| Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Army | | | | | | | | | | | Date: April 2022 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Appropriation/Budget Activity<br>2040: *Research, Development, Test & Evaluation, Army I* BA 7: *Operational Systems Development* | | | | | R-1 Program Element (Number/Name)<br>PE 0607142A *I Aviation Rocket System Product Improvement and Development* | | | | | | | |
| **COST ($ in Millions)** | **Prior Years** | **FY 2021** | **FY 2022** | **FY 2023 Base** | **FY 2023 OCO** | **FY 2023 Total** | **FY 2024** | **FY 2025** | **FY 2026** | **FY 2027** | **Cost To Complete** | **Total Cost** |
| Total Program Element | - | 11.321 | 12.417 | 11.312 | - | 11.312 | 3.078 | 0.000 | 0.000 | 0.000 | Continuing | Continuing |
| EW9: *Aviation Rocket System Product Improvement and Dev* | - | 11.321 | 12.417 | 11.312 | - | 11.312 | 3.078 | - | - | - | Continuing | Continuing |

**A. Mission Description and Budget Item Justification**

The Aviation Rockets and Small Guided Munitions Product Improvement and Development line funds the development, integration and test of current and future munitions and launchers, and their interface to platforms. Additionally, it will fund a range of improvement initiatives to modernize the Hydra-70 2.75 inch rocket and launcher system. The current Hydra-70 2.75 inch rocket system requires performance improvements to comply with 1) US Code - Title 10, Chapter 141, Section 2389 "Ensuring Safety regarding Insensitive Munitions", 2) Department of Defense (DoD) Directive 5000.1, Chairman of the Joint Chiefs of Staff (CJCS) Instruction 3170.01C, Under Secretary of Defense for Acquisition, Technology, and Logistics (OUSD (AT&L)) Memorandum of January 26, 1999, "Exemption for Existing Inventory Items to Insensitive Munitions (IM) Requirements", 3) signed Initial Capability Document (ICD) for Army Aviation Weapons, Sub-Systems and Munitions (AAWSSM), 4) Air Launched Effects (ALE) Initial Capability Refinement Document (ICRD) dated 21 October 2019, 5) Future Attack Reconnaissance Aircraft Abbreviated Capabilities Development Document (FARA A-CDD) dated 03 June 2021, and 6) existing/emerging Headquarters, Department of the Army (HQDA) G-3/5/7 and U.S. Army Training and Doctrine Command (TRADOC) aviation weapon requirements for guided and unguided rocket and munition systems. Improvements to existing rocket systems and munitions will include design, qualification and integration of precision guidance capability, increased lethality, improved target suppression, increased standoff range, reduced minimum engagement range, improved pre-launch constraints and munitions communications/programmability, increased stowed kills, increased product reliability, improved hardness against unplanned stimuli, reduced Warfighter workload, and reduced environmental impact for both manned and unmanned applications.

The Fiscal Year (FY) 2023 dollars in the amount of $11.312 million will be used for technical assessments, risk reduction efforts, technology maturation, demonstration, engineering design, engineering/manufacturing development, testing, integration, and document preparation to support current and future Army Aviation manned and unmanned platforms and munitions.

| Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Army | Date: April 2022 |
|---|---|
| **Appropriation/Budget Activity**<br>2040: *Research, Development, Test & Evaluation, Army I* BA 7: *Operational Systems Development* | **R-1 Program Element (Number/Name)**<br>PE 0607142A *I Aviation Rocket System Product Improvement and Development* |

| B. Program Change Summary ($ in Millions) | FY 2021 | FY 2022 | FY 2023 Base | FY 2023 OCO | FY 2023 Total |
|---|---|---|---|---|---|
| Previous President's Budget | 13.421 | 12.417 | 0.000 | - | 0.000 |
| Current President's Budget | 11.321 | 12.417 | 11.312 | - | 11.312 |
| Total Adjustments | -2.100 | 0.000 | 11.312 | - | 11.312 |
| • Congressional General Reductions | - | - | | | |
| • Congressional Directed Reductions | - | - | | | |
| • Congressional Rescissions | - | - | | | |
| • Congressional Adds | - | - | | | |
| • Congressional Directed Transfers | - | - | | | |
| • Reprogrammings | -2.100 | - | | | |
| • SBIR/STTR Transfer | - | - | | | |
| • Adjustments to Budget Years | - | - | 11.312 | - | 11.312 |

