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

Appropriation/Budget Activity 1319: <i>Research, Development, Test & Evaluation, Navy / BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 0603216N / <i>Aviation Survivability</i>
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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
Total Program Element	242.961	17.330	20.874	23.115	-	23.115	25.431	27.642	27.945	28.532	Continuing	Continuing
0584: <i>Acft Protective Clothing</i>	124.647	7.841	11.631	13.742	-	13.742	15.886	17.950	18.032	18.408	Continuing	Continuing
0591: <i>Acft Survivability, Vulnerability & Safety</i>	57.506	3.472	3.642	3.665	-	3.665	3.697	3.725	3.815	3.897	Continuing	Continuing
0592: <i>Acft & Ordnance Safety</i>	54.251	5.387	4.974	5.070	-	5.070	5.177	5.285	5.403	5.517	Continuing	Continuing
1819: <i>CV Acft Fire Suppress System</i>	6.557	0.630	0.627	0.638	-	0.638	0.671	0.682	0.695	0.710	Continuing	Continuing

A. Mission Description and Budget Item Justification

Aviation Survivability addresses the issues of aircrew and platform survivability, focusing on enhancing overall opportunity for aircrew and platform protection and enhanced performance. The capabilities addressed under this program element counter emerging threats of next generation operational weapons systems and enhance combat effectiveness in future operational mission scenarios.

JUSTIFICATION FOR BUDGET ACTIVITY: This program is funded under ADVANCED COMPONENT DEVELOPMENT AND PROTOTYPES because it includes all efforts necessary to evaluate integrated technologies, representative models or prototype systems in a high fidelity and realistic operating environment.

B. Program Change Summary (\$ in Millions)	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
Previous President's Budget	17.387	20.874	23.257	-	23.257
Current President's Budget	17.330	20.874	23.115	-	23.115
Total Adjustments	-0.057	0.000	-0.142	-	-0.142
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-0.001	0.000			
• SBIR/STTR Transfer	-0.056	0.000			
• Rate/Misc Adjustments	0.000	0.000	-0.142	-	-0.142

Change Summary Explanation

Schedule: Not Applicable
 Technical: Not Applicable

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Navy										Date: March 2024		
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0603216N / Aviation Survivability				Project (Number/Name) 0584 / Acft Protective Clothing			
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
0584: Acft Protective Clothing	124.647	7.841	11.631	13.742	-	13.742	15.886	17.950	18.032	18.408	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Project 0584 develops, demonstrates, prototypes, and validates technologies designed to enhance warfighter performance, protection, injury prevention, mission effectiveness, sustainment, and survivability. The project addresses readiness, life support equipment, physiological episodes, hearing protection and communication intelligibility, day / night digital advanced helmet vision systems, laser eye protection and supporting technologies, escape and crashworthy systems, active/passive restraint systems; survival and evasion, aircrew/injury modeling, crew centered cockpit design control stations, and aircraft maintainer protection. Fully protected and mission ready Aircrew are a critical component of Ready Basic Aircraft and mission execution. Project 0584 responds to a number of operational requirements documents, including OR# 210-05-88 for Chemical and Biological protection, OR# 099-05-087 for Laser Eye Protection, Aircrew Laser Eye Protection (ALEP) joint operation requirements document JORD #513-88-99, and Capabilities Program Document (CPD) Night Vision Cueing and Display (NVCD).

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
Title: Advanced Technology Crew Station	7.841	11.631	13.742	0.000	13.742
Articles:	-	-	-	-	-
FY 2024 Plans: Continue integration of I-PREDICT (Incapacitation Prediction for Readiness in Expeditionary Domains - an Integrated Computational Tool) software/algorithms and digital twin into Human System Engineering's (HSE) laboratories test and evaluation (T&E) infrastructure. Incorporate biomedically based models to enable improved risk assessment and testing to allow informed trade-offs. Move critical laboratory test capabilities from mannequin to a cadaver based model to improve the design, development, and testing of advanced personal protective equipment (PPE - e.g., crashworthy seating, vibration mitigation, helmet mounted displays, night vision devices, oxygen masks, etc.). Expand digital human modeling to assess head, neck, spine vertebral alignment/position for the design of PPE and seating systems. Continue the development and testing of active vibration damping and restraint systems that will address the full anthropometric range of male/female aviators to reduce the excessive impact and vibration while withstanding the harsh environments found on military platforms. Continue to advance extended mission effectiveness/endurance through platform improvements of seating systems to reduce the incidence of chronic and acute back and neck pain/injury. Improve seating systems, flight posture, and seat/cockpit ergonomics. Reduce Helmet Mounted Display (HMD) weight, bulk, and vibration.					

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Navy	Date: March 2024
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Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603216N / Aviation Survivability	Project (Number/Name) 0584 / Acft Protective Clothing
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B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
<p>Complete assessment digital high resolution sensor and display technologies motion blur. Determine the minimum acceptable /achievable refresh / frame rates to prevent blurring. Address improvements and preprogrammed upgrades of wavelength band/sensitivity for the silicon wafer to include Short Wavelength InfraRed (SWIR) to improve resolution at extremely low light levels and in degraded visual environments. Develop and test a wide field of view (WFOV) High Resolution Digital Goggle (HRDG) goggle (68+ degs). Assess the possibility of using wave guide optics to greatly simplify the optical train for helmet mounted displays.</p> <p>Mature prototypes of Active Noise Reduction (ANR), Dosimetry, Digital Signal Processing and related hearing protection and speech intelligibility technologies. Protect aircrew hearing while simultaneously providing effective protection, noise exposure level, intelligibility of voice and audio communication.</p> <p>Transition and continue spiral improvements to an aircraft/aircrew-mounted laser event recorder to detect and alert the warfighter when targeted/irradiated by a laser. Record characteristics of the laser strike (e.g., wavelength, power, pulse duration, etc.), as well as capture a picture of the scene with the global positioning system (GPS) coordinates.</p> <p>Continue to refine and evaluate dielectric coatings to provide higher optical densities in the long wavelength visible and near infrared portion of the electromagnetic spectrum. Improve lamination and profiling of dielectric filters. Assess dielectric deposition profile, uniformity, and thickness with a goal of increasing optical density. Continue advanced research and technology maturation activity for hearing protection, speech intelligibility improvement, active noise reduction (ANR), and dosimetry with emphasis on deep insert earplug technology transfer.</p> <p>Complete the baseline Physiological Monitor. Mature the warning elements and blue tooth hub of the Holistic Modular Aircrew Physiologic Status (HMAPS) monitoring system to mitigate physiologic episodes in real time. Refine algorithms, subsystems/sensor components, and expand monitoring to other episode contributors such as, hydration and cognitive state. Verify and validate performance and refine component and subsystem capability as required.</p> <p>Begin Human Systems Integration to address Air Wing of the Future (AWOTF). Optimize work/crew station design to maximize cognitive performance/decision making to support integrated manned and unmanned teaming (MUM-T) Air Wing of the Future. Research will address human performance as a function of cognitive workload and decision support to optimize situational awareness to deliver integrated warfighting capabilities.</p>					

