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Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Missile Defense Agency **Date:** February 2020

| | |
|---|---|
| Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide I BA 3: Advanced Technology Development (ATD)</i> | R-1 Program Element (Number/Name) PE 0603294C / <i>Common Kill Vehicle Technology</i> |
|---|---|

| COST (\$ in Millions) | Prior Years | FY 2019 | FY 2020 | FY 2021 Base | FY 2021 OCO | FY 2021 Total | FY 2022 | FY 2023 | FY 2024 | FY 2025 | Cost To Complete | Total Cost |
|---|-------------|---------|---------|--------------|-------------|---------------|---------|---------|---------|---------|------------------|------------|
| Total Program Element | 256.671 | 55.549 | 13.600 | 11.058 | - | 11.058 | 10.996 | 11.052 | 11.290 | 11.563 | Continuing | Continuing |
| MD85: <i>Common Kill Vehicle Technology</i> | 253.708 | 49.509 | 10.941 | 10.619 | - | 10.619 | 10.560 | 10.608 | 10.712 | 10.932 | Continuing | Continuing |
| MD40: <i>Program Wide Support</i> | 2.963 | 6.040 | 2.659 | 0.439 | - | 0.439 | 0.436 | 0.444 | 0.578 | 0.631 | Continuing | Continuing |

Program MDAP/MAIS Code: 362

Note

The decrease from FY 2020 to FY 2021 reflects an adjustment to the Program Wide Support (PWS) allocation, which is calculated on a pro-rata basis of the total program element (PE) value by fiscal year (FY).

A. Mission Description and Budget Item Justification

The weapons systems technology maturation efforts under the CKV program element will develop kill vehicle concepts, identify key technology gaps, and establish efforts to reduce component risks. In addition, these efforts will inform system requirements that are feasible and affordable for the engineering, manufacturing and development of future systems.

The Missile Defense Agency will pursue multiple component risk reduction efforts for weapon technologies that will enable advanced concepts and designs to mature technology for future and current end-to-end weapon systems and components up to concept prototypes.

| B. Program Change Summary (\$ in Millions) | FY 2019 | FY 2020 | FY 2021 Base | FY 2021 OCO | FY 2021 Total |
|---|----------------|----------------|---------------------|--------------------|----------------------|
| Previous President's Budget | 56.753 | 13.600 | 13.475 | - | 13.475 |
| Current President's Budget | 55.549 | 13.600 | 11.058 | - | 11.058 |
| Total Adjustments | -1.204 | 0.000 | -2.417 | - | -2.417 |
| • Congressional General Reductions | 0.000 | 0.000 | | | |
| • Congressional Directed Reductions | 0.000 | 0.000 | | | |
| • 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 | -1.204 | 0.000 | | | |
| • Missile Defeat and Defense Enhancement | 0.000 | 0.000 | 0.000 | - | 0.000 |
| • Other Adjustment | 0.000 | 0.000 | -2.417 | - | -2.417 |

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Change Summary Explanation

Decrease in FY 2021 reflects an adjustment to the PWS allocation, which is calculated on a pro-rata basis of the total PE value by FY.

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| | | |
|--|---|--|
| Appropriation/Budget Activity 0400 / 3 | R-1 Program Element (Number/Name) PE 0603294C / <i>Common Kill Vehicle Technology</i> | Project (Number/Name) MD85 / <i>Common Kill Vehicle Technology</i> |
|--|---|--|

| COST (\$ in Millions) | Prior Years | FY 2019 | FY 2020 | FY 2021 Base | FY 2021 OCO | FY 2021 Total | FY 2022 | FY 2023 | FY 2024 | FY 2025 | Cost To Complete | Total Cost |
|---|-------------|---------|---------|--------------|-------------|---------------|---------|---------|---------|---------|------------------|------------|
| <i>MD85: Common Kill Vehicle Technology</i> | 253.708 | 49.509 | 10.941 | 10.619 | - | 10.619 | 10.560 | 10.608 | 10.712 | 10.932 | Continuing | Continuing |

Note

The decrease from FY 2020 to FY 2021 reflects an adjustment to the Program Wide Support (PWS) allocation, which is calculated on a pro-rata basis of the total program element (PE) value by fiscal year (FY).

