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| Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Army | | | | | | | | | | Date: May 2017 | | | |
|---|-------------|---------|---------|--------------|--|---------------|---------|---------|---------|----------------|------------------|------------|--|
| Appropriation/Budget Activity 2040: Research, Development, Test & Evaluation, Army I BA 7: Operational Systems Development | | | | | R-1 Program Element (Number/Name) PE 0607136A I Blackhawk Product Improvement Program | | | | | | | | |
| COST (\$ in Millions) | Prior Years | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total | FY 2019 | FY 2020 | FY 2021 | FY 2022 | Cost To Complete | Total Cost | |
| Total Program Element | - | 64.011 | 46.765 | 34.416 | - | 34.416 | 17.085 | 5.167 | 7.878 | 4.700 | Continuing | Continuing | |
| ES3: Blackhawk Product Improvement Program | - | 64.011 | 46.765 | 34.416 | - | 34.416 | 17.085 | 5.167 | 7.878 | 4.700 | Continuing | Continuing | |

Note

Funds in this program were realigned in Fiscal Year (FY) 2015 from Program Element 0203744A Aircraft Modifications/Product Improvement Programs, Project 504, for more efficient program management.

A. Mission Description and Budget Item Justification

The H-60L Digital Blackhawk, now designated as UH-60V, is designed to update the existing H-60L analog architecture to a digital infrastructure enabling the upgraded aircraft to have a similar Pilot-Vehicle Interface (PVI) to the H-60M. The program will address current capability gaps and meet operational requirements by employing an evolutionary acquisition approach to leverage mature technologies that have been successfully integrated on other military aircraft. The program will reduce obsolescence and increase commonality and interoperability by installing a digital cockpit, bussing and upgrading the communication/identification suite, improving navigation guidance, and integrating Aircraft Survivability Equipment (ASE), digital moving map, and Joint Variable Message Format (JVMF) messaging.

FY 2017 UH-60V funds hardware and software development as well as training material development and developmental testing.

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|--|-----------------------|-----------------------|----------------------------|---------------------------|-----------------------------|
| <u>B. Program Change Summary (\$ in Millions)</u> | <u>FY 2016</u> | <u>FY 2017</u> | <u>FY 2018 Base</u> | <u>FY 2018 OCO</u> | <u>FY 2018 Total</u> |
| Previous President's Budget | 66.653 | 46.765 | 34.586 | - | 34.586 |
| Current President's Budget | 64.011 | 46.765 | 34.416 | - | 34.416 |
| Total Adjustments | -2.642 | 0.000 | -0.170 | - | -0.170 |
| • Congressional General Reductions | - | - | | | |
| • Congressional Directed Reductions | - | - | | | |
| • Congressional Rescissions | - | - | | | |
| • Congressional Adds | - | - | | | |
| • Congressional Directed Transfers | - | - | | | |
| • Reprogrammings | - | - | | | |
| • SBIR/STTR Transfer | -2.642 | - | | | |
| • Adjustments to Budget Years | 0.000 | 0.000 | -0.170 | - | -0.170 |

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| Exhibit R-2A, RDT&E Project Justification: FY 2018 Army | | | | | | | | | | Date: May 2017 | | |
|---|-------------|---------|---------|--------------|--|---------------|---------|---------|--|----------------|------------------|------------|
| Appropriation/Budget Activity 2040 / 7 | | | | | R-1 Program Element (Number/Name) PE 0607136A / Blackhawk Product Improvement Program | | | | Project (Number/Name) ES3 / Blackhawk Product Improvement Program | | | |
| COST (\$ in Millions) | Prior Years | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total | FY 2019 | FY 2020 | FY 2021 | FY 2022 | Cost To Complete | Total Cost |
| ES3: Blackhawk Product Improvement Program | - | 64.011 | 46.765 | 34.416 | - | 34.416 | 17.085 | 5.167 | 7.878 | 4.700 | Continuing | Continuing |
| Quantity of RDT&E Articles | - | - | - | - | - | - | - | - | - | - | | |

Note

Funds in this program were realigned in Fiscal Year (FY) 2015 from Program Element 0203744A Aircraft Modifications/Product Improvement Programs, Projected 504, for more efficient program management.

