light electro-optical sensors for real-time, computer vision based automatic target detection of explosive hazards and airfield damage from unmanned aerial and ground platforms. (Expeditionary Maneuver Warfare (EMW) and Combating Terrorism) ***FY 2025 OCO Plans:*** N/A ***FY 2024 to FY 2025 Increase/Decrease Statement:*** Funds for this Activity were moved from the same PE 0602750N under the Expeditionary Maneuver Warfare (EMW) and Combating Terrorism Activity of Project 0000 Future Naval Capabilities Applied Research.					
Title: Undersea Warfare ***Description:*** To understand and exploit the physical ocean environment to gain a tactical advantage. Develop components, sensors, signal processing algorithms, and systems that improve distributed search, localization, and surveillance. ***FY 2024 Plans:*** N/A ***FY 2025 Base Plans:*** Undersea Warfare - Continue In-water comparative analysis/testing of glider towed arrays for detection of ASW threats in the ocean environment; leverage emerging glider technologies for increased endurance and consider novel array fabrication to characterize best fit for variety of ocean environments. - Continue Development of signal processing and displays to improve performance and reduce vulnerability for submarine active sonar. - Continue Development of computational methods to detect very quiet submarine targets by combining evidence from multiple arrays. -Continue Development of algorithms and software for making probabilistic USW-related sensor performance forecasts that can be used in strike group and theater anti-submarine warfare mission plans. ***FY 2025 OCO Plans:*** N/A ***FY 2024 to FY 2025 Increase/Decrease Statement:***	0.000	0.000	6.062	0.000	6.062

Exhibit R-2A, RDT&E Project Justification: PB 2025 Navy		Date: March 2024
Appropriation/Budget Activity 1319 / 2	**R-1 Program Element (Number/Name)** PE 0602750N / *Future Naval Capabilities Applied Research*	**Project (Number/Name)** 1399 / *Ocean Battle Space Applications*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
Funds for this Activity were moved from the same PE 0602750N under the Ocean Battlespace Sensing Activity of Project 0000 Future Naval Capabilities Applied Research.					
Title: Environmental Information Warfare ***Description:*** Understand and predict the physical battlespace at time and space scales that are operationally relevant and exploit known physical maritime environmental phenomena from remote and tactical sensors. ***FY 2024 Plans:*** N/A ***FY 2025 Base Plans:*** Environmental Information Warfare -Continue Development of algorithms and software for making probabilistic USW-related sensor performance forecasts that can be used in strike group and theater anti-submarine warfare mission plans. -Continue Development of algorithms to assess and predict the impact of the atmospheric aerosols and turbulence on the performance of electro-optic and infra-red naval sensors. -Continue Algorithm development for improved cloud visibility assessment by leveraging new government-owed, open architecture paradigm in Space-Based Environmental Monitoring (SBEM) data processing and delivery needed to improve timely, accurate decision making in the maritime battlespace environment. -Continue to apply system learning to tactical environment assessment and prediction in support of aviation applications. -Continue development of improvements to polar ionosphere sensing and prediction for a regional full-physics model leveraging recently developed sensors and advances in polar space weather science. -Continue Development of a fully coupled ionospheric-thermospheric model to permit greatly improved multi-day forecasts for propagation conditions of HF communications and radars. -Continue Characterization of Earth science model error in decision support tools by examining forecast fidelity from short-term (hourly) to sub-climate (monthly) timescales using a hierarchy of data quality, from full coupled dynamical simulations to regional, statistical, and climatological guidance. -Continue Development of the numerical representation of improved tropospheric-stratospheric interaction and mesospheric data assimilation for gravity wave processes leading to extended range prediction of extreme weather events -Complete new government-owed, open architecture paradigm in Space-Based Environmental Monitoring (SBEM) data processing and delivery needed to improve timely, accurate decision making in the maritime battlespace environment.	0.000	0.000	15.580	0.000	15.580

Exhibit R-2A, RDT&E Project Justification: PB 2025 Navy		Date: March 2024
Appropriation/Budget Activity 1319 / 2	**R-1 Program Element (Number/Name)** PE 0602750N / *Future Naval Capabilities Applied Research*	**Project (Number/Name)** 1399 / *Ocean Battle Space Applications*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
-Complete development of a prototype radio frequency (RF) communications and signature management tool for small unit maneuver in the coastal and terrestrial environments to assess the environmental variability spatially and temporally. Initiate: ***FY 2025 OCO Plans:*** N/A ***FY 2024 to FY 2025 Increase/Decrease Statement:*** Funds for this Activity were moved from the same PE 0602750N under the Ocean Battlespace Sensing Activity of Project 0000 Future Naval Capabilities Applied Research.					
Accomplishments/Planned Programs Subtotals	0.000	0.000	30.095	0.000	30.095

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 / 2	R-1 Program Element (Number/Name) PE 0602750N / *Future Naval Capabilities Applied Research*	Project (Number/Name) 1400 / *Power and Energy*	

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
1400: *Power and Energy*	0.000	0.000	0.000	4.300	-	4.300	4.861	5.373	5.481	5.246	Continuing	Continuing

Note

Investments in this Project were previously funded in this same PE 0602750N under the Sea Warfare Planned Programs of Project 0000 Future Naval Capabilities Applied Research. This Project was created to promote greater transparency and execution oversight for Technical Candidate investments in the Power and Energy Focus Area. This is not a new start.

