Exhibit R-2, RDT&E Budget Item Justification: PB 2015 Missile Defense Agency											Date: March 2014	
Appropriation/Budget Activity 0400: *Research, Development, Test & Evaluation, Defense-Wide* / BA 3: *Advanced Technology Development (ATD)*					R-1 Program Element (Number/Name) PE 0603178C / *Weapons Technology*							
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	-	-	46.708	14.068	-	14.068	36.494	46.026	56.037	83.722	Continuing	Continuing
MD69: *Directed Energy Research*	-	-	22.944	13.348	-	13.348	34.476	43.203	52.251	77.743	Continuing	Continuing
MD72: *Interceptor Technology*	-	-	23.764	-	-	-	-	-	-	-	Continuing	Continuing
MD40: *Program-Wide Support*	-	-	-	0.720	-	0.720	2.018	2.823	3.786	5.979	Continuing	Continuing
MDAP/MAIS Code: 362												

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

Note

Beginning in FY 2014, the Weapons Technology effort was transferred from the Ballistic Missile Defense Technology Program Element (0603175C) to the Weapons Technology Program Element 0603178C, per the FY 2014 Consolidated Appropriations Act (P.L. 113-76).

A. Mission Description and Budget Item Justification

Weapons Technology develops solutions for destroying an increasing number of threat objects. Weapons Technology focuses on reducing the cost of an engagement by developing compact, efficient high energy lasers (HEL) and the novel beam propagation technology required for low-power to strategic-class Ballistic Missile Defense System (BMDS) applications. Weapons Technology works closely with Discrimination Sensor Technology to correlate threat identification and engagement hand over requirements to build the foundation for next-generation interceptors and multi-mission directed energy platforms.

The Missile Defense Agency (MDA) works in collaboration with the Office of the Assistant Secretary of Defense for Research and Engineering, the Defense Advanced Research Projects Agency, the High Energy Laser Joint Technology Office and Service partners in a systems engineering based strategy for collaborative research, development, test and evaluation of weapons technologies.

Within the Directed Energy Technology area, the MDA is conducting research into the transmission and control of directed energy largely above the atmosphere for mid-term missile defense applications and ultimately boost phase intercepts. First, MDA is pursuing two promising laser technologies in a competitive environment. Both technologies have demonstrated potential to efficiently scale to high power. MDA will continue HEL technology development with the goal of scaling to power levels required for robust, speed of light missile defense. Second, incrementally integrate and test lower power laser systems on unmanned aerial vehicles. These laser test platforms will address a broad spectrum of mission applications while wringing out concept of operations doctrine for incorporating lasers into the battle space. MDA is actively engaging with the other DoD Agencies and the Services to identify joint airborne laser ventures that address mid-term mission capabilities for directed energy technology. To further support these BMDS Directed Energy applications, MDA continues to invest in a number of advanced technology initiatives.

The Weapons Technology 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.

Exhibit R-2, RDT&E Budget Item Justification: PB 2015 Missile Defense Agency	Date: March 2014
Appropriation/Budget Activity 0400: *Research, Development, Test & Evaluation, Defense-Wide I* BA 3: *Advanced Technology Development (ATD)*	**R-1 Program Element (Number/Name)** PE 0603178C *I Weapons Technology*

B. Program Change Summary ($ in Millions)	FY 2013	FY 2014	FY 2015 Base	FY 2015 OCO	FY 2015 Total
Previous President's Budget	-	-	-	-	-
Current President's Budget	-	46.708	14.068	-	14.068
Total Adjustments	-	46.708	14.068	-	14.068
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	46.708			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Other Adjustment	-	-	14.068	-	14.068

Change Summary Explanation

The FY 2014 and 2015 increases reflect the transfer of the Weapons Technology effort from the Ballistic Missile Defense Technology Program Element (0603175C) to the Weapons Technology Program Element 0603178C, per the FY 2014 Consolidated Appropriations Act (P.L. 113-76).

Exhibit R-2A, RDT&E Project Justification: PB 2015 Missile Defense Agency			Date: March 2014
Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 0603178C / *Weapons Technology*	Project (Number/Name) MD69 / *Directed Energy Research*	

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: *Directed Energy Research*	-	-	22.944	13.348	-	13.348	34.476	43.203	52.251	77.743	Continuing	Continuing

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

Note

Beginning in FY 2014, the Weapons Technology effort was transferred from the Ballistic Missile Defense Technology Program Element (0603175C) to the Weapons Technology Program Element 0603178C, per the FY 2014 Consolidated Appropriations Act (P.L. 113-76).

