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Exhibit R-2, RDT&E Budget Item Justification: PB 2011 Missile Defense Agency									DATE: February 2010		
APPROPRIATION/BUDGET ACTIVITY				R-1 ITEM NOMENCLATURE							
0400: Research, Development, Test & Evaluation, Defense-Wide BA 4: Advanced Component Development & Prototypes (ACD&P)				PE 0603884C: Ballistic Missile Defense Sensors							
COST (\$ in Millions)	FY 2009 Actual	FY 2010 Estimate	FY 2011 Base Estimate	FY 2011 OCO Estimate	FY 2011 Total Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
Total Program Element	682.754	621.017	454.859	0.000	454.859	469.589	681.397	650.525	616.342	0	4,176.483
AX11: Ballistic Missile Defense Radars Block 1.0	2.697	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	2.697
BX11: Ballistic Missile Defense Radars Block 2.0	71.950	3.173	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	75.123
CX11: Ballistic Missile Defense Radars Block 3.0	110.486	12.379	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	122.865
EX11: Ballistic Missile Defense Radars Block 5.0	128.838	91.893	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	220.731
WX11: Ballistic Missile Defense Radars Capability Development	194.532	318.854	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	513.386
XX11: Ballistic Missile Defense Radars Sustainment	129.649	159.611	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	289.260
MD11: BMDS Radars	0.000	0.000	440.023	0.000	440.023	452.561	659.538	630.408	595.040	Continuing	Continuing
ZX40: Program-Wide Support	44.602	35.107	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	79.709
MD40: Program-Wide Support	0.000	0.000	14.836	0.000	14.836	17.028	21.859	20.117	21.302	Continuing	Continuing
Note											
Since its emphasis is on proving component and subsystem maturity prior to integration into a more complex integrated system, the Sensors program falls under RDT&E Budget Activity 4, Advanced Component Development and Prototypes (ACD&P).											
In accordance with the Missile Defense Agency revised budget structure, the content previously planned in Projects AX11, BX11, CX11, EX11, WX11, and XX11 for FY 2009-FY 2010 is now captured in Project MD11.											
For all BMD System Level Test Schedule information, please refer to the BMD System Level Test Schedule.											

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MDA has a set of Unifying Missile Defense Functions (UMDFs), which increase the effectiveness of the BMD System (including probability of engagement success, increase in defended area and raid size capacity, additional redundancy of architecture, unity of command) through the integration of MDA developed capabilities. These UMDF efforts are Sensor Registration (reporting of sensor errors / biases), Correlation (ensuring the information from multiple sensors seeing a threat relates to the same object), System Track (creating a single engageable track of a threat from multiple reports provided by different land, sea, and space based multiple sensors), Discrimination (identifying object details to determine the target from debris or decoys), Battle Management (combining the best sensors and shooters to ensure the highest probability of a kill), Hit / Kill Assessment (determining if the target selected was destroyed after missile impact), and Communications (providing the worldwide connection of sensors and shooters to command authorities). UMDFs are implemented across the BMDS elements to create and utilize system level data and decisions that allow Combatant Commanders the ability to automatically and manually optimize sensor coverage and interceptor inventory to defend against all ranges of ballistic threats. Sensors software development efforts will add system capabilities in compliance with BMDS Integrated Build C and D specifications for enhanced sensor capabilities to support both Regional and Strategic missions. For BMDS Integrated Build C, these capabilities include integration of Hercules Suite I algorithms, and support for C2BMC taskings such as sensor resource management. For BMDS Integrated Build D, these capabilities include improved sensor registration, integration of discrimination enhancements, and support for C2BMC correlation and sensor management improvements. In FY 2010 and FY 2011, these builds, in Capability Increments C1 and D1, will provide System-level sensor resource management with track forwarding in support of Regional and Strategic Missions (C1), limited peer-to-peer weapon system engagement coordination in support of Regional missions (C1), and enhanced BMDS capability with increased defended area and integration of System-level sensor and BMDS System Track data (D1). The FY 2011 program is balanced reflecting the four focus areas of the current Missile Defense Program: to develop, rigorously test, and field an integrated BMDS architecture to counter existing regional threats; continue a viable Homeland Defense against rogue threats beyond 2030; demonstrate our proven technologies to show Missile Defense works; and develop technologies to hedge against future missile threat growth. <u>A. Mission Description and Budget Item Justification</u> Given the unique characteristics of short-range, medium-range, intermediate-range, and intercontinental ballistic missiles (SRBMs, MRBMs, IRBMs, and ICBMs), no one missile defense interceptor or sensor system can effectively counter all ballistic missile threats. Warfighters are not only faced with the challenge of intercepting relatively small objects at great distances and very high velocities, but they may have to counter large raid sizes involving combinations of SRBMs, MRBMs, IRBMs, and ICBMs and, in the future, countermeasures associated with structured ballistic missile attacks. Stand-alone missile defense systems must be integrated into a layered BMDS to achieve cost and operational efficiencies, while improving protection performance with increased defended area and minimizing force structure costs.		

