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<b>Exhibit R-2, RDT&amp;E Budget Item Justification:</b> FY 2018 Missile Defense Agency	<b>Date:</b> May 2017
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<b>Appropriation/Budget Activity</b> 0400: <i>Research, Development, Test &amp; Evaluation, Defense-Wide / BA 4: Advanced Component Development &amp; Prototypes (ACD&amp;P)</i>	<b>R-1 Program Element (Number/Name)</b> PE 0604894C / <i>Multi Object Kill Vehicle</i>
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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	-	0.000	71.513	6.500	-	6.500	3.500	229.524	209.830	265.898	0	786.765
MD85: <i>Multi Object Kill Vehicle</i>	-	0.000	68.201	6.500	-	6.500	3.500	225.755	205.048	261.062	0	770.066
MD40: <i>Program-Wide Support</i>	-	0.000	3.312	0.000	-	0.000	0.000	3.769	4.782	4.836	0	16.699

**Program MDAP/MAIS Code:** 362

**Note**

In FY 2018, funding for Multi Object Kill Vehicle (MOKV) Development is requested in the Multi Object Kill Vehicle Program Element 0604894C and the MOKV Risk Reduction is requested in the Common Kill Vehicle Technology Program Element 0603294C.

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

The Multi-Object Kill Vehicle (MOKV) program will enhance Ground-Based Midcourse Defense (GMD) 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 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.

<b><u>B. Program Change Summary (\$ in Millions)</u></b>	<b><u>FY 2016</u></b>	<b><u>FY 2017</u></b>	<b><u>FY 2018 Base</u></b>	<b><u>FY 2018 OCO</u></b>	<b><u>FY 2018 Total</u></b>
Previous President's Budget	0.000	71.513	34.884	-	34.884
Current President's Budget	0.000	71.513	6.500	-	6.500
Total Adjustments	0.000	0.000	-28.384	-	-28.384
• 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	0.000	0.000			
• Other Adjustment	0.000	0.000	-28.384	-	-28.384

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Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Missile Defense Agency		Date: May 2017
<b>Appropriation/Budget Activity</b> 0400: <i>Research, Development, Test &amp; Evaluation, Defense-Wide I</i> BA 4: <i>Advanced Component Development &amp; Prototypes (ACD&amp;P)</i>	<b>R-1 Program Element (Number/Name)</b> PE 0604894C / <i>Multi Object Kill Vehicle</i>	
<p><b><u>Change Summary Explanation</u></b></p> <p>The decrease in FY2018 from PB17 to PB18 is due to the transfer of MOKV technology risk reduction to the Common Kill Vehicle Technology program element 0603294C to align with the FY 2017 Congressional Appropriation Conference Report.</p>		

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency										Date: May 2017		
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 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
MD85: Multi Object Kill Vehicle	-	0.000	68.201	6.500	-	6.500	3.500	225.755	205.048	261.062	0	770.066
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

**Note**

N/A

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

The Ground-based Midcourse Defense (GMD) element of the Ballistic Missile Defense System (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 Multi-Object Kill Vehicle (MOKV) that will be able to defeat complex future threats.

MDA will develop an MOKV that is:

- Effective, with the weapon payload able to use on-board and off-board data to acquire, track, select, engage and negate the threats
- Capable, enabling protection of the defended area with sufficient battlespace to meet the warfighter needs
- Enduring, available and reliable over a long service life
- Resilient, with graceful degradation, and survivable in natural and man-made wartime environments
- Compatible and fully integrated as a component of the BMDS, optimized to perform within the baseline BMDS architecture
- Modular, supporting open architecture and standards to enable efficient upgrades and sustainment
- Evolvable to future architecture expansion and modifications

