Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Navy											Date: April 2022	
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 4: *Advanced Component Development & Prototypes (ACD&P)*					R-1 Program Element (Number/Name) PE 0603216N *I Aviation Survivability*							
COST ($ in Millions)	**Prior Years**	**FY 2021**	**FY 2022**	**FY 2023 Base**	**FY 2023 OCO**	**FY 2023 Total**	**FY 2024**	**FY 2025**	**FY 2026**	**FY 2027**	**Cost To Complete**	**Total Cost**
Total Program Element	213.156	13.242	24.815	17.434	-	17.434	19.054	21.020	23.062	25.411	Continuing	Continuing
0584: *Acft Protective Clothing*	112.754	6.087	5.836	7.842	-	7.842	9.853	11.717	13.625	15.835	Continuing	Continuing
0591: *Acft Survivability, Vulnerability & Safety*	50.808	1.433	5.450	3.575	-	3.575	3.620	3.634	3.660	3.685	Continuing	Continuing
0592: *Acft & Ordnance Safety*	44.219	5.124	4.928	5.387	-	5.387	4.937	5.015	5.114	5.218	Continuing	Continuing
1819: *CV Acft Fire Suppress System*	5.375	0.598	0.601	0.630	-	0.630	0.644	0.654	0.663	0.673	Continuing	Continuing
9999: *Congressional Adds*	0.000	0.000	8.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	8.000

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 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Previous President's Budget	13.342	16.815	0.000	-	0.000
Current President's Budget	13.242	24.815	17.434	-	17.434
Total Adjustments	-0.100	8.000	17.434	-	17.434
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	8.000			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.100	0.000			
• Program Adjustments	0.000	0.000	0.000	-	0.000
• Rate/Misc Adjustments	0.000	0.000	0.000	-	0.000
• Adjustments to Budget Year	-	-	17.434	-	17.434

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Navy	Date: April 2022
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 0603216N *I Aviation Survivability*

Congressional Add Details ($ in Millions, and Includes General Reductions)	FY 2021	FY 2022
Project: 9999: *Congressional Adds*		
Congressional Add: *Context-based augmented reality identification framework*	0.000	8.000
Congressional Add Subtotals for Project: 9999	0.000	8.000
Congressional Add Totals for all Projects	0.000	8.000

Change Summary Explanation

FY 2023 funding increase reflects the fact that the FY 2022 President's Budget request did not include out-year funding.

Exhibit R-2A, RDT&E Project Justification: PB 2023 Navy			Date: April 2022
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 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
0584: *Acft Protective Clothing*	112.754	6.087	5.836	7.842	-	7.842	9.853	11.717	13.625	15.835	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. The goal is to ensure they are able to perform their mission effectively on time, safely, every time. 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 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Title: Advanced Technology Crew Station	6.087	5.836	7.842	0.000	7.842
Articles:	-	-	-	-	-
FY 2022 Plans: Improve and refine subsystems and components of the baseline Physiological Monitor and algorithms. Mature the warning elements of the Physiological Monitor to include the capability to enact steps to mitigate physiologic episodes in real time. The objective is to refine the algorithms, reduce the technology gaps in the subsystems/ sensor components, and expand monitoring to other episode contributors such as, hydration and cognitive state. Verification and validation testing will continue to refine component and subsystem capability. Continue development, and begin integration and support of "Incapacitation Prediction for Readiness in Expeditionary Domains - an Integrated Computational Tool (I-PREDICT)". Integrate I-PREDICT into Human System's laboratories to move to a model based system to improve the design and development of advanced personal protective equipment (PPE - e.g., helmet mounted displays, night vision devices, helmets, visors, oxygen masks, etc.) to predict and prevent incidents that increase the level of back pain and long-term disabilities. Expand digital human modeling to be able 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 systems to include magneto rheological (MR) technologies. Evaluate the ability of MR and other adaptive damping systems to address the full anthropometric range of male/female aviators while withstanding the harsh environments found on military platforms to reduce					

Exhibit R-2A, RDT&E Project Justification: PB 2023 Navy		Date: April 2022
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 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
the excessive impact and vibration causing debilitating neck/spine injuries. Other Basic and Applied Research mission endurance development efforts will be assessed, and the most mature / promising will be developed further and readied for qualification to meet fleet endurance requirements. Continue integration of Intevac's digital high resolution sensor and eMagin's display into the High Resolution Digital Goggle (HRDG). Complete effort to develop and test a wide field of view (FOV) goggle (initially 68 deg. FOV). Complete the study of motion blur on resolution to define minimum acceptable refresh / frame rates to prevent blurring. Investigate the possibility of extending the wavelength band/sensitivity of the silicon wafer in the digital sensor to include Short Wave InfraRed (SWIR). SWIR is expected to improve resolution at extremely low light levels and in degraded visual environments. Adjudicate the differences found in ballistic test procedures used by DoD and suppliers. Determine the effect of variability in testing and whether redesign of substrates is needed. Refine the action spetra of the solar dots recently developed to be indicative of a graded solar exposure. Continue to refine and evaluate thicker dielectric coatings to provide progressively higher optical densities in the long wavelength visible and near infrared portion of the electromagnetic spectrum. Assess dielectric deposition profile (square vs. sinusoidal), uniformity, and thickness with a goal of increasing optical density. Compare and contrast vapor vs. magnetron sputtering deposition approaches. Continue advanced research and technology maturation activity for hearing protection and speech intelligibility improvement.					
FY 2023 Base Plans: Continue to refine the subsystems and components of the baseline Physiological Monitor. Mature the warning elements of the Physiological Monitor Holistic Modular Aircrew Physiologic Status (HMAPS) monitoring system and algorithms, to include warning and the capability to enact steps to mitigate physiologic episodes in real time. Refine algorithms, reduce the technology gaps in the 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. Begin integration of "Incapacitation Prediction for Readiness in Expeditionary Domains - an Integrated Computational Tool (I-PREDICT)" into Human System Engineering's (HSE) laboratories test and evaluation (T&E) infrastructure. Incorporate biomedically valid software and algorithms to predict chronic and acute injury to enable improved risk assessment in critical HSE laboratories and allow informed trade-off and accelerated, focused testing to enable effective design of PPE, vehicle interiors, and selection of protective tactics, techniques, and procedures. Move critical laboratory test capabilities from mannequin to a cadaver, model based system to improve the design and development of advanced personal protective equipment					