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Navy	Date: March 2024
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Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603216N / <i>Aviation Survivability</i>	Project (Number/Name) 0584 / <i>Acft Protective Clothing</i>
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B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
<p>Continue a coordinated effort with the Naval Medical Research Unit - Dayton (NAMRU-D) Ohio to assess critical research projects in the areas of hypoxia, anthropometry, neck/back pain, laser eye protection, and hearing protection. Ensure the research is coordinated and aligns with ongoing Human Systems Engineering research efforts.</p> <p><i>FY 2025 Base Plans:</i> Continue to expand and integrate I-Predict (Incapacitation Prediction for Readiness in Expeditionary Domains - an Integrated Computational Tool) into the lavatory and T&E infrastructure of the Human Systems Engineering Department (HSED). The first use case has been identified to begin the verification and validation of I-Predict, which leverages lessons learned and software/algorithms maturation. Working with the acquisition community to incorporate this biomedically based model to enable improved risk assessment and testing to allow informed trade-offs. Using I-Predict's cadaver based digital twins to improve the bio fidelity of critical laboratory test capabilities currently using / based on anthropometric test devices (ATD) (i.e., mannequin) to improve the biofidelity of design, development, and testing of advanced personal protective equipment (PPE - e.g., crashworthy seating, vibration mitigation, helmet mounted displays, night vision devices, oxygen masks, etc.). Expand digital human modeling to assess head, neck, spine vertebral alignment/position for the design of PPE and seating systems. Continue development and testing to address the full anthropometric range of male/female aviators in order to reduce the excessive impact and vibration while withstanding the harsh environments found on military platforms.</p> <p>Assessment of motion blur of digital high resolution sensors and displays has been completed. The refresh / frame rates to eliminate all blur is unattainable so the course has shifted to identifying the minimum acceptable levels of blurring. Address improvements and preprogrammed upgrades of wavelength band/sensitivity for the silicon wafer to include Short Wavelength InfraRed (SWIR) to improve resolution at extremely low light levels and in degraded visual environments. A wide field of view (WFOV) High Resolution Digital Goggle (HRDG) goggle (68+ degs) is under development as well as assessing wave guide technology to greatly simplify the optical train for helmet mounted displays.</p> <p>Mature prototypes of Active Noise Reduction (ANR), Dosimetry, Digital Signal Processing and related hearing protection and speech intelligibility technologies. Protect aircrew hearing while simultaneously providing effective ANR while allowing intelligibility of voice and audio communication. Portions of the previous years' ANR work are scheduled to transition in FY25. Hearing protection Advanced development will now focus on moving hearing protection to in ear solutions. Development areas include miniaturizing components, adding dosimetry,</p>					

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B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
<p>improving signal processing, maintaining hearing situational awareness and addressing power. There will also be a renewed focus on improving speech intelligibility in the Naval diverse environments.</p> <p>Transition and continue spiral improvements to an aircraft/aircrew-mounted laser event recorder (LER) to detect and alert the warfighter when targeted/irradiated by a laser. The LER will record characteristics of the laser strike (e.g., wavelength, power, pulse duration, etc.), as well as capture a picture of the scene with the global positioning system (GPS) coordinates.</p> <p>Continue to refine and evaluate dielectric coatings to provide higher optical densities in the long wavelength visible and near infrared portion of the electromagnetic spectrum. The includes improve lamination and profiling of dielectric filters. Assess dielectric deposition profile, uniformity, and thickness with a goal of increasing optical density. Explore the adding photosensitive filters (i.e., photochromics) to provide a day /night solution</p> <p>The Physiological Monitor Hub is planned for transition in FY24. There will be continued development of Mask Sensors and Physiological Monitor systems, and efforts to refine the monitor (HsPro low energy blue tooth enabled), monitoring performance, and improving warning. Continue to address other physiologic episode contributors such as hydration, cognitive state and fatigues. In a spiral development / upgrade type approach, the algorithms, subsystems/sensor components, monitors and warning systems will continue to be refined and improved. Verify and validate performance and refine component and subsystem capability as required.</p> <p>Continue to build Human Systems Integration core/cadre to address Air Wing of the Future (AWOTF). Optimize work/crew station design to maximize cognitive performance/decision making to support integrated manned and unmanned teaming (MUM-T) Air Wing of the Future. Engage early with programs during the advanced development stage to advocate for HIS in future Naval Systems. Research will address human performance as a function of cognitive workload and decision support to optimize situational awareness / decision making to deliver integrated warfighting capabilities.</p> <p>Continue a coordinated effort with the Naval Medical Research Unit - Dayton (NAMRU-D) to align, research, and assess critical research projects such as hypoxia, anthropometry, neck/back pain, laser eye protection, and hearing protection. Ensure the research is coordinated and aligns with ongoing Human Systems Engineering research efforts.</p>					

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Navy		Date: March 2024
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603216N / Aviation Survivability	Project (Number/Name) 0584 / Acft Protective Clothing

