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Exhibit R-2, RDT&E Budget Item Justification: PB 2015 Missile Defense Agency **Date:** March 2014

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 0603901C / <i>Directed Energy Research</i>
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COST (\$ in Millions)	Prior Years	FY 2013	FY 2014	FY 2015 Base	FY 2015 OCO #	FY 2015 Total	FY 2016	FY 2017	FY 2018	FY 2019	Cost To Complete	Total Cost
Total Program Element	46.243	20.024	-	-	-	-	-	-	-	-	-	66.267
MD69: <i>Directed Energy Research</i>	46.243	18.923	-	-	-	-	-	-	-	-	-	65.166
MD40: <i>Program-Wide Support</i>	-	1.101	-	-	-	-	-	-	-	-	-	1.101

MDAP/MAIS Code: 362

The FY 2015 OCO Request will be submitted at a later date.

Note
FY 2014 and 2015 funding is requested in the Weapons Technology Program Element, 0603178C, Project MD69.

A. Mission Description and Budget Item Justification

The Missile Defense Agency (MDA) is conducting research into the transmission and control of directed energy largely above the atmosphere for non-intercept missile defense applications and ultimately boost phase intercepts. The agency works in collaboration with the Office of the Assistant Secretary of Defense for Research and Engineering, the Defense Advanced Research Projects Agency and the High Energy Laser Joint Technology Office in a systems engineering based strategy for the research, development, test and evaluation of high energy laser technologies.

To transition to the next generation high power directed energy platform, MDA is pursuing two promising laser technologies in a competitive environment. These candidate laser systems offer a path to high efficiency, electrically-driven, compact, light-weight high energy lasers for multiple missile defense applications including discrimination and boost phase defense. MDA is pursuing the Diode Pumped Alkali Laser System and fiber combining laser technologies based on their efficiency and scaling potential. A 200 kilowatt (kW) class flight qualifiable laser prototype will be built and tested based on the selected technology for Ballistic Missile Defense System (BMDS) enhancement. In parallel with laser development, a surrogate high altitude, long endurance platform will be instrumented to collect high altitude flight environment data to inform the design and flight compatible packaging of the high powered laser payloads. MDA is also investing in a number of advanced technology initiatives which will support the design of the next-generation airborne laser platform.

The Directed Energy Research contributions to the Prioritized Capabilities List include: Prevent Attack - counter emerging or advanced air and missile threats and Persistent Surveillance - improve birth-to-death tracking, identification and targeting.

MD40 Program-Wide Support (PWS) consists of essential non-headquarters management costs in support of the MDA functions and activities across the entire Ballistic Missile Defense System (BMDS).

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B. Program Change Summary (\$ in Millions)	FY 2013	FY 2014	FY 2015 Base	FY 2015 OCO	FY 2015 Total
Previous President's Budget	46.944	-	-	-	-
Current President's Budget	20.024	-	-	-	-
Total Adjustments	-26.920	-	-	-	-
• Congressional General Reductions	-0.030	-			
• Congressional Directed Reductions	-24.000	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-0.777	-			
• SBIR/STTR Transfer	-0.219	-			
• Other Adjustment	-1.894	-	-	-	-

Change Summary Explanation

The FY 2013 Reduction is a result of Congressional Directed Reductions and SBIR/STTR transfers.

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Appropriation/Budget Activity 0400 / 3					R-1 Program Element (Number/Name) PE 0603901C / <i>Directed Energy Research</i>				Project (Number/Name) MD69 / <i>Directed Energy Research</i>			
COST (\$ in Millions)	Prior Years	FY 2013	FY 2014	FY 2015 Base	FY 2015 OCO #	FY 2015 Total	FY 2016	FY 2017	FY 2018	FY 2019	Cost To Complete	Total Cost
MD69: <i>Directed Energy Research</i>	46.243	18.923	-	-	-	-	-	-	-	-	-	65.166

The FY 2015 OCO Request will be submitted at a later date.

Note

N/A

A. Mission Description and Budget Item Justification

The Missile Defense Agency (MDA) is partnering with Federally Funded Research and Development Centers (FFRDCs) and the Defense Advanced Research Projects Agency (DARPA) to pursue advanced laser technologies such as the Diode Pumped Alkali Laser System (DPALS) and fiber laser beam combining systems in a competitive environment, and will monitor other emerging laser technologies for investment and development.