A. Mission Description and Budget Item Justification

This project develops and matures technologies that enable superior warfighting capabilities for surface and sub-surface naval platforms, undersea weapons and countermeasures, and Marine Corps technologies to a point where they can be proposed and continued as Future Naval Capabilities in program element (PE) 0603673N, Future Naval Capabilities Advanced Technology Development.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
Title: Naval Power Systems	0.000	0.000	4.300	0.000	4.300
Description: The Power and Energy planned programs develop increasingly efficient, reliable, resilient, and abundant energy for Navy and Marine Corps infrastructure, platforms, systems, and equipment. Power and Energy technology investments seek to optimize power and energy density, energy efficiency, service life, reliability, low maintenance operation, safety, and cost. It represents areas previously identified under the Naval Power Systems Thrust.					
FY 2024 Plans: N/A					
FY 2025 Base Plans: Continue: - Electrical Ship Asset efforts: aging modelling and Reliability and Condition Assessment (ESARCA) efforts to investigate methods that lead to effective use of electrical insulation materials on ships employing high voltage electrical equipment.					
Complete:					

Exhibit R-2A, RDT&E Project Justification: PB 2025 Navy		Date: March 2024
Appropriation/Budget Activity 1319 / 2	**R-1 Program Element (Number/Name)** PE 0602750N / *Future Naval Capabilities Applied Research*	**Project (Number/Name)** 1400 / *Power and Energy*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
- COTS Battery Phase II (COTS B II) research to develop and demonstrate a custom battery design that uses automotive industry commercial-off-the-shelf (COTS) battery hardware and lifecycle data-driven reliability approaches to battery management. - High Density Kinetic Energy Storage System (HD KESS) efforts to prove the feasibility of a non-battery Energy Magazine. Initiate: - Feasibility studies and technology development to explore next generation applications of Power and Energy technologies in Navy and Marine Corps environments. ***FY 2025 OCO Plans:*** N/A ***FY 2024 to FY 2025 Increase/Decrease Statement:*** Funding increase from FY2024 to FY2025 is due to movement of funds from the same PE 0602750N under the Sea Warfare and Weapons planned programs of Project 0000 Future Naval Capabilities Applied Research. It represents areas previously identified under the Naval Power Systems Thrust.					
Accomplishments/Planned Programs Subtotals	0.000	0.000	4.300	0.000	4.300

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 / 2					R-1 Program Element (Number/Name) PE 0602750N / *Future Naval Capabilities Applied Research*				Project (Number/Name) 1401 / *Undersea Systems Payloads and Weapons*			
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**
1401: *Undersea Systems Payloads and Weapons*	0.000	0.000	0.000	3.584	-	3.584	4.050	4.478	4.567	4.372	Continuing	Continuing

Note

Investments in this Project were previously funded in this same PE 0602750N under the Sea Warfare and Weapons Planned Programs of Project 0000 Future Naval Capabilities Applied Research. This Project was created to promote greater transparency and execution oversight for Technical Candidate investments in the Undersea Systems Payloads & Weapons Focus Area. This is not a new start.

A. Mission Description and Budget Item Justification

This project develops and matures technologies that enable superior warfighting capabilities for surface and sub-surface naval platforms, undersea weapons and countermeasures, and Marine Corps technologies to a point where they can be proposed and continued as Future Naval Capabilities in program element (PE) 0603673N, Future Naval Capabilities Advanced Technology Development.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
Title: Undersea Weapons	0.000	0.000	3.584	0.000	3.584
Description: The Undersea Systems, Payloads, and Weapons activity produces innovative affordable, persistent, and stealthy undersea technologies that leverage the asymmetric advantage afforded by subsurface operations. It represents areas previously identified under the Undersea Weapons Thrust.					
FY 2024 Plans: N/A					
FY 2025 Base Plans: Continue: - Feasibility studies to explore next generation applications of Undersea Weapons in Navy and Marine Corps environments. Complete: N/A Initiate: - Feasibility studies and technology development to explore next generation applications of Undersea Systems, Payloads, and Weapons in Navy and Marine Corps environments.					
FY 2025 OCO Plans:					

