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**Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Navy** **Date:** March 2023

|   |   |
|---|---|
| <b>Appropriation/Budget Activity</b><br>1319: <i>Research, Development, Test &amp; Evaluation, Navy / BA 4: Advanced Component Development &amp; Prototypes (ACD&amp;P)</i> | <b>R-1 Program Element (Number/Name)</b><br>PE 0603216N / <i>Aviation Survivability</i> |
|---|---|

| COST (\$ in Millions)                                       | Prior Years | FY 2022 | FY 2023 | FY 2024 Base | FY 2024 OCO | FY 2024 Total | FY 2025 | FY 2026 | FY 2027 | FY 2028 | Cost To Complete | Total Cost |
|---|-------------|---------|---------|--------------|-------------|---------------|---------|---------|---------|---------|------------------|------------|
| Total Program Element                                       | 226.398     | 24.286  | 17.387  | 20.874       | -           | 20.874        | 23.257  | 25.634  | 27.892  | 28.211  | Continuing       | Continuing |
| 0584: <i>Acft Protective Clothing</i>                       | 118.841     | 5.806   | 7.842   | 11.631       | -           | 11.631        | 13.835  | 16.048  | 18.161  | 18.262  | Continuing       | Continuing |
| 0591: <i>Acft Survivability, Vulnerability &amp; Safety</i> | 52.241      | 5.265   | 3.528   | 3.642        | -           | 3.642         | 3.683   | 3.712   | 3.739   | 3.828   | Continuing       | Continuing |
| 0592: <i>Acft &amp; Ordnance Safety</i>                     | 49.343      | 4.908   | 5.387   | 4.974        | -           | 4.974         | 5.097   | 5.201   | 5.308   | 5.424   | Continuing       | Continuing |
| 1819: <i>CV Acft Fire Suppress System</i>                   | 5.973       | 0.584   | 0.630   | 0.627        | -           | 0.627         | 0.642   | 0.673   | 0.684   | 0.697   | Continuing       | Continuing |
| 9999: <i>Congressional Adds</i>                             | 0.000       | 7.723   | 0.000   | 0.000        | -           | 0.000         | 0.000   | 0.000   | 0.000   | 0.000   | 0.000            | 7.723      |

**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>B. Program Change Summary (\$ in Millions)</b> | <b><u>FY 2022</u></b> | <b><u>FY 2023</u></b> | <b><u>FY 2024 Base</u></b> | <b><u>FY 2024 OCO</u></b> | <b><u>FY 2024 Total</u></b> |
|---|-----------------------|-----------------------|----------------------------|---------------------------|-----------------------------|
| Previous President's Budget                       | 24.815                | 17.434                | 19.054                     | -                         | 19.054                      |
| Current President's Budget                        | 24.286                | 17.387                | 20.874                     | -                         | 20.874                      |
| Total Adjustments                                 | -0.529                | -0.047                | 1.820                      | -                         | 1.820                       |
| • Congressional General Reductions                | -                     | -0.047                |                            |                           |                             |
| • Congressional Directed Reductions               | -                     | -                     |                            |                           |                             |
| • Congressional Rescissions                       | -                     | -                     |                            |                           |                             |
| • Congressional Adds                              | -                     | -                     |                            |                           |                             |
| • Congressional Directed Transfers                | -                     | -                     |                            |                           |                             |
| • Reprogrammings                                  | -                     | -                     |                            |                           |                             |
| • SBIR/STTR Transfer                              | -0.529                | 0.000                 |                            |                           |                             |
| • Program Adjustments                             | 0.000                 | 0.000                 | 1.654                      | -                         | 1.654                       |
| • Rate/Misc Adjustments                           | 0.000                 | 0.000                 | 0.166                      | -                         | 0.166                       |

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| <b>Exhibit R-2, RDT&amp;E Budget Item Justification:</b> PB 2024 Navy | <b>Date:</b> March 2023 |
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| <b>Appropriation/Budget Activity</b><br>1319: <i>Research, Development, Test &amp; Evaluation, Navy / BA 4: Advanced Component Development &amp; Prototypes (ACD&amp;P)</i> | <b>R-1 Program Element (Number/Name)</b><br>PE 0603216N / <i>Aviation Survivability</i> |
|---|---|

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

**Project:** 9999: *Congressional Adds*

Congressional Add: *Context-based augmented reality identification framework*

Congressional Add Subtotals for Project: 9999

Congressional Add Totals for all Projects

|  | FY 2022 | FY 2023 |
|--|---------|---------|
|  | 7.723   | 0.000   |
|  | 7.723   | 0.000   |
|  | 7.723   | 0.000   |

**Change Summary Explanation**

\$1.820M increase from PB23 includes increases for Air Wing of the Future workstations and aircrew hearing damage research as well as other miscellaneous program adjustments.

Schedule 0584: Ejection/Spine Pain Modeling is extended from 3rd QTR FY22 to 4th QTR FY28 to assess critical research projects in the areas of neck/back pain protection.

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|--|--------------------|----------------|----------------|---------------------|--|----------------------|----------------|----------------|---|-------------------------|-------------------------|-------------------|
| <b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2024 Navy |                    |                |                |                     |  |                      |                |                |   | <b>Date:</b> March 2023 |                         |                   |
| <b>Appropriation/Budget Activity</b><br>1319 / 4                   |                    |                |                |                     | <b>R-1 Program Element (Number/Name)</b><br>PE 0603216N / Aviation Survivability |                      |                |                | <b>Project (Number/Name)</b><br>0584 / Acft Protective Clothing |                         |                         |                   |
| <b>COST (\$ in Millions)</b>                                       | <b>Prior Years</b> | <b>FY 2022</b> | <b>FY 2023</b> | <b>FY 2024 Base</b> | <b>FY 2024 OCO</b>   | <b>FY 2024 Total</b> | <b>FY 2025</b> | <b>FY 2026</b> | <b>FY 2027</b>  | <b>FY 2028</b>          | <b>Cost To Complete</b> | <b>Total Cost</b> |
| 0584: Acft Protective Clothing                                     | 118.841            | 5.806          | 7.842          | 11.631              | -  | 11.631               | 13.835         | 16.048         | 18.161  | 18.262                  | 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)**

|  | <b>FY 2022</b> | <b>FY 2023</b> | <b>FY 2024 Base</b> | <b>FY 2024 OCO</b> | <b>FY 2024 Total</b> |
|--|----------------|----------------|---------------------|--------------------|----------------------|
| <b>Title:</b> Advanced Technology Crew Station   | 5.806          | 7.842          | 11.631              | 0.000              | 11.631               |
| <b>Articles:</b>   | -              | -              | -                   | -                  | -                    |
| <b>FY 2023 Plans:</b><br>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 (PPE - e.g., crashworthy seating, vibration mitigation, helmet mounted displays, night vision devices, oxygen |                |                |                     |                    |                      |