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
Continue to work with NAMRU-D to build Advanced Development opportunities with NAWCAD HSED for projects aligned for NAVAIR acquisition transition. Continue to build off of initial and expand collaborations that include endurance, physiology, breathing systems, human modeling, vision systems and special disorientation. FY 2025 OCO Plans: N/A FY 2024 to FY 2025 Increase/Decrease Statement: Increase is due to the approved unfunded requests for Human Systems Integration core/cadre to address Air Wing of the Future (AWOTF) and Hearing Protection Issues.					
Accomplishments/Planned Programs Subtotals	7.841	11.631	13.742	0.000	13.742

C. Other Program Funding Summary (\$ in Millions)											
<u>Line Item</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025 Base</u>	<u>FY 2025 OCO</u>	<u>FY 2025 Total</u>	<u>FY 2026</u>	<u>FY 2027</u>	<u>FY 2028</u>	<u>FY 2029</u>	<u>Cost To Complete</u>	<u>Total Cost</u>
• OPN 4268: Aviation Support Equipment	80.392	82.115	110.993	-	110.993	142.664	156.061	142.265	144.036	Continuing	Continuing

Remarks

D. Acquisition Strategy

Primary Hardware Development for the Navy Advanced Technology Crew Station efforts will be performed under a Cost Plus Fixed Fee (CPFF) Indefinite Delivery Indefinite Quantity contract (ID/IQ).

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2025 Navy **Date:** March 2024

Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603216N / Aviation Survivability	Project (Number/Name) 0584 / Acft Protective Clothing
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Product Development (\$ in Millions)				FY 2023		FY 2024		FY 2025 Base		FY 2025 OCO		FY 2025 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Systems Engineering	WR	NAWCAD : Pax River MD	38.155	0.802	Oct 2022	2.232	Oct 2023	1.852	Oct 2024	-		1.852	Continuing	Continuing	Continuing
Primary Hardware Development	C/CPFF	EOTECH : San Jose CA	10.811	1.000	Dec 2022	1.200	Dec 2023	2.100	Dec 2024	-		2.100	0.000	15.111	15.111
Primary Hardware Development	MIPR	US Army CERDEC : Ft. Belvoir VA	3.727	0.000		0.356	Dec 2023	0.000		-		0.000	0.000	4.083	4.083
Primary Hardware Development	C/CPFF	Innovital : Calverton MD	0.933	0.000		0.133	Dec 2023	0.000		-		0.000	0.000	1.066	1.066
Physiological Monitoring	C/CPFF	TBD : TBD	2.740	0.870	Nov 2022	0.000		0.750	Mar 2025	-		0.750	0.000	4.360	4.360
I-PREDICT	C/CPFF	TBD : TBD	2.500	2.000	Nov 2022	2.000	Dec 2023	1.300	Mar 2025	-		1.300	0.000	7.800	7.800
Laser Eye Protection	C/CPFF	TBD : TBD	0.439	0.500	Nov 2022	0.600	Dec 2023	0.900	Mar 2025	-		0.900	0.000	2.439	2.439
Prior Year Prod Dev no Longer Funded in Budget Year or Outyears	Various	Various : Various	23.380	0.000		0.000		0.000		-		0.000	0.000	23.380	23.380
Enhanced Visual	C/CPFF	SA Photonics, LLC : TBD	0.700	0.000		1.000	Dec 2023	0.000		-		0.000	0.000	1.700	1.700
Research & Development	MIPR	NAMRUD : Dayton, Oh	0.000	0.300	Oct 2022	0.900	Oct 2023	1.900	Mar 2025	-		1.900	0.000	3.100	3.100
Subtotal			83.385	5.472		8.421		8.802		-		8.802	Continuing	Continuing	N/A

Support (\$ in Millions)				FY 2023		FY 2024		FY 2025 Base		FY 2025 OCO		FY 2025 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Configuration Management	WR	NAWCAD : Pax River MD	5.152	0.975	Oct 2022	1.340	Oct 2023	1.100	Oct 2024	-		1.100	Continuing	Continuing	Continuing
Prior Year Support no Longer Funded in Budget Year or Outyears	Various	Various : Various	3.232	0.000		0.000		0.000		-		0.000	0.000	3.232	3.232
Subtotal			8.384	0.975		1.340		1.100		-		1.100	Continuing	Continuing	N/A

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Exhibit R-4, RDT&E Schedule Profile: PB 2025 Navy **Date:** March 2024

Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603216N / <i>Aviation Survivability</i>	Project (Number/Name) 0584 / <i>Acft Protective Clothing</i>
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	FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028				FY 2029							
	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q				
Acft Protective Clothing	Physiologic Monitoring																															
	Digital Human Modeling																															
	Dielectric Stack Technology																															
	Advanced Test Methodologies																															
Dye Doped Substrates																																
Holistic Modular Aircrew Physiologic Status (HMAPS)																																
Advanced Technology Crew Station					Laser Event Recorder (LER)																											
	Digital Sensor Technologies																															
	Digital Display Technologies																															
	Ejection / Spine Pain Modeling																															
	Incapacitation Prediction for Readiness in Expeditionary Domains - an Integrated Computational Tool																															
	Aeromedical Research & Development, NAMRU-D																															

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Exhibit R-4A, RDT&E Schedule Details: PB 2025 Navy **Date:** March 2024

Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603216N / <i>Aviation Survivability</i>	Project (Number/Name) 0584 / <i>Acft Protective Clothing</i>
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Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>Acft Protective Clothing</i>				
Physiologic Monitoring	1	2023	4	2029
Digital Human Modeling	1	2023	4	2029
Dielectric Stack Technology	1	2023	4	2029
Dye Doped Substrates	1	2023	4	2023
Advanced Test Methodologies	1	2023	4	2029
Holistic Modular Aircrew Physiologic Status (HMAPS)	1	2023	4	2023
Advanced Technology Crew Station: Laser Event Recorder (LER)	1	2023	1	2027
Advanced Technology Crew Station: Digital Sensor Technologies	1	2023	4	2029
Advanced Technology Crew Station: Digital Display Technologies	1	2023	4	2029
Advanced Technology Crew Station: Ejection / Spine Pain Modeling	1	2023	4	2029
Advanced Technology Crew Station: Incapacitation Prediction for Readiness in Expeditionary Domains - an Integrated Computational Tool (I-PREDICT)	1	2023	4	2029
Advanced Technology Crew Station: Aeromedical Research & Development, NAMRU-D	1	2023	4	2029