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The most operationally effective missile defense architecture is a layering of endoatmospheric and exoatmospheric missile interceptor systems with ground and space sensors connected and managed by a robust Command and Control, Battle Management and Communication (C2BMC) infrastructure. The FY 2011 program is balanced to develop, rigorously test, and field an integrated BMDS architecture to counter existing regional threats, continue developing our limited ICBM defense, prove our Missile Defense System works, and develop new technologies to address future threats. The current program has four focus areas: 1. Enhance missile defense to defend deployed forces, allies, and friends against theater threats 2. Continue a viable homeland defense against rogue threats beyond 2030 3. Prove missile defense works 4. Develop technologies to hedge against future missile threat growth THE KEY ENABLER FOR THESE FOCUS AREAS IS A PERVASIVE SENSOR NET. BMDS effectiveness depends upon the quality of services (that is, data of sufficient accuracy and low enough latency) rendered by the interdependent BMDS programs to each other. The BMD Sensors program provides essential data for the command and control of BMDS weapon systems, such as Terminal High Altitude Area Defense (THAAD) and Groundbased Midcourse Defense (GMD). These sensors, connected to the BMDS through C2BMC, enable detection and tracking of targets, and provide fire-control quality ballistic missile position, velocity, and discrimination data to BMDS weapon systems. As threats expand and mature, the need for continuously available sensors supports investment in the operations, sustainment, and enhancement of existing radars, as well as the development of new sensors, such as the Precision Tracking Space System (PTSS). The Ballistic Missile Defense System (BMDS) development approach allows sensor technologies and capabilities to be incorporated as they mature and evolve into a layered network of sensors. Overlapping sensor coverage with a diversity of sensor types will improve detection, track, discrimination and kill assessments. The extended sensor coverage and accuracy provided by a network of layered sensors makes the BMDS more efficient, reduces the number of target engagements needed, conserving interceptor inventory and ensuring a high probability of successful engagement.		

