

UNCLASSIFIED

| | |
|---|-------------------------|
| Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Missile Defense Agency | Date: March 2019 |
|---|-------------------------|

| | |
|---|--|
| Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide / BA 4: Advanced Component Development & Prototypes (ACD&P)</i> | R-1 Program Element (Number/Name) PE 0604894C / <i>Multi Object Kill Vehicle</i> |
|---|--|

| COST (\$ in Millions) | Prior Years | FY 2018 | FY 2019 | FY 2020 Base | FY 2020 OCO | FY 2020 Total | FY 2021 | FY 2022 | FY 2023 | FY 2024 | Cost To Complete | Total Cost |
|--|-------------|---------|---------|--------------|-------------|---------------|---------|---------|---------|---------|------------------|------------|
| Total Program Element | - | 6.347 | 6.500 | 0.000 | - | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 12.847 |
| MD85: <i>Multi Object Kill Vehicle</i> | - | 6.347 | 6.130 | 0.000 | - | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 12.477 |
| MD40: <i>Program-Wide Support</i> | - | 0.000 | 0.370 | 0.000 | - | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.370 |

Program MDAP/MAIS Code: 362

Note

FY 2020 MOKV funding realigned to other Department of Defense priorities.

A. Mission Description and Budget Item Justification

The MOKV program will enhance the BMDS Homeland Defense Interceptor performance to enable the Warfighter to counter more numerous and complex threats to the Homeland by enabling engagement of multiple objects from a single interceptor. The Missile Defense Agency (MDA) is developing the concepts for a MOKV based on a modular, open systems architecture designed to common interfaces and standards, making upgrades easier and broadening MDA's vendor and supplier base.

The MOKV will rely on a Ballistic Missile Defense System (BMDS) architecture that balances performance across the Sensors, Command, Control, Battle Management and Communications (C2BMC), and GMD elements. Analyses show that having multiple kill vehicles on each interceptor can dramatically improve the performance of the system, significantly reduce the burden on interceptor inventory, and reduce cost to defend the Homeland.

| <u>B. Program Change Summary (\$ in Millions)</u> | <u>FY 2018</u> | <u>FY 2019</u> | <u>FY 2020 Base</u> | <u>FY 2020 OCO</u> | <u>FY 2020 Total</u> |
|--|-----------------------|-----------------------|----------------------------|---------------------------|-----------------------------|
| Previous President's Budget | 6.500 | 8.256 | 33.935 | - | 33.935 |
| Current President's Budget | 6.347 | 6.500 | 0.000 | - | 0.000 |
| Total Adjustments | -0.153 | -1.756 | -33.935 | - | -33.935 |
| • Congressional General Reductions | 0.000 | 0.000 | | | |
| • Congressional Directed Reductions | 0.000 | -1.756 | | | |
| • Congressional Rescissions | 0.000 | 0.000 | | | |
| • Congressional Adds | 0.000 | 0.000 | | | |
| • Congressional Directed Transfers | 0.000 | 0.000 | | | |
| • Reprogrammings | 0.000 | 0.000 | | | |
| • SBIR/STTR Transfer | 0.000 | 0.000 | | | |
| • Missile Defeat and Defense Enhancement | 0.000 | 0.000 | 0.000 | - | 0.000 |
| • Other Adjustment | -0.153 | 0.000 | -33.935 | - | -33.935 |

Change Summary Explanation

FY 2020 MOKV funding realigned to other Department of Defense priorities.

UNCLASSIFIED

| Exhibit R-2A, RDT&E Project Justification: PB 2020 Missile Defense Agency | | | | | | | | | | Date: March 2019 | | |
|---|-------------|---------|---------|--------------|--|---------------|---------|---------|---|------------------|------------------|------------|
| Appropriation/Budget Activity 0400 / 4 | | | | | R-1 Program Element (Number/Name) PE 0604894C / Multi Object Kill Vehicle | | | | Project (Number/Name) MD85 / Multi Object Kill Vehicle | | | |
| COST (\$ in Millions) | Prior Years | FY 2018 | FY 2019 | FY 2020 Base | FY 2020 OCO | FY 2020 Total | FY 2021 | FY 2022 | FY 2023 | FY 2024 | Cost To Complete | Total Cost |
| MD85: Multi Object Kill Vehicle | - | 6.347 | 6.130 | 0.000 | - | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 12.477 |
| Quantity of RDT&E Articles | - | - | - | - | - | - | - | - | - | - | | |

Note

FY 2020 MOKV funding realigned to other Department of Defense priorities.