A. Mission Description and Budget Item Justification

The H-60L Digital Blackhawk, now designated as UH-60V, is designed to update the existing H-60L analog architecture to a digital infrastructure enabling the upgraded aircraft to have a similar Pilot-Vehicle Interface (PVI) to the H-60M. The program will address current capability gaps and meet operational requirements by employing an evolutionary acquisition approach to leverage mature technologies that have been successfully integrated on other military aircraft. The program will reduce obsolescence and increase commonality and interoperability by installing a digital cockpit, bussing and upgrading the communication/identification suite, improving navigation guidance, and integrating Aircraft Survivability Equipment (ASE), digital moving map, and Joint Variable Message Format (JVMF) messaging.

FY 2017 UH-60V funds hardware and software development as well as training material development and developmental testing.

B. Accomplishments/Planned Programs (\$ in Millions)

| | FY 2016 | FY 2017 | FY 2018 |
|---|----------------|----------------|----------------|
| Title: Product Development | 53.102 | 34.335 | 24.007 |
| Description: The UH-60V program provides an integrated digital map, integrated performance planning, common functionality and commonality of training with UH-60M. Product Development includes all activities related to Hardware and Software development, Prototype Manufacturing (5 units), Training Equipment, Data, and Production Engineering and Planning for the UH60V program. Examples of specific activities include drawing development, work instruction development, prototype builds, Preliminary Design Review (PDR)/Critical Design Review (CDR), Software Engineering Directorate (SED) Simulation Integration Laboratory (SIL) design, Software Development (aircraft and off aircraft), trainers, and training material development. | | | |
| FY 2016 Accomplishments: Continue development of the UH-60V kit. Refinement of Performance Specification and sub-system specifications to support requirements. Artifacts updated during FY16 to support design refinement and reviews include: Mechanical Drawings, Electrical Drawings, Installation Drawings, and Safety Documentation. Successful completion of Critical Design Review (CDR), Software Stages of Involvement Audit (SOI), and Technical Interchange Meeting (TIM). Conducted activities in support of Flight Readiness Review (FRR) to include Formal Qualification Testing (FQT) of software Build 1. Risk reduction activities conducted in the Bench Test Facility (BTF) for early assessment of software maturity. Delivered GFE/GFI for prototype development and System | | | |

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| Exhibit R-2A, RDT&E Project Justification: FY 2018 Army | | Date: May 2017 | | |
| Appropriation/Budget Activity 2040 / 7 | R-1 Program Element (Number/Name) PE 0607136A / Blackhawk Product Improvement Program | Project (Number/Name) ES3 / Blackhawk Product Improvement Program | | |
| B. Accomplishments/Planned Programs (\$ in Millions) | | FY 2016 | FY 2017 | FY 2018 |
| Integration Laboratories. Completed de-modification of electrical and mechanical for EDM 1 and 2. Began installation of UH-60V kits on EDM 1 and EDM 2. Inducted EDM 4 & 5 at Corpus Christi Army Depot (CCAD). FY 2017 Plans: Conduct Physical Configuration Audit (PCA) on delivered UH-60V kit. Delivery of software Build 1 and associated technical data package (TDP) that will be used for first flight. Conduct FRR to obtain Airworthiness Release (AWR) for flight testing. Conduct Formal Qualification Testing (FQT), Software SOI 3 and TIM. Continue risk reduction activities in the SIL for early assessment of software maturity. Begin verification of Technical Manuals (TMs) on EDM 4 & 5. Complete installation of UH-60V kit on EDM 2 and begin installation on EDM 3. Begin induction activities on EDM 4 & 5 at Corpus Christi Army Depot (CCAD). FY 2018 Plans: Delivery of software Build 3 and associated technical data package (TDP) that will be used to support IOT&E. Complete installation of UH-60V kit on EDM 3 and begin Government verification of Technical Manuals (TMs). Complete installation of UH-60V kits on EDM 4 & 5. Begin TADSS development. | | | | |
| Title: Support Description: Support Costs include Systems Engineering/Program Management (SEPM) type activities performed at the Prototype Integration Facility (PIF). This includes Army Engineering Directorate (AED) support for propulsion, structures, aeromechanics, mission equipment, as well as PIF program management. FY 2016 Accomplishments: Continued SEPM activities in support of UH-60V. FY 2017 Plans: Continue SEPM activities in support of UH-60V. FY 2018 Plans: Continue SEPM activities in support of UH-60V. | | 3.065 | 3.104 | 2.681 |
| Title: Test & Evaluation Description: The Utility Helicopters Project Office (UHPO) is responsible for day-to-day test management activities to include execution of all developmental tests and support of operational tests for the UH-60V Program. The focal point for test management is the UH-60V Test Lead Engineer who is the chair for the UH-60V Test and Evaluation (T&E) Working-level Integrated Product Team. The UH-60 T&E team ensures integration and coordination of test and data requirements among all agencies involved in the test and acquisition of the UH-60V effort. T&E activities include, but not limited to, ensuring component hardware qualification is accomplished, system level Electromagnetic Environmental Effects (E3) testing, Daylight Readability testing, Air Traffic Control Radar Beacon System (ATCRBS), Identification Friend or Foe (IFF), Mark XIIA System (AIMS) | | 1.920 | 3.597 | 3.800 |

