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Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Missile Defense Agency										Date: March 2019		
Appropriation/Budget Activity 0400: Research, Development, Test & Evaluation, Defense-Wide I BA 3: Advanced Technology Development (ATD)					R-1 Program Element (Number/Name) PE 0603294C I Common Kill Vehicle Technology							
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	201.109	55.562	56.753	13.600	-	13.600	13.475	16.187	18.232	22.949	Continuing	Continuing
MD85: Common Kill Vehicle Technology	201.109	52.599	50.713	10.941	-	10.941	10.941	10.940	10.950	10.950	Continuing	Continuing
MD40: Program Wide Support	-	2.963	6.040	2.659	-	2.659	2.534	5.247	7.282	11.999	Continuing	Continuing
Program MDAP/MAIS Code: 362												

Note

Beginning in FY 2020, in accordance with Department priorities, Multi Object Kill Vehicle (MOKV) efforts include limited component technology maturation and concept studies for future MOKV development.

A. Mission Description and Budget Item Justification

The MOKV program will enhance interceptor performance to enable the Warfighter to counter numerous and complex threats to the homeland by establishing the technological foundation for engaging multiple objects from a single interceptor compared to what is currently fielded. The Missile Defense Agency (MDA) is developing the concepts for an MOKV 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.

MOKV will rely on a Ballistic Missile Defense System (BMDS) architecture that balances performance across the sensor, Command, Control, Battle Management and Communications, and kill vehicle elements. Analysis shows 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 per kill to defend the Homeland.

B. Program Change Summary (\$ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Previous President's Budget	252.879	189.753	205.645	-	205.645
Current President's Budget	55.562	56.753	13.600	-	13.600
Total Adjustments	-197.317	-133.000	-192.045	-	-192.045
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	-160.000	-55.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	0.000			
• Congressional Directed Transfers	-36.000	-78.000			
• Reprogrammings	0.000	0.000			
• SBIR/STTR Transfer	-1.317	0.000			
• Missile Defeat and Defense Enhancement	0.000	0.000	0.000	-	0.000

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0400: Research, Development, Test & Evaluation, Defense-Wide I BA 3: Advanced Technology Development (ATD)		PE 0603294C I Common Kill Vehicle Technology			
• Other Adjustment		0.000	0.000	-192.045	-192.045
Change Summary Explanation					
Decrease in FY 2018 from PB19 to PB20 reflects the congressional adjustment of -\$196.000 million in accordance with the FY 2018 Appropriations Act.					
Decrease in FY 2019 from PB19 to PB20 reflects the congressional adjustment of -\$133.000 million in accordance with the FY 2019 Appropriations Act.					
Decrease in FY 2020 from PB19 to PB20 reflects reduced MOKV efforts to limited component technology maturation and concept studies for future MOKV development in accordance with Department priorities.					

