Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Navy											Date: May 2017	
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 2016**	**FY 2017**	**FY 2018 Base**	**FY 2018 OCO**	**FY 2018 Total**	**FY 2019**	**FY 2020**	**FY 2021**	**FY 2022**	**Cost To Complete**	**Total Cost**
Total Program Element	177.880	5.343	5.239	5.566	-	5.566	5.792	5.825	5.948	6.064	Continuing	Continuing
0584: *Acft Protective Clothing*	97.056	2.279	2.441	2.534	-	2.534	2.613	2.635	2.691	2.743	Continuing	Continuing
0591: *Acft Survivability, Vulnerability & Safety*	43.827	1.434	1.383	1.385	-	1.385	1.516	1.525	1.557	1.587	Continuing	Continuing
0592: *Acft & Ordnance Safety*	34.434	1.043	0.907	1.060	-	1.060	1.067	1.062	1.085	1.108	Continuing	Continuing
1819: *CV Acft Fire Suppress System*	2.563	0.570	0.508	0.587	-	0.587	0.596	0.603	0.615	0.626	Continuing	Continuing
9999: *Congressional Adds*	0.000	0.017	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	0.017

Note

9999 Congressional Add belongs to 0603261N.

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 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Previous President's Budget	10.904	5.239	5.847	-	5.847
Current President's Budget	5.343	5.239	5.566	-	5.566
Total Adjustments	-5.561	0.000	-0.281	-	-0.281
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-5.311	0.000			
• SBIR/STTR Transfer	-0.249	0.000			
• Program Adjustments	0.000	0.000	-0.248	-	-0.248

Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Navy					Date: May 2017
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*			
• Rate/Misc Adjustments	-0.001	0.000	-0.033	-	-0.033

Congressional Add Details ($ in Millions, and Includes General Reductions)

	FY 2016	FY 2017
Project: 9999: *Congressional Adds*		
Congressional Add: *Unmanned System Integration*	0.017	0.000
Congressional Add Subtotals for Project: 9999	0.017	0.000
Congressional Add Totals for all Projects	0.017	0.000

Change Summary Explanation

Technical: Not applicable.

Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy										Date: May 2017		
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 2016**	**FY 2017**	**FY 2018 Base**	**FY 2018 OCO**	**FY 2018 Total**	**FY 2019**	**FY 2020**	**FY 2021**	**FY 2022**	**Cost To Complete**	**Total Cost**
0584: *Acft Protective Clothing*	97.056	2.279	2.441	2.534	-	2.534	2.613	2.635	2.691	2.743	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Project 0584 develops, demonstrates, and validates technologies designed to enhance warfighter performance, protection, mission effectiveness, and survivability. The project addresses life support equipment, advanced helmet vision systems, escape systems technology, crew centered cockpit design, and control stations. Integrate and use alternative and new technologies for the Pilot Vehicle Integration, optimization of Intelligence Surveillance and Reconnaissance (ISR), and Forward Air Control-Air mission areas. Demonstrate innovative tools / approaches to improve situational awareness, new ISR technologies, and Graphical User Interfaces (new symbology and optimized logic for system employment). It 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, and the joint Air Force/Navy (CAF-208-93) for an Aerospace Control Helmet Mounted Cueing System.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Title: Advanced Technology Crew Station	1.246	1.292	1.158	0.000	1.158
Articles:	-	-	-	-	-

FY 2016 Accomplishments:

Complete integration and development of 4 megapixel sensor, display, and electronics into a new variant of a night vision goggle. Integrated units will be used for environmental and other required testing to ready the capability for transition into safety of flight testing. Begin work on ultra-high resolution displays (20/15 acuity at overcast starlight) and solid state low light sensors. Begin verification and validation of head, neck and spine model for helmet mounted displays and the model's predictive validity of head mounted systems during crash events.

FY 2017 Plans:

Continue development of the seat vibration attenuation and continue to mature an aviation physiologic monitoring/warning system. Develop and evaluate potential second sources for high resolution digital near infra-red sensors and micro displays. Pursue the new silicon wafer design, Next Gen Electron Bombarded Active Pixel Sensor. Explore solid state low light sensors; alternate micro display technologies such as Wave Guide, Quantum dot, and flexible displays; and short wave infra-red sensor development.