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The BMD Sensors Program contributes to all four missile defense focus areas as follows: ENHANCE REGIONAL DEFENSE Development, delivery and deployment of AN/TPY-2 radars for either forward-based or THAAD Fire Unit use to meet warfighter needs Operations and sustainment of deployed AN/TPY-2 radars in Japan, Israel, and other locations (to be determined) AN/TPY-2 radars can be configured to operate either as a THAAD Fire Unit Radar (terminal mode) or Forward-Based Radar. These radars are transportable, adding flexibility to respond to geographical changes in threats. Under this Program Element, four AN/TPY-2 radars have completed manufacturing (AN/TPY-2 #2, 3, 5, and 6), and one is in production (AN/TPY-2 #7). The AN/TPY-2 used in a forward-based role provides detection and tracking during the boost phase. This significantly reduces the uncertainty in target discrimination and reaction time, increasing the probability of a successful BMDS engagement. The AN/TPY-2 used in terminal mode as a Fire Unit Radar (FUR) is an integral component of the Terminal High Altitude Area Defense (THAAD) Battery. The FUR is capable of tracking multiple threats and multiple interceptors during engagements in the terminal phase. It provides surveillance, acquisition, track, discrimination, interceptor communications, and hit assessment data collection for the fire control. The current and planned utilization of the AN/TPY-2 radars supports US STRATCOM, COCOMs, THAAD, and the Aegis BMD weapon system. Currently, AN/TPY-2 radars are supporting missile defense in both Japan and Israel. BMDS regional defense includes the Phased Adaptive Approach (PAA). This approach was developed in response to the rapid proliferation of short and medium range ballistic missiles in Iran and the threat they pose to U.S. Allies and partners, as well as to U.S. deployed personnel and their accompanying families in the Middle East and in Europe. By leveraging recent advances in sensor and interceptor technologies, the United States will aggressively counter this growing regional threat with a more powerful and agile system. The United States is pursuing a four phased approach which will provide a more effective missile defense capability for defense of NATO territories and enhance U.S. homeland defense. It will be complementary of and interoperable with those being developed by NATO, be applicable in other theaters around the world, and will be more adaptable and flexible in order to counter threat advances and provide increased defended areas over time. The initial phase includes the deployment of current and proven missile defense, including the sea-based Aegis Weapons System, the SM-3 interceptor (Block IA), and sensors such as the forward-based Army Navy/Transportable Radar Surveillance system (AN/TPY-2). Subsequent phases will be implemented based on technical maturity, appropriate testing, and threat driven requirements.		

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The BMDS Sensors regional defense program also includes the Groundbased Radar - Prototype (GBR-P) -- a large, steerable, X-band phased array radar currently located at the Reagan Test Site, Kwajalein Atoll. This radar is currently maintained in caretaker status and is available to support BMDS testing and X-Band software development efforts.		
CONTINUE VIABLE HOMELAND DEFENSE Operations and sustainment of the Sea-Based X-Band Radar (SBX) and UEWR's at Thule, Beale, and Fylingdales Operations and sustainment of the COBRA DANE radar Upgrade of the Thule Early Warning Radar (EWR) to add missile defense capability to this sensor Initial and refined design for upgrade of the Clear, AK Early Warning Radar beginning in FY11. The Thule Early Warning Radar (EWR) located at Thule Air Base, Greenland, is an Ultra High Frequency (UHF) radar that is being upgraded to include missile defense functionality. This capability will expand defense of the U.S. to include defense against limited Iranian long-range threats. The radars located at Beale Air Force Base (AFB), CA, and RAF Fylingdales, UK, are UHF radars that are completing their upgrades for Missile Defense to the UEWR configuration. The COBRA DANE radar located at Eareckson AFS, Shemya, Alaska (AK) is also part of the BMDS Homeland Defense architecture.		
PROVE MISSILE DEFENSE Participation in BMDS flight and ground test campaigns Modeling and simulation efforts to include: enhanced sensor models, development of RF scene generators, integration of digital simulations into the BMDS modeling and simulation architecture, and verification, validation, and accreditation (VV&A) of radar models Development and implementation of Concurrent, Test, Training, and Operations (CTTO) capabilities		
HEDGE AGAINST FUTURE THREATS System engineering, and software development and testing support		