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Appropriation/Budget Activity 0400 / 3					R-1 Program Element (Number/Name) PE 0603294C / Common Kill Vehicle Technology				Project (Number/Name) MD85 / Common Kill Vehicle Technology																											
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: Common Kill Vehicle Technology	201.109	52.599	50.713	10.941	-	10.941	10.941	10.940	10.950	10.950	Continuing	Continuing																								
<p>Note</p> <p>Beginning in FY 2020, in accordance with Department priorities, Multi Object Kill Vehicle (MOKV) efforts include limited component technology maturation and concept studies for future MOKV development.</p> <p>A. Mission Description and Budget Item Justification</p> <p>MDA will focus on MOKV competitive technology risk reduction with industry.</p> <p>The MOKV concepts and identified technology component risk reduction will formulate the trade space across cost, risk, and kill vehicle performance to inform requirements that are feasible and affordable for the engineering, manufacturing and development of a future MOKV.</p> <p>As part of MOKV concept development, industry identified technology component risk reduction efforts that support their concepts. In FY 2019, MDA will continue limited risk reduction for selected kill vehicle and carrier vehicle component technologies that lower technical risk. MOKV limited component technology risk reduction will draw from existing efforts such as engagement management, communications, seekers and advanced sensors, divert attitude and control systems, integrated avionics, and inertial measurement units. In FY 2020, MOKV efforts are limited to component technology maturation and concept studies for future MOKV development.</p> <p>B. Accomplishments/Planned Programs (\$ in Millions)</p> <table><tr><td></td><td>FY 2018</td><td>FY 2019</td><td>FY 2020</td></tr><tr><td>Title: Common Kill Vehicle</td><td>52.599</td><td>50.713</td><td>10.941</td></tr><tr><td colspan="4">Description: Competitive component technology risk reduction of MOKV concepts with industry. Specific and/or unique accomplishments to each FY are as follows:</td></tr><tr><td colspan="4">FY 2019 Plans: Conduct limited technology risk reduction for selected component technologies that lower technical risk. Potential candidate MOKV limited component technology risk reduction will draw from existing efforts such as engagement management, communications, seekers and advanced sensors, divert attitude and control systems, integrated avionics, and inertial measurement units.</td></tr><tr><td colspan="4">FY 2020 Plans: Conduct limited component technology maturation and concept studies for future MOKV development.</td></tr><tr><td colspan="4">FY 2019 to FY 2020 Increase/Decrease Statement:</td></tr></table>														FY 2018	FY 2019	FY 2020	Title: Common Kill Vehicle	52.599	50.713	10.941	Description: Competitive component technology risk reduction of MOKV concepts with industry. Specific and/or unique accomplishments to each FY are as follows:				FY 2019 Plans: Conduct limited technology risk reduction for selected component technologies that lower technical risk. Potential candidate MOKV limited component technology risk reduction will draw from existing efforts such as engagement management, communications, seekers and advanced sensors, divert attitude and control systems, integrated avionics, and inertial measurement units.				FY 2020 Plans: Conduct limited component technology maturation and concept studies for future MOKV development.				FY 2019 to FY 2020 Increase/Decrease Statement:			
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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>			

B. Accomplishments/Planned Programs (\$ in Millions)							FY 2018	FY 2019	FY 2020
In FY 2020, in accordance with Department priorities, Multi Object Kill Vehicle (MOKV) efforts include limited component technology maturation and concept studies for future MOKV development.									
Accomplishments/Planned Programs Subtotals							52.599	50.713	10.941

C. Other Program Funding Summary (\$ in Millions)											
Line Item	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
• 0603176C: <i>Advanced Concepts and Performance Assessment</i>	17.683	13.017	14.208	-	14.208	14.904	15.142	16.262	16.574	Continuing	Continuing
• 0603178C: <i>Weapons Technology</i>	28.894	13.400	10.000	-	10.000	10.000	10.000	0.000	0.000	Continuing	Continuing
• 0603180C: <i>Advanced Research</i>	23.765	42.565	20.674	-	20.674	21.154	21.521	22.041	22.465	Continuing	Continuing
• 0604894C: <i>Multi Object Kill Vehicle</i>	6.347	6.500	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	12.847
Remarks											
D. Acquisition Strategy											
The full acquisition strategy consists of three focus areas. First, through competition with missile integration contractors, develop kill vehicle architectures and interfaces with competitive design of multi- object kill 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 and competitive procurements. Make investments that mitigate the component technology gaps for future multi- object kill vehicles 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 concept using proven modeling and analysis techniques.											
E. Performance Metrics											
N/A											

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Appropriation/Budget Activity 0400 / 3					R-1 Program Element (Number/Name) PE 0603294C / Common Kill Vehicle Technology				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	-	2.963	6.040	2.659	-	2.659	2.534	5.247	7.282	11.999	Continuing	Continuing

Note

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

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)

	FY 2018	FY 2019	FY 2020
Title: Program Wide Support	2.963	6.040	2.659
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.			
FY 2019 Plans: - SEE ABOVE.			
FY 2020 Plans:			

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B. Accomplishments/Planned Programs (\$ in Millions)		FY 2018	FY 2019
- SEE ABOVE.			
FY 2019 to FY 2020 Increase/Decrease Statement: Decrease from FY 2019 to FY 2020 reflects the PWS allocation on a pro-rata basis across multiple Agency PE's each fiscal year based on the total Agency budget, and therefore fluctuates per PE by fiscal year.			
Accomplishments/Planned Programs Subtotals		2.963	6.040
C. Other Program Funding Summary (\$ in Millions) N/A			
Remarks			
D. Acquisition Strategy N/A			
E. Performance Metrics N/A			