A. Mission Description and Budget Item Justification

MDA has implemented a structured, disciplined systems engineering process to assure the MOKV is a BMDS solution. The systems engineering effort will define the requirements for a deployable MOKV. The Government will develop MOKV system engineering guidelines from industry concepts, government analysis, modeling, and simulation. Results from MOKV concept development and follow on technology risk reduction efforts will inform the Top Level Requirements development needed in order to execute a feasible, affordable future MOKV Product Development. MDA anticipates deploying this capability in the next decade to address the evolving threat.

As part of MOKV concept development, industry identified technology component risk reduction efforts that support their concepts. MOKV technology risk reduction efforts include maturation of engagement management algorithms, communications, seekers, advanced sensors, Divert and Attitude Control Systems (DACs) propulsion, integrated avionics, and Guidance, Navigation and Control (GNC) technology.

The GMD element of the BMDS provides combatant commanders with a continuously available (24 hours a day, 365 days a year) capability to defend the United States Homeland against Intercontinental Ballistic Missile (ICBM) attacks. In order to address the evolving and expanding threat of ballistic missile attacks on the Homeland, MDA is developing a more capable ground-based interceptor with a MOKV that will be able to defeat complex future threats.

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

| | FY 2018 | FY 2019 | FY 2020 |
|--|----------------|----------------|----------------|
| Title: Multi-Object Kill Vehicle | 6.347 | 6.130 | 0.000 |
| Articles: | - | - | - |
| <p>Description: In order to address the evolving and expanding threat of ballistic missile attacks on the Homeland, MDA is developing a more capable ground-based interceptor with a MOKV that will be able to defeat complex future threats.</p> <p>The MOKV replaces a unitary kill vehicle (KV) on current GBIs with a payload containing multiple, smaller kill vehicles (KVs). The MOKV concept also allows for a potentially substantial reduction of the GBI inventory required to protect the homeland, as multiple GBIs with a unitary KV will no longer be required to address a target complex with multiple threats.</p> <p>Specific and/or unique accomplishments to each FY are as follows:</p> <p>FY 2019 Plans:</p> <p>- Complete and document initial market research</p> | | | |

UNCLASSIFIED

| | | | | | | | | | | | |
|--|----------------|----------------|--|------------------------------|--------------------------------|---|-------------------------|----------------|----------------|-------------------------|-------------------|
| Exhibit R-2A, RDT&E Project Justification: PB 2020 Missile Defense Agency | | | | | | | Date: March 2019 | | | | |
| Appropriation/Budget Activity 0400 / 4 | | | R-1 Program Element (Number/Name) PE 0604894C / <i>Multi Object Kill Vehicle</i> | | | Project (Number/Name) MD85 / <i>Multi Object Kill Vehicle</i> | | | | | |
| B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each) | | | | | | | FY 2018 | FY 2019 | FY 2020 | | |
| - Complete an initial basic acquisition strategy for competitive development, engineering, test, manufacture, and production for the MOKV FY 2020 Plans: N/A FY 2019 to FY 2020 Increase/Decrease Statement: FY 2020 MOKV funding realigned to other Department of Defense priorities. | | | | | | | | | | | |
| Accomplishments/Planned Programs Subtotals | | | | | | | 6.347 | 6.130 | 0.000 | | |
| C. Other Program Funding Summary (\$ in Millions) | | | | | | | | | | | |
| <u>Line Item</u> | <u>FY 2018</u> | <u>FY 2019</u> | <u>FY 2020</u> <u>Base</u> | <u>FY 2020</u> <u>OCO</u> | <u>FY 2020</u> <u>Total</u> | <u>FY 2021</u> | <u>FY 2022</u> | <u>FY 2023</u> | <u>FY 2024</u> | <u>Cost To Complete</u> | <u>Total Cost</u> |
| • 0603294C: <i>Common Kill Vehicle Technology</i> | 55.562 | 56.753 | 13.600 | - | 13.600 | 13.475 | 16.187 | 18.232 | 22.949 | Continuing | Continuing |
| Remarks | | | | | | | | | | | |
| D. Acquisition Strategy | | | | | | | | | | | |
| The acquisition strategy for Technology Risk Reduction consists of three focus areas. First, through competition with missile integration contractors, develop kill vehicle architectures and interfaces with competitive design of MOKV concepts incorporating engagement management concept of operations, kill vehicles and enhanced discrimination capability. Second, conduct risk reduction activities to identify and mature the technology necessary to increase the reliability and performance of our kill vehicles using the Advanced Technology Innovation Broad Agency Announcement (BAA) and competitive procurements. Make investments that mitigate the component development gaps for future MOKV, and enhance the competitive environment. Make the necessary investments to maturing component technology; enhanced inertial navigation and kill vehicle-to-kill vehicle communications. Third, leverage the technical expertise of Federally Funded Research and Development Centers (FFRDCs), University Applied Research Centers (UARCs), and Universities and government laboratories to independently develop reference concept using proven modeling/analysis techniques. | | | | | | | | | | | |
| E. Performance Metrics | | | | | | | | | | | |
| N/A | | | | | | | | | | | |