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0400: Research, Development, Test & Evaluation, Defense-Wide		PE 0603884C: Ballistic Missile Defense Sensors			
BA 4: Advanced Component Development & Prototypes (ACD&P)					
Development of radar discrimination advanced algorithms and Common X-Band software for TPY-2 radars to address evolving threats					
Implementation of BMDS Unifying Missile Defense Functions (UMDF) to improve BMDS efficiency and effectiveness					
Operations and support of the External Sensors Lab (ESL) -- a research and development lab critical to researching potential capabilities gained from sensors external to the BMDS					
As new sensor data sources are brought into the External Sensors Lab (ESL), the overall performance of existing capabilities are improved and new capabilities for the BMDS are discovered. Algorithms developed by ESL will contribute to precision radar cueing, system track, and hit/kill assessment. Precision radar cueing by ESL has been successfully demonstrated several times during flight testing. ESL provides engineering-level code to the C2BMC program for maturing the algorithms into robust, operationally suitable code.					
B. Program Change Summary (\$ in Millions)					
	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
Previous President's Budget	767.593	636.856	0.000	0.000	0.000
Current President's Budget	682.754	621.017	454.859	0.000	454.859
Total Adjustments	-84.839	-15.839	454.859	0.000	454.859
• Congressional General Reductions		0.000			
• Congressional Directed Reductions		-15.839			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds		0.000			
• Congressional Directed Transfers		0.000			
• Reprogrammings	-9.120	0.000			
• SBIR/STTR Transfer	-11.155	0.000			
• Other Adjustment Detail	-64.564	0.000	454.859	0.000	454.859
Change Summary Explanation					
FY 2009 decreases include SBIR/STTR transfers, MDA adjustments, and rescissions external to the Agency. European Midcourse Radar (EMR) funding is moved to the new EMR PE 0603909C for FY 2009 and to the new European Capability PE 0603911C for FY 2010.					
No FY 2011 data provided in PB10. ;					

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COST (\$ in Millions)	FY 2009 Actual	FY 2010 Estimate	FY 2011 Base Estimate	FY 2011 OCO Estimate	FY 2011 Total Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
AX11: Ballistic Missile Defense Radars Block 1.0	2.697	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	2.697
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0		
Note NA											
A. Mission Description and Budget Item Justification Ballistic Missile Defense Radars (BMDS) Project AX11 defends the U.S. from limited North Korean long-range threats. This effort funds the Commercial Power Project supporting AN/TPY-2 #2 Forward Based Radar in Shariki, Japan. It will provide commercial power as the primary power source.											
B. Accomplishments/Planned Program (\$ in Millions)											
							FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
AN/TPY-2 #2 Commercial Power See Description Below FY 2009 Accomplishments: Japanese completed installation of power lines from substation to radar site Completed site construction to support power equipment installation Completed Commercial Power installation and checkout FY 2010 Plans: NA FY 2011 Base Plans: NA							2.697	0.000	0.000	0.000	0.000

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B. Accomplishments/Planned Program (\$ in Millions)											
							FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
FY 2011 OCO Plans: NA											
Accomplishments/Planned Programs Subtotals							2.697	0.000	0.000	0.000	0.000
C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total	FY 2012	FY 2013	FY 2014	FY 2015	Cost To Complete	Total Cost
• 0603175C: Ballistic Missile Defense Technology	117.602	189.229	132.220	0.000	132.220	236.875	239.873	197.118	197.852	0	1,310.769
• 0603881C: Ballistic Missile Defense Terminal Defense Segment	951.414	715.732	436.482	0.000	436.482	250.275	336.711	500.983	521.717	0	3,713.314
• 0603882C: Ballistic Missile Defense Mid-Course Segment	1,472.683	1,027.371	1,346.181	0.000	1,346.181	1,112.655	1,291.790	1,099.029	1,033.213	0	8,382.922
• 0603883C: Ballistic Missile Defense Boost Defense Segment	384.365	182.317	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	566.682
• 0603886C: Ballistic Missile Defense System Interceptor	308.869	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	308.869
• 0603888C: Ballistic Missile Defense Test and Targets	906.952	823.333	1,113.425	0.000	1,113.425	1,105.959	951.371	871.929	829.608	0	6,602.577
• 0603890C: Ballistic Missile Defense Enabling Programs	402.776	358.751	402.769	0.000	402.769	468.673	457.745	473.871	488.799	0	3,053.384
• 0603891C: SPECIAL PROGRAMS - MDA	182.998	250.185	270.189	0.000	270.189	269.040	450.645	517.486	601.315	0	2,541.858
• 0603892C: BMD AEGIS	1,054.323	1,435.717	1,467.278	0.000	1,467.278	1,021.878	1,112.668	1,076.739	923.316	0	8,091.919
• 0603893C: SPACE TRACKING & SURVEILLANCE SYSTEM	209.831	161.609	112.678	0.000	112.678	98.500	56.424	52.928	34.661	0	726.631