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| <b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2024 Navy | <b>Date:</b> March 2023 |
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|--|---|--|
| <b>Appropriation/Budget Activity</b><br>1319 / 4 | <b>R-1 Program Element (Number/Name)</b><br>PE 0603216N / <i>Aviation Survivability</i> | <b>Project (Number/Name)</b><br>0584 / <i>Acft Protective Clothing</i> |
|--|---|--|

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

|   | FY 2022 | FY 2023 | FY 2024 Base | FY 2024 OCO | FY 2024 Total |
|---|---------|---------|--------------|-------------|---------------|
| <p>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.</p> <p>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).</p> <p>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.</p> <p>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.</p> <p>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.</p> <p><b><i>FY 2024 Base Plans:</i></b></p> |         |         |              |             |               |

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| <b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2024 Navy |   | <b>Date:</b> March 2023  |
| <b>Appropriation/Budget Activity</b><br>1319 / 4                   | <b>R-1 Program Element (Number/Name)</b><br>PE 0603216N / <i>Aviation Survivability</i> | <b>Project (Number/Name)</b><br>0584 / <i>Acft Protective Clothing</i> |

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

|  | <b>FY 2022</b> | <b>FY 2023</b> | <b>FY 2024<br/>Base</b> | <b>FY 2024<br/>OCO</b> | <b>FY 2024<br/>Total</b> |
|--|----------------|----------------|-------------------------|------------------------|--------------------------|
| 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.   |                |                |                         |                        |                          |
| 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.  |                |                |                         |                        |                          |
| 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.   |                |                |                         |                        |                          |
| 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.  |                |                |                         |                        |                          |
| 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   |                |                |                         |                        |                          |

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| <b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2024 Navy | <b>Date:</b> March 2023 |
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| <b>Appropriation/Budget Activity</b><br>1319 / 4 | <b>R-1 Program Element (Number/Name)</b><br>PE 0603216N / Aviation Survivability | <b>Project (Number/Name)</b><br>0584 / Acft Protective Clothing |
|--|--|---|

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

|  | FY 2022 | FY 2023 | FY 2024 Base | FY 2024 OCO | FY 2024 Total |
|--|---------|---------|--------------|-------------|---------------|
| 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.  |         |         |              |             |               |
| 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.  |         |         |              |             |               |
| 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. 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. |         |         |              |             |               |
| <b>FY 2024 OCO Plans:</b><br>N/A   |         |         |              |             |               |
| <b>FY 2023 to FY 2024 Increase/Decrease Statement:</b><br>The increase from FY23 to FY24 is for Biomedically Based T&E, Digital Night Vision Tech Maturation, Laser Event Recorder, Aircrew ANR & Dosimetry, and Air Wing of the Future workstations.  |         |         |              |             |               |
| <b>Accomplishments/Planned Programs Subtotals</b>  | 5.806   | 7.842   | 11.631       | 0.000       | 11.631        |

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

| <u>Line Item</u>                       | <u>FY 2022</u> | <u>FY 2023</u> | <u>FY 2024 Base</u> | <u>FY 2024 OCO</u> | <u>FY 2024 Total</u> | <u>FY 2025</u> | <u>FY 2026</u> | <u>FY 2027</u> | <u>FY 2028</u> | <u>Cost To Complete</u> | <u>Total Cost</u> |
|--|----------------|----------------|---------------------|--------------------|----------------------|----------------|----------------|----------------|----------------|-------------------------|-------------------|
| • OPN 4268: Aviation Support Equipment | 62.496         | 82.118         | 82.115              | -                  | 82.115               | 113.003        | 133.709        | 140.261        | 131.545        | Continuing              | Continuing        |

**Remarks**

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**Exhibit R-2A, RDT&E Project Justification:** PB 2024 Navy **Date:** March 2023

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| <b>Appropriation/Budget Activity</b><br>1319 / 4 | <b>R-1 Program Element (Number/Name)</b><br>PE 0603216N / <i>Aviation Survivability</i> | <b>Project (Number/Name)</b><br>0584 / <i>Acft Protective Clothing</i> |
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**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 2024 Navy** **Date:** March 2023

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

| <b>Product Development (\$ in Millions)</b>                     |                                   |   |                    | <b>FY 2022</b> |                   | <b>FY 2023</b> |                   | <b>FY 2024 Base</b> |                   | <b>FY 2024 OCO</b> |                   | <b>FY 2024 Total</b> |                         |                   |                                 |
|---|-----------------------------------|---|--------------------|----------------|-------------------|----------------|-------------------|---------------------|-------------------|--------------------|-------------------|----------------------|-------------------------|-------------------|---------------------------------|
| <b>Cost Category Item</b>                                       | <b>Contract Method &amp; Type</b> | <b>Performing Activity &amp; Location</b> | <b>Prior Years</b> | <b>Cost</b>    | <b>Award Date</b> | <b>Cost</b>    | <b>Award Date</b> | <b>Cost</b>         | <b>Award Date</b> | <b>Cost</b>        | <b>Award Date</b> | <b>Cost</b>          | <b>Cost To Complete</b> | <b>Total Cost</b> | <b>Target Value of Contract</b> |
| Systems Engineering   | WR                                | NAWCAD : Pax River MD                     | 37.539             | 0.616          | Oct 2021          | 0.802          | Oct 2022          | 2.232               | Oct 2023          | -                  |                   | 2.232                | Continuing              | Continuing        | Continuing                      |
| Primary Hardware Development                                    | C/CPFF                            | Intevac : San Jose CA                     | 9.341              | 1.470          | Dec 2021          | 1.000          | Dec 2022          | 1.200               | Dec 2023          | -                  |                   | 1.200                | 0.000                   | 13.011            | 13.011                          |
| Primary Hardware Development                                    | MIPR                              | US Army CERDEC : Ft. Belvoir VA           | 3.640              | 0.087          | Dec 2021          | 0.000          |                   | 0.356               | Dec 2023          | -                  |                   | 0.356                | 0.000                   | 4.083             | 4.083                           |
| Primary Hardware Development                                    | C/CPFF                            | Innovital : Calverton MD                  | 0.933              | 0.000          |                   | 0.000          |                   | 0.133               | Dec 2023          | -                  |                   | 0.133                | 0.000                   | 1.066             | 1.066                           |
| Physiological Monitoring  | C/CPFF                            | TBD : TBD                                 | 2.230              | 0.510          | Dec 2021          | 0.870          | Nov 2022          | 0.000               |                   | -                  |                   | 0.000                | 0.000                   | 3.610             | 3.610                           |
| I-PREDICT   | C/CPFF                            | TBD : TBD                                 | 1.000              | 1.500          | Dec 2021          | 2.000          | Nov 2022          | 2.000               | Dec 2023          | -                  |                   | 2.000                | 0.000                   | 6.500             | 6.500                           |
| Laser Eye Protection  | C/CPFF                            | TBD : TBD                                 | 0.350              | 0.089          | Dec 2021          | 0.500          | Nov 2022          | 0.600               | Dec 2023          | -                  |                   | 0.600                | 0.000                   | 1.539             | 1.539                           |
| 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          |                   | 1.000               | Dec 2023          | -                  |                   | 1.000                | 0.000                   | 1.700             | 1.700                           |
| Research & Development  | MIPR                              | NAMRUD : Dayton, Oh                       | 0.000              | 0.000          |                   | 0.300          | Oct 2022          | 0.900               | Oct 2023          | -                  |                   | 0.900                | 0.000                   | 1.200             | 1.200                           |
| <b>Subtotal</b>   |                                   |   | 79.113             | 4.272          |                   | 5.472          |                   | 8.421               |                   | -                  |                   | 8.421                | Continuing              | Continuing        | N/A                             |