**Change Summary Explanation**

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

| Exhibit R-2A, RDT&E Project Justification: PB 2023 Army | | | Date: April 2022 |
|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 7 | R-1 Program Element (Number/Name)<br>PE 0607142A / *Aviation Rocket System Product Improvement and Development* | Project (Number/Name)<br>EW9 / *Aviation Rocket System Product Improvement and Dev* | |

| COST ($ in Millions) | Prior Years | FY 2021 | FY 2022 | FY 2023 Base | FY 2023 OCO | FY 2023 Total | FY 2024 | FY 2025 | FY 2026 | FY 2027 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EW9: *Aviation Rocket System Product Improvement and Dev* | - | 11.321 | 12.417 | 11.312 | - | 11.312 | 3.078 | - | - | - | Continuing | Continuing |
| Quantity of RDT&E Articles | - | - | - | - | - | - | - | - | - | - | | |

**A. Mission Description and Budget Item Justification**

The Aviation Rockets and Small Guided Munitions Product Improvement and Development line funds the development, integration and test of current and future munitions and launchers, and their interface to platforms. Additionally, it will fund a range of improvement initiatives to modernize the Hydra-70 2.75 inch rocket and launcher system. The current Hydra-70 2.75 inch rocket system requires performance improvements to comply with 1) US Code - Title 10, Chapter 141, Section 2389 "Ensuring Safety regarding Insensitive Munitions", 2) Department of Defense (DoD) Directive 5000.1, Chairman of the Joint Chiefs of Staff (CJCS) Instruction 3170.01C, Under Secretary of Defense for Acquisition, Technology, and Logistics (OUSD (AT&L)) Memorandum of January 26, 1999, "Exemption for Existing Inventory Items to Insensitive Munitions (IM) Requirements", 3) signed Initial Capability Document (ICD) for Army Aviation Weapons, Sub-Systems and Munitions (AAWSSM), 4) Air Launched Effects (ALE) Initial Capability Refinement Document (ICRD) dated 21 October 2019, 5) Future Attack Reconnaissance Aircraft Abbreviated Capabilities Development Document (FARA A-CDD) dated 03 June 2021, and 6) existing/emerging Headquarters, Department of the Army (HQDA) G-3/5/7 and U.S. Army Training and Doctrine Command (TRADOC) aviation weapon requirements for guided and unguided rocket and munition systems. Improvements to existing rocket systems and munitions will include design, qualification and integration of precision guidance capability, increased lethality, improved target suppression, increased standoff range, reduced minimum engagement range, improved pre-launch constraints and munitions communications/programmability, increased stowed kills, increased product reliability, improved hardness against unplanned stimuli, reduced Warfighter workload, and reduced environmental impact for both manned and unmanned applications.

The Fiscal Year (FY) 2023 dollars in the amount of $11.312 million will be used for technical assessments, risk reduction efforts, technology maturation, demonstration, engineering design, engineering/manufacturing development, testing, integration, and document preparation to support current and future Army Aviation manned and unmanned platforms and munitions.