FY 2018 Base Plans:

Continue to mature aviation physiologic monitoring, warning system and its integration. Begin development of next generation of high resolution (9 mega pixel) color digital near to mid infra-red sensors and micro displays. Explore alternative Organic Light-Emitting Diode micro display technologies such as Wave Guide, Quantum dot,

Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy		Date: May 2017
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 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
and flexible displays; and near and short wave infra-red sensor development. Explore technologies to improve aircraft seating and body-mounted equipment to increase mission endurance and enhance crashworthiness. Complete testing, and refinement as necessary, of the seat damper system and active seat cushion. ***FY 2018 OCO Plans:*** N/A					
Title: Advanced Integrated Life Support System	1.033	1.149	1.376	0.000	1.376
Articles:	-	-	-	-	-
FY 2016 Accomplishments: Integrate recently patented stacked optical filter test methodology/device and determine true optical power and limits for helmet mounted systems. Complete and validate indicator of solar degradation on protective eyewear and equipment. Continue development of in-house expertise in digital human modeling and 3D scanning capabilities. ***FY 2017 Plans:*** Investigate active visor tinting and prototype integration with advanced helmet mounted display concepts. Assess optical quality of compound multiple surfaces on the aggregate optical powers. Complete testing of solarization indicators and determine type and location on spectacle or visor systems. Upgrade laser systems to assess the impact on laser bleaching of ultra-short pulses. Continue to mature on shore supplier of Dielectric Coatings. Mature digital human modeling capability which may include investing in additional crash testing. Performance moderators to the SANTOSHUMAN suite and add an additional joint H-46 crash test. ***FY 2018 Base Plans:*** Investigate active measures of solarization and its effect on the ballistic properties of polycarbonate / other materials. Upgrade laser protection to withstand the impact of ultra-fast (femtosecond) high intensity pulses. Continue to mature on-shore supplier of Dielectric Coatings. Investigate the optimal integration of head borne prototype systems (Helmet Mounted Displays, Enhanced Visual Acuity, Hearing Protection with Active Noise Reduction and talk through capability, Modular Helmet, etc.) for increased functionality and reduced loading on the head and spine. Mature digital human modeling capability for crew accommodation and cockpit integration. Investigate methods to reduce spinal loading during normal and emergency operations, which may include investing in additional crash testing, such as joint H-46 crash tests. ***FY 2018 OCO Plans:*** N/A					
Accomplishments/Planned Programs Subtotals	2.279	2.441	2.534	0.000	2.534

Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy		Date: May 2017
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603216N / *Aviation Survivability*	**Project (Number/Name)** 0584 / *Acft Protective Clothing*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
• OPN 4268: *Aviation Support Equipment*	48.773	39.099	33.838	29.245	63.083	32.520	45.835	47.136	62.044	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 Indefinite Delivery Indefinite Quantity contract.

E. Performance Metrics

Develop advanced crashworthy system level models, investigate improved visual search methodologies, and improve the ability to assess cockpit compatibility through new analytic approaches to anthropometry.

Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy			Date: May 2017
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 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
0591: *Acft Survivability, Vulnerability & Safety*	43.827	1.434	1.383	1.385	-	1.385	1.516	1.525	1.557	1.587	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Aircraft Survivability, Vulnerability and Safety. This project develops prototype hardware 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 fire and explosion suppression techniques for fuel systems.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Title: Technology Requirements	0.090	0.181	0.035	0.000	0.035
Articles:	-	-	-	-	-
FY 2016 Accomplishments: Planned trade studies include threats assessments, rotary wing survivability requirements, and vulnerability assessment of both fixed wing and rotary wing aircraft platforms.					
FY 2017 Plans: Planned trade studies include threats assessments, vulnerability assessments of both rotary wing and fixed wing aircraft, and updates to the Survivability Master Plan.					
FY 2018 Base Plans: Maintain a comprehensive Survivability Master Plan; assess technologies to identify survivability gaps as part of the OPNAV Aircraft Survivability Investment Strategy; mature survivability assessment processes; support rotary wing and fixed wing programmatic requirements for survivability studies, assessments, and analyses.					
FY 2018 OCO Plans: N/A					
Title: Technology Design & Development	0.990	0.944	1.298	0.000	1.298
Articles:	-	-	-	-	-
FY 2016 Accomplishments:					

Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy		Date: May 2017
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 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Assess technologies to address shortfalls identified as part of the OPNAV Aircraft Survivability Investment Strategy (OASIS) project. Establish an architecture to integrate Aviation Survivability Equipment (iASE) between USN/USMC aircraft platforms. ***FY 2017 Plans:*** Assess technologies to address shortfalls identified as part of the OASIS project. Establish an architecture to iASE between USN/USMC aircraft platforms. ***FY 2018 Base Plans:*** Develop recommended courses of action to resolve survivability deficiencies; develop and support Integrated Aircraft Survivability Equipment (iASE) initiatives; manage, coordinate, or develop iASE capabilities and transition to programs of record. Begin investigating Virtual Electronic Combat Training System (VECTS) CH-53K integration concept; support MH-60R Tactical Demonstration to include Electric-Optical/Infrared and Radio Frequency threats; and provide coordinated support to update VECTS as needed for radar warning receiver APR-39 C(V2). ***FY 2018 OCO Plans:*** N/A					
Title: Technology Test & Evaluation	0.354	0.258	0.052	0.000	0.052
Articles:	-	-	-	-	-
FY 2016 Accomplishments: Integration, laboratory and flight testing of prototype hardware in support of the iASE architecture development. Ballistic testing representative sample material against identified threats for incorporation into OASIS models. ***FY 2017 Plans:*** Integration, laboratory, and flight testing of prototype hardware in support of the iASE architecture development and in support of countermeasures simulation hardware. ***FY 2018 Base Plans:*** Determine performance values for technologies to support survivability requirements; assess optimal cueing and informational displays to enhance aircrew situational awareness and facilitate susceptibility reduction techniques; support flight testing of prototype hardware and software solutions for Integrated Aircraft Survivability Equipment; develop, manage or support survivability technology demonstrations. ***FY 2018 OCO Plans:***					

Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy		Date: May 2017
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 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
N/A					
Accomplishments/Planned Programs Subtotals	1.434	1.383	1.385	0.000	1.385

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.

E. Performance Metrics

Evaluate 100% of deployed/developmental United States Navy/United States Marine Corp aircraft platforms for survivability deficiencies using Navy gap analysis as baseline. Identify prototype hardware solutions to address 25% to 50% of deficiencies, and initiate a minimum of two new demonstration projects per year.

Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy			Date: May 2017
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 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
0592: *Acft & Ordnance Safety*	34.434	1.043	0.907	1.060	-	1.060	1.067	1.062	1.085	1.108	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 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Title: Insensitive Munitions (IM)	1.043	0.907	1.060	0.000	1.060
Articles:	-	-	-	-	-
FY 2016 Accomplishments: Improve Air-to-Air Demonstration: Continue Sidewinder warhead/rocket motor technology risk reduction evaluation in support of PMA-259 planned block II+/III transition with high-level group high-performance motor, digital detection initiator, improved multi-layered case warhead design, and radio frequency cook-off sensor. Continue IM technology evaluation for metal matrix composite rocket motor IM demonstration in support of future Navy rocket transitions. Improve Air-Launched Weapons: Continue final IM testing/static fire of minimum smoke (MS) propellant demonstration of a cast/cure MS composite propellant that will meet -65 degree requirement for fixed-wing platforms in the current Hellfire configuration. Conduct IM evaluation of the Bomb Live Unit (BLU) 110 vented base plug redesign that failed during previous qualification testing. Advanced Containment/Case/Warhead Materials: Demonstrate IM performance of the Joint Multiple Effects Warhead System warhead with the redesigned fuze well on the follow-through bomb to enhance survivability during penetration. Initiate an IM evaluation of Mk 135 rocket motor with venting on Mk 14 container used in both shipping and storage of Tomahawk. Shock/Blast Barrier Protection Modeling, Demonstration, and Testing: Continue shape charge jet (SCJ) barrier evaluation/demonstration for SCJ mitigation in air-launched systems.					

Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy		Date: May 2017
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 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Advanced Energetic Materials: Evaluate a Joint Service Insensitive Munitions Technology Program (JIMTP) transition new explosive fill for BLU 111 to address Navy unique issues (i.e., irreversible growth, explosive train reliability for a very insensitive main fill, and thermal environments and ullage requirements for the fill to ensure improved IM demonstrated in JIMTP). ***FY 2017 Plans:*** Improve Air-to-Air Demonstration: Continue Sidewinder warhead/rocket motor technology risk reduction evaluation in support of PMA-259 planned block III transition with highly-loaded-grain, high-performance motor, digital detonation initiator, improved multi-layered case warhead design, and radio frequency cook-off sensor. Evaluate metal matrix composite rocket motor for application into air to air/ground weapon systems. Improve Air-Launched Weapons: Continue Insensitive Munitions (IM) testing/static fire of minimum smoke propellant demonstration of a cast/cure minimum smoke composite propellant that will meet -65 degree requirement for fixed-wing platforms. Testing will be done in a Hellfire configuration to demonstrate transition ability to a system with equivalent requirements. Finalize IM evaluation of the Bomb Live Unit (BLU) 110 vented base plug redesign that failed during previous qualification testing and transition to PMA 201 for final qualification. Finalize evaluation of Highly-loaded-grain high performance rocket motor and application of Slow-cook-off-sensor technology in Advanced Anti-Radiation Guided Missile configuration for transition to PMA 242 Engineering, Manufacturing and Development (EMD). Advanced Containment/Case/Warhead Materials: Demonstrate IM performance of the Joint Multiple Effects Warhead System in the new revised configuration for transition to PMA 280 EMD program. Shock/Blast Barrier Protection Modeling, Demonstration, and Testing: Continue tech-watch investigation for effective, affordable blast barrier and impact mitigation for application to Tomahawk weapon. Advanced Energetic Materials: Evaluate a Joint Service Insensitive Munitions Technology Program (JIMTP) transition new explosive fill for BLU 111 to address Navy unique issues (i.e., irreversible growth, explosive train reliability for a very insensitive main fill, and thermal environments and ullage requirements for the fill to ensure improved IM demonstrated in JIMTP). ***FY 2018 Base Plans:*** Improve Air-to-Air Demonstration: Continue Sidewinder warhead technology risk reduction evaluation in support of PMA-259 planned block II+ or III transition with digital detonation initiator, improved multi-layered case warhead design. Continue Sidewinder rocket motor technology risk reduction evaluation in support of PMA-259					

Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy		Date: May 2017
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 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
planned block III transition with highly-loaded-grain, high-performance motor, and radio frequency cook-off sensor. Evaluation of Metal Matrix Composite structures was completed in FY 17. Improve Air-Launched Weapons: Continue Insensitive Munitions (IM) and performance evaluation of a cast/cure minimum smoke composite propellant that will meet -65 degree requirement for fixed-wing platforms. Testing will be done in a Hellfire configuration to demonstrate transition ability to a system with equivalent requirements in support of PMA 242 tier III requirements. Continue evaluation of Highly-loaded-grain high performance rocket motor and application of Slow-cook-off-sensor technology in Advanced Anti-Radiation Guided Missile configuration for transition to PMA 242 AARGM BLK II upgrade. Advanced Containment/Case/Warhead Materials: Demonstrate IM performance of the Joint Multiple Effects Warhead System in the new revised configuration for transition to PMA 280 FY 19 planned warhead upgrade. Initiate IM and Operational performance evaluation of Eutectic Metal Composite(EMC) for Rocket Motor and Warhead components. EMC technology provides improved material strength properties and the ability to produce structures w/ advanced configurations that would potentially enhance both IM and operational performance. Shock/Blast Barrier Protection Modeling, Demonstration, and Testing: Continue tech-watch investigation for effective, affordable blast barrier and impact mitigation for application to Tomahawk weapon. Advanced Energetic Materials: Initiate evaluation of a Joint Service Insensitive Munitions Technology Program (JIMTP) transition new explosive fill for BLU 111 to address Navy unique issues (i.e., irreversible growth, explosive train reliability for a very insensitive main fill, and thermal environments and ullage requirements for the fill to ensure improved IM demonstrated in JIMTP. ***FY 2018 OCO Plans:*** N/A					
Accomplishments/Planned Programs Subtotals	1.043	0.907	1.060	0.000	1.060

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy		Date: May 2017
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603216N / *Aviation Survivability*	**Project (Number/Name)** 0592 / *Acft & Ordnance Safety*

D. Acquisition Strategy

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

E. Performance Metrics

The Aircraft and Ordnance Safety program will initiate six to nine technology development/maturation efforts to improve IM signature and will work to transition those technologies to weapons programs. The weapons programs will be chosen based on PEO(U&W) weapons portfolio and will focus on the priority weapons as defined in the IM strategic plan.

Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy			Date: May 2017
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 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
1819: *CV Acft Fire Suppress System*	2.563	0.570	0.508	0.587	-	0.587	0.596	0.603	0.615	0.626	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 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Title: Fire-Fighting	0.570	0.508	0.587	0.000	0.587
Articles:	-	-	-	-	-

FY 2016 Accomplishments:

Continue support for Naval Air Training and Operating Procedures Standardization improvements, and modeling and simulation for fire prediction. Complete the purple K efficiency based on particle size testing and industry assessment. Continue monitoring aqueous film forming foam developments and other clean agents. Continue to develop improved protocols for helicopter roll-over crashes, and evaluate equipment improvements for saws, spreaders, and other improvements. Evaluate flash-hood and crash-fire-rescue face shield improvements. Determine final requirements and business case for eye protection for metal and ordnance fires. 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. Evaluate and develop the protocols to mitigate the risks of mixed fuels on-board carriers. Prioritize highest payoff areas on carriers and other vessels that will lead to the development of automation systems to reduce manning.

FY 2017 Plans:

Continue support for Naval Air Training and Operating Procedures Standardization improvements, and modeling and simulation for fire prediction. Continue monitoring aqueous film forming foam developments and other clean agents. Continue to develop improved protocols for helicopter roll-over crashes, and evaluate equipment improvements for saws, spreaders, and other improvements. Finalize 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

Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy		Date: May 2017
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 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
strike firefighting operations impacts. Start new project looking at firefighter issues related to unmanned air vehicle systems including composites, weapons and fuels. Conduct testing on new sensor and automation systems to improve firefighter response to weapons fires. ***FY 2018 Base Plans:*** Continue support for Naval Air Training and Operating Procedures Standardization improvements, and modeling and simulation for fire prediction. Continue monitoring aqueous film forming foam developments and other clean agents. Continue to evaluate equipment improvements for saws, spreaders, and other improvements to reduce or discontinue the use of Motor Gasoline on ships. Finalize 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 unmanned air vehicle systems including composites, weapons and fuels. Evaluate training and certification requirements and equipment to bring the ship up to aviation boatswains mate capabilities and readiness for Auxiliary Crane Support ships that rely on the ships damage control team and limited resources. Develop procedures to be used aboard ship to rapidly and safely extinguished deep seated smoldering fires with composite materials. ***FY 2018 OCO Plans:*** N/A					
Accomplishments/Planned Programs Subtotals	0.570	0.508	0.587	0.000	0.587

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.

E. Performance Metrics

The Carrier Aircraft Fire Suppression (CAFS) program will, at a minimum, fund six to ten projects per year that investigate and evaluate tactical capability gaps and potential capability improvements regarding shipboard aircraft fire suppression doctrine and equipment. CAFS projects will have a greater than 90% success rate of insertion into Department of the Navy shipboard aircraft fire-fighting procedures and documentation.

Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy			Date: May 2017
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 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
9999: *Congressional Adds*	0.000	0.017	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	0.017
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

Note

This congressional add is being moved to 0603261N for proper execution.

A. Mission Description and Budget Item Justification

In order for Navy UAS to meet mission needs, both national and international policies relating to airspace access and use by UAS need to continue to evolve. Navy efforts will focus on advancing future policies that will permit unfettered access to airspace for UAS. Additionally, advancements are needed in Detect and Avoid technology in the areas of sensors, algorithms, and the integration of the sensors, displays, and integration with the U.S.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2016	FY 2017
Congressional Add: Unmanned System Integration	0.017	0.000
FY 2016 Accomplishments: Develop Integrated Separation Concepts, Airspace Integration Safety Case/ Assessment; Detect and Avoid and Fusion, Separation Algorithms, Safe and Efficient Terminal Airspace Surface Operations and Traffic/Airspace Information displays. Assess Availability/Quality of Surveillance Data, Human-Automation Interaction; and Predictability/Contingency Management.		
FY 2017 Plans: N/A		
Congressional Adds Subtotals	0.017	0.000

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

E. Performance Metrics

Navy's efforts are in alignment with the most recent Department of Defense Report to Congress on The Progress of Research Activities to Advance Access of Unmanned Aircraft Systems to the National Airspace System - Jan 2015.