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**Exhibit R-2, RDT&E Budget Item Justification:** PB 2013 Missile Defense Agency **DATE:** February 2012

<b>APPROPRIATION/BUDGET ACTIVITY</b> 0400: <i>Research, Development, Test &amp; Evaluation, Defense-Wide</i> BA 6: <i>RDT&amp;E Management Support</i>	<b>R-1 ITEM NOMENCLATURE</b> PE 0605502C: <i>Small Business Innovative Research - MDA</i>
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COST (\$ in Millions)	FY 2011	FY 2012	FY 2013 Base	FY 2013 OCO	FY 2013 Total	FY 2014	FY 2015	FY 2016	FY 2017	Cost To Complete	Total Cost
Total Program Element	113.234	-	-	-	-	-	-	-	-	0.000	113.234
MD45: <i>Small Business Innovative Research</i>	113.234	-	-	-	-	-	-	-	-	0.000	113.234

**Note**

NA

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

This project explores innovative concepts pursuant to Public Law 106-554 (Small Business Reauthorization Act of 2000) and Public Law 107-50 (Small Business Technology Transfer Program Reauthorization Act of 2001), which mandates a two-phase competition for small businesses with innovative technologies that can also be commercialized. The Small Business Innovation Research (SBIR) and Small Business Technology Transfer (STTR) programs will develop new dual-use technologies for possible future Missile Defense Agency (MDA) Ballistic Missile Defense Systems (BMDS) needs. Dual-use means that the technologies will also be judged on their potential for future private sector investment both as a vehicle for reducing development time and cost, unit costs of new MDA BMDS technologies, and as a route to national economic growth through new commercial products. MDA will conduct the competition and will award and manage the contracts.

The Missile Defense Agency`s SBIR/STTR investments are divided into 13 Research Areas from 6 MDA Elements:

Aegis Ballistic Missile Defense (BMD): A hybrid program office (MDA/Navy) that builds BMD Capability for use in multi-mission ships and in Aegis Ashore.

Command, Control, Communication, Computer Intelligence Surveillance and Reconnaissance (C4ISR): Defines, develops and deploys an integrated Sensor and Command and Control (C2) capability for Missile Defense

Engineering: Defines the current and future BMDS: leads and is responsible for its technical design and development, and supports its integration and assessment.

Program and Integration: Supervises the Acquisition Category ID ACAT 1D Ballistic Missile Defense System Program portfolio including element design, development, system integration, and test.

Test: Characterizes ballistic missile defense capabilities and supports fielding of an integrated and effective capability to the Warfighter.

Advanced Technology: Develops cost and operationally effective capabilities; explores and develops technology to counter future threats.

Small Business Innovation Research (SBIR) topic areas for FY 2011 included:

- Methodologies for Accurate Scene Generation of Target Characteristics as Seen by an Airborne Platform through Dynamic Atmospheric Conditions
- Methodologies for Accurate Scene Generation of Complex Target Plume Characteristics
- Methodologies for Developing Extremely Large IR Scene Projectors
- Methodologies for a Partial Frame Correlation of Multiple Sensors
- Smart Infrared Focal Plane Arrays and Advanced Electronics
- Acquisition, Tracking and Pointing Technologies