Exhibit R-2A, RDT&E Project Justification: PB 2023 Navy		Date: April 2022
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 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
(PPE - e.g., crashworthy seating, vibration mitigation, helmet mounted displays, night vision devices, oxygen masks, etc.) to predict and prevent chronic and acute back pain and long-term disabilities. Expand digital human modeling to be able 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. Ensure adaptive damping systems address the full anthropometric range of male/female aviators to reduce the excessive impact and vibration causing debilitating neck/spine injuries while withstanding the harsh environments found on military platforms. Continue assessing other Basic and Applied Research PPE and mission endurance developmental efforts to prepare the most mature / promising for transition to programs of record. Investigate motion blur when using digital high resolution sensor and display technologies in the High Resolution Digital Goggle (HRDG). 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). SWIR is expected to improve resolution at extremely low light levels and in degraded visual environments. Develop and test a wide field of view (WFOV) HRDG goggle (68+ degs). Transition and continue spiral improvements to an aircraft/aircrew-mounted device to detect and alert the warfighter when targeted/irradiated by a laser. Record characteristics (e.g., wavelength, power, pulse duration, etc.) of the laser strike, as well as capture a picture of the scene with the global positioning system (GPS) location. Continue to refine and evaluate on-shore vapor deposition 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 (square vs. sinusoidal), uniformity, and thickness with a goal of increasing optical density. Continue to advance vapor deposition as the preferred approach. 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. Initiate and sign a Memorandum of Agreement (MOA) with the Naval Medical Research Unit - Dayton (NAMRU-D) Ohio. Identify critical research projects in the areas of neck and back pain, spatial disorientation, laser eye protection, and hearing protection. Ensure the research is coordinated and aligns with ongoing Human Systems Engineering research efforts.					
FY 2023 OCO Plans:					

Exhibit R-2A, RDT&E Project Justification: PB 2023 Navy		Date: April 2022
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 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
N/A ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Four high priority efforts were added starting in 2023. 1) Accelerated , Expanded Dynamic Test & Evaluation - biomedically based software & algorithms to enable improved design, risk assessment, and accelerated, focused testing; 2) Digital Night Vision Technology Maturation - high-resolution sensor & display, expanding field of view (FOV) +60 degrees; 3) Laser Event Recorder - detect & alert when targeted/irradiated by a laser. Records wavelength, power, pulse duration. Captures picture of the scene & GPS location; and 4) NAMRU-D Aeromedical Research - Effects of cockpit pressure fluctuations on performance, Pilot spatial disorientation, Respiratory dynamics in the flight environment, Aircrew neck and back pain and injury analysis, Aircrew oxygen mask design and valve fault patterns, Hydration strategies and dehydration effects/mitigation, Physiological aviator optimization, Oculomotor physical standards, Laser Eye Protection, Fatigue countermeasures, and Hearing protection device optimization.					
Accomplishments/Planned Programs Subtotals	6.087	5.836	7.842	0.000	7.842

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
• OPN 4268: *Aviation Support Equipment*	57.149	70.665	86.409	-	86.409	96.842	96.522	109.583	117.594	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).

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Navy			Date: April 2022
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603216N / *Aviation Survivability*	Project (Number/Name) 0584 / *Acft Protective Clothing*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Systems Engineering	WR	NAWCAD : Pax River MD	36.937	0.602	Oct 2020	0.616	Oct 2021	0.802	Oct 2022	-		0.802	Continuing	Continuing	Continuing
Primary Hardware Development	C/CPFF	Intevac : San Jose CA	8.091	1.250	Dec 2020	1.500	Dec 2021	1.000	Dec 2022	-		1.000	0.000	11.841	11.841
Primary Hardware Development	MIPR	US Army CERDEC : Ft. Belvoir VA	3.590	0.050	Dec 2020	0.087	Dec 2021	0.000		-		0.000	0.000	3.727	3.727
Primary Hardware Development	C/CPFF	Innovital : Calverton MD	0.783	0.150	Dec 2020	0.000		0.000		-		0.000	0.000	0.933	0.933
Physiological Monitoring	C/CPFF	TBD : TBD	1.000	1.230	Mar 2021	0.510	Dec 2021	0.870	Nov 2022	-		0.870	0.000	3.610	3.610
I-PREDICT	C/CPFF	TBD : TBD	0.000	1.000	Jun 2021	1.500	Dec 2021	2.000	Nov 2022	-		2.000	0.000	4.500	4.500
Laser Eye Protection	C/CPFF	TBD : TBD	0.000	0.350	Jun 2021	0.089	Dec 2021	0.500	Nov 2022	-		0.500	0.000	0.939	0.939
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		0.000		0.000		-		0.000	0.000	0.700	0.700
Research & Development	MIPR	NAMRUD : Dayton, Oh	0.000	0.000		0.000		0.300	Oct 2022	-		0.300	0.000	0.300	-
		Subtotal	74.481	4.632		4.302		5.472		-		5.472	Continuing	Continuing	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Configuration Management	WR	NAWCAD : Pax River MD	4.241	0.400	Oct 2020	0.511	Oct 2021	0.975	Oct 2022	-		0.975	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	7.473	0.400		0.511		0.975		-		0.975	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Navy		Date: April 2022
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603216N / *Aviation Survivability*	**Project (Number/Name)** 0584 / *Acft Protective Clothing*

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation	WR	NAWCAD : Pax River MD	7.098	0.706	Oct 2020	0.698	Oct 2021	0.945	Oct 2022	-		0.945	Continuing	Continuing	Continuing
Prior Year T&E no Longer Funded in Budget Year or Outyears	Various	Various : Various	18.240	0.000		0.000		0.000		-		0.000	0.000	18.240	18.240
		Subtotal	25.338	0.706		0.698		0.945		-		0.945	Continuing	Continuing	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Support	WR	NAWCAD : Pax River MD	4.936	0.334	Oct 2020	0.320	Oct 2021	0.440	Oct 2022	-		0.440	Continuing	Continuing	Continuing
Travel	PO	NAVAIR : Pax River MD	0.526	0.015	Oct 2020	0.005	Oct 2021	0.010	Oct 2022	-		0.010	Continuing	Continuing	Continuing
Need Item Text	C/BA	Not Specified : Not Specified	0.000	0.000		0.000		0.000		-		0.000	0.000	0.000	-
		Subtotal	5.462	0.349		0.325		0.450		-		0.450	Continuing	Continuing	N/A

	Prior Years	FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	112.754	6.087		5.836		7.842		-		7.842	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Navy		Date: April 2022
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603216N / *Aviation Survivability*	**Project (Number/Name)** 0584 / *Acft Protective Clothing*