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2021 | FY 2022 | FY 2023 |
|---|---|---|---|
| ***Title:*** Guided Air-to-Ground Rocket (AGR) variants (Advanced Precision Kill Weapon System (APKWS)) | 0.748 | 0.785 | 0.801 |
| ***Description:*** These funds will be used to optimize current and future air-to ground variant integration on the Apache and for activities required to obtain an Army Full Materiel Release (FMR). This effort will utilize in-house expertise and Other Government Agencies in order to complete activities to include design and build of all-up-round (AUR) containers and test assets, conduct of environmental qualification testing, performance of ground firings, update of aviation platform software, support of Apache weapon survey firings, technical support to platform integration and testing, and development and revision of training/maintenance materiel. | | | |
| ***FY 2022 Plans:*** | | | |

| Exhibit R-2A, RDT&E Project Justification: PB 2023 Army | | Date: April 2022 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0607142A / *Aviation Rocket System Product Improvement and Development* | **Project (Number/Name)**<br>EW9 / *Aviation Rocket System Product Improvement and Dev* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2021 | FY 2022 | FY 2023 |
|---|---|---|---|
| 1. Complete development of fire control integration on the AH-64E Apache for current rotary wing guided variants, and continue fire control optimization for the single variant block upgrade variant.<br>2. Characterize performance changes/improvements of single software variant block upgrade of guided rockets and qualify for use on Army Aviation platforms.<br>***FY 2023 Plans:***<br>Complete characterization of performance changes/improvements of single software variant block upgrade of guided rockets and qualify for use on Army Aviation platforms.<br>***FY 2022 to FY 2023 Increase/Decrease Statement:***<br>Minimal increase accounts for inflation. | | | |
| ***Title:*** Army Aviation Weapons<br>***Description:*** These funds will be used for fielded Army Aviation modular weapon systems and their interface to fielded launchers and platforms. These efforts will utilize in-house subject matter expertise, Other Government Agencies, defense industry capabilities, and Other Transactional Agreements to complete activities to include technical assessment, risk reduction efforts, technology maturation, demonstration, engineering design, engineering/manufacturing development, test, integration and document preparation for Army Aviation manned and unmanned platforms.<br>***FY 2022 Plans:***<br>1. Perform analysis, engineering design, and demonstration of propulsion, sensor, datalink and navigation technologies that will enable future munitions to meet requirements of the Army Aviation Weapons, Sub systems and Munitions (AAWSSM) Initial Capability Document and the Army Aviation Munition Strategy, and provide future munitions capabilities.<br>2. Assessments, development, risk reduction effort and documentation to determine feasibility of the adaptation of fielded/legacy launcher technologies with future launcher technologies.<br>***FY 2023 Plans:***<br>1. Continue analysis, engineering design, and demonstration of propulsion, sensor, datalink and navigation technologies that will enable future munitions to meet requirements of the Army Aviation Weapons, Sub-Systems and Munitions Initial Capability Document and the Army Aviation Munition Strategy.<br>2. Continue studies, assessments, risk reduction effort and documentation to determine feasibility of the adaptation of future guided and unguided munition technologies.<br>3. Proceed from launcher concept development to prototype development, integration, and testing phase with future and enduring munitions.<br>***FY 2022 to FY 2023 Increase/Decrease Statement:*** | 0.762 | 4.193 | 9.767 |