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Navy										Date: March 2024		
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0603216N / Aviation Survivability				Project (Number/Name) 0591 / Acft Survivability, Vulnerability & Safety			
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
0591: Acft Survivability, Vulnerability & Safety	57.506	3.472	3.642	3.665	-	3.665	3.697	3.725	3.815	3.897	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Aircraft Survivability, Vulnerability and Safety. This project evaluates and develops prototype hardware and software solutions to improve the survivability of Navy and Marine Corps aircraft. This project addresses the likelihood of an aircraft being hit (susceptibility) and the probability of a kill if the aircraft is hit (vulnerability). Types of programs funded under this project include signature reduction efforts, subsystem and component hardening and development of integrated Aviation Survivability Equipment (iASE) architectures for simulation and training systems. This project also provides an engineering level modeling and simulation capability to assess electronic warfare capabilities and to support future electronic warfare investment strategies. Further, this effort expands upon existing high fidelity Hardware In The Loop (HITL) capability and this expanded capability will enable the assessment of Electronic Warfare (EW) concepts versus future (i.e. not fully defined) threat systems. This project will include the development of new or modification of existing modules which are high fidelity representations of the EW and threat system's components and will support iASE hardware and software research and future technological survivability concepts as they become available.

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
Title: Technology Requirements	0.045	0.045	0.045	0.000	0.045
Articles:	-	-	-	-	-
FY 2024 Plans: Continue to update and expand threats assessments to include new and/or evolved threats. Update modeling and simulation capabilities to better reflect the evolving threat environment.					
FY 2025 Base Plans: Continue to update and expand threats assessments to include new and/or evolved threats. Update modeling and simulation capabilities to better reflect the evolving threat environment.					
FY 2025 OCO Plans: N/A					
Title: Technology Design & Development	3.245	3.532	3.539	0.000	3.539
Articles:	-	-	-	-	-
FY 2024 Plans: The Advanced Electronic Warfare (ADVEW) effort expands upon existing high fidelity Hardware-in-the-Loop capability. This expanded capability will enable the assessment of EW concepts versus future (i.e. not fully					

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Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603216N / Aviation Survivability	Project (Number/Name) 0591 / Acft Survivability, Vulnerability & Safety

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
<p>defined) threat systems. The effort will include the development of new or modification of existing Modelling & Simulation (M&S) modules, and will incorporate products from the Benchmark threat model library, which are high fidelity representations of the EW and threat system's components. Benchmark operates at the dwell-to-dwell level and carries its pedigree through decades of development of high-precision radar tracking algorithms developed under the Missile Defense Agency (MDA). These highly advanced algorithms form the basis for a threat radars receive chain, a critical component not found in existing open-loop stimulation systems and other modeling tools. The effort will ultimately enable a continuum that enables development of new systems from requirements definition, to development and continual assessments, which support the Model Based Systems Engineering approach.</p> <p>FY 2025 Base Plans: This effort will expand upon the work done in FY24 to incorporate products from the Benchmark threat model library into existing high fidelity Hardware-in-the-Loop capability to enable the assessment of EW concepts versus anticipated threat systems still to be developed. These highly advanced algorithms form the basis for a threat radars receive chain, a critical component not found in existing open-loop stimulation systems and other modeling tools. The effort will ultimately enable a continuum that enables development of new systems from requirements definition, to development and continual assessments, which support the Model Based Systems Engineering approach.</p> <p>FY 2025 OCO Plans: N/A</p> <p>FY 2024 to FY 2025 Increase/Decrease Statement: Funding increase of \$0.007 is due to increased Advanced Electronic Warfare (ADVEW) modeling and simulation efforts.</p>					
<p>Title: Technology Test & Evaluation</p> <p align="right">Articles:</p> <p>FY 2024 Plans: Continue prototype hardware testing in support of ASE architecture development and in support of countermeasures simulation hardware. Test newly developed or modified modules to validate accuracy of representations of the EW and threat systems components.</p> <p>FY 2025 Base Plans:</p>	0.182	0.065	0.081	0.000	0.081
	-	-	-	-	-

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Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603216N / <i>Aviation Survivability</i>	Project (Number/Name) 0591 / <i>Acft Survivability, Vulnerability & Safety</i>

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
Continue prototype hardware testing in support of ASE architecture development and in support of countermeasures simulation hardware as modules are completed. Test newly developed or modified modules to validate accuracy of representations of the EW and threat systems components. FY 2025 OCO Plans: N/A FY 2024 to FY 2025 Increase/Decrease Statement: Increase of \$0.016 is due to increased Advanced Electronic Warfare (ADVEW) modeling and simulation efforts.					
Accomplishments/Planned Programs Subtotals	3.472	3.642	3.665	0.000	3.665

C. Other Program Funding Summary (\$ in Millions)

N/A

Remarks

D. Acquisition Strategy

Primary Hardware Development will be performed under either a Cost Plus Fixed Fee or a Firm Fixed Price contract.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2025 Navy											Date: March 2024				
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0603216N / Aviation Survivability					Project (Number/Name) 0591 / Acft Survivability, Vulnerability & Safety				