UNCLASSIFIED

| Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Missile Defense Agency | | | | | | | | | | | | Date: March 2019 | | | |
|--|------------------------|--------------------------------|-------------|---------|------------|--|------------|--------------|------------|---|------------|------------------|------------------|------------|--------------------------|
| Appropriation/Budget Activity 0400 / 4 | | | | | | R-1 Program Element (Number/Name) PE 0604894C / Multi Object Kill Vehicle | | | | Project (Number/Name) MD85 / Multi Object Kill Vehicle | | | | | |
| Product Development (\$ in Millions) | | | | FY 2018 | | FY 2019 | | FY 2020 Base | | FY 2020 OCO | | FY 2020 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 |
| Multi-Object Kill Vehicle - MOKV Technology Development | C/CPFF | Various : Various | 0.000 | 0.444 | | 0.000 | | 0.000 | | - | | 0.000 | Continuing | Continuing | Continuing |
| Subtotal | | | 0.000 | 0.444 | | 0.000 | | 0.000 | | - | | 0.000 | Continuing | Continuing | N/A |
| Remarks N/A | | | | | | | | | | | | | | | |
| Support (\$ in Millions) | | | | FY 2018 | | FY 2019 | | FY 2020 Base | | FY 2020 OCO | | FY 2020 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 |
| Multi-Object Kill Vehicle - Contract Support Services | C/CPFF | Various : AL/AK/CA/CO/VA | 0.000 | 1.211 | Nov 2017 | 3.265 | Nov 2018 | 0.000 | | - | | 0.000 | Continuing | Continuing | Continuing |
| Multi-Object Kill Vehicle - FFRDC Support Services | MIPR | Various : Various | 0.000 | 1.427 | Nov 2017 | 1.011 | Nov 2018 | 0.000 | | - | | 0.000 | Continuing | Continuing | Continuing |
| Multi-Object Kill Vehicle - MOKV Development | C/CPFF | Various : AL/AK/CA/CO/VA | 0.000 | 0.000 | | 0.236 | Nov 2018 | 0.000 | | - | | 0.000 | Continuing | Continuing | Continuing |
| Multi-Object Kill Vehicle - Other Government Agencies | MIPR | Various : Various | 0.000 | 3.265 | Nov 2017 | 1.618 | Nov 2018 | 0.000 | | - | | 0.000 | Continuing | Continuing | Continuing |
| Subtotal | | | 0.000 | 5.903 | | 6.130 | | 0.000 | | - | | 0.000 | Continuing | Continuing | N/A |
| Remarks N/A | | | | | | | | | | | | | | | |
| Test and Evaluation (\$ in Millions) | | | | FY 2018 | | FY 2019 | | FY 2020 Base | | FY 2020 OCO | | FY 2020 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 |
| Subtotal | | | - | - | | - | | - | | - | | - | - | - | N/A |
| Remarks N/A | | | | | | | | | | | | | | | |

UNCLASSIFIED

| | | | | | | | | | | | | | | | |
|--|--|--|-------------|---------|--|---------|--|--------------|--|---|------------------|---------------|------------------|------------|--------------------------|
| Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Missile Defense Agency | | | | | | | | | | | Date: March 2019 | | | | |
| Appropriation/Budget Activity 0400 / 4 | | | | | R-1 Program Element (Number/Name) PE 0604894C / Multi Object Kill Vehicle | | | | | Project (Number/Name) MD85 / Multi Object Kill Vehicle | | | | | |
| | | | Prior Years | FY 2018 | | FY 2019 | | FY 2020 Base | | FY 2020 OCO | | FY 2020 Total | Cost To Complete | Total Cost | Target Value of Contract |
| Project Cost Totals | | | 0.000 | 6.347 | | 6.130 | | 0.000 | | - | | 0.000 | Continuing | Continuing | N/A |

Remarks

Award Date reflects date of first obligation. Additional obligations may incrementally occur throughout the year.