| <b>Support (\$ in Millions)</b>                                |                                   |   |                    | <b>FY 2022</b> |                   | <b>FY 2023</b> |                   | <b>FY 2024 Base</b> |                   | <b>FY 2024 OCO</b> |                   | <b>FY 2024 Total</b> |                         |                   |                                 |
|--|-----------------------------------|---|--------------------|----------------|-------------------|----------------|-------------------|---------------------|-------------------|--------------------|-------------------|----------------------|-------------------------|-------------------|---------------------------------|
| <b>Cost Category Item</b>                                      | <b>Contract Method &amp; Type</b> | <b>Performing Activity &amp; Location</b> | <b>Prior Years</b> | <b>Cost</b>    | <b>Award Date</b> | <b>Cost</b>    | <b>Award Date</b> | <b>Cost</b>         | <b>Award Date</b> | <b>Cost</b>        | <b>Award Date</b> | <b>Cost</b>          | <b>Cost To Complete</b> | <b>Total Cost</b> | <b>Target Value of Contract</b> |
| Configuration Management                                       | WR                                | NAWCAD : Pax River MD                     | 4.641              | 0.511          | Oct 2021          | 0.975          | Oct 2022          | 1.340               | Oct 2023          | -                  |                   | 1.340                | 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                           |
| <b>Subtotal</b>  |                                   |   | 7.873              | 0.511          |                   | 0.975          |                   | 1.340               |                   | -                  |                   | 1.340                | Continuing              | Continuing        | N/A                             |



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**Exhibit R-4, RDT&E Schedule Profile: PB 2024 Navy** **Date:** March 2023

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

|   | FY 2022                                     |    |    |    | FY 2023   |    |    |    | FY 2024 |    |    |    | FY 2025 |    |    |    | FY 2026 |    |    |    | FY 2027 |    |    |    | FY 2028 |    |    |    |
|---|---|----|----|----|---|----|----|----|---------|----|----|----|---------|----|----|----|---------|----|----|----|---------|----|----|----|---------|----|----|----|
|   | 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 |
| <b>Acft Protective Clothing</b>         | Physiologic Monitoring                      |    |    |    |   |    |    |    |         |    |    |    |         |    |    |    |         |    |    |    |         |    |    |    |         |    |    |    |
|   | Digital Human Modeling                      |    |    |    |   |    |    |    |         |    |    |    |         |    |    |    |         |    |    |    |         |    |    |    |         |    |    |    |
|   | Dielectric Stack Technology                 |    |    |    |   |    |    |    |         |    |    |    |         |    |    |    |         |    |    |    |         |    |    |    |         |    |    |    |
|   | Dye Doped Substrates                        |    |    |    |   |    |    |    |         |    |    |    |         |    |    |    |         |    |    |    |         |    |    |    |         |    |    |    |
|   | Advanced Test Methodologies                 |    |    |    |   |    |    |    |         |    |    |    |         |    |    |    |         |    |    |    |         |    |    |    |         |    |    |    |
|   |   |    |    |    | Holistic Modular Aircrew Physiologic Status (HMAPS)   |    |    |    |         |    |    |    |         |    |    |    |         |    |    |    |         |    |    |    |         |    |    |    |
| <b>Advanced Technology Crew Station</b> | Laser Event Recorder (LER)                  |    |    |    |   |    |    |    |         |    |    |    |         |    |    |    |         |    |    |    |         |    |    |    |         |    |    |    |
|   | Digital Sensor Technologies                 |    |    |    |   |    |    |    |         |    |    |    |         |    |    |    |         |    |    |    |         |    |    |    |         |    |    |    |
|   | Digital Display Technologies                |    |    |    |   |    |    |    |         |    |    |    |         |    |    |    |         |    |    |    |         |    |    |    |         |    |    |    |
|   | Ejection / Spine Pain Modeling              |    |    |    |   |    |    |    |         |    |    |    |         |    |    |    |         |    |    |    |         |    |    |    |         |    |    |    |
|   | Energy Absorbing Seats                      |    |    |    |   |    |    |    |         |    |    |    |         |    |    |    |         |    |    |    |         |    |    |    |         |    |    |    |
|   | Vision Standards                            |    |    |    | 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 2024 Navy** **Date:** March 2023

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

Schedule Details

| Events by Sub Project   | Start   |      | End     |      |
|---|---------|------|---------|------|
|   | Quarter | Year | Quarter | Year |
| <b><i>Acft Protective Clothing</i></b>  |         |      |         |      |
| Physiologic Monitoring  | 1       | 2022 | 4       | 2028 |
| Digital Human Modeling  | 1       | 2022 | 4       | 2028 |
| Dielectric Stack Technology   | 1       | 2022 | 4       | 2028 |
| Dye Doped Substrates  | 1       | 2022 | 4       | 2023 |
| Advanced Test Methodologies   | 1       | 2022 | 4       | 2028 |
| 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       | 2022 | 4       | 2028 |
| Advanced Technology Crew Station: Digital Display Technologies  | 1       | 2022 | 4       | 2028 |
| Advanced Technology Crew Station: Ejection / Spine Pain Modeling  | 1       | 2022 | 4       | 2028 |
| Advanced Technology Crew Station: Energy Absorbing Seats  | 1       | 2022 | 4       | 2022 |
| Advanced Technology Crew Station: Vision Standards  | 1       | 2022 | 4       | 2022 |
| Advanced Technology Crew Station: Incapacitation Prediction for Readiness in Expeditionary Domains - an Integrated Computational Tool (I-PREDICT) | 1       | 2023 | 4       | 2028 |
| Advanced Technology Crew Station: Aeromedical Research & Development, NAMRU-D   | 1       | 2023 | 4       | 2028 |