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- Development of line-narrowed diode pumps sources for DPAL systems
- Development of optical quality thin-film coatings for DPAL windows
- Innovative Signature Exploitation for Long Range Object Discrimination
- Sensor Resource Management
- Guidance, Navigation and Control Algorithms and Hardware for Advanced Interceptors
- Light Weight Divert and Attitude Control Systems for Missile Defense Interceptors
- Long-Term Missile Aging Reliability Prediction for Advanced Platforms
- Anti-Tamper Technology for Missile Defense
- Develop and Demonstrate High Performance Infrared Focal Plane Arrays with Advanced Quantum Structures
- Composite Structures for lightweight missile components
- Hot gas components for lightweight missile components
- Sensor & Mitigation Technologies for Liquid Hypergolic Propulsion Systems
- Advanced Power Storage Systems for Interceptors
- Innovative Propulsion Technology for Missile Defense Interceptors
- Characterization and Incorporation of Vernier Engines within the Plume Modeling Process
- Advanced Particle Treatment in Modeling Rocket Exhaust Plumes
- Intelligent Adaptive Needs Characterization for M&S Systems Engineering
- Improved Techniques for Optimistic Modeling
- Star Background Model
- Automatic Test and Analysis (ATA) Tool
- Mitigation of the effects of the ionosphere on Upgraded Early Warning Radars
- Innovative Solid State Power Supply-Modulator for High Power Traveling Wave Tube Amplifier
- Methodologies for Accurate Assessment of Target Characteristics
- Telemetry Impact Reduction for Target Objects
- Passive Techniques for Flight Reconstruction Data
- Techniques for Anchoring Debris Models

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<b>B. Program Change Summary (\$ in Millions)</b>	<b>FY 2011</b>	<b>FY 2012</b>	<b>FY 2013 Base</b>	<b>FY 2013 OCO</b>	<b>FY 2013 Total</b>
Previous President's Budget	-	-	-	-	-
Current President's Budget	113.234	-	-	-	-
Total Adjustments	113.234	-	-	-	-
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	113.234	-			
• Other Adjustment	-	-	-	-	-

**Change Summary Explanation**

FY 2011 funds were transferred to Small Business Innovation Research/Small Business Technology Transfer from other Program Elements.

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COST (\$ in Millions)	FY 2011	FY 2012	FY 2013 Base	FY 2013 OCO	FY 2013 Total	FY 2014	FY 2015	FY 2016	FY 2017	Cost To Complete	Total Cost
MD45: <i>Small Business Innovative Research</i>	113.234	-	-	-	-	-	-	-	-	0.000	113.234
Quantity of RDT&E Articles	0	0	0		0	0	0	0	0		

**Note**

N/A

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

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Program and Integration: Supervises the Acquisition Category ID ACAT 1D Ballistic Missile Defense System Program portfolio including element design, development, system integration, and test.

Test: Characterizes ballistic missile defense capabilities and supports fielding of an integrated and effective capability to the Warfighter.

Advanced Technology: Develops cost and operationally effective capabilities; explores and develops technology to counter future threats. The SBIR Research Areas for FY 2012 include Test Instrumentation, Aegis, Command Control Battle Management Communication (C2BMC), Radar, Infrared, Tamper, Standard Missile-3 Block IIB, Directed Energy, and Quality, Safety and Mission Assurance.

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

	FY 2011	FY 2012	FY 2013
<b>Title:</b> FY11 Accomplishments	113.234	-	-
<b>Articles:</b>	0	0	0
<b>Description:</b> See Description Below			

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<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>	<b>FY 2011</b>	<b>FY 2012</b>	<b>FY 2013</b>
<p><b><i>FY 2011 Accomplishments:</i></b>  FY 2011 Accomplishments:  - Awarded 146 Phase Is (\$100K average award) and 60 Phase IIs (including modifications to existing Phase IIs) (\$860K average award).  - Phase I Selections were in the following 9 research areas: Command, Control, Battle Management and Communications (C2BMC), Directed Energy, Information Assurance, Interceptor Technology, Manufacturing and Producibility, Modeling Simulation and Phenomenology, Radar Technology, Space Technology, and Innovation Concepts and Special Focus Projects.  - Phase II Selections were in the following 8 research areas: Interceptor Technology, Manufacturing Process, Innovation Concepts and Special Focus Projects, Radar Systems, Space Technology, Command, Control, Battle Management and Communications (C2BMC), Modeling &amp; Simulation, and Directed Energy.</p> <p><b><i>FY 2012 Plans:</i></b>  NA</p> <p><b><i>FY 2013 Plans:</i></b>  NA</p>			
<b>Accomplishments/Planned Programs Subtotals</b>	113.234	-	-

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

N/A

**D. Acquisition Strategy**

N/A

**E. Performance Metrics**

N/A