UNCLASSIFIED

| | | | | | | | | | | | | | | | | | |
|---|--|-------------------------------|--|--|--|------------------------------|------------------|---|--|---------|--|---------|--|---------|--|---------|--|
| Exhibit R-4, RDT&E Schedule Profile: PB 2020 Missile Defense Agency | | | | | | | Date: March 2019 | | | | | | | | | | |
| Appropriation/Budget Activity 0400 / 4 | | | | R-1 Program Element (Number/Name) PE 0604894C / Multi Object Kill Vehicle | | | | Project (Number/Name) MD85 / Multi Object Kill Vehicle | | | | | | | | | |
| Significant Event Complete ▲ | | Milestone Decision Complete ★ | | Element Test Complete ◆ | | System Level Test Complete ● | | Complete Activity ◆ | | | | | | | | | |
| Significant Event Planned △ | | Milestone Decision Planned ☆ | | Element Test Planned ◇ | | System Level Test Planned ○ | | Planned Activity ◇ | | | | | | | | | |
| | | | | FY 2018 | | FY 2019 | | FY 2020 | | FY 2021 | | FY 2022 | | FY 2023 | | FY 2024 | |
| MOKV Development Acquisition Strategy | | | | ◆◆◆◆ | | ◆◆◆◆ | | | | | | | | | | | |

UNCLASSIFIED

| | |
|---|-------------------------|
| Exhibit R-4A, RDT&E Schedule Details: PB 2020 Missile Defense Agency | Date: March 2019 |
|---|-------------------------|

| | | |
|--|--|---|
| Appropriation/Budget Activity 0400 / 4 | R-1 Program Element (Number/Name) PE 0604894C / <i>Multi Object Kill Vehicle</i> | Project (Number/Name) MD85 / <i>Multi Object Kill Vehicle</i> |
|--|--|---|

Schedule Details

| Events | Start | | End | |
|---------------------------------------|---------|------|---------|------|
| | Quarter | Year | Quarter | Year |
| MOKV Development Acquisition Strategy | 1 | 2018 | 4 | 2019 |

UNCLASSIFIED

| Exhibit R-2A, RDT&E Project Justification: PB 2020 Missile Defense Agency | | | | | | | | | | Date: March 2019 | | |
|---|-------------|---------|---------|--------------|--|---------------|---------|---------|--|------------------|------------------|------------|
| Appropriation/Budget Activity 0400 / 4 | | | | | R-1 Program Element (Number/Name) PE 0604894C / Multi Object Kill Vehicle | | | | Project (Number/Name) MD40 / Program-Wide Support | | | |
| COST (\$ in Millions) | Prior Years | FY 2018 | FY 2019 | FY 2020 Base | FY 2020 OCO | FY 2020 Total | FY 2021 | FY 2022 | FY 2023 | FY 2024 | Cost To Complete | Total Cost |
| MD40: Program-Wide Support | - | 0.000 | 0.370 | 0.000 | - | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.370 |
| Quantity of RDT&E Articles | - | - | - | - | - | - | - | - | - | - | | |

Note

FY 2020 reflects proportional PWS changes as a result of the consolidation of the CKV Technology program element 0603294 with this program element 0604894C.

A. Mission Description and Budget Item Justification

Program Wide Support (PWS) contains non-headquarters management costs in support of MDA functions and activities across the entire BMDS. It Includes Government Civilians and Contract Support Services. This provides integrity and oversight of the BMDS as well as supports MDA in the development and evaluation of technologies that will respond to the changing threat. Additionally, PWS includes personnel to support global deployments performing deployment site preparation and activation, and provides facility capabilities for MDA Executing Agent locations. Other MDA wide costs include: physical and technical security; civilian drug testing; audit readiness; the Science, Technology, Engineering, and Mathematics (STEM) program; legal services and settlements; travel and agency training; office, equipment, vehicle, and warehouse leases; utilities and base operations; data and unified communications support; supplies and maintenance; materiel and readiness and central property management of equipment; and similar operating expenses. PWS is allocated on a pro-rata basis across most Agency PEs and therefore fluctuates per PE by fiscal year based on the total Agency budget in that fiscal year.

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

| | FY 2018 | FY 2019 | FY 2020 |
|--|----------------|----------------|----------------|
| Title: Program Wide Support | 0.000 | 0.370 | 0.000 |
| Articles: | - | - | - |
| <p>Description: Program Wide Support (PWS) contains non-headquarters management costs in support of MDA functions and activities across the entire BMDS. It Includes Government Civilians and Contract Support Services. This provides integrity and oversight of the BMDS as well as supports MDA in the development and evaluation of technologies that will respond to the changing threat. Additionally, PWS includes personnel to support global deployments performing deployment site preparation and activation, and provides facility capabilities for MDA Executing Agent locations. Other MDA wide costs include: physical and technical security; civilian drug testing; audit readiness; the Science, Technology, Engineering, and Mathematics (STEM) program; legal services and settlements; travel and agency training; office, equipment, vehicle, and warehouse leases; utilities and base operations; data and unified communications support; supplies and maintenance; materiel and readiness and central property management of equipment; and similar operating expenses. PWS is allocated on a pro-rata basis across most Agency PEs and therefore fluctuates per PE by fiscal year based on the total Agency budget in that fiscal year.</p> | | | |
| <p>FY 2019 Plans: - SEE ABOVE.</p> | | | |
| <p>FY 2020 Plans:</p> | | | |