| Exhibit R-2A, RDT&E Project Justification: PB 2023 Army | | Date: April 2022 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0607142A / *Aviation Rocket System Product Improvement and Development* | **Project (Number/Name)**<br>EW9 / *Aviation Rocket System Product Improvement and Dev* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2021 | FY 2022 | FY 2023 |
|---|---|---|---|
| Increase due to additional emphasis on technology and concept maturation supporting the Army Aviation Munition Strategy. | | | |
| ***Title:*** Modular Effects Launcher (MEL)/Launcher Electronics Assembly (LEA)<br><br>***Description:*** These funds will be used to upgrade and enhance launcher components to support current and future munitions outlined in the Army Aviation Weapons, Sub-Systems and Munitions Initial Capability Document, dated 17 July 2018, the Air Launched Effects (ALE) Initial Capability Refinement Document (ICRD) dated 21 Oct 2019, and the Future Attack Reconnaissance Aircraft Abbreviated Capabilities Development Document (FARA A-CDD) dated 03 June 2021. This effort allows the Government to align technology-enabling solutions with the Army Aviation Weapons, Sub-Systems and Munitions Initial Capability Document, maturing technological developments of launcher component prototypes to mitigate launcher limitations. The launcher component efforts will define and provide the interfaces between aircraft and emerging munitions utilizing a nonproprietary, open systems architecture allowing easy compatibility when integrating onto aviation platforms. The inherent flexibility of an open architecture serves as a building block for future weapon systems.<br><br>***FY 2022 Plans:***<br>1. Continue Launcher Electronics Assembly (LEA) development.<br>2. Inform fielded/legacy launcher capabilities against evolving threats and with future munitions/launch platform interface requirements.<br><br>***FY 2023 Plans:***<br>1. Complete launcher technologies architecture design, and structure concept development.<br>2. Complete technical assessments and concept studies to inform capabilities against evolving threats.<br><br>***FY 2022 to FY 2023 Increase/Decrease Statement:***<br>Decrease due to completion of efforts. | 9.811 | 6.986 | 0.744 |
| ***Title:*** SBIR/STTR<br><br>***FY 2022 Plans:***<br>Funding transferred in accordance with Title 15 USC ?638<br><br>***FY 2022 to FY 2023 Increase/Decrease Statement:***<br>Funding transferred in accordance with Title 15 USC ?638 | - | 0.453 | - |
| **Accomplishments/Planned Programs Subtotals** | 11.321 | 12.417 | 11.312 |

| Exhibit R-2A, RDT&E Project Justification: PB 2023 Army | | Date: April 2022 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0607142A / *Aviation Rocket System Product Improvement and Development* | **Project (Number/Name)**<br>EW9 / *Aviation Rocket System Product Improvement and Dev* |

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

| Line Item | FY 2021 | FY 2022 | FY 2023 Base | FY 2023 OCO | FY 2023 Total | FY 2024 | FY 2025 | FY 2026 | FY 2027 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|
| • E37300: *Rocket, Hydra 70, All Types* | 159.795 | 117.536 | 171.697 | - | 171.697 | 64.937 | 73.261 | 96.162 | 76.532 | Continuing | Continuing |

**Remarks**

E37300 procures guided and unguided Hydra Rockets

**D. Acquisition Strategy**

The Acquisition Strategy utilizes in-house expertise, Other Government Agencies, defense industry capabilities, and when appropriate Other Transactional Agreements. The strategy allows the Government the ability to support urgent operational needs and unanticipated requirements, which require immediate and expert attention.

This strategy will allow for the Government to maintain the relevance of the Hydra-70 all-up-round rocket, its variants, and Small Guided Munitions, and posture for emerging requirements and capabilities, while leveraging new authorities and progressing as many technologies as funding allows.

| Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army | | | Date: April 2022 |
|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 7 | R-1 Program Element (Number/Name)<br>PE 0607142A / *Aviation Rocket System Product Improvement and Development* | Project (Number/Name)<br>EW9 / *Aviation Rocket System Product Improvement and Dev* | |

**Management Services ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2021 Cost | FY 2021 Award Date | FY 2022 Cost | FY 2022 Award Date | FY 2023 Base Cost | FY 2023 Base Award Date | FY 2023 OCO Cost | FY 2023 OCO Award Date | FY 2023 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| System Engineering/ Project Management | Various | Various : Performers | 8.879 | 1.902 | Oct 2020 | 2.038 | Nov 2021 | 2.079 | Nov 2022 | - | | 2.079 | Continuing | Continuing | - |
| SBIR/STTR | C/TBD | Various : Various | - | - | | 0.453 | Apr 2022 | - | | - | | - | Continuing | Continuing | - |
| | | **Subtotal** | 8.879 | 1.902 | | 2.491 | | 2.079 | | - | | 2.079 | Continuing | Continuing | N/A |