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

	<b>FY 2016</b>	<b>FY 2017</b>	<b>FY 2018</b>
<b>Title:</b> Multi-Object Kill Vehicle	0.000	68.201	6.500
<b>Articles:</b>	-	-	-
<p><b>Description:</b> Development of the Multi Object Kill Vehicle (MOKV) Development Acquisition Strategy. In FY 2018 funding for MOKV Development is requested in the Multi Object Kill Vehicle program element 0604894C and the MOKV Risk Reduction is requested in the Common Kill Vehicle Technology program element 0603294C.</p> <p>The MOKV concept 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><b>FY 2016 Accomplishments:</b></p>			

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> FY 2018 Missile Defense Agency		<b>Date:</b> May 2017	
<b>Appropriation/Budget Activity</b> 0400 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0604894C / <i>Multi Object Kill Vehicle</i>	<b>Project (Number/Name)</b> MD85 / <i>Multi Object Kill Vehicle</i>	
<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>		<b>FY 2016</b>	<b>FY 2017</b>
N/A  <b>FY 2017 Plans:</b> see above  <b>FY 2018 Plans:</b> Decrease from FY 2017 to FY 2018 due to transfer of risk reduction funds to the Common Kill Vehicle Technology program element 0603294C.  - Conduct market research to shape acquisition strategy - Develop an acquisition strategy for competitive development, engineering, test, manufacture, and production for the MOKV - Establish initial modeling and simulation capability to support MOKV project decisions - Initiate contract requirements development			
<b>Accomplishments/Planned Programs Subtotals</b>		0.000	68.201
<b>C. Other Program Funding Summary (\$ in Millions)</b>			
N/A			
<b>Remarks</b>			
<b>D. Acquisition Strategy</b>			
The acquisition strategy will support transition of Multi Object Kill Vehicle (MOKV) from risk reduction activities into a full development effort as an integrated part of the Ground-based Midcourse Defense Element. The MOKV project will follow a pre-planned product improvement strategy and use modular open architectures to allow MDA to incorporate advanced technologies into the design once the technologies are sufficiently mature. MDA will use proven analysis and testing techniques to independently verify contractor designs against the defined system performance specifications and standards prior to production.			
<b>E. Performance Metrics</b>			
N/A			

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Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Missile Defense Agency												Date: May 2017			
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 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
Multi-Object Kill Vehicle - Inertial Measurement Unit Development	C/CPFF	Kearfott : NJ	0.000	0.000		3.700	Nov 2016	0.000		-		0.000	Continuing	Continuing	Continuing
Multi-Object Kill Vehicle - MOKV Technology Risk Reduction	C/CPFF	TBD : TBD	0.000	0.000		44.463	Nov 2016	0.000		-		0.000	Continuing	Continuing	Continuing
Subtotal			0.000	0.000		48.163		0.000		-		0.000	-	-	-
Remarks															
N/A															
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
Multi-Object Kill Vehicle - Contract Support Services	C/CPFF	Various : AL/AK/CA/CO/VA	0.000	0.000		0.909	Oct 2016	2.800	Nov 2017	-		2.800	Continuing	Continuing	Continuing
Multi-Object Kill Vehicle - Contract Support Services DV	C/CPFF	Various : AL	0.000	0.000		0.860	Nov 2016	0.000		-		0.000	Continuing	Continuing	Continuing
Multi-Object Kill Vehicle - FFRDC Support Services	MIPR	Various : Various	0.000	0.000		0.000		0.750	Nov 2017	-		0.750	Continuing	Continuing	Continuing
Multi-Object Kill Vehicle - Government Civilian Salaries GM	Allot	MDA : AL/VA	0.000	0.000		1.364	Oct 2016	0.000		-		0.000	Continuing	Continuing	Continuing
Multi-Object Kill Vehicle - Government Civilian Salaries and Travel	Allot	MDA : AL	0.000	0.000		4.866	Oct 2016	0.000		-		0.000	Continuing	Continuing	Continuing
Multi-Object Kill Vehicle - Inertial Measurement Unit Radiation Support	MIPR	TBD : TBD	0.000	0.000		0.300	Nov 2016	0.000		-		0.000	Continuing	Continuing	Continuing
Multi-Object Kill Vehicle - Inertial Measurement Unit Support	MIPR	Army Aviation and Missile Research Development and	0.000	0.000		0.150	Nov 2016	0.000		-		0.000	Continuing	Continuing	Continuing