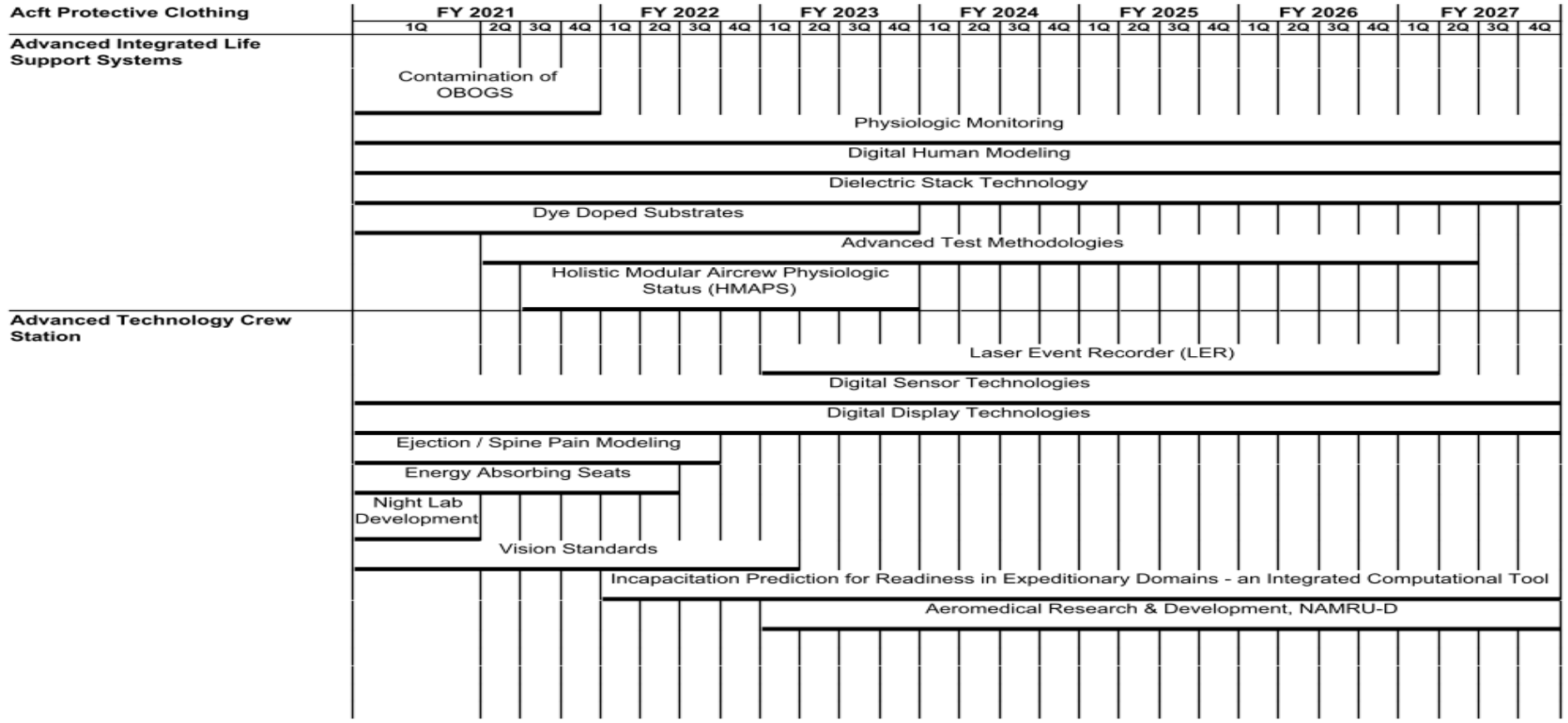

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Exhibit R-4A, RDT&E Schedule Details: PB 2023 Navy		Date: April 2022
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603216N / *Aviation Survivability*	**Project (Number/Name)** 0584 / *Acft Protective Clothing*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Acft Protective Clothing				
Advanced Integrated Life Support Systems: Contamination of OBOGS	1	2021	4	2021
Advanced Integrated Life Support Systems: Physiologic Monitoring	1	2021	4	2027
Advanced Integrated Life Support Systems: Digital Human Modeling	1	2021	4	2027
Advanced Integrated Life Support Systems: Dielectric Stack Technology	1	2021	4	2027
Advanced Integrated Life Support Systems: Dye Doped Substrates	1	2021	4	2023
Advanced Integrated Life Support Systems: Advanced Test Methodologies	2	2021	4	2027
Advanced Integrated Life Support Systems: 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	2021	4	2027
Advanced Technology Crew Station: Digital Display Technologies	1	2021	4	2027
Advanced Technology Crew Station: Ejection / Spine Pain Modeling	1	2021	3	2022
Advanced Technology Crew Station: Energy Absorbing Seats	1	2021	4	2022
Advanced Technology Crew Station: Night Lab Development	1	2021	2	2021
Advanced Technology Crew Station: Vision Standards	1	2021	4	2022
Advanced Technology Crew Station: Incapacitation Prediction for Readiness in Expeditionary Domains - an Integrated Computational Tool (I-PREDICT)	1	2023	4	2027
Advanced Technology Crew Station: Aeromedical Research & Development, NAMRU-D	1	2023	4	2027

Exhibit R-2A, RDT&E Project Justification: PB 2023 Navy			Date: April 2022
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 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
0591: *Acft Survivability, Vulnerability & Safety*	50.808	1.433	5.450	3.575	-	3.575	3.620	3.634	3.660	3.685	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 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Title: Technology Requirements	0.045	0.045	0.045	0.000	0.045
Articles:	-	-	-	-	-
FY 2022 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 2023 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 2023 OCO Plans: N/A					
Title: Technology Design & Development	1.288	3.400	3.301	0.000	3.301
Articles:	-	-	-	-	-
FY 2022 Plans: Conduct initial Navy Future Vertical Lift (FVL) assessment to inform the Request for Proposals and then update annually to provide a feedback loop to the Model Based Systems Engineering effort. Evaluate design					

Exhibit R-2A, RDT&E Project Justification: PB 2023 Navy		Date: April 2022
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 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
of proposed Miniaturized Self Defense Missile (MSDM) system and determine integration properties for each candidate aircraft platform. Support the Multilayered Obstructed Brokered (MOB) HUB software integration package efforts. ***FY 2023 Base 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 defined) threat systems. The effort will include the development of new or modification of existing Modelling & Simulation (M&S) modules which are high fidelity representations of the EW and threat system's components. 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. ***FY 2023 OCO Plans:*** N/A ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Decrease from FY22 to FY23 due to completion of initial Navy Future Vertical Lift (FVL) assessment.					
Title: Technology Test & Evaluation	0.100	2.005	0.229	0.000	0.229
Articles:	-	-	-	-	-
FY 2022 Plans: Continue prototype hardware testing in support of the iASE architecture development and in support of countermeasures simulation hardware. Continue testing combat situational awareness capability in a simulated environment. Test newly developed or modified modules to validate accuracy of representations of the EW and threat system's components. Perform a continuum of assessments from early M&S through Hardware-in-the-Loop as the EW system matures. Support the Multilayered Obstructed Brokered (MOB) HUB software integration package efforts. ***FY 2023 Base Plans:*** Continue prototype hardware testing in support of the iASE architecture development and in support of Common Carriage countermeasures simulation hardware. Continue testing combat situational awareness capability in a simulated environment. Test newly developed or modified modules to validate accuracy of representations of the					