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|  |                    |                |                |                     |  |                      |                |                |   |                         |                         |                   |
|--|--------------------|----------------|----------------|---------------------|--|----------------------|----------------|----------------|---|-------------------------|-------------------------|-------------------|
| <b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2024 Navy |                    |                |                |                     |  |                      |                |                |   | <b>Date:</b> March 2023 |                         |                   |
| <b>Appropriation/Budget Activity</b><br>1319 / 4                   |                    |                |                |                     | <b>R-1 Program Element (Number/Name)</b><br>PE 0603216N / Aviation Survivability |                      |                |                | <b>Project (Number/Name)</b><br>0591 / Acft Survivability, Vulnerability & Safety |                         |                         |                   |
| <b>COST (\$ in Millions)</b>                                       | <b>Prior Years</b> | <b>FY 2022</b> | <b>FY 2023</b> | <b>FY 2024 Base</b> | <b>FY 2024 OCO</b>   | <b>FY 2024 Total</b> | <b>FY 2025</b> | <b>FY 2026</b> | <b>FY 2027</b>  | <b>FY 2028</b>          | <b>Cost To Complete</b> | <b>Total Cost</b> |
| 0591: Acft Survivability, Vulnerability & Safety                   | 52.241             | 5.265          | 3.528          | 3.642               | -  | 3.642                | 3.683          | 3.712          | 3.739   | 3.828                   | 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)**

|   | <b>FY 2022</b> | <b>FY 2023</b> | <b>FY 2024 Base</b> | <b>FY 2024 OCO</b> | <b>FY 2024 Total</b> |
|---|----------------|----------------|---------------------|--------------------|----------------------|
| <b>Title:</b> Technology Requirements   | 0.045          | 0.045          | 0.045               | 0.000              | 0.045                |
| <b>Articles:</b>  | -              | -              | -                   | -                  | -                    |
| <b>FY 2023 Plans:</b><br>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.                              |                |                |                     |                    |                      |
| <b>FY 2024 Base Plans:</b><br>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.                         |                |                |                     |                    |                      |
| <b>FY 2024 OCO Plans:</b><br>N/A  |                |                |                     |                    |                      |
| <b>Title:</b> Technology Design & Development   | 3.215          | 3.301          | 3.532               | 0.000              | 3.532                |
| <b>Articles:</b>  | -              | -              | -                   | -                  | -                    |
| <b>FY 2023 Plans:</b><br>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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| <b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2024 Navy |  | <b>Date:</b> March 2023   |
| <b>Appropriation/Budget Activity</b><br>1319 / 4                   | <b>R-1 Program Element (Number/Name)</b><br>PE 0603216N / Aviation Survivability | <b>Project (Number/Name)</b><br>0591 / Acft Survivability, Vulnerability & Safety |

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

|   | <b>FY 2022</b> | <b>FY 2023</b> | <b>FY 2024 Base</b> | <b>FY 2024 OCO</b> | <b>FY 2024 Total</b> |
|---|----------------|----------------|---------------------|--------------------|----------------------|
| <p>defined) threat systems. The effort will include the development of new or modification of existing Modelling &amp; Simulation (M&amp;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.</p> <p><b>FY 2024 Base Plans:</b><br/>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 &amp; Simulation (M&amp;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><b>FY 2024 OCO Plans:</b><br/>N/A</p> <p><b>FY 2023 to FY 2024 Increase/Decrease Statement:</b><br/>Increase of \$0.231M due to addition of Benchmark products to ADVEW simulation modules.</p> |                |                |                     |                    |                      |
| <p><b>Title:</b> Technology Test &amp; Evaluation</p> <p align="right"><b>Articles:</b></p> <p><b>FY 2023 Plans:</b><br/>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 EW and threat system's components. Address test anomalies identified during MOB HUB integration test events completed in FY22.</p> <p><b>FY 2024 Base Plans:</b></p>   | 2.005          | 0.182          | 0.065               | 0.000              | 0.065                |
|   | -              | -              | -                   | -                  | -                    |

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| <b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2024 Navy |   | <b>Date:</b> March 2023  |
| <b>Appropriation/Budget Activity</b><br>1319 / 4                   | <b>R-1 Program Element (Number/Name)</b><br>PE 0603216N / <i>Aviation Survivability</i> | <b>Project (Number/Name)</b><br>0591 / <i>Acft Survivability, Vulnerability &amp; Safety</i> |

| <b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>  | <b>FY 2022</b> | <b>FY 2023</b> | <b>FY 2024 Base</b> | <b>FY 2024 OCO</b> | <b>FY 2024 Total</b> |
|--|----------------|----------------|---------------------|--------------------|----------------------|
| 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.<br><br><b>FY 2024 OCO Plans:</b><br>N/A<br><br><b>FY 2023 to FY 2024 Increase/Decrease Statement:</b><br>Decrease of \$0.117M is due to the MobHUB testing and anomaly evaluation that is scheduled to be completed in FY23. |                |                |                     |                    |                      |
| <b>Accomplishments/Planned Programs Subtotals</b>  | 5.265          | 3.528          | 3.642               | 0.000              | 3.642                |

**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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|---|--|--|--|--|--|--|--|--|--|--|---|--|--|--|--|
| <b>Exhibit R-3, RDT&amp;E Project Cost Analysis: PB 2024 Navy</b> |  |  |  |  |  |  |  |  |  |  | <b>Date: March 2023</b>   |  |  |  |  |
| <b>Appropriation/Budget Activity</b><br>1319 / 4                  |  |  |  |  |  | <b>R-1 Program Element (Number/Name)</b><br>PE 0603216N / Aviation Survivability |  |  |  |  | <b>Project (Number/Name)</b><br>0591 / Acft Survivability, Vulnerability & Safety |  |  |  |  |

| <b>Product Development (\$ in Millions)</b>       |                                   |   |                    | <b>FY 2022</b> |                   | <b>FY 2023</b> |                   | <b>FY 2024 Base</b> |                   | <b>FY 2024 OCO</b> |                   | <b>FY 2024 Total</b> |                         |                   |                                 |
|---|-----------------------------------|---|--------------------|----------------|-------------------|----------------|-------------------|---------------------|-------------------|--------------------|-------------------|----------------------|-------------------------|-------------------|---------------------------------|
| <b>Cost Category Item</b>                         | <b>Contract Method &amp; Type</b> | <b>Performing Activity &amp; Location</b> | <b>Prior Years</b> | <b>Cost</b>    | <b>Award Date</b> | <b>Cost</b>    | <b>Award Date</b> | <b>Cost</b>         | <b>Award Date</b> | <b>Cost</b>        | <b>Award Date</b> | <b>Cost</b>          | <b>Cost To Complete</b> | <b>Total Cost</b> | <b>Target Value of Contract</b> |
| Systems Engineering                               | WR                                | NAWCAD : Pax River, MD                    | 13.888             | 1.191          | Oct 2021          | 1.188          | Oct 2022          | 2.822               | Oct 2023          | -                  |                   | 2.822                | Continuing              | Continuing        | Continuing                      |
| Systems Engineering                               | WR                                | NAWCWD : China Lake, CA                   | 0.679              | 0.731          | Jan 2022          | 0.461          | Nov 2022          | 0.055               | Mar 2024          | -                  |                   | 0.055                | Continuing              | Continuing        | Continuing                      |
| Systems Engineering                               | MIPR                              | DTIC : Ft. Belvoir, VA                    | 3.311              | 0.820          | Nov 2021          | 1.200          | Nov 2022          | 0.450               | Oct 2023          | -                  |                   | 0.450                | 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                      | 0.000              | 0.060          | Jan 2022          | 0.060          | Jan 2023          | 0.050               | Dec 2023          | -                  |                   | 0.050                | 0.000                   | 0.170             | 0.170                           |
| System Engineering                                | C/CPFF                            | Mantech : Fairfax, VA                     | 0.000              | 0.300          | Jan 2022          | 0.000          |                   | 0.000               |                   | -                  |                   | 0.000                | 0.000                   | 0.300             | 0.300                           |
| System Engineering                                | WR                                | NSWC : Crane, IN                          | 0.000              | 0.095          | Jan 2022          | 0.095          | Jan 2023          | 0.050               | May 2024          | -                  |                   | 0.050                | 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              | 0.000          |                   | 0.250          | Jan 2023          | 0.000               |                   | -                  |                   | 0.000                | 0.000                   | 0.250             | 0.250                           |
| System Engineering                                | C/CPFF                            | SURVICE : Belcamp, MD                     | 0.000              | 0.000          |                   | 0.000          |                   | 0.100               | Jan 2024          | -                  |                   | 0.100                | 0.000                   | 0.100             | 0.100                           |
| <b>Subtotal</b>                                   |                                   |   | 39.346             | 3.197          |                   | 3.254          |                   | 3.527               |                   | -                  |                   | 3.527                | Continuing              | Continuing        | N/A                             |