**Product Development ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2021 Cost | FY 2021 Award Date | FY 2022 Cost | FY 2022 Award Date | FY 2023 Base Cost | FY 2023 Base Award Date | FY 2023 OCO Cost | FY 2023 OCO Award Date | FY 2023 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Advanced Precision Kill Weapon System (APKWS) | MIPR | CCDC : Redstone Arsenal, AL | 1.388 | 0.405 | Apr 2021 | 0.667 | Apr 2022 | 0.681 | Apr 2023 | - | | 0.681 | 0.000 | 3.141 | - |
| Army Aviation Weapons | MIPR | Various : Various Performers | 11.963 | 0.419 | Mar 2021 | 0.678 | Mar 2022 | 5.002 | Mar 2023 | - | | 5.002 | Continuing | Continuing | - |
| Modular Effects Launcher (MEL)/Launcher Electronics Assembly (LEA) | MIPR | CCDC : Redstone Arsenal, AL | - | 8.595 | Mar 2021 | 5.712 | Jan 2022 | 0.624 | Jan 2023 | - | | 0.624 | Continuing | Continuing | - |
| | | **Subtotal** | 13.351 | 9.419 | | 7.057 | | 6.307 | | - | | 6.307 | Continuing | Continuing | N/A |

**Support ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2021 Cost | FY 2021 Award Date | FY 2022 Cost | FY 2022 Award Date | FY 2023 Base Cost | FY 2023 Base Award Date | FY 2023 OCO Cost | FY 2023 OCO Award Date | FY 2023 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Research Studies | MIPR | CCDC : Redstone Arsenal, AL | 2.076 | - | | 2.869 | Jan 2022 | 2.926 | Jan 2023 | - | | 2.926 | Continuing | Continuing | - |
| | | **Subtotal** | 2.076 | - | | 2.869 | | 2.926 | | - | | 2.926 | Continuing | Continuing | N/A |