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| Exhibit R-2A, RDT&E Project Justification: FY 2018 Army | | Date: May 2017 | |
| Appropriation/Budget Activity 2040 / 7 | R-1 Program Element (Number/Name) PE 0607136A / Blackhawk Product Improvement Program | Project (Number/Name) ES3 / Blackhawk Product Improvement Program | |
| B. Accomplishments/Planned Programs (\$ in Millions) | | FY 2016 | FY 2017 |
| certification testing, Limited User Test (LUT), Initial Operational Test and Evaluation (IOTE), Cybersecurity, Interoperability tests, and AFTD Baseline Flight Testing. | | | |
| FY 2016 Accomplishments: Continued test planning and execution efforts for developmental system level test events. Continued the development and approval of system level checklists and the following test plans: flight test, Electromagnetic Compatibility (EMC), Modal Rap, Electromagnetic Vulnerability (EMV), Delta Electromagnetic Environmental Effects (E3), Interoperability and AIMs certification. | | | |
| FY 2017 Plans: Prepare, document and receive approval of flight test Airworthiness Release (AWR) for developmental flight test activities. Continue test planning and execution efforts for continuous improvement of system level test. Conduct test planning efforts for IOT&E. | | | |
| FY 2018 Plans: Complete flight testing on software Build 2 and review flight test report. Continue test planning and execution efforts for continuous improvement of system level testing to include software builds (3 & 4) for IOT&E. Conduct LUT. | | | |
| Title: Management Services | | | |
| Description: Management Services includes all activities related to Government/Contractor SEPM to include the cost of Government and Contractor personnel supporting the UH-60V program. | | | |
| FY 2016 Accomplishments: Continued core and contractor (SEPM) activities in support of UH-60V. | | | |
| FY 2017 Plans: Continue core and contractor (SEPM) activities in support of UH-60V. | | | |
| FY 2018 Plans: Continue core and contractor (SEPM) activities in support of UH-60V. | | | |
| Accomplishments/Planned Programs Subtotals | | 5.924 | 3.928 |
| | | 64.011 | 34.416 |