Exhibit R-2A, RDT&E Project Justification: PB 2023 Navy		Date: April 2022
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 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
EW and threat system's components. Address test anomalies identified during MOB HUB integration test events completed in FY22. ***FY 2023 OCO Plans:*** N/A ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Evaluation of MOB HUB effectiveness will conclude in FY22 with identified anomalies investigated during FY23.					
Accomplishments/Planned Programs Subtotals	1.433	5.450	3.575	0.000	3.575

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.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Navy		Date: April 2022
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)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Systems Engineering	WR	NAWCAD : Pax River, MD	13.662	0.226	Oct 2020	1.376	Oct 2021	1.235	Oct 2022	-		1.235	Continuing	Continuing	Continuing
Systems Engineering	WR	NAWCWD : China Lake, CA	0.592	0.087	Jan 2021	0.731	Jan 2022	0.461	Nov 2022	-		0.461	Continuing	Continuing	Continuing
Systems Engineering	MIPR	DTIC : Ft. Belvoir, VA	2.436	0.875	Nov 2020	0.820	Nov 2021	1.200	Nov 2022	-		1.200	0.000	5.331	5.331
System Engineering	C/CPFF	TEKLA : Dumfries, VA	0.100	0.100	Apr 2021	0.000		0.000		-		0.000	0.000	0.200	0.200
System Engineering	WR	NAWCWD : Pt Mugu, CA	0.000	0.000		0.060	Jan 2022	0.060	Jan 2023	-		0.060	0.000	0.120	0.120
System Engineering	C/CPFF	Mantech : Fairfax,VA	0.000	0.000		0.300	Jan 2022	0.000		-		0.000	0.000	0.300	0.300
System Engineering	WR	NSWC : Crane, IN	0.000	0.000		0.095	Jan 2022	0.095	Jan 2023	-		0.095	0.000	0.190	0.190
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	0.000		0.000		0.250	Jan 2023	-		0.250	0.000	0.250	-
		Subtotal	38.058	1.288		3.382		3.301		-		3.301	Continuing	Continuing	N/A

Remarks

All prior year lines have been consolidated

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total 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

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Navy		Date: April 2022
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603216N / *Aviation Survivability*	**Project (Number/Name)** 0591 / *Acft Survivability, Vulnerability & Safety*

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation	WR	NAWCAD : Patuxent River, MD	2.553	0.050	Apr 2021	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Developmental Test & Evaluation	WR	NAWCWD : China Lake, CA	0.000	0.050	May 2021	2.023	Oct 2021	0.229	Oct 2022	-		0.229	Continuing	Continuing	Continuing
Developmental Test & Evaluation	C/CPFF	GTRI : Atlanta, GA	0.100	0.000		0.000		0.000		-		0.000	0.000	0.100	0.100
Prior Year T&E cost no longer funded in FYDP	Various	Various : Various	2.995	0.000		0.000		0.000		-		0.000	0.000	2.995	2.995
		Subtotal	5.648	0.100		2.023		0.229		-		0.229	Continuing	Continuing	N/A

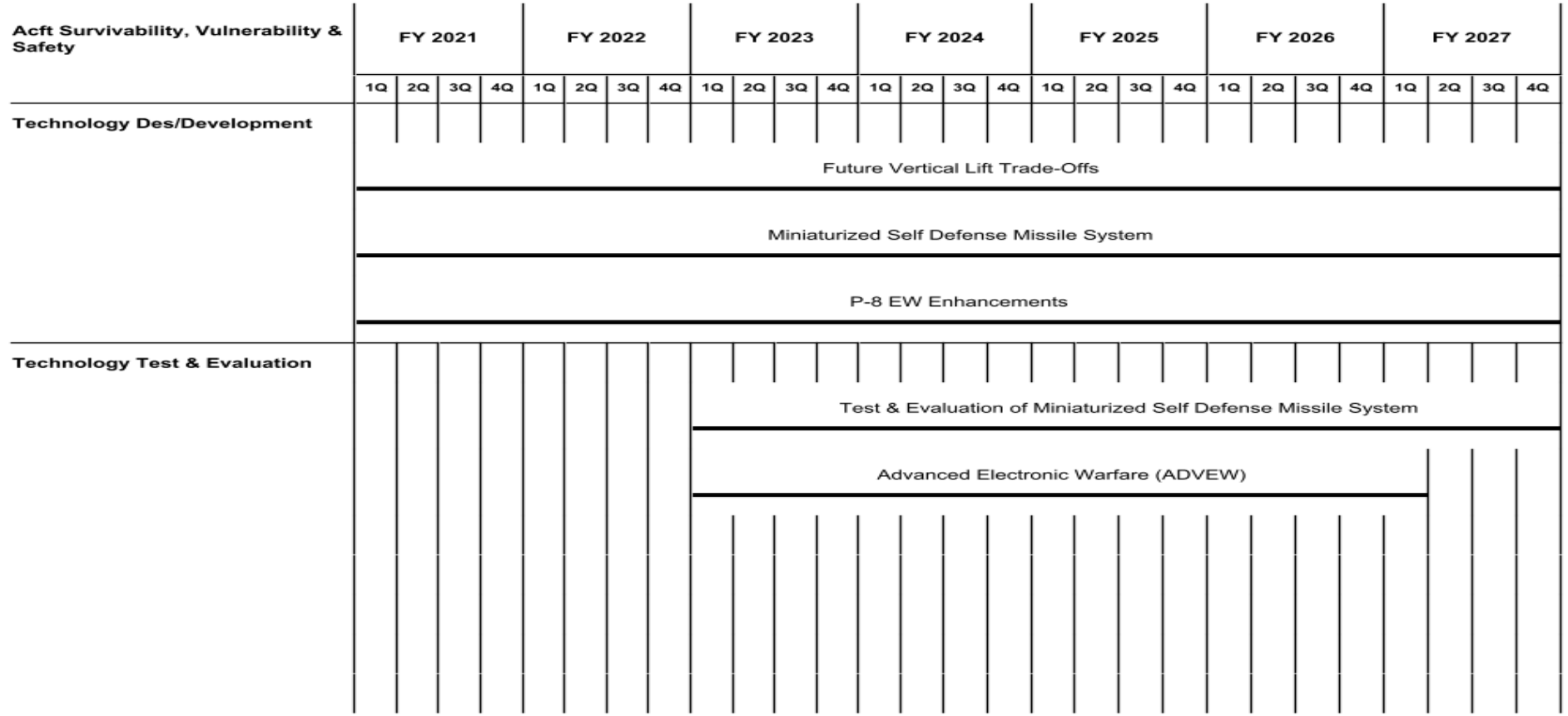
Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Support	WR	NAWCAD : Pax River, MD	1.808	0.045	Oct 2020	0.045	Oct 2021	0.045	Oct 2022	-		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	2.533	0.045		0.045		0.045		-		0.045	Continuing	Continuing	N/A