Product Development (\$ in Millions)				FY 2023		FY 2024		FY 2025 Base		FY 2025 OCO		FY 2025 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Systems Engineering	WR	NAWCAD : Pax River, MD	15.079	1.132	Oct 2022	2.822	Oct 2023	2.060	Oct 2024	-		2.060	Continuing	Continuing	Continuing
Systems Engineering	WR	NAWCWD : China Lake, CA	1.410	0.461	Nov 2022	0.055	Mar 2024	0.260	Nov 2024	-		0.260	Continuing	Continuing	Continuing
Systems Engineering	MIPR	DTIC : Ft. Belvoir, VA	4.131	1.200	Nov 2022	0.450	Oct 2023	0.000		-		0.000	0.000	5.781	5.781
System Engineering	C/CPFF	TEKLA : Dumfries, VA	0.200	0.000		0.000		0.000		-		0.000	0.000	0.200	0.200
System Engineering	WR	NAWCWD : Pt Mugu, CA	0.060	0.060	Jan 2023	0.050	Dec 2023	0.000		-		0.000	0.000	0.170	0.170
System Engineering	C/CPFF	Mantech : Fairfax, VA	0.300	0.000		0.000		0.000		-		0.000	0.000	0.300	0.300
System Engineering	WR	NSWC : Crane, IN	0.095	0.095	Jan 2023	0.050	May 2024	0.000		-		0.000	0.000	0.240	0.240
Prior Year Prod Dev cost no longer funded in FYDP	Various	Various : Various	21.268	0.000		0.000		0.000		-		0.000	0.000	21.268	21.268
System Engineering	MIPR	AFRL : Eglin AFB, FL	0.000	0.250	Jan 2023	0.000		0.000		-		0.000	0.000	0.250	0.250
System Engineering	C/CPFF	SURVICE : Belcamp, MD	0.000	0.000		0.100	Jan 2024	0.610	Jan 2025	-		0.610	0.000	0.710	0.710
System Engineering	C/CPFF	SAIC : Indianapolis, IN	0.000	0.000		0.000		0.609	Dec 2024	-		0.609	0.000	0.609	0.609
Subtotal			42.543	3.198		3.527		3.539		-		3.539	Continuing	Continuing	N/A

Remarks
All prior year lines have been consolidated

Support (\$ in Millions)				FY 2023		FY 2024		FY 2025 Base		FY 2025 OCO		FY 2025 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Prior Year Support cost no longer funded in FYDP	Various	Various : Various	4.569	0.000		0.000		0.000		-		0.000	0.000	4.569	4.569
Subtotal			4.569	0.000		0.000		0.000		-		0.000	0.000	4.569	N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2025 Navy												Date: March 2024			
Appropriation/Budget Activity				R-1 Program Element (Number/Name)				Project (Number/Name)							
1319 / 4				PE 0603216N / Aviation Survivability				0591 / Acft Survivability, Vulnerability & Safety							
Test and Evaluation (\$ in Millions)				FY 2023		FY 2024		FY 2025 Base		FY 2025 OCO		FY 2025 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation (DT&E)	WR	NAWCAD : Patuxent River, MD	2.603	0.000		0.070	Feb 2024	0.081	Jan 2025	-		0.081	Continuing	Continuing	Continuing
Developmental Test & Evaluation (DT&E)	WR	NAWCWD : China Lake, CA	2.073	0.229	Oct 2022	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Prior Year Developmental Test & Evaluation Not Funded FYDP (PYDT&E)	C/CPFF	GTRI : Atlanta, GA	0.100	0.000		0.000		0.000		-		0.000	0.000	0.100	0.100
Prior Year Developmental Test & Evaluation Not Funded FYDP (PYDT&E)	Various	Various : Various	2.995	0.000		0.000		0.000		-		0.000	0.000	2.995	2.995
Subtotal			7.771	0.229		0.070		0.081		-		0.081	Continuing	Continuing	N/A
Management Services (\$ in Millions)				FY 2023		FY 2024		FY 2025 Base		FY 2025 OCO		FY 2025 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Support	WR	NAWCAD : Pax River, MD	1.898	0.045	Oct 2022	0.045	Oct 2023	0.045	Oct 2024	-		0.045	Continuing	Continuing	Continuing
Prior Year Mgmt cost no longer funded in FYDP	Various	Various : Various	0.725	0.000		0.000		0.000		-		0.000	0.000	0.725	0.725
Subtotal			2.623	0.045		0.045		0.045		-		0.045	Continuing	Continuing	N/A
Project Cost Totals			57.506	3.472		3.642		3.665		-		3.665	Continuing	Continuing	N/A
Remarks															

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Exhibit R-4, RDT&E Schedule Profile: PB 2025 Navy **Date:** March 2024

Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603216N / <i>Aviation Survivability</i>	Project (Number/Name) 0591 / <i>Acft Survivability, Vulnerability & Safety</i>
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Acft Survivability, Vulnerability & Safety	FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028				FY 2029																			
	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q																
Technology Des/Development	Future Vertical Lift Trade-Offs																																											
	Miniaturized Self Defense Missile System																																											
	EW Enhancements																																											
Technology Test & Evaluation	Test & Evaluation of Miniaturized Self Defense Missile System																																											
	Advanced Electronic Warfare (ADVEW)																																											

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Exhibit R-4A, RDT&E Schedule Details: PB 2025 Navy		Date: March 2024
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603216N / <i>Aviation Survivability</i>	Project (Number/Name) 0591 / <i>Acft Survivability, Vulnerability & Safety</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>Acft Survivability, Vulnerability & Safety</i>				
Technology Des/Development: Future Vertical Lift Trade-Offs	1	2023	4	2029
Technology Des/Development: Miniaturized Self Defense Missile System	1	2023	4	2027
Technology Des/Development: EW Enhancements	1	2023	4	2029
Technology Test & Evaluation: Test & Evaluation of Miniaturized Self Defense Missile System	1	2023	4	2027
Technology Test & Evaluation: Advanced Electronic Warfare (ADVEW)	1	2023	4	2029

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Navy										Date: March 2024		
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0603216N / Aviation Survivability				Project (Number/Name) 0592 / Acft & Ordnance Safety			
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
0592: Acft & Ordnance Safety	54.251	5.387	4.974	5.070	-	5.070	5.177	5.285	5.403	5.517	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Aircraft and Ordnance Safety Program transitions innovative munitions safety technology to Navy and Marine Corps air weapons, to comply with the Chief of Naval Operations direction that all munitions carried aboard Navy ships be insensitive to unplanned stimuli (thermal, impact, and shock events). The Aircraft and Ordnance Safety Program also ensures the safety and protection of personnel, aircraft, ships, and operational facilities, through improved precision targeting, fail-safe ordnance, selective effects munitions and shock/blast force protection technologies.