**Remarks**  
All prior year lines have been consolidated

| <b>Support (\$ in Millions)</b>                  |                                   |   |                    | <b>FY 2022</b> |                   | <b>FY 2023</b> |                   | <b>FY 2024 Base</b> |                   | <b>FY 2024 OCO</b> |                   | <b>FY 2024 Total</b> |                         |                   |                                 |
|--|-----------------------------------|---|--------------------|----------------|-------------------|----------------|-------------------|---------------------|-------------------|--------------------|-------------------|----------------------|-------------------------|-------------------|---------------------------------|
| <b>Cost Category Item</b>                        | <b>Contract Method &amp; Type</b> | <b>Performing Activity &amp; Location</b> | <b>Prior Years</b> | <b>Cost</b>    | <b>Award Date</b> | <b>Cost</b>    | <b>Award Date</b> | <b>Cost</b>         | <b>Award Date</b> | <b>Cost</b>        | <b>Award Date</b> | <b>Cost</b>          | <b>Cost To Complete</b> | <b>Total Cost</b> | <b>Target Value of Contract</b> |
| 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                           |
| <b>Subtotal</b>                                  |                                   |   | 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 2024 Navy              |                        |                                |             |                                      |            |         |            |   |            |             |            | Date: March 2023 |                  |            |                          |
|---|------------------------|--------------------------------|-------------|--------------------------------------|------------|---------|------------|---|------------|-------------|------------|------------------|------------------|------------|--------------------------|
| 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 2022                              |            | FY 2023 |            | FY 2024 Base                                      |            | FY 2024 OCO |            | FY 2024 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                                |            | 0.000   |            | 0.070   | Feb 2024   | -           |            | 0.070            | Continuing       | Continuing | Continuing               |
| Developmental Test & Evaluation (DT&E)                              | WR                     | NAWCWD : China Lake, CA        | 0.050       | 2.023                                | Oct 2021   | 0.229   | Oct 2022   | 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                    |
| <b>Subtotal</b>   |                        |                                | 5.748       | 2.023                                |            | 0.229   |            | 0.070   |            | -           |            | 0.070            | Continuing       | Continuing | N/A                      |
| Management Services (\$ in Millions)                                |                        |                                |             | FY 2022                              |            | FY 2023 |            | FY 2024 Base                                      |            | FY 2024 OCO |            | FY 2024 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         | 1.853       | 0.045                                | Oct 2021   | 0.045   | Oct 2022   | 0.045   | Oct 2023   | -           |            | 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                    |
| <b>Subtotal</b>   |                        |                                | 2.578       | 0.045                                |            | 0.045   |            | 0.045   |            | -           |            | 0.045            | Continuing       | Continuing | N/A                      |
| <b>Project Cost Totals</b>  |                        |                                | 52.241      | 5.265                                |            | 3.528   |            | 3.642   |            | -           |            | 3.642            | Continuing       | Continuing | N/A                      |
| <b>Remarks</b>  |                        |                                |             |                                      |            |         |            |   |            |             |            |                  |                  |            |                          |

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**Exhibit R-4, RDT&E Schedule Profile: PB 2024 Navy** **Date:** March 2023

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

| <b>Acft Survivability, Vulnerability &amp; Safety</b> | FY 2022                                  |    |    |    | FY 2023   |    |    |    | FY 2024 |    |    |    | FY 2025 |    |    |    | FY 2026 |    |    |    | FY 2027 |    |    |    | FY 2028                             |    |    |    |  |  |  |  |
|---|--|----|----|----|---|----|----|----|---------|----|----|----|---------|----|----|----|---------|----|----|----|---------|----|----|----|-------------------------------------|----|----|----|--|--|--|--|
|   | 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 |  |  |  |  |
| <b>Technology Des/Development</b>                     | Future Vertical Lift Trade-Offs          |    |    |    |   |    |    |    |         |    |    |    |         |    |    |    |         |    |    |    |         |    |    |    |                                     |    |    |    |  |  |  |  |
|   | Miniaturized Self Defense Missile System |    |    |    |   |    |    |    |         |    |    |    |         |    |    |    |         |    |    |    |         |    |    |    |                                     |    |    |    |  |  |  |  |
|   | EW Enhancements                          |    |    |    |   |    |    |    |         |    |    |    |         |    |    |    |         |    |    |    |         |    |    |    |                                     |    |    |    |  |  |  |  |
| <b>Technology Test &amp; Evaluation</b>               |  |    |    |    | Test & Evaluation of Miniaturized Self Defense Missile System |    |    |    |         |    |    |    |         |    |    |    |         |    |    |    |         |    |    |    | Advanced Electronic Warfare (ADVEW) |    |    |    |  |  |  |  |

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| <b>Exhibit R-4A, RDT&amp;E Schedule Details:</b> PB 2024 Navy |   | <b>Date:</b> March 2023  |
| <b>Appropriation/Budget Activity</b><br>1319 / 4              | <b>R-1 Program Element (Number/Name)</b><br>PE 0603216N / <i>Aviation Survivability</i> | <b>Project (Number/Name)</b><br>0591 / <i>Acft Survivability, Vulnerability &amp; Safety</i> |

Schedule Details

| Events by Sub Project   | Start   |      | End     |      |
|---|---------|------|---------|------|
|   | Quarter | Year | Quarter | Year |
| <b><i>Acft Survivability, Vulnerability &amp; Safety</i></b>                                |         |      |         |      |
| Technology Des/Development: Future Vertical Lift Trade-Offs                                 | 1       | 2022 | 4       | 2028 |
| Technology Des/Development: Miniaturized Self Defense Missile System                        | 1       | 2022 | 4       | 2027 |
| Technology Des/Development: EW Enhancements   | 1       | 2022 | 4       | 2028 |
| 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       | 2028 |