	Prior Years	FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	50.808	1.433		5.450		3.575		-		3.575	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Navy		Date: April 2022
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603216N / *Aviation Survivability*	**Project (Number/Name)** 0591 / *Acft Survivability, Vulnerability & Safety*



2023DON - 0603216N - 0591

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Navy		Date: April 2022
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603216N / *Aviation Survivability*	**Project (Number/Name)** 0591 / *Acft Survivability, Vulnerability & Safety*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Acft Survivability, Vulnerability & Safety				
Technology Des/Development: Future Vertical Lift Trade-Offs	1	2021	4	2027
Technology Des/Development: Miniaturized Self Defense Missile System	1	2021	4	2027
Technology Des/Development: P-8 EW Enhancements	1	2021	4	2027
Technology Test & Evaluation: Test & Evaluation of Miniaturized Self Defense Missile System	1	2023	4	2027
Technology Test & Evaluation: Advanced Electronic Warfare (ADVEW)	1	2023	1	2027

Exhibit R-2A, RDT&E Project Justification: PB 2023 Navy			Date: April 2022
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 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
0592: *Acft & Ordnance Safety*	44.219	5.124	4.928	5.387	-	5.387	4.937	5.015	5.114	5.218	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 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Title: Insensitive Munitions (IM)	5.124	4.928	5.387	0.000	5.387
Articles:	-	-	-	-	-

FY 2022 Plans:

Air-to-Air Demonstration: Sidewinder Rocket Motor IM improvements and demonstrations will be conducted during FY22. The 21-inch High Loaded Grain (HLG) motor will be demonstrated. This motor will provide insight into increasing range and propulsion technology. Exploring technology to decrease explosions in rocket motor demonstrated by using thermite as means of igniting prior to a major explosion during slow cook-off and/or fast cook-off

Improved Air-Launched Weapons: Bomb Live Unit 111 tested with a different explosive fill, while maintaining its lethality. Advanced Anti-Radiation Guidance Missile upgrades for distance and lethality. Improvements in fuzes will see systems changing to the new version, Fuze Munitions Unit 139 (FMU-139). Continued testing on the impulse motor as well as upgrades on the Long Range Anti-Ship Missile.

Advanced Containment/Case/Warhead Material: Developing several new techniques for warhead initiation. Insertion of new warhead for the TOMAHAWK missile system.

Shock/Blast Barrier Protection/Modeling and Simulation: Modeling of the FMU-139 to be used for future assessment of the units. Continued development of remote sensing for slow cook-off, which will be advantageous for ships carrying weapons. Using Large Scale Gap Test to improve analysis of shock initiation of energetics using energy per unit area technique.

FY 2023 Base 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 cook-off and/or fast cook-off. Documenting

Exhibit R-2A, RDT&E Project Justification: PB 2023 Navy		Date: April 2022
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603216N / *Aviation Survivability*	**Project (Number/Name)** 0592 / *Acft & Ordnance Safety*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
more than 30 insensitive munitions tests completed with more than 6 different Sidewinder warhead concepts in support of a potential major missile upgrade. Demonstration of an improved liner system for GP bombs. Improved Air-Launched Weapons: A new cook-off mitigating liner system for bombs will be demonstrated. Development of novel electronic safe and arm devices for loitering munitions. Loitering munitions fulfill an essential needs gap but pose unique fuze design constraints. Advanced Containment/Case/Warhead Material: Shock/Blast Barrier Protection/Modeling and Simulation: 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 performance. ***FY 2023 OCO Plans:*** N/A ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Increase is due to testing requirements for Air-Launched Weapons ramping up as planned in FY23.					
Accomplishments/Planned Programs Subtotals	5.124	4.928	5.387	0.000	5.387

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.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Navy			Date: April 2022
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603216N / *Aviation Survivability*	Project (Number/Name) 0592 / *Acft & Ordnance Safety*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Systems Engineering	WR	NAWCWD : China Lake, CA	44.211	5.124	Oct 2020	4.928	Oct 2021	5.387	Oct 2022	-		5.387	Continuing	Continuing	Continuing
		Subtotal	44.211	5.124		4.928		5.387		-		5.387	Continuing	Continuing	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Prior Year Mgmt no longer funded in FYDP	Various	Various : Various	0.008	0.000		0.000		0.000		-		0.000	0.000	0.008	0.008
		Subtotal	0.008	0.000		0.000		0.000		-		0.000	0.000	0.008	N/A

	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	44.219	5.124		4.928		5.387		-		5.387	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Navy		Date: April 2022
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603216N / *Aviation Survivability*	**Project (Number/Name)** 0592 / *Acft & Ordnance Safety*