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0400: Research, Development, Test & Evaluation, Defense-Wide BA 4: Advanced Component Development & Prototypes (ACD&P)				PE 0603884C: Ballistic Missile Defense Sensors			AX11: Ballistic Missile Defense Radars Block 1.0				
C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total	FY 2012	FY 2013	FY 2014	FY 2015	Cost To Complete	Total Cost
• 0603894C: MULTIPLE KILL VEHICLE	226.027	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	226.027
• 0603895C: BMD SYSTEM SPACE PROGRAM	23.250	12.492	10.942	0.000	10.942	11.182	11.347	11.749	12.155	0	93.117
• 0603896C: BMD C2BMC	275.174	334.734	342.625	0.000	342.625	364.085	289.778	323.922	298.936	0	2,229.254
• 0603897C: BMD HERCULES	51.629	47.932	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	99.561
• 0603898C: BMD JOINT WARFIGHTER SUPPORT	66.283	61.098	68.726	0.000	68.726	62.239	63.451	65.158	67.231	0	454.186
• 0603901C: DIRECTED ENERGY RESEARCH	0.000	0.000	98.688	0.000	98.688	101.371	103.449	104.572	104.141	0	512.221
• 0603904C: MISSILE DEFENSE INTEGRATION & OPERATIONS CENTER (MDIOC)	102.823	86.483	86.198	0.000	86.198	88.181	78.517	80.410	83.087	0	605.699
• 0603906C: REGARDING TRENCH	3.159	6.130	7.529	0.000	7.529	8.295	8.286	8.479	8.675	0	50.553
• 0603907C: SEA BASED X-BAND RADAR (SBX)	143.878	167.153	153.056	0.000	153.056	150.104	159.832	160.163	197.099	0	1,131.285
• 0603908C: BMD EUROPEAN INTERCEPTOR SITE	348.722	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	348.722
• 0603909C: BMD EUROPEAN MIDCOURSE RADAR	73.728	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	73.728
• 0603911C: BMD EUROPEAN CAPABILITY	0.000	50.226	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	50.226
• 0603912C: BMD European Comm Support	26.016	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	26.016
• 0603913C: ISRAELI COOPERATIVE	0.000	201.323	121.735	0.000	121.735	111.100	113.101	116.114	119.172	0	782.545
• 0604880C: LAND-BASED SM-3	0.000	0.000	281.378	0.000	281.378	345.937	187.062	93.456	139.595	0	1,047.428
	0.000	255.987	318.800	0.000	318.800	405.500	416.300	337.300	227.500	0	1,961.387

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C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total	FY 2012	FY 2013	FY 2014	FY 2015	Cost To Complete	Total Cost
• 0604881C: Aegis SM-3 BLOCK IIA CO-DEVELOPMENT											
• 0604883C: PRECISION TRACKING SPACE SYSTEM	0.000	0.000	66.969	0.000	66.969	123.851	184.800	348.360	482.952	0	1,206.932
• 0604884C: AIRBORNE INFRARED (ABIR)	0.000	0.000	111.671	0.000	111.671	103.636	123.591	103.668	58.773	0	501.339
• 0605502C: Small Business Innovative Research BMDO	124.788	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	124.788
• 0901585C: Pentagon Reservation	20.146	19.709	20.482	0.000	20.482	0.000	0.000	0.000	0.000	0	60.337
• 0901598C: Management Headquarters-MDA	87.151	52.403	29.754	0.000	29.754	29.421	29.974	30.567	31.171	0	290.441
D. Acquisition Strategy											
The Consolidated - Contractor Logistics Support (C-CLS) contract was awarded in FY 2008 to operate and maintain the AN/TPY-2 radars and provide logistical support for other radars in the BMDS Radars PE. The C-CLS contract provides the operations and support activities required for site surveys, planning, relocation, depot maintenance, forward-based system operations, repair, and replacement. The contract is an Indefinite Delivery/Indefinite Quantity (IDIQ) task order contract.											
E. Performance Metrics											
NA											