UNCLASSIFIED

| | | | |
|--|--|--|----------------|
| Exhibit R-2A, RDT&E Project Justification: PB 2020 Missile Defense Agency | | Date: March 2019 | |
| Appropriation/Budget Activity 0400 / 4 | R-1 Program Element (Number/Name) PE 0604894C / <i>Multi Object Kill Vehicle</i> | Project (Number/Name) MD40 / <i>Program-Wide Support</i> | |
| B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each) | | FY 2018 | FY 2019 |
| - SEE ABOVE. | | | |
| FY 2019 to FY 2020 Increase/Decrease Statement: Decrease in FY 2020 reflects proportional PWS changes as a result of the consolidation of the CKV Technology program element 0603294 with this program element 0604894C. | | | |
| Accomplishments/Planned Programs Subtotals | | 0.000 | 0.370 |
| C. Other Program Funding Summary (\$ in Millions) N/A | | | |
| Remarks | | | |
| D. Acquisition Strategy N/A | | | |
| E. Performance Metrics N/A | | | |

UNCLASSIFIED

| Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Missile Defense Agency | | | | | | | | | | | | Date: March 2019 | | | |
|---|------------------------|---|-------------|---------|------------|--|------------|-----------------|------------|--|------------|------------------|------------------|------------|--------------------------|
| Appropriation/Budget Activity 0400 / 4 | | | | | | R-1 Program Element (Number/Name) PE 0604894C / Multi Object Kill Vehicle | | | | Project (Number/Name) MD40 / Program-Wide Support | | | | | |
| Support (\$ in Millions) | | | | FY 2018 | | FY 2019 | | FY 2020 Base | | FY 2020 OCO | | FY 2020 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 Wide Support - Agency Operations Management | Allot | Various : Multi: AL, CA, CO, VA | 0.000 | 0.000 | | 0.370 | Jul 2019 | 0.000 | | - | | 0.000 | Continuing | Continuing | Continuing |
| Program Wide Support - Agency Operations and Support Services (FFP) | C/FFP | Various : Multi: AK, AL, CA, CO, HI, VA | 0.000 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | Continuing | Continuing | Continuing |
| Program Wide Support - Agency Operations and Support Services (Reqn) | Reqn | Various : Multi: AK, AL, CA, CO, VA | 0.000 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | Continuing | Continuing | Continuing |
| Program Wide Support - Facilities and Maintenance | MIPR | Various : Multi: AK, AL, CA, VA | 0.000 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | Continuing | Continuing | Continuing |
| Subtotal | | | 0.000 | 0.000 | | 0.370 | | 0.000 | | - | | 0.000 | Continuing | Continuing | N/A |
| Remarks | | | | | | | | | | | | | | | |
| N/A | | | | | | | | | | | | | | | |
| | | | Prior Years | FY 2018 | | FY 2019 | | FY 2020 Base | | FY 2020 OCO | | FY 2020 Total | Cost To Complete | Total Cost | Target Value of Contract |
| Project Cost Totals | | | 0.000 | 0.000 | | 0.370 | | 0.000 | | - | | 0.000 | Continuing | Continuing | N/A |
| Remarks | | | | | | | | | | | | | | | |
| Award Date reflects date of first obligation. Additional obligations may incrementally occur throughout the year. | | | | | | | | | | | | | | | |

UNCLASSIFIED

PE 0604894C: *Multi Object Kill Vehicle* **UNCLASSIFIED**
 Missile Defense Agency Page 11 of 12 R-1 Line #116

UNCLASSIFIED

| | | | |
|--|--|--|------------------|
| Exhibit R-4A, RDT&E Schedule Details: PB 2020 Missile Defense Agency | | | Date: March 2019 |
| Appropriation/Budget Activity 0400 / 4 | R-1 Program Element (Number/Name) PE 0604894C / Multi Object Kill Vehicle | Project (Number/Name) MD40 / Program-Wide Support | |

Schedule Details

| Events | Start | | End | |
|---------------------------|---------|------|---------|------|
| | Quarter | Year | Quarter | Year |
| MD40 Program-Wide Support | 1 | 2018 | 4 | 2024 |