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
Title: Insensitive Munitions (IM)	5.387	4.974	5.070	0.000	5.070
Articles:	-	-	-	-	-
FY 2024 Plans:					
Air-to-Air Demonstration: Exploring technology to mitigate explosive reaction in rocket motors demonstrated by using thermite as means of ignition prior to an explosion during slow heating and/or fast heating.					
Improved Air-Launched Weapons: Development of novel electronic safe and arm devices for loitering munitions. Loitering munitions fulfill an essential needs gap but pose unique fuze design constraints. Assessing fragment impact survivability for the variable fragmentation warhead in a RAM/Sidewinder form factor including design refinement and CTH modeling of the configuration. Documenting results of an improved liner system demonstration for GP bombs.					
Advanced Containment/Case/Warhead Material: Investigating how an Insensitive Munitions (IM) compliant payload reacts during fragment impact testing when pyrophoric liners are incorporated into the payload designs. There has been little to no research demonstrated on how pyrophoric materials affect the insensitive munitions performance of systems.					
Shock/Blast Barrier Protection/Modeling and Simulation: Advancing predictive capabilities and characterizing a Navy explosive of interest for shock initiation. Continued development of remote sensing for slow cook-off, which will be advantageous for ships carrying weapons. Generating data to support advancements in predictive capabilities of shock initiation in regard to explosive trains, insensitive munitions threats, and warhead					

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Navy		Date: March 2024
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603216N / <i>Aviation Survivability</i>	Project (Number/Name) 0592 / <i>Acft & Ordnance Safety</i>

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
<p>performance. Evaluating, through energy fluence techniques, the shock mitigation of the Precision-controlled Additively Manufactured (PAM) Fragmentation Technology when exposed to fragment impact conditions.</p> <p><i>FY 2025 Base Plans:</i> Air-to-Air Demonstration: Demonstration of the baseline response of a two-stage air-launched missile system in a fast heating scenario. Provide an assessment of the results and feasibility of existing insensitive munitions solutions to mitigate the observed response. Follow-on testing with iterated design incorporating proposed insensitive munitions technology solutions.</p> <p>Improved Air-Launched Weapons: Development of novel electronic safe-arm fuze for loitering munitions. Loitering munitions fulfill an essential needs gap but pose unique fuze design constraints. Development of a new electronic safe and arm devices that can replace multiple legacy out-of-line fuzes as they near their respective end-of-life. The new Electronic Safe Arm Fuze (ESAF) design will replace the primary energetics that are used in the legacy fuzes with less sensitive Low Energy Exploding Foil Initiators. Eliminating the sensitive primary energetics will improve the insensitive munition (IM) performance of the fuzes.</p> <p>Developing a Spherical High Output Convergence (SHOC) warhead charge providing an increase in blast effects and explosive output by overdriving a high explosive (HE) using multipoint initiation (MPI). The use of a spherical geometry and MPI allows SHOC to reduce the volume and mass of the warhead. Implementing the SHOC design along with IM explosives to meet IM objectives while increasing performance.</p> <p>Advanced Containment/Case/Warhead Material: Developing a blast enhancing material/liner that functions as a shock and fragment mitigating solution based off the high performance Glycidyl Azide Polymer (GAP) and aluminum (Al) material known as GAZAL and fractal foam.</p> <p>Shock/Blast Barrier Protection/Modeling and Simulation: Advancing steel shielding technology for application in containers, trailers and other logistical configurations. Continued to evaluate the ballistic performance of high ductility steel against triple .50 cal AP bullet impact (BI) and fragment impact (FI) threats. Refining data and models of explosives to provide warhead engineers and external contractors better models to describe weapon behavior, especially under hazard scenarios like bullet impact, fragment impact, and sympathetic reaction. Extending and refining the experimental techniques to develop both the scientific basis and business model needed to conduct these types of experiments in collaboration with formulators, and other researchers at DOD and DOE laboratories. This modeling and simulation efforts will support advanced initiation/fuze components, advanced packaging materials, sympathetic reaction mitigating containers, and reduced sensitivity explosive fills, as it enhances the capability to model the effect of specific energetics as well as other materials in contact with</p>					

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Navy	Date: March 2024
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Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603216N / Aviation Survivability	Project (Number/Name) 0592 / Acft & Ordnance Safety
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B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
<p>energetics. Continued development of a remote RF sensor capability based on previous identification of pre-ignition events and the material changes prior to ignition. Identified pre-ignition events appear to be universal to all energetic materials. Assessment of fragment impact survivability for a modular payload warhead with PBXN-110/112 or PBXW-114 main-fill. This includes insensitive munition design refinement and CTH modeling of the design to determine if additional design considerations need to be added to survive fragment/bullet stimuli. Demonstrate design effectiveness against single fragment impact.</p> <p>FY 2025 OCO Plans: N/A</p> <p>FY 2024 to FY 2025 Increase/Decrease Statement: Increase is for follow-on testing with iterated design incorporating proposed insensitive munitions technology solutions.</p>					
Accomplishments/Planned Programs Subtotals	5.387	4.974	5.070	0.000	5.070

C. Other Program Funding Summary (\$ in Millions)

N/A

Remarks

D. Acquisition Strategy

All planned programs are accomplished via civilian labor and use of government testing facilities.