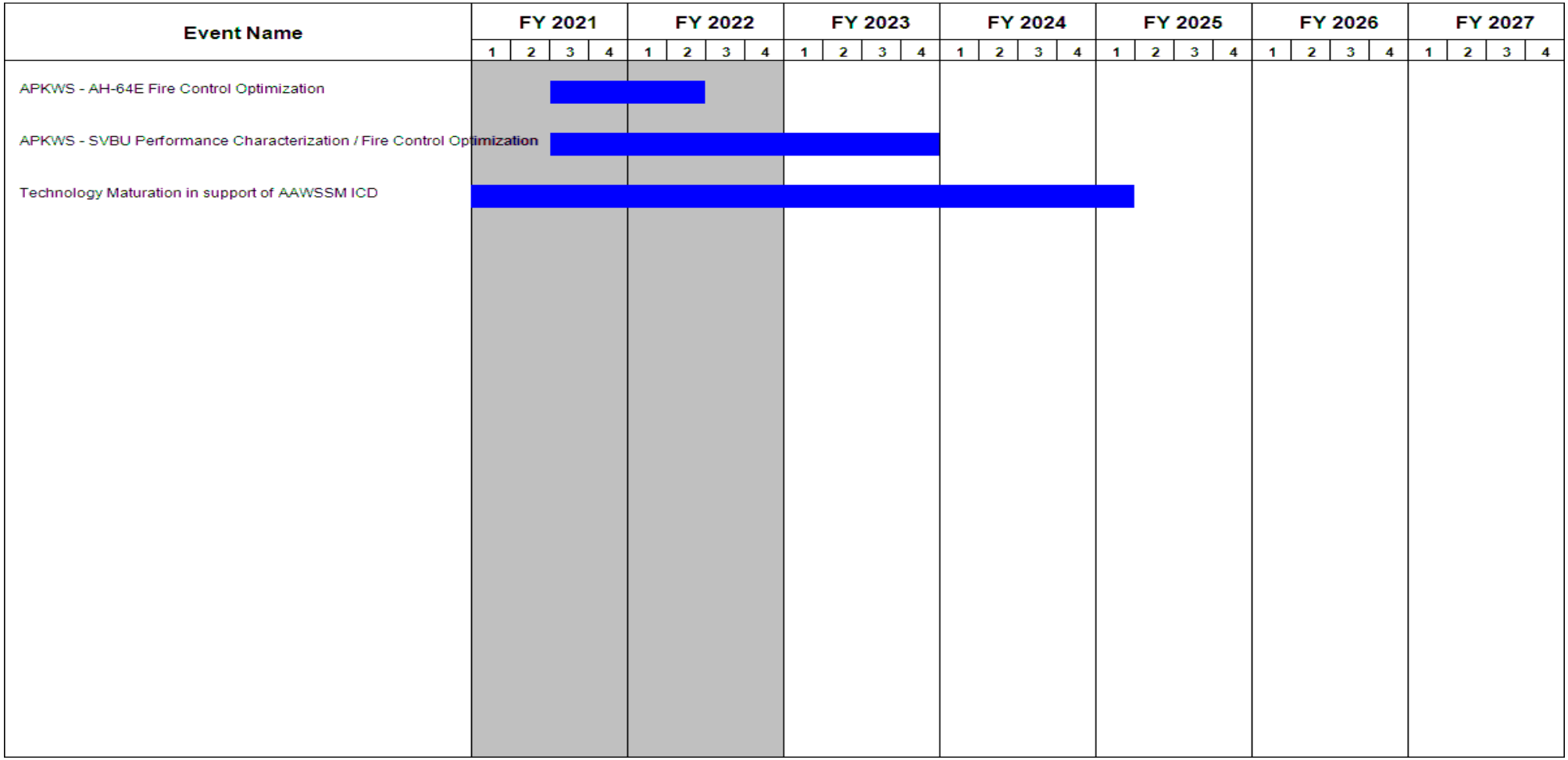
| | Prior Years | FY 2021 | | FY 2022 | | FY 2023 Base | | FY 2023 OCO | | FY 2023 Total | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Project Cost Totals** | 24.306 | 11.321 | | 12.417 | | 11.312 | | - | | 11.312 | Continuing | Continuing | N/A |

| Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army | | | Date: April 2022 |
|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 7 | R-1 Program Element (Number/Name)<br>PE 0607142A / *Aviation Rocket System Product Improvement and Development* | Project (Number/Name)<br>EW9 / *Aviation Rocket System Product Improvement and Dev* | |

| | Prior Years | FY 2021 | FY 2022 | FY 2023 Base | FY 2023 OCO | FY 2023 Total | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|

**Remarks**

| Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army | | Date: April 2022 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0607142A / *Aviation Rocket System Product Improvement and Development* | **Project (Number/Name)**<br>EW9 / *Aviation Rocket System Product Improvement and Dev* |



| Exhibit R-4A, RDT&E Schedule Details: PB 2023 Army | | Date: April 2022 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0607142A / *Aviation Rocket System Product Improvement and Development* | **Project (Number/Name)**<br>EW9 / *Aviation Rocket System Product Improvement and Dev* |

## Schedule Details

| | Start | | End | |
|---|---|---|---|---|
| **Events** | **Quarter** | **Year** | **Quarter** | **Year** |
| APKWS - AH-64E Fire Control Optimization | 3 | 2021 | 2 | 2022 |
| APKWS - SVBU Performance Characterization / Fire Control Optimization | 3 | 2021 | 4 | 2023 |
| Technology Maturation in support of AAWSSM ICD | 2 | 2019 | 1 | 2025 |

**Note**

APKWS: Advanced Precision Kill Weapon System
AAWSSM ICD: Army Aviation Weapons, Sub-Systems and Munitions Initial Capability Document
SVBU: Single Variant Block Upgrade