FY 2014 and 2015 Base Plans have been transferred to the Weapons Technology Program Element 0603178C, Budget Project MD69

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

	FY 2013	FY 2014	FY 2015
Title: Directed Energy Research	18.923	-	-
Description: Laser Technology Development/Airborne Laser Test Bed Closeout			
FY 2013 Accomplishments:			
-Made investments to mature directed energy technology for missile defense applications			
-Continued development of next-generation kilowatt-class fiber amplifiers. Procured 27 compact fiber amps from Nufern and IPG Photonics. Demonstrated highest power to date, 1.5 kilowatts, from a beam combinable, single fiber amplifier.			
-Continued development of fiber laser beam combining techniques to validate laser combining architectures. Demonstrated ability to coherently combine 21 separate fiber amplifiers, reaching a world record output power of 17.5 kilowatts with near perfect beam quality.			
-Continued development of high power diode-pumped alkali systems. Set multiple world records to include a maximum output power of 3.91 kilowatts and a laser run time of 4 minutes.			
-Conducted experiments to characterize the high altitude, low Mach flight environment. Designed, fabricated, and integrated a platform vibration instrumentation package into the Phantom Eye Unmanned Aerial Vehicle (UAV). Completed an initial flight, collecting data from take off to 28,000 feet.			

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Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 0603901C / <i>Directed Energy Research</i>	Project (Number/Name) MD69 / <i>Directed Energy Research</i>
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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2013	FY 2014	FY 2015
<p>-Removed/de-militarized Airborne Laser Test Bed (ALTB) hardware, fixtures, tooling and government furnished property. Dispositioned 13,000 property line items valued at \$78 million and 1,000 ALTB aircraft parts valued at \$30 million to 36 DoD organizations for re-use.</p> <p>FY 2014 Plans: FY 2014 plans have been transferred to the Weapons Technology Program Element 0603178C, Budget Project MD69</p> <p>FY 2015 Plans: N/A</p>			
Accomplishments/Planned Programs Subtotals	18.923	-	-

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

N/A

Remarks

D. Acquisition Strategy

N/A

E. Performance Metrics

N/A

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Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 0603901C / <i>Directed Energy Research</i>	Project (Number/Name) MD40 / <i>Program-Wide Support</i>
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COST (\$ in Millions)	Prior Years	FY 2013	FY 2014	FY 2015 Base	FY 2015 OCO #	FY 2015 Total	FY 2016	FY 2017	FY 2018	FY 2019	Cost To Complete	Total Cost
MD40: <i>Program-Wide Support</i>	-	1.101	-	-	-	-	-	-	-	-	-	1.101

The FY 2015 OCO Request will be submitted at a later date.

Note

N/A

A. Mission Description and Budget Item Justification

Program-Wide Support (PWS) contains non-headquarters management costs in support of Missile Defense Agency (MDA) functions and activities across the entire Ballistic Missile Defense System (BMDS). It includes Government Civilians, Contract Support Service, and Federally Funded Research and Development Center (FFRDC) providing integrity and oversight of the BMDS as well as, supporting MDA in enabling the development and evaluation of technologies that will respond to the changing threat. In addition, includes Global Deployment personnel and support performing deployment site preparation and activation. Other costs included provide facility capabilities for MDA Executing Agent locations, such as physical and technical security, legal services, travel and agency training, office and equipment leases, utilities, data and unified communications support, supplies and maintenance, materiel and readiness and central property management of equipment, and similar operating expenses. Also includes legal settlements. In keeping with congressional intent, Program Wide Support is allocated on a pro-rata basis and therefore, fluctuates by year based on the total MDA budget.

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

	FY 2013	FY 2014	FY 2015
Title: Program Wide Support	1.101	-	-
Description: N/A			
FY 2013 Accomplishments: See paragraph A: Mission Description and Budget Item Justification			
FY 2014 Plans: See paragraph A: Mission Description and Budget Item Justification			
FY 2015 Plans: N/A			
Accomplishments/Planned Programs Subtotals	1.101	-	-

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

N/A

Remarks

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Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 0603901C / <i>Directed Energy Research</i>	Project (Number/Name) MD40 / <i>Program-Wide Support</i>
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D. Acquisition Strategy

N/A

E. Performance Metrics

N/A