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|  |                    |                |                |                     |  |                      |                |                |   |                         |                         |                   |
|--|--------------------|----------------|----------------|---------------------|--|----------------------|----------------|----------------|---|-------------------------|-------------------------|-------------------|
| <b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2024 Navy |                    |                |                |                     |  |                      |                |                |   | <b>Date:</b> March 2023 |                         |                   |
| <b>Appropriation/Budget Activity</b><br>1319 / 4                   |                    |                |                |                     | <b>R-1 Program Element (Number/Name)</b><br>PE 0603216N / Aviation Survivability |                      |                |                | <b>Project (Number/Name)</b><br>0592 / Acft & Ordnance Safety |                         |                         |                   |
| <b>COST (\$ in Millions)</b>                                       | <b>Prior Years</b> | <b>FY 2022</b> | <b>FY 2023</b> | <b>FY 2024 Base</b> | <b>FY 2024 OCO</b>   | <b>FY 2024 Total</b> | <b>FY 2025</b> | <b>FY 2026</b> | <b>FY 2027</b>  | <b>FY 2028</b>          | <b>Cost To Complete</b> | <b>Total Cost</b> |
| 0592: Acft & Ordnance Safety                                       | 49.343             | 4.908          | 5.387          | 4.974               | -  | 4.974                | 5.097          | 5.201          | 5.308   | 5.424                   | 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)**

|  | <b>FY 2022</b> | <b>FY 2023</b> | <b>FY 2024 Base</b> | <b>FY 2024 OCO</b> | <b>FY 2024 Total</b> |
|--|----------------|----------------|---------------------|--------------------|----------------------|
| <b>Title:</b> Insensitive Munitions (IM)   | 4.908          | 5.387          | 4.974               | 0.000              | 4.974                |
| <b>Articles:</b>   | -              | -              | -                   | -                  | -                    |
| <b>FY 2023 Plans:</b>  |                |                |                     |                    |                      |
| 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 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.  |                |                |                     |                    |                      |
| <b>FY 2024 Base Plans:</b>   |                |                |                     |                    |                      |
| 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.  |                |                |                     |                    |                      |

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| <b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2024 Navy | <b>Date:</b> March 2023 |
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|  |  |   |
|--|--|---|
| <b>Appropriation/Budget Activity</b><br>1319 / 4 | <b>R-1 Program Element (Number/Name)</b><br>PE 0603216N / Aviation Survivability | <b>Project (Number/Name)</b><br>0592 / Acft & Ordnance Safety |
|--|--|---|

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

|  | FY 2022 | FY 2023 | FY 2024 Base | FY 2024 OCO | FY 2024 Total |
|--|---------|---------|--------------|-------------|---------------|
| 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 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 performance. Evaluating, through energy fluence techniques, the shock mitigation of the Precision-controlled Additively Manufactured (PAM) Fragmentation Technology when exposed to fragment impact conditions. |         |         |              |             |               |
| <b>FY 2024 OCO Plans:</b><br>N/A   |         |         |              |             |               |
| <b>FY 2023 to FY 2024 Increase/Decrease Statement:</b><br>The budget was decreased from FY23 to FY24 to account for the anticipated successful completion of the Improved Air to Air Missile Demonstration Testing for the Sidewinder Rocket Motor.  |         |         |              |             |               |
| <b>Accomplishments/Planned Programs Subtotals</b>  | 4.908   | 5.387   | 4.974        | 0.000       | 4.974         |

**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 2024 Navy** **Date:** March 2023

|  |  |   |
|--|--|---|
| <b>Appropriation/Budget Activity</b><br>1319 / 4 | <b>R-1 Program Element (Number/Name)</b><br>PE 0603216N / Aviation Survivability | <b>Project (Number/Name)</b><br>0592 / Acft & Ordnance Safety |
|--|--|---|

| <b>Acft &amp; Ordnance Safety</b>  | <b>FY 2022</b>   |    |    |    | <b>FY 2023</b> |    |    |    | <b>FY 2024</b> |    |    |    | <b>FY 2025</b> |    |    |    | <b>FY 2026</b> |    |    |    | <b>FY 2027</b> |    |    |    | <b>FY 2028</b> |    |    |    |
|--|--|----|----|----|----------------|----|----|----|----------------|----|----|----|----------------|----|----|----|----------------|----|----|----|----------------|----|----|----|----------------|----|----|----|
|  | 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 |
|  | Improved Air to Air Missile Demonstration Testing: Electromagnetic Compatibility (EMC) |    |    |    |                |    |    |    |                |    |    |    |                |    |    |    |                |    |    |    |                |    |    |    |                |    |    |    |
| 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: Advanced Anti-Radiation Guided missile (AARGM RM)       |  |    |    |    |                |    |    |    |                |    |    |    |                |    |    |    |                |    |    |    |                |    |    |    |                |    |    |    |
| 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: Barriers                             |  |    |    |    |                |    |    |    |                |    |    |    |                |    |    |    |                |    |    |    |                |    |    |    |                |    |    |    |
| 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                        |  |    |    |    |                |    |    |    |                |    |    |    |                |    |    |    |                |    |    |    |                |    |    |    |                |    |    |    |
| 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-4, RDT&E Schedule Profile: PB 2024 Navy Date: March 2023

|  |   |  |
|--|---|--|
| <b>Appropriation/Budget Activity</b><br>1319 / 4 | <b>R-1 Program Element (Number/Name)</b><br>PE 0603216N / <i>Aviation Survivability</i> | <b>Project (Number/Name)</b><br>0592 / <i>Acft &amp; Ordnance Safety</i> |
|--|---|--|

|                                  |  |
|----------------------------------|--|
| <i>2024DON - 0603216N - 0592</i> |  |
|----------------------------------|--|

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**Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy** **Date:** March 2023

|  |  |   |
|--|--|---|
| <b>Appropriation/Budget Activity</b><br>1319 / 4 | <b>R-1 Program Element (Number/Name)</b><br>PE 0603216N / Aviation Survivability | <b>Project (Number/Name)</b><br>0592 / Acft & Ordnance Safety |
|--|--|---|