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Exhibit R-4, RDT&E Schedule Profile: PB 2025 Navy **Date:** March 2024

Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603216N / Aviation Survivability	Project (Number/Name) 0592 / Acft & Ordnance Safety
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	FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028				FY 2029			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4

	FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028				FY 2029			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Acft & Ordnance Safety																												
Improved Air to Air Missile Demonstration Testing																												
Improved Air to Air Missile Demonstration Testing: Sidewinder Rocket Motor IM DEMO (2)																												
Improved Air to Air Missile Demonstration Testing: Sidewinder IM Compatible Warhead																												
Improved Air Launched Weapons: Explosive Fill Evaluation																												
Improved Air Launched Weapons																												
Improved Air Launched Weapons: AARGM RM IM Evaluation																												
Improved Air Launched Weapons: Fuze Munitions (FMU)-139 D/B Modeling																												
Improved Air Launched Weapons: Impulse Motor																												
Improved Air Launched Weapons: Long Range Anti-Ship Missile (LRASM)																												
Shock/Blast Barrier Protection Modeling and DEMO																												
Shock/Blast Barrier Protection Modeling and DEMO: Supersonic Range Strike Missile																												
Shock/Blast Barrier Protection Modeling and DEMO: Warhead Initiation																												
Shock/Blast Barrier Protection Modeling and DEMO: Warhead Liner																												

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Exhibit R-4, RDT&E Schedule Profile: PB 2025 Navy **Date:** March 2024

Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603216N / <i>Aviation Survivability</i>	Project (Number/Name) 0592 / <i>Acft & Ordnance Safety</i>
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	FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028				FY 2029			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Shock/Blast Barrier Protection Modeling and DEMO: Remote Sensing of SCO Events																												
Shock/Blast Barrier Protection Modeling and DEMO: Precision controlled additive																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2025 Navy		Date: March 2024
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603216N / <i>Aviation Survivability</i>	Project (Number/Name) 0592 / <i>Acft & Ordnance Safety</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Acft & Ordnance Safety				
Improved Air to Air Missile Demonstration Testing	1	2023	4	2029
Improved Air to Air Missile Demonstration Testing: Sidewinder Rocket Motor IM DEMO (2)	1	2023	2	2023
Improved Air to Air Missile Demonstration Testing: Sidewinder IM Compatible Warhead	1	2023	2	2023
Improved Air Launched Weapons: Explosive Fill Evaluation	1	2023	4	2023
Improved Air Launched Weapons	1	2023	4	2029
Improved Air Launched Weapons: AARGM RM IM Evaluation	1	2023	3	2023
Improved Air Launched Weapons: Fuze Munitions (FMU)-139 D/B Modeling	1	2023	1	2023
Improved Air Launched Weapons: Impulse Motor	1	2023	4	2023
Improved Air Launched Weapons: Long Range Anti-Ship Missile (LRASM)	1	2023	3	2024
Shock/Blast Barrier Protection Modeling and DEMO	1	2023	4	2029
Shock/Blast Barrier Protection Modeling and DEMO: Supersonic Range Strike Missile	1	2023	4	2027
Shock/Blast Barrier Protection Modeling and DEMO: Warhead Initiation	1	2023	4	2027
Shock/Blast Barrier Protection Modeling and DEMO: Warhead Liner	1	2023	4	2027
Shock/Blast Barrier Protection Modeling and DEMO: Remote Sensing of SCO Events	1	2023	4	2027
Shock/Blast Barrier Protection Modeling and DEMO: Precision controlled additive	1	2023	4	2027

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Navy										Date: March 2024		
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0603216N / Aviation Survivability				Project (Number/Name) 1819 / CV Acft Fire Suppress System			
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
1819: CV Acft Fire Suppress System	6.557	0.630	0.627	0.638	-	0.638	0.671	0.682	0.695	0.710	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This project develops improved fire-fighting systems and fire protective measures for aircraft-related fires on aircraft carriers, including assessment of fire properties, definition of fire threats, improvements to fire-fighting agents and delivery systems, fire detection and suppression system performance evaluations, and fire-fighter training improvements.

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
Title: Fire-Fighting	0.630	0.627	0.638	0.000	0.638
Articles:	-	-	-	-	-
FY 2024 Plans:					
Continue support for Naval Air Training and Operating Procedures Standardization improvements for aircraft fire prediction and protection. Continue monitoring aqueous film forming foam developments and other clean agents. Continue to monitor and test new equipment improvements for saws, spreaders, and other improvements to reduce or discontinue the use of Motor Gasoline on ships. Continue evaluations for flash-hood, crash-fire-rescue face shield and firefighter personnel floatation device improvements. Add the testing of radiant heat testing for proximity firefighting ensembles. Continue to monitor and recommend Electromagnetic Aircraft Launch Systems fire doctrine, Carrier Fixed Wing Aircraft Nuclear hangar bay conflagration management system operations, and unmanned carrier launched airborne surveillance and strike firefighting operations impacts. Continue project looking at firefighting issues related to aircraft composites, weapons and fuels and develop procedures to be used aboard ship to rapidly and safely extinguished deep-seated smoldering fires with composite materials. Add firefighting and rescue operational testing for effective aircraft canopy breaching. Continue to evaluate training and certification requirements and equipment to bring the ship up to aviation boatswains mate capabilities and readiness for Air Capable Ships, ships that rely on the ships damage control team and limited resources to fight aircraft related fires. Continue improved weapons cooling scenario testing. Continue project looking at options for firefighter equipment storage on Carrier Fixed-Wing Aircraft Nuclear (CVN) and Landing Helicopter Assault/Dock (LHA/D) ships.					
FY 2025 Base Plans:					
Continue support for Naval Air Training and Operating Procedures Standardization improvements for aircraft fire prediction and protection. Continue monitoring aqueous film forming foam developments and other					