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Product Development (\$ in Millions) <table border="1" style="width:100%; border-collapse: collapse; margin-top: 10px;"> <tr> <th rowspan="2">Cost Category Item</th> <th rowspan="2">Contract Method & Type</th> <th rowspan="2">Performing Activity & Location</th> <th rowspan="2">Total Prior Years Cost</th> <th colspan="2">FY 2010</th> <th colspan="2">FY 2011 Base</th> <th colspan="2">FY 2011 OCO</th> <th>FY 2011 Total</th> <th rowspan="2">Cost To Complete</th> <th rowspan="2">Total Cost</th> <th rowspan="2">Target Value of Contract</th> </tr> <tr> <th>Cost</th> <th>Award Date</th> <th>Cost</th> <th>Award Date</th> <th>Cost</th> <th>Award Date</th> <th>Cost</th> </tr> <tr> <td>AN/TPY-2 #2 Commercial Power AN/TPY-2 #2 - Commercial Power AX11</td> <td>SS/Various</td> <td>Raytheon MA</td> <td align="right">2.697</td> <td align="right">0.000</td> <td></td> <td align="right">0.000</td> <td></td> <td align="right">0.000</td> <td></td> <td align="right">0.000</td> <td align="right">0</td> <td align="right">2.697</td> <td>Continuing</td> </tr> <tr> <td align="right" colspan="3">Subtotal</td> <td align="right">2.697</td> <td align="right">0.000</td> <td></td> <td align="right">0.000</td> <td></td> <td align="right">0.000</td> <td></td> <td align="right">0.000</td> <td align="right">0.000</td> <td align="right">2.697</td> <td></td> </tr> </table>														Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total	Cost To Complete	Total Cost	Target Value of Contract	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	AN/TPY-2 #2 Commercial Power AN/TPY-2 #2 - Commercial Power AX11	SS/Various	Raytheon MA	2.697	0.000		0.000		0.000		0.000	0	2.697	Continuing	Subtotal			2.697	0.000		0.000		0.000		0.000	0.000	2.697	
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total	Cost To Complete	Total Cost	Target Value of Contract																																																	
				Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost																																																				
AN/TPY-2 #2 Commercial Power AN/TPY-2 #2 - Commercial Power AX11	SS/Various	Raytheon MA	2.697	0.000		0.000		0.000		0.000	0	2.697	Continuing																																																	
Subtotal			2.697	0.000		0.000		0.000		0.000	0.000	2.697																																																		
Remarks NA																																																														
Support (\$ in Millions) <table border="1" style="width:100%; border-collapse: collapse; margin-top: 10px;"> <tr> <th rowspan="2">Cost Category Item</th> <th rowspan="2">Contract Method & Type</th> <th rowspan="2">Performing Activity & Location</th> <th rowspan="2">Total Prior Years Cost</th> <th colspan="2">FY 2010</th> <th colspan="2">FY 2011 Base</th> <th colspan="2">FY 2011 OCO</th> <th>FY 2011 Total</th> <th rowspan="2">Cost To Complete</th> <th rowspan="2">Total Cost</th> <th rowspan="2">Target Value of Contract</th> </tr> <tr> <th>Cost</th> <th>Award Date</th> <th>Cost</th> <th>Award Date</th> <th>Cost</th> <th>Award Date</th> <th>Cost</th> </tr> <tr> <td align="right" colspan="3">Subtotal</td> <td align="right">0.000</td> <td align="right">0.000</td> <td></td> <td align="right">0.000</td> <td></td> <td align="right">0.000</td> <td></td> <td align="right">0.000</td> <td></td> <td></td> <td></td> </tr> </table>														Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total	Cost To Complete	Total Cost	Target Value of Contract	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Subtotal			0.000	0.000		0.000		0.000		0.000																	
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total	Cost To Complete	Total Cost	Target Value of Contract																																																	
				Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost																																																				
Subtotal			0.000	0.000		0.000		0.000		0.000																																																				
Remarks NA																																																														