Schedule Details

| Events by Sub Project  | Start   |      | End     |      |
|--|---------|------|---------|------|
|  | Quarter | Year | Quarter | Year |
| <b>Acft &amp; Ordnance Safety</b>  |         |      |         |      |
| Improved Air to Air Missile Demonstration Testing: Electromagnetic Compatibility (EMC) | 1       | 2022 | 4       | 2028 |
| 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: Explosive Fill Evaluation                               | 1       | 2022 | 4       | 2023 |
| Improved Air Launched Weapons: Advanced Anti-Radiation Guided missile (AARGM RM)       | 1       | 2022 | 4       | 2028 |
| Improved Air Launched Weapons: AARGM RM IM Evaluation                                  | 1       | 2022 | 3       | 2023 |
| Improved Air Launched Weapons: Fuze Munitions (FMU)-139 D/B Modeling                   | 1       | 2022 | 1       | 2023 |
| Improved Air Launched Weapons: Impulse Motor   | 1       | 2022 | 4       | 2023 |
| Improved Air Launched Weapons: Long Range Anti-Ship Missile (LRASM)                    | 1       | 2022 | 3       | 2024 |
| Shock/Blast Barrier Protection Modeling and DEMO: Barriers                             | 1       | 2022 | 4       | 2028 |
| Shock/Blast Barrier Protection Modeling and DEMO: Supersonic Range Strike Missile      | 1       | 2022 | 4       | 2027 |
| Shock/Blast Barrier Protection Modeling and DEMO: Warhead Initiation                   | 1       | 2022 | 4       | 2027 |
| Shock/Blast Barrier Protection Modeling and DEMO: Warhead Liner                        | 1       | 2022 | 4       | 2027 |
| Shock/Blast Barrier Protection Modeling and DEMO: Remote Sensing of SCO Events         | 1       | 2022 | 4       | 2027 |
| Shock/Blast Barrier Protection Modeling and DEMO: Precision controlled additive        | 1       | 2022 | 4       | 2027 |

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|--|--------------------|----------------|----------------|---------------------|--|----------------------|----------------|----------------|---|-------------------------|-------------------------|-------------------|
| <b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2024 Navy |                    |                |                |                     |  |                      |                |                |   | <b>Date:</b> March 2023 |                         |                   |
| <b>Appropriation/Budget Activity</b><br>1319 / 4                   |                    |                |                |                     | <b>R-1 Program Element (Number/Name)</b><br>PE 0603216N / Aviation Survivability |                      |                |                | <b>Project (Number/Name)</b><br>1819 / CV Acft Fire Suppress System |                         |                         |                   |
| <b>COST (\$ in Millions)</b>                                       | <b>Prior Years</b> | <b>FY 2022</b> | <b>FY 2023</b> | <b>FY 2024 Base</b> | <b>FY 2024 OCO</b>   | <b>FY 2024 Total</b> | <b>FY 2025</b> | <b>FY 2026</b> | <b>FY 2027</b>  | <b>FY 2028</b>          | <b>Cost To Complete</b> | <b>Total Cost</b> |
| 1819: CV Acft Fire Suppress System                                 | 5.973              | 0.584          | 0.630          | 0.627               | -  | 0.627                | 0.642          | 0.673          | 0.684   | 0.697                   | 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)**

|  | <b>FY 2022</b> | <b>FY 2023</b> | <b>FY 2024 Base</b> | <b>FY 2024 OCO</b> | <b>FY 2024 Total</b> |
|--|----------------|----------------|---------------------|--------------------|----------------------|
| <b>Title:</b> Fire-Fighting  | 0.584          | 0.630          | 0.627               | 0.000              | 0.627                |
| <b>Articles:</b>   | -              | -              | -                   | -                  | -                    |
| <b>FY 2023 Plans:</b>  |                |                |                     |                    |                      |
| 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. |                |                |                     |                    |                      |
| <b>FY 2024 Base Plans:</b>   |                |                |                     |                    |                      |
| 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-   |                |                |                     |                    |                      |

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| <b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2024 Navy |   | <b>Date:</b> March 2023  |
| <b>Appropriation/Budget Activity</b><br>1319 / 4                   | <b>R-1 Program Element (Number/Name)</b><br>PE 0603216N / <i>Aviation Survivability</i> | <b>Project (Number/Name)</b><br>1819 / <i>CV Acft Fire Suppress System</i> |

| <b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>   | <b>FY 2022</b> | <b>FY 2023</b> | <b>FY 2024 Base</b> | <b>FY 2024 OCO</b> | <b>FY 2024 Total</b> |
|---|----------------|----------------|---------------------|--------------------|----------------------|
| <p>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.</p> <p><b>FY 2024 OCO Plans:</b><br/>N/A</p> <p><b>FY 2023 to FY 2024 Increase/Decrease Statement:</b><br/>FY24 decrease to fund higher priority requirement changes within the department.</p> |                |                |                     |                    |                      |
| <b>Accomplishments/Planned Programs Subtotals</b>   | 0.584          | 0.630          | 0.627               | 0.000              | 0.627                |

**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 2024 Navy** **Date:** March 2023

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

| <b>Product Development (\$ in Millions)</b>    |                        |                                |             | FY 2022 |            | FY 2023 |            | FY 2024 Base |            | FY 2024 OCO |            | FY 2024 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        | 0.379       | 0.072   | Oct 2021   | 0.072   | Oct 2022   | 0.077        | Oct 2023   | -           |            | 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                    |
| <b>Subtotal</b>                                |                        |                                | 0.714       | 0.072   |            | 0.072   |            | 0.077        |            | -           |            | 0.077         | Continuing       | Continuing | N/A                      |

**Remarks**  
All prior year lines have been consolidated.

| <b>Support (\$ in Millions)</b> |                        |                                   |             | FY 2022 |            | FY 2023 |            | FY 2024 Base |            | FY 2024 OCO |            | FY 2024 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           | 0.948       | 0.164   | Oct 2021   | 0.181   | Oct 2022   | 0.180        | Oct 2023   | -           |            | 0.180         | Continuing       | Continuing | Continuing               |
| Engineering Support             | C/CPFF                 | Hughes Associates : Baltimore, MD | 0.172       | 0.010   | Nov 2021   | 0.010   | Nov 2022   | 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              | 0.049       | 0.010   | May 2022   | 0.010   | May 2023   | 0.010        | May 2024   | -           |            | 0.010         | Continuing       | Continuing | Continuing               |
| <b>Subtotal</b>                 |                        |                                   | 1.453       | 0.184   |            | 0.201   |            | 0.190        |            | -           |            | 0.190         | Continuing       | Continuing | N/A                      |

| <b>Test and Evaluation (\$ in Millions)</b> |                        |                                   |             | FY 2022 |            | FY 2023 |            | FY 2024 Base |            | FY 2024 OCO |            | FY 2024 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           | 2.237       | 0.208   | Oct 2021   | 0.237   | Oct 2022   | 0.220        | Oct 2023   | -           |            | 0.220         | Continuing       | Continuing | Continuing               |
| Developmental Test & Evaluation (DT&E)      | C/FFP                  | Hughes Associates : Baltimore, MD | 0.718       | 0.060   | Nov 2021   | 0.060   | Nov 2022   | 0.080        | Nov 2023   | -           |            | 0.080         | 0.000            | 0.918      | 0.918                    |



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**Exhibit R-4, RDT&E Schedule Profile: PB 2024 Navy** **Date:** March 2023