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Navy	Date: March 2024
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Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603216N / Aviation Survivability	Project (Number/Name) 1819 / CV Acft Fire Suppress System
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B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
<p>clean agents. Continue to monitor and test new equipment improvements for saws, spreaders, and other improvements to reduce or discontinue the use of Motor Gasoline on ships. Continue evaluations for flash-hood, and firefighter personnel floatation device improvements. Continue the testing of radiant heat testing for proximity firefighting ensembles. Continue to monitor and recommend Electromagnetic Aircraft Launch Systems fire doctrine, Carrier Fixed Wing Aircraft Nuclear hangar bay conflagration management system operations, and unmanned carrier launched airborne surveillance and strike firefighting operations impacts. Continue project looking at firefighting issues related to aircraft composites, weapons and fuels and develop procedures to be used aboard ship to rapidly and safely extinguished deep-seated smoldering fires with composite materials. Add firefighting and rescue operational testing for effective aircraft canopy breaching. Continue to evaluate training and certification requirements and equipment to bring the ship up to aviation boatswains mate capabilities and readiness for Air Capable Ships, ships that rely on the ships damage control team and limited resources to fight aircraft related fires. Finalize improved weapons cooling scenario testing. Finalize project looking at options for firefighter equipment storage on Carrier Fixed-Wing Aircraft Nuclear (CVN) and Landing Helicopter Assault/Dock (LHA/D) ships. New project to determine safe and effective means to reduce flow from Liquid Oxygen (LOX) bottles through firefighter response.</p> <p>FY 2025 OCO Plans: N/A</p> <p>FY 2024 to FY 2025 Increase/Decrease Statement: Increase is to fund requirement changes for Operating Procedures standardization improvements.</p>					
Accomplishments/Planned Programs Subtotals	0.630	0.627	0.638	0.000	0.638

C. Other Program Funding Summary (\$ in Millions)
N/A

Remarks

D. Acquisition Strategy
This is a non-ACAT program. Procurement strategy is determined by market survey and cooperative opportunities.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2025 Navy **Date:** March 2024

Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603216N / Aviation Survivability	Project (Number/Name) 1819 / CV Acft Fire Suppress System
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Product Development (\$ in Millions)				FY 2023		FY 2024		FY 2025 Base		FY 2025 OCO		FY 2025 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Systems Engineering	WR	NAWCWD : China Lake, CA	0.451	0.072	Oct 2022	0.077	Oct 2023	0.077	Oct 2024	-		0.077	Continuing	Continuing	Continuing
Prior Yr Prod Dev no longer funded in the FYDP	Various	Various : Various	0.335	0.000		0.000		0.000		-		0.000	0.000	0.335	0.335
Subtotal			0.786	0.072		0.077		0.077		-		0.077	Continuing	Continuing	N/A

Remarks
All prior year lines have been consolidated.

Support (\$ in Millions)				FY 2023		FY 2024		FY 2025 Base		FY 2025 OCO		FY 2025 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Engineering Support	C/CPFF	ICI : Virginia Beach, VA	0.135	0.000		0.000		0.000		-		0.000	0.000	0.135	0.135
Engineering Support	WR	NAWCWD : China Lake, CA	1.112	0.181	Oct 2022	0.180	Oct 2023	0.200	Oct 2024	-		0.200	Continuing	Continuing	Continuing
Engineering Support	C/CPFF	Hughes Associates : Baltimore, MD	0.182	0.010	Nov 2022	0.000		0.000		-		0.000	0.000	0.192	0.192
Engineering Support	C/CPFF	AVW : Chesapeake, VA	0.149	0.000		0.000		0.000		-		0.000	0.000	0.149	0.149
Engineering Support	WR	NRL : Washington, DC	0.059	0.010	May 2023	0.010	May 2024	0.010	May 2025	-		0.010	Continuing	Continuing	Continuing
Subtotal			1.637	0.201		0.190		0.210		-		0.210	Continuing	Continuing	N/A

Test and Evaluation (\$ in Millions)				FY 2023		FY 2024		FY 2025 Base		FY 2025 OCO		FY 2025 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Developmental Test & Evaluation (DT&E)	WR	NAWCWD : China Lake, CA	2.445	0.237	Oct 2022	0.220	Oct 2023	0.220	Oct 2024	-		0.220	Continuing	Continuing	Continuing
Developmental Test & Evaluation (DT&E)	C/FFP	Hughes Associates : Baltimore, MD	0.778	0.060	Nov 2022	0.080	Nov 2023	0.070	Nov 2024	-		0.070	0.000	0.988	0.988

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Exhibit R-4, RDT&E Schedule Profile: PB 2025 Navy **Date:** March 2024

Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603216N / <i>Aviation Survivability</i>	Project (Number/Name) 1819 / <i>CV Acft Fire Suppress System</i>
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CV Acft Fire Suppress System	FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028				FY 2029			
	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q
Product Development-Systems Engineering	Monitor Systems (Aqueous Film Forming Foam, Cleaning Agents, EMALS, etc.)																											
Engineering Support	Firefighting NATOPS																											
	ACS Aviation Firefighting Readiness																											
Test & Evaluation	Aircraft Rescue Systems																											
	Aircraft Firefighting PPE																											
	Firefighting Hazards (Composite)																											
	Weapons Cooling																											
	LOX Leak Control																											

2025DON - 0603216N - 1819

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Exhibit R-4A, RDT&E Schedule Details: PB 2025 Navy **Date:** March 2024

Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603216N / <i>Aviation Survivability</i>	Project (Number/Name) 1819 / <i>CV Acft Fire Suppress System</i>
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Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>CV Acft Fire Suppress System</i>				
Product Development-Systems Engineering: Monitor Systems (Aqueous Film Forming Foam, Cleaning Agents, Electro Magnetic Aircraft Launch System (EMALS), etc.)	1	2023	4	2029
Engineering Support: Firefighting NATOPS	1	2023	4	2029
Engineering Support: Air Capable Ship (ACS) Aviation Firefighting Readiness	1	2023	4	2028
Test & Evaluation: Aircraft Rescue Systems	1	2023	4	2029
Test & Evaluation: Aircraft Firefighting Personal Protective Equipment (PPE)	1	2023	2	2029
Test & Evaluation: Firefighting Hazards (Composite)	1	2023	4	2028
Test & Evaluation: Weapons Cooling	1	2023	4	2028
Test & Evaluation: LOX Leak Control	1	2025	1	2029