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Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Missile Defense Agency												Date: May 2017			
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					
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
		Engineering Center : AL													
Multi-Object Kill Vehicle - MOKV Engagement Management Algorithms	MIPR	MIT/LL : MA	0.000	0.000		0.400	Oct 2016	0.000		-		0.000	Continuing	Continuing	Continuing
Multi-Object Kill Vehicle - MOKV Engineering Support	C/CPFF	Johns Hopkins University / Applied Research Lab : MD	0.000	0.000		3.476	Nov 2016	0.000		-		0.000	Continuing	Continuing	Continuing
Multi-Object Kill Vehicle - MOKV Engineering/ Engagement Management Support	MIPR	Army Aviation and Missile Research Development and Engineering Center : AL	0.000	0.000		2.920	Nov 2016	0.000		-		0.000	Continuing	Continuing	Continuing
Multi-Object Kill Vehicle - MOKV OGA Support	MIPR	NSWC Carderock : MD	0.000	0.000		0.194	Nov 2016	0.000		-		0.000	Continuing	Continuing	Continuing
Multi-Object Kill Vehicle - MOKV Seeker Engineering Support	C/CPFF	Utah State University/Space Dynamics Lab : UT	0.000	0.000		0.390	Nov 2016	0.000		-		0.000	Continuing	Continuing	Continuing
Multi-Object Kill Vehicle - Other Government Agencies	MIPR	Various : Various	0.000	0.000		0.000		1.800	Nov 2017	-		1.800	Continuing	Continuing	Continuing
Multi-Object Kill Vehicle - Technical Direction Agent	MIPR	Various : AL/CA/GA/MA/MD/NM/UT/VA	0.000	0.000		2.691	Oct 2016	1.150	Nov 2017	-		1.150	Continuing	Continuing	Continuing
Multi-Object Kill Vehicle - Various	TBD	Various : Various	0.000	0.000		1.518	Oct 2016	0.000		-		0.000	Continuing	Continuing	Continuing
Subtotal			0.000	0.000		20.038		6.500		-		6.500	-	-	-
Remarks N/A															

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<b>Exhibit R-3, RDT&amp;E Project Cost Analysis: FY 2018 Missile Defense Agency</b>												<b>Date: May 2017</b>		
<b>Appropriation/Budget Activity</b> 0400 / 4						<b>R-1 Program Element (Number/Name)</b> PE 0604894C / <i>Multi Object Kill Vehicle</i>				<b>Project (Number/Name)</b> MD85 / <i>Multi Object Kill Vehicle</i>				

  

<b>Test and Evaluation (\$ in Millions)</b>				<b>FY 2016</b>		<b>FY 2017</b>		<b>FY 2018 Base</b>		<b>FY 2018 OCO</b>		<b>FY 2018 Total</b>			
<b>Cost Category Item</b>	<b>Contract Method &amp; Type</b>	<b>Performing Activity &amp; Location</b>	<b>Prior Years</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Cost To Complete</b>	<b>Total Cost</b>	<b>Target Value of Contract</b>
<b>Subtotal</b>			-	-		-		-		-		-	-	-	-

  

<b>Remarks</b> N/A															
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			<b>Prior Years</b>	<b>FY 2016</b>		<b>FY 2017</b>		<b>FY 2018 Base</b>		<b>FY 2018 OCO</b>		<b>FY 2018 Total</b>	<b>Cost To Complete</b>	<b>Total Cost</b>	<b>Target Value of Contract</b>
<b>Project Cost Totals</b>			0.000	0.000		68.201		6.500		-		6.500	-	-	-

  