Exhibit R-2A, RDT&E Project Justification: PB 2025 Navy		Date: March 2024
Appropriation/Budget Activity 1319 / 2	**R-1 Program Element (Number/Name)** PE 0602750N / *Future Naval Capabilities Applied Research*	**Project (Number/Name)** 1401 / *Undersea Systems Payloads and Weapons*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
N/A ***FY 2024 to FY 2025 Increase/Decrease Statement:*** Funding increase from FY2024 to FY2025 is due to movement of funds from the same PE 0602750N under the Sea Warfare and Weapons Activity of Project 0000 Future Naval Capabilities Applied Research. It represents areas previously identified under Undersea Weapons Thrust.					
Accomplishments/Planned Programs Subtotals	0.000	0.000	3.584	0.000	3.584

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 / 2	R-1 Program Element (Number/Name) PE 0602750N / *Future Naval Capabilities Applied Research*	Project (Number/Name) 5893 / *Decision Superiority*	

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
5893: *Decision Superiority*	0.000	0.000	0.000	11.322	-	11.322	10.172	11.547	10.795	11.698	Continuing	Continuing

Note

Investments in Project 5893 Decision Superiority were previously funded in this same PE 0602750N under the C4ISR and Special Projects planned programs of Project 0000 Future Naval Capabilities Applied Research. This Project was created to promote greater transparency and execution oversight for Technical Candidate investments in Decision Superiority in the Department of the Navy's annual budget request. This is not a new start.

A. Mission Description and Budget Item Justification

Decision Superiority researches and develops communications, networking, information processing, analysis, decision making, and understanding to obtain decisive advantage across the spectrum of naval missions and warfare.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
Title: Communications and Networking	0.000	0.000	5.087	0.000	5.087
Description: Communications and Networking develops technologies and techniques that enable distributed maritime operations.					
FY 2024 Plans: N/A					
FY 2025 Base Plans: Communications and Networking: Continue: - Analyzing Fifth generation (5G) security and protocols to identify vulnerabilities to close security gaps to increase resiliency and robustness against adversarial attack. - Maturing promising over the horizon communications that include low probability of detection and low probability of intercept features to enable distributed maritime operations. - Development of multi-beam communications for data dissemination and unmanned and autonomous control applications. - Development of software defined modem technologies for waveform interoperability, low probability of intercept and joint service compatibility.					
FY 2025 OCO Plans:					

Exhibit R-2A, RDT&E Project Justification: PB 2025 Navy		Date: March 2024
Appropriation/Budget Activity 1319 / 2	**R-1 Program Element (Number/Name)** PE 0602750N / *Future Naval Capabilities Applied Research*	**Project (Number/Name)** 5893 / *Decision Superiority*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
N/A ***FY 2024 to FY 2025 Increase/Decrease Statement:*** Funding increase from FY 2024 to FY 2025 is due to a realignment of funds from the same PE 0602750N under the C4ISR and Special Projects planned programs of Project 0000 Future Naval Capabilities Applied Research.					
Title: Intelligence, Decision-Making Superiority, C2 and Combat Systems ***Description:*** Intelligence, Decision-Making Superiority, C2 and Combat Systems conducts applied research dedicated to developing decision tools to allow Commanders to rapidly and confidently move from data-to-options-to-informed decisions. ***FY 2024 Plans:*** N/A ***FY 2025 Base Plans:*** Intelligence, Decision-Making Superiority, C2 and Combat Systems: Continue: - Developing frameworks for cross platform intelligent resource management and data dissemination providing both enhanced Distributed Maritime Operations and system resilience. - Optimization of machine learning and AI algorithms for planning to execution synchronization of hard kill, cyber and electromagnetic engagements. - Development of advanced computing for machine learning on the tactical edge. Complete: - Developing capabilities that allow commanders to rapidly and confidently move from data-to-options-to-informed decision both at the Maritime Operations Center and Afloat. Initiate: - Development of multi-level security protocols and solution for DMO. ***FY 2025 OCO Plans:*** N/A ***FY 2024 to FY 2025 Increase/Decrease Statement:***	0.000	0.000	6.235	0.000	6.235

Exhibit R-2A, RDT&E Project Justification: PB 2025 Navy		Date: March 2024
Appropriation/Budget Activity 1319 / 2	**R-1 Program Element (Number/Name)** PE 0602750N / *Future Naval Capabilities Applied Research*	**Project (Number/Name)** 5893 / *Decision Superiority*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
Funding increase from FY 2024 to FY 2025 is due to a realignment of funds from the same PE 0602750N under the C4ISR and Special Projects planned programs of Project 0000 Future Naval Capabilities Applied Research.					
Accomplishments/Planned Programs Subtotals	0.000	0.000	11.322	0.000	11.322

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 / 2	R-1 Program Element (Number/Name) PE 0602750N / *Future Naval Capabilities Applied Research*	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	3.379	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	3.379

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: Operational readiness via next-generation satellites	3.379	0.000
FY 2023 Accomplishments: Conduct research supporting operational readiness via next-generation satellites.		
FY 2024 Plans: N/A		
Congressional Adds Subtotals	3.379	0.000

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A