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**Exhibit R-2, RDT&E Budget Item Justification:** PB 2012 Missile Defense Agency **DATE:** February 2011

<b>APPROPRIATION/BUDGET ACTIVITY</b> 0400: <i>Research, Development, Test &amp; Evaluation, Defense-Wide</i> BA 4: <i>Advanced Component Development &amp; Prototypes (ACD&amp;P)</i>	<b>R-1 ITEM NOMENCLATURE</b> PE 0603897C: <i>BMD HERCULES</i>
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COST (\$ in Millions)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total	FY 2013	FY 2014	FY 2015	FY 2016	Cost To Complete	Total Cost
Total Program Element	45.250	-	-	-	-	-	-	-	-	0.000	45.250
WX02: <i>Hercules Capability Development</i>	43.414	-	-	-	-	-	-	-	-	0.000	43.414
ZX40: <i>Program-Wide Support</i>	1.836	-	-	-	-	-	-	-	-	0.000	1.836

**Note**  
Software and algorithm work was moved to the BMDS Technology Program Element 0603175C in FY 2011. In accordance with the Missile Defense Agency revised budget structure, the content previously planned in Project WX02 for FY 2010 is now captured in Project MD25.

**A. Mission Description and Budget Item Justification**  
The Agency seeks out and invests in next generation technology by executing research with universities, Federally Funded Research and Development Centers, University Affiliated Research Centers, small businesses and industry at all levels to address the threats we expect to face in the future. Project Hercules develops technology to address emerging threats.

Project Hercules contributions to Combatant Commanders' Achievable Capabilities List include:

- Evaluate airborne and space based sensor data for applicability to the future BMDS
- Integrate and fuse sensor data for greater track accuracy
- Classify, identify, characterize, and discriminate items of interest

Three goals for Hercules are:

- Develop, deliver, and support integration of algorithms and software to execute early intercept concepts and demonstrations
- Develop, deliver, and support integration of algorithms and software to improve the performance of radar and electro-optical sensors
- Develop, deliver, and support integration of algorithms and software for advanced battle management and decision making concepts

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<b>B. Program Change Summary (\$ in Millions)</b>	<b><u>FY 2010</u></b>	<b><u>FY 2011</u></b>	<b><u>FY 2012 Base</u></b>	<b><u>FY 2012 OCO</u></b>	<b><u>FY 2012 Total</u></b>
Previous President's Budget	47.932	-	-	-	-
Current President's Budget	45.250	-	-	-	-
Total Adjustments	-2.682	-	-	-	-
• Congressional General Reductions		-			
• Congressional Directed Reductions		-			
• Congressional Rescissions	-	-			
• Congressional Adds		-			
• Congressional Directed Transfers		-			
• Reprogrammings	-1.655	-			
• SBIR/STTR Transfer	-0.955	-			
• Other Adjustment Detail	-0.072	-	-	-	-

**Change Summary Explanation**

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2012 Missile Defense Agency									<b>DATE:</b> February 2011		
<b>APPROPRIATION/BUDGET ACTIVITY</b> 0400: <i>Research, Development, Test &amp; Evaluation, Defense-Wide</i> BA 4: <i>Advanced Component Development &amp; Prototypes (ACD&amp;P)</i>				<b>R-1 ITEM NOMENCLATURE</b> PE 0603897C: <i>BMD HERCULES</i>				<b>PROJECT</b> WX02: <i>Hercules Capability Development</i>			
<b>COST (\$ in Millions)</b>	<b>FY 2010</b>	<b>FY 2011</b>	<b>FY 2012 Base</b>	<b>FY 2012 OCO</b>	<b>FY 2012 Total</b>	<b>FY 2013</b>	<b>FY 2014</b>	<b>FY 2015</b>	<b>FY 2016</b>	<b>Cost To Complete</b>	<b>Total Cost</b>
WX02: <i>Hercules Capability Development</i>	43.414	-	-	-	-	-	-	-	-	0.000	43.414
Quantity of RDT&E Articles	0	0	0		0	0	0	0	0		

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

Project Hercules develops algorithms and software in the context of persistent sensor coverage, pervasive weapons coverage, global battle management, effective targeting, and effectiveness in advance environments and early intercept capability demonstration managed by MDA's Advanced Technology Directorate. Hercules develops detection, tracking, discrimination, and decision making prototype algorithms to improve the performance of command and control, battle management, communications, sensor, and weapon components.