Acft & Ordnance Safety

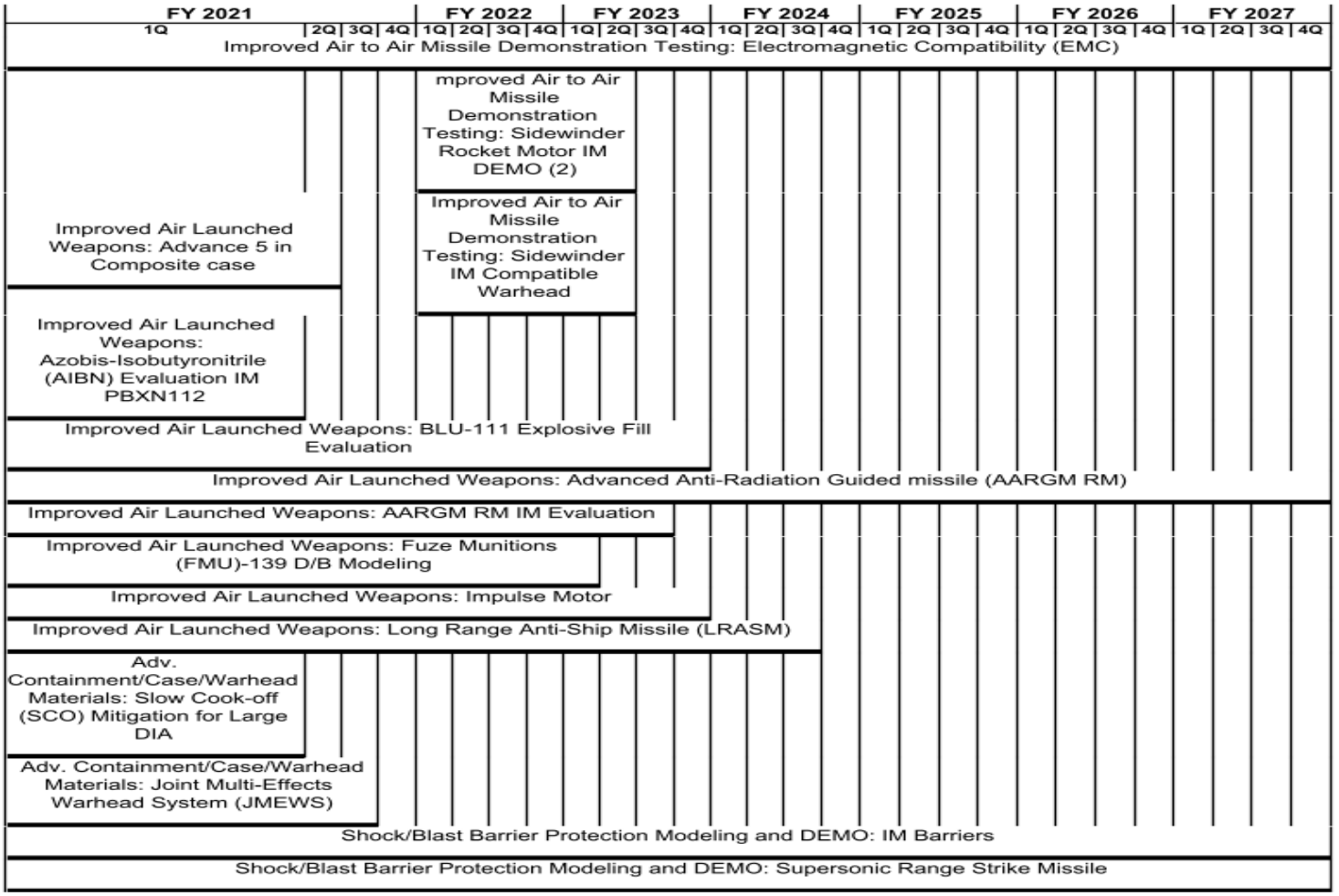
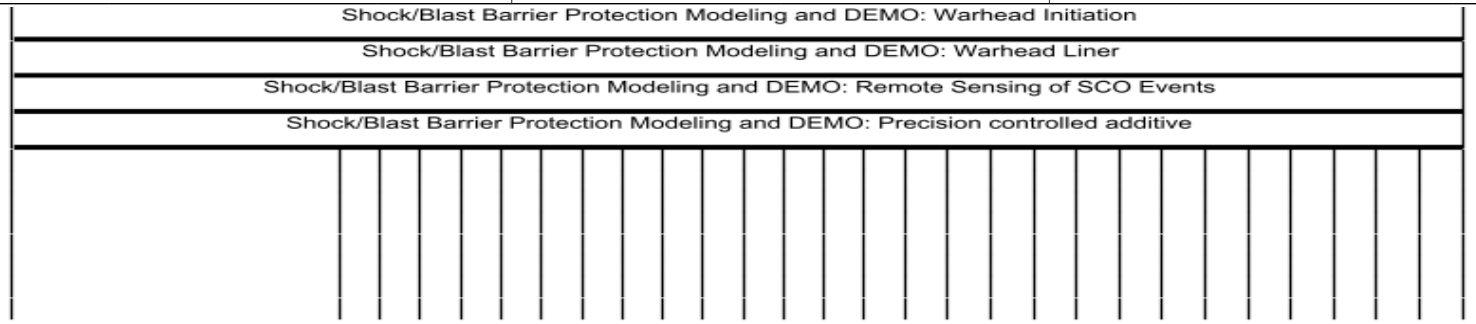


Exhibit R-4, RDT&E Schedule Profile: PB 2023 Navy		Date: April 2022
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603216N / *Aviation Survivability*	**Project (Number/Name)** 0592 / *Acft & Ordnance Safety*



2023DON - 0603216N - 0592

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Navy		Date: April 2022
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603216N / *Aviation Survivability*	**Project (Number/Name)** 0592 / *Acft & Ordnance Safety*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Acft & Ordnance Safety				
Improved Air to Air Missile Demonstration Testing: Electromagnetic Compatibility (EMC)	1	2021	4	2027
Improved Air to Air Missile Demonstration Testing: Sidewinder Rocket Motor IM DEMO (2)	1	2022	2	2023
Improved Air to Air Missile Demonstration Testing: Sidewinder IM Compatible Warhead	1	2022	2	2023
Improved Air Launched Weapons: Advance 5 in Composite case	1	2021	2	2021
Improved Air Launched Weapons: Azobis-Isobutyronitrile (AIBN) Evaluation IM PBXN112	1	2021	1	2021
Improved Air Launched Weapons: BLU-111 Explosive Fill Evaluation	1	2021	4	2023
Improved Air Launched Weapons: Advanced Anti-Radiation Guided missile (AARGM RM)	1	2021	4	2027
Improved Air Launched Weapons: AARGM RM IM Evaluation	1	2021	3	2023
Improved Air Launched Weapons: Fuze Munitions (FMU)-139 D/B Modeling	1	2021	1	2023
Improved Air Launched Weapons: Impulse Motor	1	2021	4	2023
Improved Air Launched Weapons: Long Range Anti-Ship Missile (LRASM)	1	2021	3	2024
Adv. Containment/Case/Warhead Materials: Slow Cook-off (SCO) Mitigation for Large DIA	1	2021	1	2021
Adv. Containment/Case/Warhead Materials: Joint Multi-Effects Warhead System (JMEWS)	1	2021	3	2021
Shock/Blast Barrier Protection Modeling and DEMO: IM Barriers	1	2021	4	2027
Shock/Blast Barrier Protection Modeling and DEMO: Supersonic Range Strike Missile	1	2021	4	2027
Shock/Blast Barrier Protection Modeling and DEMO: Warhead Initiation	1	2021	4	2027
Shock/Blast Barrier Protection Modeling and DEMO: Warhead Liner	1	2021	4	2027

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Navy		Date: April 2022
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603216N / *Aviation Survivability*	**Project (Number/Name)** 0592 / *Acft & Ordnance Safety*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Shock/Blast Barrier Protection Modeling and DEMO: Remote Sensing of SCO Events	1	2021	4	2027
Shock/Blast Barrier Protection Modeling and DEMO: Precision controlled additive	1	2021	4	2027

Exhibit R-2A, RDT&E Project Justification: PB 2023 Navy			Date: April 2022
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 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
1819: *CV Acft Fire Suppress System*	5.375	0.598	0.601	0.630	-	0.630	0.644	0.654	0.663	0.673	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 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Title: Fire-Fighting	0.598	0.601	0.630	0.000	0.630
Articles:	-	-	-	-	-

FY 2022 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 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. 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 firefighter issues related to composites, weapons and fuels and develop procedures to be used aboard ship to rapidly and safely extinguished deep-seated smoldering fires with composite materials. 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's(CVN)and Landing Helicopter Assault/Dock (LHA/D) ships.