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| Exhibit R-2A, RDT&E Project Justification: FY 2018 Army | | | | | | | | | Date: May 2017 | | |
| Appropriation/Budget Activity 2040 / 7 | | | | R-1 Program Element (Number/Name) PE 0607136A / Blackhawk Product Improvement Program | | | | Project (Number/Name) ES3 / Blackhawk Product Improvement Program | | | |
| C. Other Program Funding Summary (\$ in Millions) | | | | | | | | | | | |
| Line Item | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total | FY 2019 | FY 2020 | FY 2021 | FY 2022 | Cost To Complete | Total Cost |
| • UH-60 A and L Models A05009: UH-60 Black Hawk A and L Models A05009 | 55.441 | 46.173 | 76.516 | - | 76.516 | 168.085 | 211.146 | 215.457 | 219.159 | 0.000 | 991.977 |
| Remarks | | | | | | | | | | | |
| A05009 UH-60 Blackhawk A and L Models provides procurement funding for conversions to UH-60V starting in FY2018. | | | | | | | | | | | |
| D. Acquisition Strategy | | | | | | | | | | | |
| The UH-60V program plans to leverage a Government-owned Government-operated (GOGO) facility to design, integrate and build five production representative aircraft. The Prototype Integration Facility (PIF) will build three aircraft and two more aircraft will be built at Corpus Christi Army Depot (CCAD). The GOGO facility uses a cost plus contract vehicle and conducted full and open competition for the selection of the avionics solution provider. | | | | | | | | | | | |
| E. Performance Metrics | | | | | | | | | | | |
| N/A | | | | | | | | | | | |

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| Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Army | | | | | | | | | | | | Date: May 2017 | | | |
| Appropriation/Budget Activity 2040 / 7 | | | | | | R-1 Program Element (Number/Name) PE 0607136A / Blackhawk Product Improvement Program | | | | | | Project (Number/Name) ES3 / Blackhawk Product Improvement Program | | | |
| Management Services (\$ in Millions) | | | | FY 2016 | | FY 2017 | | FY 2018 Base | | FY 2018 OCO | | FY 2018 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 |
| UH-60V - Organic | MIPR | Various : Redstone Arsenal, AL | 3.606 | 3.515 | Oct 2015 | 3.231 | Oct 2016 | 1.657 | Oct 2017 | - | | 1.657 | 0.000 | 12.009 | 0.000 |
| UH-60V - Contractor | C/LH | Various : Redstone Arsenal, AL | 2.576 | 2.409 | Oct 2015 | 2.498 | Oct 2016 | 2.271 | Oct 2017 | - | | 2.271 | 0.000 | 9.754 | 0.000 |
| Subtotal | | | 6.182 | 5.924 | | 5.729 | | 3.928 | | - | | 3.928 | 0.000 | 21.763 | 0.000 |
| Product Development (\$ in Millions) | | | | FY 2016 | | FY 2017 | | FY 2018 Base | | FY 2018 OCO | | FY 2018 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 |
| UH-60V Development Engineering | C/CPFF | AMRDEC PIF : Redstone Arsenal, AL | 38.953 | 53.102 | Oct 2015 | 34.335 | Oct 2016 | 24.007 | Oct 2017 | - | | 24.007 | 0.000 | 150.397 | 0.000 |
| Subtotal | | | 38.953 | 53.102 | | 34.335 | | 24.007 | | - | | 24.007 | 0.000 | 150.397 | 0.000 |
| Support (\$ in Millions) | | | | FY 2016 | | FY 2017 | | FY 2018 Base | | FY 2018 OCO | | FY 2018 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 |
| UH-60V | MIPR | Various : Redstone Arsenal, AL | 3.171 | 3.065 | Oct 2015 | 3.104 | Oct 2016 | 2.681 | Oct 2017 | - | | 2.681 | 0.000 | 12.021 | 0.000 |
| Subtotal | | | 3.171 | 3.065 | | 3.104 | | 2.681 | | - | | 2.681 | 0.000 | 12.021 | 0.000 |
| Test and Evaluation (\$ in Millions) | | | | FY 2016 | | FY 2017 | | FY 2018 Base | | FY 2018 OCO | | FY 2018 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 |
| UH-60V | MIPR | Redstone Test Center : Redstone Arsenal, AL | 0.100 | 1.920 | Jan 2016 | 3.597 | Oct 2016 | 3.800 | Oct 2017 | - | | 3.800 | 0.000 | 9.417 | 0.000 |
| Subtotal | | | 0.100 | 1.920 | | 3.597 | | 3.800 | | - | | 3.800 | 0.000 | 9.417 | 0.000 |