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

|  | FY 2022   |    |    |    | FY 2023 |    |    |    | FY 2024 |    |    |    | FY 2025 |    |    |    | FY 2026 |    |    |    | FY 2027 |    |    |    | FY 2028 |    |    |    |
|--|---|----|----|----|---------|----|----|----|---------|----|----|----|---------|----|----|----|---------|----|----|----|---------|----|----|----|---------|----|----|----|
|  | 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 |
| <b>CV Acft Fire Suppress System</b>            |   |    |    |    |         |    |    |    |         |    |    |    |         |    |    |    |         |    |    |    |         |    |    |    |         |    |    |    |
| <b>Product Development-Systems Engineering</b> |   |    |    |    |         |    |    |    |         |    |    |    |         |    |    |    |         |    |    |    |         |    |    |    |         |    |    |    |
|  | Monitor Systems (Aqueous Film Forming Foam, Cleaning Agents, EMALS, etc.) |    |    |    |         |    |    |    |         |    |    |    |         |    |    |    |         |    |    |    |         |    |    |    |         |    |    |    |
| <b>Engineering Support</b>                     |   |    |    |    |         |    |    |    |         |    |    |    |         |    |    |    |         |    |    |    |         |    |    |    |         |    |    |    |
|  | Firefighting NATOPS   |    |    |    |         |    |    |    |         |    |    |    |         |    |    |    |         |    |    |    |         |    |    |    |         |    |    |    |
|  | ACS Aviation Firefighting Readiness                                       |    |    |    |         |    |    |    |         |    |    |    |         |    |    |    |         |    |    |    |         |    |    |    |         |    |    |    |
| <b>Test &amp; Evaluation</b>                   |   |    |    |    |         |    |    |    |         |    |    |    |         |    |    |    |         |    |    |    |         |    |    |    |         |    |    |    |
|  | Aircraft Rescue Systems   |    |    |    |         |    |    |    |         |    |    |    |         |    |    |    |         |    |    |    |         |    |    |    |         |    |    |    |
|  | Aircraft Firefighting PPE   |    |    |    |         |    |    |    |         |    |    |    |         |    |    |    |         |    |    |    |         |    |    |    |         |    |    |    |
|  | Firefighting Hazards (Composite)  |    |    |    |         |    |    |    |         |    |    |    |         |    |    |    |         |    |    |    |         |    |    |    |         |    |    |    |
|  | Weapons Cooling   |    |    |    |         |    |    |    |         |    |    |    |         |    |    |    |         |    |    |    |         |    |    |    |         |    |    |    |

2024DON - 0603216N - 1819

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**Exhibit R-4A, RDT&E Schedule Details:** PB 2024 Navy **Date:** March 2023

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

Schedule Details

| Events by Sub Project  | Start   |      | End     |      |
|--|---------|------|---------|------|
|  | Quarter | Year | Quarter | Year |
| <b><i>CV Acft Fire Suppress System</i></b>   |         |      |         |      |
| Product Development-Systems Engineering: Monitor Systems (Aqueous Film Forming Foam, Cleaning Agents, Electro Magnetic Aircraft Launch System (EMALS), etc.) | 1       | 2022 | 4       | 2028 |
| Engineering Support: Firefighting NATOPS   | 1       | 2022 | 4       | 2028 |
| Engineering Support: Air Capable Ship (ACS) Aviation Firefighting Readiness  | 1       | 2022 | 4       | 2028 |
| Test & Evaluation: Aircraft Rescue Systems   | 1       | 2022 | 4       | 2028 |
| Test & Evaluation: Aircraft Firefighting Personal Protective Equipment (PPE)   | 1       | 2022 | 2       | 2028 |
| Test & Evaluation: Firefighting Hazards (Composite)  | 1       | 2022 | 4       | 2028 |
| Test & Evaluation: Weapons Cooling   | 1       | 2022 | 4       | 2028 |

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**Exhibit R-2A, RDT&E Project Justification:** PB 2024 Navy **Date:** March 2023

| Appropriation/Budget Activity<br>1319 / 4 |             |         |         |              | R-1 Program Element (Number/Name)<br>PE 0603216N / Aviation Survivability |               |         |         | Project (Number/Name)<br>9999 / Congressional Adds |         |                  |            |
|---|-------------|---------|---------|--------------|---|---------------|---------|---------|--|---------|------------------|------------|
| COST (\$ in Millions)                     | Prior Years | FY 2022 | FY 2023 | FY 2024 Base | FY 2024 OCO   | FY 2024 Total | FY 2025 | FY 2026 | FY 2027  | FY 2028 | Cost To Complete | Total Cost |
| 9999: <i>Congressional Adds</i>           | 0.000       | 7.723   | 0.000   | 0.000        | -   | 0.000         | 0.000   | 0.000   | 0.000  | 0.000   | 0.000            | 7.723      |
| 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 2022 | FY 2023 |
|--|---------|---------|
| <b>Congressional Add:</b> Context-based augmented reality identification framework                                 | 7.723   | 0.000   |
| <b>FY 2022 Accomplishments:</b> Funding will support Congressional Add efforts in context based augmented reality. |         |         |
| <b>FY 2023 Plans:</b> N/A  |         |         |
| <b>Congressional Adds Subtotals</b>  | 7.723   | 0.000   |

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

N/A

**Remarks**

**D. Acquisition Strategy**

FY2022 Congressional Add for 0584 - TBD



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**Exhibit R-4, RDT&E Schedule Profile: PB 2024 Navy** **Date:** March 2023

|  |  |   |
|--|--|---|
| <b>Appropriation/Budget Activity</b><br>1319 / 4 | <b>R-1 Program Element (Number/Name)</b><br>PE 0603216N / Aviation Survivability | <b>Project (Number/Name)</b><br>9999 / Congressional Adds |
|--|--|---|

| <b>Proj 9999</b>   | <b>FY 2022</b> |    |             |    | <b>FY 2023</b> |    |    |    | <b>FY 2024</b> |    |    |    | <b>FY 2025</b> |    |    |    | <b>FY 2026</b> |    |    |    | <b>FY 2027</b> |    |    |    | <b>FY 2028</b> |    |    |    |
|--|----------------|----|-------------|----|----------------|----|----|----|----------------|----|----|----|----------------|----|----|----|----------------|----|----|----|----------------|----|----|----|----------------|----|----|----|
|  | 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 |
| Context-based augmented reality identification framework |                |    | Development |    |                |    |    |    |                |    |    |    |                |    |    |    |                |    |    |    |                |    |    |    |                |    |    |    |
|  |                |    |             |    |                |    |    |    |                |    |    |    |                |    |    |    |                |    |    |    |                |    |    |    |                |    |    |    |

2024OSD - 0603216N - 9999

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**Exhibit R-4A, RDT&E Schedule Details:** PB 2024 Navy **Date:** March 2023

|  |   |  |
|--|---|--|
| <b>Appropriation/Budget Activity</b><br>1319 / 4 | <b>R-1 Program Element (Number/Name)</b><br>PE 0603216N / <i>Aviation Survivability</i> | <b>Project (Number/Name)</b><br>9999 / <i>Congressional Adds</i> |
|--|---|--|

Schedule Details

| Events by Sub Project  | Start   |      | End     |      |
|--|---------|------|---------|------|
|  | Quarter | Year | Quarter | Year |
| <b>Proj 9999</b>   |         |      |         |      |
| Context-based augmented reality identification framework: Context-based augmented reality identification framework | 3       | 2022 | 4       | 2023 |