FY 2023 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 clean agents. Continue to monitor 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-

Exhibit R-2A, RDT&E Project Justification: PB 2023 Navy		Date: April 2022
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603216N / *Aviation Survivability*	**Project (Number/Name)** 1819 / *CV Acft Fire Suppress System*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
fire-rescue face shield and firefighter personnel floatation device improvements. 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 firefighter issues related to composites, weapons and fuels and develop procedures to be used aboard ship to rapidly and safely extinguished deep-seated smoldering fires with composite materials. 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's(CVN)and Landing Helicopter Assault/Dock (LHA/D) ships. ***FY 2023 OCO Plans:*** N/A ***FY 2022 to FY 2023 Increase/Decrease Statement:*** The FY23 increase of $0.029 will be utilized to support the weapons cooling project.					
Accomplishments/Planned Programs Subtotals	0.598	0.601	0.630	0.000	0.630

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.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Navy			Date: April 2022
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603216N / *Aviation Survivability*	Project (Number/Name) 1819 / *CV Acft Fire Suppress System*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Systems Engineering	WR	NAWCWD : China Lake, CA	0.304	0.075	Oct 2020	0.072	Oct 2021	0.072	Oct 2022	-		0.072	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	0.639	0.075		0.072		0.072		-		0.072	Continuing	Continuing	N/A

Remarks

All prior year lines have been consolidated.

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
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	0.766	0.182	Oct 2020	0.181	Oct 2021	0.181	Oct 2022	-		0.181	Continuing	Continuing	Continuing
Engineering Support	C/CPFF	Hughes Associates : Baltimore, MD	0.162	0.010	Nov 2020	0.010	Nov 2021	0.010	Nov 2022	-		0.010	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	0.039	0.010	May 2021	0.010	May 2022	0.010	May 2023	-		0.010	Continuing	Continuing	Continuing
		Subtotal	1.251	0.202		0.201		0.201		-		0.201	Continuing	Continuing	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Technology Test & Evaluation	WR	NAWCWD : China Lake, CA	2.026	0.211	Oct 2020	0.208	Oct 2021	0.237	Oct 2022	-		0.237	Continuing	Continuing	Continuing
Technology Test & Evaluation	C/FFP	Hughes Associates : Baltimore, MD	0.658	0.060	Nov 2020	0.060	Nov 2021	0.060	Nov 2022	-		0.060	0.000	0.838	0.838

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Navy			Date: April 2022
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603216N / *Aviation Survivability*	Project (Number/Name) 1819 / *CV Acft Fire Suppress System*	

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Prior yr T&E no longer funded in the FYDP	Various	Various : Various	0.329	0.000		0.000		0.000		-		0.000	0.000	0.329	0.329
		Subtotal	3.013	0.271		0.268		0.297		-		0.297	Continuing	Continuing	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management	WR	NAWCWD : China Lake, CA	0.472	0.050	Oct 2020	0.060	Oct 2021	0.060	Oct 2022	-		0.060	Continuing	Continuing	Continuing
		Subtotal	0.472	0.050		0.060		0.060		-		0.060	Continuing	Continuing	N/A

	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	5.375	0.598		0.601		0.630		-		0.630	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Navy		Date: April 2022
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603216N / *Aviation Survivability*	**Project (Number/Name)** 1819 / *CV Acft Fire Suppress System*