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| Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Army | | | | | | | | | | | | Date: May 2017 | | |
| Appropriation/Budget Activity 2040 / 7 | | | | | R-1 Program Element (Number/Name) PE 0607136A / <i>Blackhawk Product Improvement Program</i> | | | | | Project (Number/Name) ES3 / <i>Blackhawk Product Improvement Program</i> | | | | |

| Test and Evaluation (\$ in Millions) | | | | FY 2016 | | FY 2017 | | FY 2018 Base | | FY 2018 OCO | | FY 2018 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 |
| Remarks Government Support | | | | | | | | | | | | | | | |
| | | | Prior Years | FY 2016 | | FY 2017 | | FY 2018 Base | | FY 2018 OCO | | FY 2018 Total | Cost To Complete | Total Cost | Target Value of Contract |
| Project Cost Totals | | | 48.406 | 64.011 | | 46.765 | | 34.416 | | - | | 34.416 | 0.000 | 193.598 | - |
| Remarks | | | | | | | | | | | | | | | |

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| Exhibit R-4, RDT&E Schedule Profile: FY 2018 Army | | | | | | | | | | | | | | | | Date: May 2017 | | | | | | | | | | | | | | | | |
|---|---------|---|---|---|----------------------------------|---|---|---|---------|---|---|---|-------------|---|---|----------------|---------|---|---|---|-------------------|---|---|---|-------------|---|---|---|--|--|--|--|
| Appropriation/Budget Activity | | | | | | | | | | R-1 Program Element (Number/Name) | | | | | | | | Project (Number/Name) | | | | | | | | | | | | | | |
| 2040 / 7 | | | | | | | | | | PE 0607136A / Blackhawk Product Improvement Program | | | | | | | | ES3 / Blackhawk Product Improvement Program | | | | | | | | | | | | | | |
| Event Name | FY 2016 | | | | FY 2017 | | | | FY 2018 | | | | FY 2019 | | | | FY 2020 | | | | FY 2021 | | | | FY 2022 | | | | | | | |
| | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | | | | |
| UH-60V Development (Research, Development, Test, and Evaluation (RDTE)) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | UH-60V EMD (Product Development) | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | Support | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | Test and Evaluation | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | Management Services | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| UH-60V Future Integration Efforts (RDTE) | | | | | | | | | | | | | | | | | | | | | | | | | Integration | | | | | | | |
| UH-60V Digital Modifications (Low Rate Initial Production (LRIP); (APA) | | | | | | | | | | | | | UH-60V LRIP | | | | | | | | | | | | | | | | | | | |
| UH-60V Digital Modifications Production (APA) | | | | | | | | | | | | | | | | | | | | | UH-60V Production | | | | | | | | | | | |

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| Exhibit R-4A, RDT&E Schedule Details: FY 2018 Army | | | Date: May 2017 |
| Appropriation/Budget Activity 2040 / 7 | R-1 Program Element (Number/Name) PE 0607136A / <i>Blackhawk Product Improvement Program</i> | Project (Number/Name) ES3 / <i>Blackhawk Product Improvement Program</i> | |

Schedule Details

| Events | Start | | End | |
|---|---------|------|---------|------|
| | Quarter | Year | Quarter | Year |
| UH-60V Development (Research, Development, Test, and Evaluation (RDTE) | 4 | 2014 | 4 | 2020 |
| Support (RDTE) | 1 | 2014 | 4 | 2019 |
| Test and Evaluation (RDTE) | 4 | 2015 | 4 | 2019 |
| Management Services (RDTE) | 1 | 2014 | 4 | 2019 |
| UH-60V Future Integration Efforts (RDTE) | 1 | 2021 | 4 | 2022 |
| UH-60V Digital Modifications (Low Rate Initial Production (LRIP); (APA) | 4 | 2018 | 4 | 2019 |
| UH-60V Digital Modifications Production (APA) | 1 | 2020 | 1 | 2024 |