A. Mission Description and Budget Item Justification

The Missile Defense Agency (MDA) Directed Energy project develops next-generation lasers and integrates them into high altitude for missile defense testing. MDA is pursuing two discrete lasers, the Diode Pumped Alkali Laser system at Lawrence Livermore National Laboratory and the Fiber Combining Laser system at the Massachusetts Institute of Technology/Lincoln Laboratory, These technologies were chosen based on their potential for efficiency and scaling to strategic-class power levels. Both technologies set power records last year and are on track to demonstrate performance improvements in FY 2015. In parallel, the MDA will partner with Industry to define concepts that could be used to develop and integrate a multi-kilowatt-class laser into an Unmanned Aerial Vehicle. The MDA will collaborate with our Service partners for joint development and test opportunities.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2013	FY 2014	FY 2015
Title: Directed Energy Research	-	22.944	13.348
Description: Beginning in FY 2014, the Directed Energy Research effort was transferred from the Ballistic Missile Defense Technology Program Element (0603175C) to the Weapons Technology Program Element 0603178C, per the FY 2014 Consolidated Appropriations Act (P.L. 133-76).			
FY 2013 Accomplishments: FY 2013 accomplishments are captured in the Directed Energy Program Element, 0603901C.			
FY 2014 Plans: - Demonstrate the efficiency, producibility, and scaling potential of candidate laser technology - Continue development of the Diode Pumped Alkali Laser System (DPALS) to produce high efficiency and excellent beam quality. Complete window, diode and wave guide development in support of the Alpha unit build - Improve operability and performance of the DPALS to increase average laser power, increase laser system efficiency, measure beam quality and reduce risks to system performance from chemical interactions - In conjunction with the Defense Advanced Research Projects Agency, demonstrate a 30 kilowatt (kW) Fiber Combining Laser (FCL) scalable to high power with high efficiency and near-ideal beam quality to efficiently deliver energy to targets at long range - Conduct experiments using a high altitude, low mach platform to validate directed energy lethality models			

Exhibit R-2A, RDT&E Project Justification: PB 2015 Missile Defense Agency		Date: March 2014
Appropriation/Budget Activity 0400 / 3	**R-1 Program Element (Number/Name)** PE 0603178C / *Weapons Technology*	**Project (Number/Name)** MD69 / *Directed Energy Research*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2013	FY 2014	FY 2015
- Initiate contracts with Industry to define concepts that could be used to develop and integrate a multi-kilowatt class laser into an Unmanned Aerial Vehicle for multi-mission demonstrations ***FY 2015 Plans:*** - Demonstrate a 10 kW subscale DPALS design with high efficiency and excellent beam quality - In conjunction with the Defense Advanced Research Projects Agency complete the engineering development unit for the next-generation FCL compact amplifier and complete the system concept for a mid-power flight system - Analyze and evaluate DPALS and FCL laboratory test data, as well as power and efficiency analysis for scaling to Ballistic Missile Defense System relevant power levels - Compete contracts with Industry to define concepts that could be used to develop and integrate a multi-kilowatt class laser into an Unmanned Aerial Vehicle for multi-mission demonstrations			
Accomplishments/Planned Programs Subtotals	-	22.944	13.348

C. Other Program Funding Summary ($ in Millions)

Line Item	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
• 0603175C: *Ballistic Missile Defense Technology*	69.438	9.321	38.800	-	38.800	76.400	52.000	112.800	178.000	-	536.759
• 0603176C: *Advanced Concepts and Performance Assessment*	-	6.919	8.470	-	8.470	10.683	10.867	11.687	11.994	Continuing	Continuing
• 0603177C: *Discrimination Sensor Technology*	-	29.642	45.110	-	45.110	59.278	60.054	62.897	21.051	Continuing	Continuing
• 0603179C: *Advanced C4ISR*	-	36.500	15.329	-	15.329	10.389	3.942	-	-	-	66.160
• 0603180C: *Advanced Research*	-	19.188	16.584	-	16.584	16.715	16.924	18.336	18.723	Continuing	Continuing

Remarks

D. Acquisition Strategy

The acquisition strategy for directed energy technology consists of partnering with Federally Funded Research and Development Centers and University Affiliated Research Centers. Missile Defense Agency (MDA) will leverage Agency and partner subject matter experts and use government model based assessments to inform Better Buying Power philosophy acquisition decisions. MDA will then award contracts to industry and universities via the Advanced Technology Innovation Broad Agency Announcement and competitive procurements to develop and demonstrate promising components and integrated systems in realistic test environments. Directed energy technology shapes future BMDS acquisition decisions by advancing and documenting the technology readiness levels of emerging and developing technology, while simultaneously assessing the performance and contributions of the technology to the Ballistic Missile Defense System architecture.