A. Mission Description and Budget Item Justification

The CKV program will enhance weapons systems performance to enable the Warfighter to counter numerous and complex threats to the homeland by establishing the technological foundation for improving current and future systems. The Missile Defense Agency is developing next-generation kill vehicle concepts and technology based on a modular open systems architecture designed to common interfaces and standards, making upgrades easier, and enabling a more competitive, broader supplier industrial base.

Common Kill Vehicle (CKV) Technology research efforts will include maturation of advanced weapon technologies for current weapon systems concepts (e.g., Aegis, Terminal High Altitude Area Defense (THAAD), Ground-Based Midcourse Defense (GMD)) and advance concepts and designs to mature technology for future and current end-to-end weapon systems and components up to concept prototypes. The CKV program efforts will be well integrated with the Missile Defense System architecture.

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

| | | | | |
|---|---------|---------|--|---------|
| Title: Common Kill Vehicle | FY 2019 | FY 2020 | | FY 2021 |
| Description: CKV research efforts will include maturation of advanced weapons technologies for current weapon systems concepts (e.g., Aegis, THAAD, GMD) and advance concepts and designs to mature technology for future and current end-to-end weapon systems and components up to concept prototypes. | 49.509 | 10.941 | | 10.619 |
| Specific and/or unique accomplishments to each FY are as follows: | | | | |
| FY 2020 Plans: Develop weapon system concepts, identify key technology gaps, and develop and test technologies necessary to the successful requirements validation and technology risk reduction of advanced MDS weapon systems. | | | | |
| FY 2021 Plans: | | | | |

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| Exhibit R-2A, RDT&E Project Justification: PB 2021 Missile Defense Agency | | Date: February 2020 |
| Appropriation/Budget Activity 0400 / 3 | R-1 Program Element (Number/Name) PE 0603294C / <i>Common Kill Vehicle Technology</i> | Project (Number/Name) MD85 / <i>Common Kill Vehicle Technology</i> |

| B. Accomplishments/Planned Programs (\$ in Millions) | FY 2019 | FY 2020 | FY 2021 |
|---|----------------|----------------|----------------|
| Develop weapon system concepts, identify key technology gaps, and develop and test technologies necessary to the successful requirements validation and technology risk reduction of advanced MDS weapon systems. | | | |
| FY 2020 to FY 2021 Increase/Decrease Statement: N/A | | | |
| Accomplishments/Planned Programs Subtotals | 49.509 | 10.941 | 10.619 |

| C. Other Program Funding Summary (\$ in Millions) | | | | | | | | | | | |
|---|----------------|----------------|-------------------------|------------------------|--------------------------|----------------|----------------|----------------|----------------|-----------------------------|-------------------|
| Line Item | FY 2019 | FY 2020 | FY 2021 Base | FY 2021 OCO | FY 2021 Total | FY 2022 | FY 2023 | FY 2024 | FY 2025 | Cost To Complete | Total Cost |
| • 0603176C: <i>Advanced Concepts and Performance Assessment</i> | 12.720 | 46.201 | 14.910 | - | 14.910 | 15.178 | 16.205 | 16.879 | 17.300 | Continuing | Continuing |
| • 0603178C: <i>Weapons Technology</i> | 13.400 | 0.000 | 0.000 | - | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | Continuing | Continuing |
| • 0603180C: <i>Advanced Research</i> | 42.100 | 27.674 | 18.687 | - | 18.687 | 18.883 | 18.975 | 19.720 | 20.222 | Continuing | Continuing |
| • 0604894C: <i>Multi Object Kill Vehicle</i> | 5.754 | 0.000 | 0.000 | - | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 5.754 |