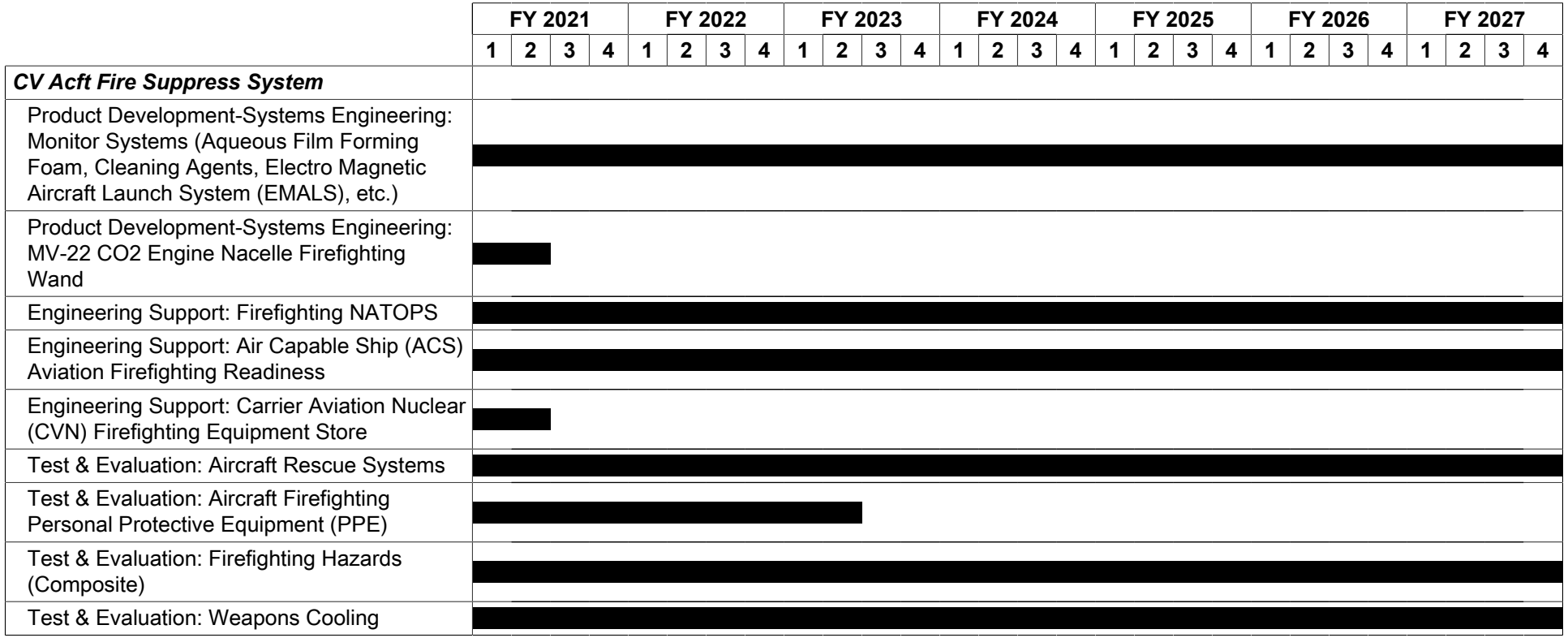


Exhibit R-4A, RDT&E Schedule Details: PB 2023 Navy		Date: April 2022
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603216N / *Aviation Survivability*	**Project (Number/Name)** 1819 / *CV Acft Fire Suppress System*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
CV Acft Fire Suppress System				
Product Development-Systems Engineering: Monitor Systems (Aqueous Film Forming Foam, Cleaning Agents, Electro Magnetic Aircraft Launch System (EMALS), etc.)	1	2021	4	2027
Product Development-Systems Engineering: MV-22 CO2 Engine Nacelle Firefighting Wand	1	2021	2	2021
Engineering Support: Firefighting NATOPS	1	2021	4	2027
Engineering Support: Air Capable Ship (ACS) Aviation Firefighting Readiness	1	2021	4	2027
Engineering Support: Carrier Aviation Nuclear (CVN) Firefighting Equipment Store	1	2021	2	2021
Test & Evaluation: Aircraft Rescue Systems	1	2021	4	2027
Test & Evaluation: Aircraft Firefighting Personal Protective Equipment (PPE)	1	2021	2	2023
Test & Evaluation: Firefighting Hazards (Composite)	1	2021	4	2027
Test & Evaluation: Weapons Cooling	1	2021	4	2027

Exhibit R-2A, RDT&E Project Justification: PB 2023 Navy			Date: April 2022
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603216N / *Aviation Survivability*	Project (Number/Name) 9999 / *Congressional Adds*	

COST ($ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
9999: *Congressional Adds*	0.000	0.000	8.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	8.000
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

FY2022 Congressional Add

C747: Context based augmented reality identification framework

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022
Congressional Add: Context-based augmented reality identification framework	0.000	8.000
FY 2021 Accomplishments: N/A		
FY 2022 Plans: Funding will support Congressional Add efforts in context based augmented reality.		
Congressional Adds Subtotals	0.000	8.000

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

FY2022 Congressional Add for 0584 - TBD

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Navy			Date: April 2022
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603216N / *Aviation Survivability*	Project (Number/Name) 9999 / *Congressional Adds*	

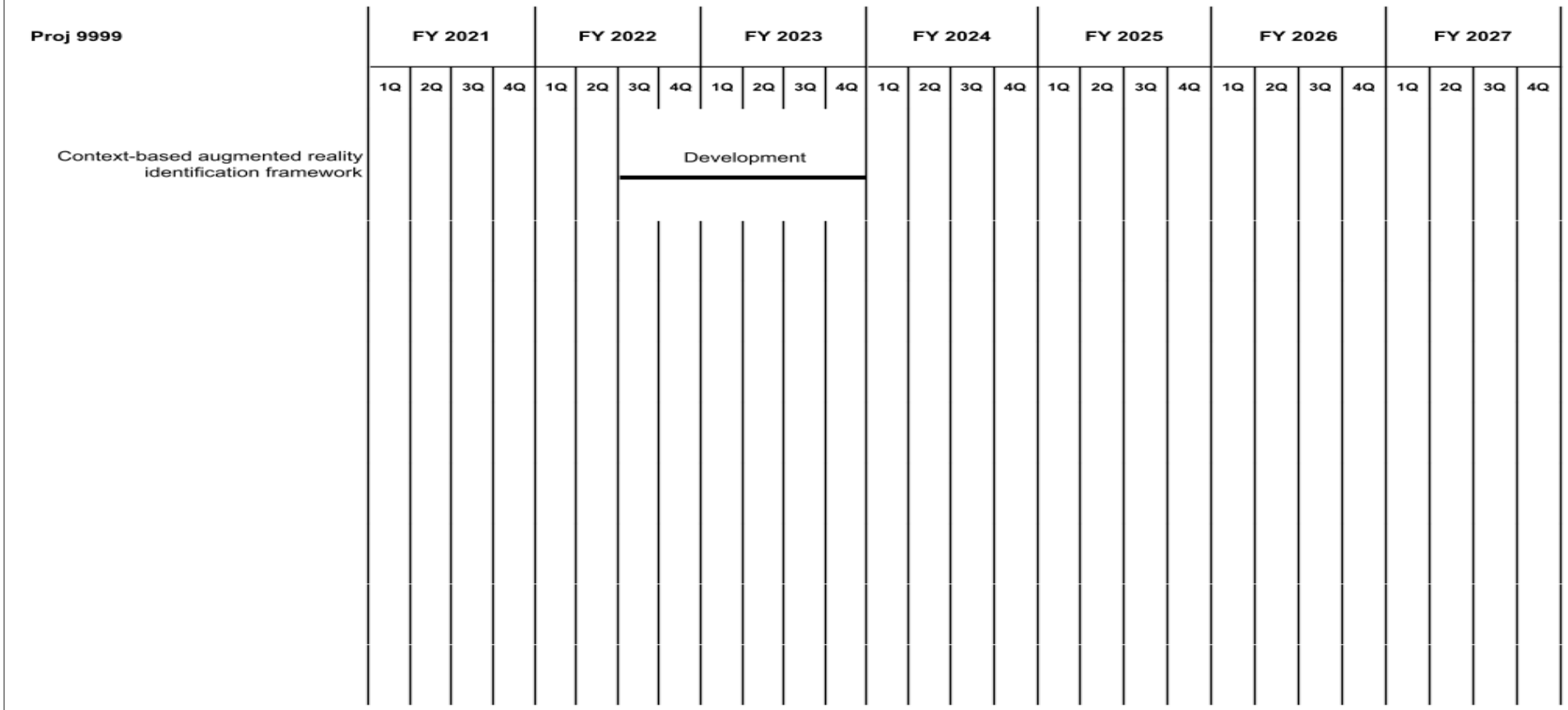
Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Congressional Add TBD	TBD	TBD : TBD	0.000	0.000		8.000	Sep 2022	0.000		-		0.000	0.000	8.000	-
		Subtotal	0.000	0.000		8.000		0.000		-		0.000	0.000	8.000	N/A

	Prior Years	FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	0.000		8.000		0.000		-		0.000	0.000	8.000	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Navy		Date: April 2022
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603216N / *Aviation Survivability*	**Project (Number/Name)** 9999 / *Congressional Adds*



2023PB - 0603216N - 9999

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Navy		Date: April 2022
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603216N / *Aviation Survivability*	**Project (Number/Name)** 9999 / *Congressional Adds*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 9999				
Context-based augmented reality identification framework: Context-based augmented reality identification framework	3	2022	4	2023