Exhibit R-2A, RDT&E Project Justification: PB 2015 Missile Defense Agency		Date: March 2014
Appropriation/Budget Activity 0400 / 3	**R-1 Program Element (Number/Name)** PE 0603178C / *Weapons Technology*	**Project (Number/Name)** MD69 / *Directed Energy Research*

E. Performance Metrics

N/A

Exhibit R-2A, RDT&E Project Justification: PB 2015 Missile Defense Agency			Date: March 2014
Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 0603178C / *Weapons Technology*	Project (Number/Name) MD72 / *Interceptor Technology*	

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
MD72: *Interceptor Technology*	-	-	23.764	-	-	-	-	-	-	-	Continuing	Continuing

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

Note

Beginning in FY 2014, the Weapons Technology effort was transferred from the Ballistic Missile Defense Technology Program Element (0603175C) to the Weapons Technology Program Element 0603178C, per the FY 2014 Consolidated Appropriations Act (P.L. 113-76).

A. Mission Description and Budget Item Justification

The Interceptor Technology project focuses on development and test of component and sub-systems for solid propulsion divert and attitude control systems. No funding is requested for the Interceptor Technology project for FY 2015.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2013	FY 2014	FY 2015
Title: Interceptor Technology	-	23.764	-
Description: The Interceptor Technology project focuses on development and test of component and sub-systems for solid propulsion divert and attitude control systems. No funding is requested for the Interceptor Technology project for FY 2015. ***FY 2013 Accomplishments:*** FY 2013 Accomplishments are captured in the Standard Missile - 3 Block IIB Program Element, 0603902C. ***FY 2014 Plans:*** Conduct development and testing of enabling components for solid propulsion divert and attitude control systems that reduce the risk associated with long operation, precision control, safe operation and lower weight advanced kill vehicles. ***FY 2015 Plans:*** N/A			
Accomplishments/Planned Programs Subtotals	-	23.764	-

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

The acquisition strategy to conduct this technology development effort consists of partnering with Federally Funded Research and Development Centers and University Affiliated Research Centers. This effort leverages Agency and partner subject matter experts and government model based assessments to inform Better Buying

Exhibit R-2A, RDT&E Project Justification: PB 2015 Missile Defense Agency		Date: March 2014
Appropriation/Budget Activity 0400 / 3	**R-1 Program Element (Number/Name)** PE 0603178C / *Weapons Technology*	**Project (Number/Name)** MD72 / *Interceptor Technology*

Power philosophy acquisition decisions. The Missile Defense Agency will also award contracts to industry and universities via the Advanced Technology Innovation Broad Agency Announcement and competitive procurements. This Program Element shapes future BMDS acquisition decisions by advancing and documenting the technology readiness levels of emerging and developing technology, while simultaneously assessing the performance and contributions of the technology to the Ballistic Missile Defense System (BMDS) architecture.

E. Performance Metrics

N/A

Exhibit R-2A, RDT&E Project Justification: PB 2015 Missile Defense Agency			Date: March 2014
Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 0603178C / *Weapons Technology*	Project (Number/Name) MD40 / *Program-Wide Support*	

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: *Program-Wide Support*	-	-	-	0.720	-	0.720	2.018	2.823	3.786	5.979	Continuing	Continuing

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

Note

Beginning in FY 2014, the Weapons Technology effort was transferred from the Ballistic Missile Defense Technology Program Element (0603175C) to the Weapons Technology Program Element 0603178C, per the FY 2014 Consolidated Appropriations Act (P.L. 113-76).

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	-	-	0.720
Description: See paragraph A: Mission Description and Budget Item Justification			
FY 2013 Accomplishments: N/A			
FY 2014 Plans: N/A			
FY 2015 Plans: See paragraph A: Mission Description and Budget Item Justification			
Accomplishments/Planned Programs Subtotals	-	-	0.720

C. Other Program Funding Summary ($ in Millions)

N/A

Exhibit R-2A, RDT&E Project Justification: PB 2015 Missile Defense Agency		Date: March 2014
Appropriation/Budget Activity 0400 / 3	**R-1 Program Element (Number/Name)** PE 0603178C / *Weapons Technology*	**Project (Number/Name)** MD40 / *Program-Wide Support*

C. Other Program Funding Summary ($ in Millions)

Remarks

D. Acquisition Strategy

N/A

E. Performance Metrics

N/A