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

	<b>FY 2010</b>	<b>FY 2011</b>	<b>FY 2012</b>
<b>Title:</b> Hercules Technology Development	30.077	-	-
<b>Articles:</b>	0		
<b>Description:</b> See Description Below			
<b>FY 2010 Accomplishments:</b> Persistent Sensor Coverage			
-Continued development of discrimination algorithms that exploit unique opportunities in electro-optical and infrared sensors			
Pervasive Weapons Coverage			
-Researched approaches at the system level to address advanced evolving threats concerns			
-Identified algorithmic options for enabling early intercept			
-Developed sensor surveillance algorithms to support weapons engagement that exploit a wide range of sensor technology areas			
Global Battle Management			
-Built battle manager interfaces for unmanned aerial vehicle, space-based sensors and fire control			
-Developed advanced algorithms that take advantage of tracks from multiple sensors providing geographic and phenomenological diversity to form system level tracks			

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<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>		<b>FY 2010</b>	<b>FY 2011</b>	<b>FY 2012</b>
<p>Effective Targeting</p> <ul style="list-style-type: none"> <li>-Conducted research and develop algorithms that take advantage of features and attributes measured from multiple sensors providing geographic and phenomenological diversity for discrimination</li> <li>-Continued development of lethal region discrimination capabilities</li> </ul> <p>Effectiveness in Adverse Environments</p> <ul style="list-style-type: none"> <li>-Initiated research into approaches at the sensor level to address advanced threats</li> <li>-Conducted early research and developed algorithms to mitigate the effects of countermeasures</li> </ul>				
<p><b>Title:</b> Program Office</p> <p><b>Description:</b> See Description Below</p> <p><b>FY 2010 Accomplishments:</b> This includes the management of the technology program.</p> <ul style="list-style-type: none"> <li>-Funded government personnel salaries for program management, project support, project costs and travel.</li> <li>-Supported activities for technology development.</li> </ul>		<b>Articles:</b> 13.337 0	-	-
<b>Accomplishments/Planned Programs Subtotals</b>		43.414	-	-
<b>C. Other Program Funding Summary (\$ in Millions)</b>				
N/A				
<b>D. Acquisition Strategy</b>				
<p>MDA's fiscal year FY 2010 budget submission reflected an emphasis on early intercept research and development. The acquisition strategy to conduct this technology development effort consists of three pillars. First, leverage the technical expertise of Federally Funded Research and Development Centers and University Applied Research Centers. Second, continue to leverage relevant existing contracts within limits of Competition and Contracting Act (CICA) taking into account contractor past performance, scope, ceiling and period of performance. Third, for new technology initiatives, seek industry solutions via the Advanced Technology Broad Agency Announcement and competitive procurements.</p>				

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**E. Performance Metrics**

NA

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**Exhibit R-3, RDT&E Project Cost Analysis: PB 2012 Missile Defense Agency** **DATE:** February 2011

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<b>Product Development (\$ in Millions)</b>				FY 2011		FY 2012 Base		FY 2012 OCO		FY 2012 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Hercules Technology Development Algorithm Development WX02	Various	Various:Various	24.962	-		-		-		-	0.000	24.962	25.165
<b>Subtotal</b>			24.962	-		-		-		-	0.000	24.962	25.165

**Remarks**

<b>Support (\$ in Millions)</b>				FY 2011		FY 2012 Base		FY 2012 OCO		FY 2012 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Hercules Technology Development Algorithm WX02	Various	Various:Various	3.810	-		-		-		-	0.000	3.810	3.810
Program Office Algorithm Development WX02	Various	Sparta:Huntsville, AL	14.292	-		-		-		-	0.000	14.292	14.343
<b>Subtotal</b>			18.102	-		-		-		-	0.000	18.102	18.153

<b>Test and Evaluation (\$ in Millions)</b>				FY 2011		FY 2012 Base		FY 2012 OCO		FY 2012 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Hercules Technology Development Evaluation and Testing WX02	Various	Various:Various	3.040	-		-		-		-	0.000	3.040	3.040
<b>Subtotal</b>			3.040	-		-		-		-	0.000	3.040	3.040

**Remarks**

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COST (\$ in Millions)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total	FY 2013	FY 2014	FY 2015	FY 2016	Cost To Complete	Total Cost
ZX40: <i>Program-Wide Support</i>	1.836	-	-	-	-	-	-	-	-	0.000	1.836
Quantity of RDT&E Articles	0	0	0		0	0	0	0	0		

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

Funding for the FY 2010 accomplishments is reported in prior year budget project ZX40 (\$1,836).

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

	FY 2010	FY 2011	FY 2012
<b>Title:</b> Civilian Salaries and Support	1.836	-	-
<b>Articles:</b>	0	0	0
<b>Description:</b> See Description Below			
<b>FY 2010 Accomplishments:</b> Funding for the FY 2010 accomplishments is reported in prior year budget project ZX40 (\$1,836).			
<b>FY 2011 Plans:</b> Program Wide Support does not exist in this PE for FY 2011.			
<b>FY 2012 Plans:</b> Program Wide Support does not exist in this PE for FY 2012.			
<b>Accomplishments/Planned Programs Subtotals</b>	1.836	-	-

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

N/A

**D. Acquisition Strategy**

NA

**E. Performance Metrics**

NA