Remarks

D. Acquisition Strategy

The full acquisition strategy consists of three focus areas. First, through competition with industry, develop weapon system architectures and interfaces with competitive design for improvements to current and future weapon systems. Second, conduct risk reduction activities to identify and mature the technology necessary to increase the reliability and performance of our weapon systems using the Advanced Technology Innovation Broad Agency Announcement and competitive development. Make investments that mitigate the component technology gaps for current and future weapon systems that enhance the competitive environment. Third, leverage the technical expertise of Federally Funded Research and Development Centers, University Applied Research Centers, and Universities and government laboratories to independently develop reference concepts using proven modeling and analysis techniques.

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| Appropriation/Budget Activity 0400 / 3 | R-1 Program Element (Number/Name) PE 0603294C / <i>Common Kill Vehicle Technology</i> | Project (Number/Name) MD40 / <i>Program Wide Support</i> |
|--|---|--|

| COST (\$ in Millions) | Prior Years | FY 2019 | FY 2020 | FY 2021 Base | FY 2021 OCO | FY 2021 Total | FY 2022 | FY 2023 | FY 2024 | FY 2025 | Cost To Complete | Total Cost |
|-----------------------------------|-------------|---------|---------|--------------|-------------|---------------|---------|---------|---------|---------|------------------|------------|
| MD40: <i>Program Wide Support</i> | 2.963 | 6.040 | 2.659 | 0.439 | - | 0.439 | 0.436 | 0.444 | 0.578 | 0.631 | Continuing | Continuing |

Note

Program Wide Support (PWS) is allocated on a pro-rata basis across multiple Agency PEs each fiscal year based on the total Agency budget, and therefore fluctuates per PE by fiscal year.

A. Mission Description and Budget Item Justification

PWS contains non-headquarters management costs in support of MDA functions and activities across the entire MDS. These functions include Government Civilians and Contract Support Services. This effort provides integrity and oversight of the MDS 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 worldwide. 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 across multiple geographic locations; commercial and ancillary facility services; management of all facility aspects regardless of lifecycle stage; supplies and maintenance; compliance with statutory environmental requirements; data and unified communications support; materiel and readiness and central property management of equipment; Facilities Sustainment, Restoration and Modernization (FSRM) program, (formerly Real Property Maintenance) to keep the Department's inventory of facilities in good working order; 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)

| | | | |
|--|---------|---------|---------|
| Title: Program Wide Support | FY 2019 | FY 2020 | FY 2021 |
| Description: PWS contains non-headquarters management costs in support of MDA functions and activities across the entire MDS. These functions include Government Civilians and Contract Support Services. This effort provides integrity and oversight of the MDS 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 worldwide. 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 across multiple geographic locations; commercial and ancillary facility services; management of all facility aspects regardless of lifecycle stage; supplies and maintenance; compliance with statutory environmental requirements; data and unified communications support; materiel and readiness and central property management of equipment; Facilities Sustainment, Restoration and Modernization (FSRM) program, (formerly Real Property Maintenance) to keep the Department's inventory of | 6.040 | 2.659 | 0.439 |

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| B. Accomplishments/Planned Programs (\$ in Millions) | FY 2019 | FY 2020 | FY 2021 |
|---|----------------|----------------|----------------|
| facilities in good working order; 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. | | | |
| <i>FY 2020 Plans:</i> - SEE ABOVE. | | | |
| <i>FY 2021 Plans:</i> - SEE ABOVE. | | | |
| <i>FY 2020 to FY 2021 Increase/Decrease Statement:</i> Decrease from FY 2020 to FY 2021 reflects the PWS allocation on a pro-rata basis across multiple Agency PEs each fiscal year based on the total Agency budget, and therefore fluctuates per PE by fiscal year. | | | |
| Accomplishments/Planned Programs Subtotals | 6.040 | 2.659 | 0.439 |

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

N/A

Remarks

D. Acquisition Strategy

N/A