<b>Remarks</b> N/A															
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Exhibit R-4, RDT&E Schedule Profile: FY 2018 Missile Defense Agency														Date: May 2017						
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 2016		FY 2017		FY 2018		FY 2019		FY 2020		FY 2021		FY 2022		
MOKV Development Acquisition Strategy											◇	◇	◇	◇	◇	◇	◇			
MOKV Development														◇	◇	◇	◇	◇	◇	◇



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<b>Exhibit R-4A, RDT&amp;E Schedule Details:</b> FY 2018 Missile Defense Agency	<b>Date:</b> May 2017
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<b>Appropriation/Budget Activity</b> 0400 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0604894C / <i>Multi Object Kill Vehicle</i>	<b>Project (Number/Name)</b> MD85 / <i>Multi Object Kill Vehicle</i>
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Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
MOKV Development Acquisition Strategy	1	2018	4	2019
MOKV Development	1	2020	4	2023

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency										Date: May 2017		
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 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
MD40: Program-Wide Support	-	0.000	3.312	0.000	-	0.000	0.000	3.769	4.782	4.836	0	16.699
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

**Note**

Beginning FY 2017, Program Wide Support (PWS) was proportionately allocated to Multi Object Kill Vehicle.

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

PWS contains non-headquarters management costs, including Government Civilians and Contract Support Services , in support of MDA functions and activities across the entire BMDS. 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 Global Deployment personnel and support performing deployment site preparation and activation and, provides facility capabilities for MDA Executing Agent locations. Other MDA wide costs includes: 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 and therefore, fluctuates by year based on the adjusted RDT&E profile (which excludes: 0305103C Cyber Security Initiative, 0603274C Special Programs, 0603913C Israeli Cooperative Program and 0901598C Management Headquarters).

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

	<b>FY 2016</b>	<b>FY 2017</b>	<b>FY 2018</b>
<b>Title:</b> Program Wide Support	0.000	3.312	0.000
<b>Articles:</b>	-	-	-
<b>Description:</b> N/A			
<b>FY 2016 Accomplishments:</b> N/A			
<b>FY 2017 Plans:</b> - This is a new Program Element beginning FY 2017. 0604894C Multi-Object Kill Vehicle was created in FY 2017 transitioning from 0603294C Common Kill Vehicle. Program Wide Support was redistributed across RDT&E Program Elements with a proportional allocation to Multi-Object Kill Vehicle			
<b>FY 2018 Plans:</b> N/A			
<b>Accomplishments/Planned Programs Subtotals</b>	0.000	3.312	0.000

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency		Date: May 2017
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>C. Other Program Funding Summary (\$ in Millions)</b> N/A		
<b>Remarks</b>		
<b>D. Acquisition Strategy</b> N/A		
<b>E. Performance Metrics</b> N/A		

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Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Missile Defense Agency												Date: May 2017			
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 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
Program Wide Support - Agency Operations Management	Allot	Various : Multi: AL, CA, CO, VA	0.000	0.000		0.066	Jul 2017	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		2.327	Aug 2017	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		0.919	Jul 2017	0.000		-		0.000	Continuing	Continuing	Continuing
Subtotal			0.000	0.000		3.312		0.000		-		0.000	-	-	-
Remarks N/A															
			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			0.000	0.000		3.312		0.000		-		0.000	-	-	-
Remarks N/A															

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Exhibit R-4, RDT&E Schedule Profile: FY 2018 Missile Defense Agency														Date: May 2017																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															
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**UNCLASSIFIED**

<b>Exhibit R-4A, RDT&amp;E Schedule Details:</b> FY 2018 Missile Defense Agency	<b>Date:</b> May 2017
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<b>Appropriation/Budget Activity</b> 0400 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0604894C / <i>Multi Object Kill Vehicle</i>	<b>Project (Number/Name)</b> MD40 / <i>Program-Wide Support</i>
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Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
MD40 Program-Wide Support	1	2017	4	2022