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Missile Defense Agency											DATE: February 2010		
APPROPRIATION/BUDGET ACTIVITY 0400: <i>Research, Development, Test & Evaluation, Defense-Wide</i> BA 4: <i>Advanced Component Development & Prototypes (ACD&P)</i>				R-1 ITEM NOMENCLATURE PE 0603884C: <i>Ballistic Missile Defense Sensors</i>				PROJECT AX11: <i>Ballistic Missile Defense Radars Block 1.0</i>					
Test and Evaluation (\$ in Millions)													
				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 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
Subtotal			0.000	0.000		0.000		0.000		0.000			
Remarks NA													
Management Services (\$ in Millions)													
				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 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
Subtotal			0.000	0.000		0.000		0.000		0.000			
Remarks NA													
			Total Prior Years Cost	FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			2.697	0.000		0.000		0.000		0.000	0.000	2.697	
Remarks NA													

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Exhibit R-4, RDT&E Schedule Profile: PB 2011 Missile Defense Agency							DATE: February 2010				
APPROPRIATION/BUDGET ACTIVITY 0400: <i>Research, Development, Test & Evaluation, Defense-Wide</i> BA 4: <i>Advanced Component Development & Prototypes (ACD&P)</i>				R-1 ITEM NOMENCLATURE PE 0603884C: <i>Ballistic Missile Defense Sensors</i>				PROJECT AX11: <i>Ballistic Missile Defense Radars Block 1.0</i>			

	FY 2009				FY 2010				FY 2011				FY 2012				FY 2013				FY 2014				FY 2015			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Complete Power Upgrade for AN/TPY-2 #2																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2011 Missile Defense Agency			DATE: February 2010															
APPROPRIATION/BUDGET ACTIVITY 0400: <i>Research, Development, Test & Evaluation, Defense-Wide</i> BA 4: <i>Advanced Component Development & Prototypes (ACD&P)</i>	R-1 ITEM NOMENCLATURE PE 0603884C: <i>Ballistic Missile Defense Sensors</i>	PROJECT AX11: <i>Ballistic Missile Defense Radars Block 1.0</i>																
Schedule Details <table border="1" style="margin: auto; border-collapse: collapse;"> <thead> <tr> <th rowspan="2" style="width:50%;">Event</th> <th colspan="2" style="width:20%;">Start</th> <th colspan="2" style="width:20%;">End</th> </tr> <tr> <th style="width:10%;">Quarter</th> <th style="width:10%;">Year</th> <th style="width:10%;">Quarter</th> <th style="width:10%;">Year</th> </tr> </thead> <tbody> <tr> <td>Complete Power Upgrade for AN/TPY-2 #2</td> <td align="center">4</td> <td align="center">2009</td> <td align="center">4</td> <td align="center">2009</td> </tr> </tbody> </table>					Event	Start		End		Quarter	Year	Quarter	Year	Complete Power Upgrade for AN/TPY-2 #2	4	2009	4	2009
Event	Start		End															
	Quarter	Year	Quarter	Year														
Complete Power Upgrade for AN/TPY-2 #2	4	2009	4	2009														

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Exhibit R-2A, RDT&E Project Justification: PB 2011 Missile Defense Agency								DATE: February 2010			
APPROPRIATION/BUDGET ACTIVITY 0400: <i>Research, Development, Test & Evaluation, Defense-Wide</i> BA 4: <i>Advanced Component Development & Prototypes (ACD&P)</i>				R-1 ITEM NOMENCLATURE PE 0603884C: <i>Ballistic Missile Defense Sensors</i>				PROJECT BX11: <i>Ballistic Missile Defense Radars Block 2.0</i>			
COST (\$ in Millions)	FY 2009 Actual	FY 2010 Estimate	FY 2011 Base Estimate	FY 2011 OCO Estimate	FY 2011 Total Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
BX11: <i>Ballistic Missile Defense Radars Block 2.0</i>	71.950	3.173	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	75.123
Quantity of RDT&E Articles	0	1	0	0	0	0	0	0	0		
Note RDT&E Articles: AN/TPY-2 #7 radar production began in FY 2007 and will be delivered to MDA in FY 2010. A. Mission Description and Budget Item Justification Sensors Project BX11 provides funding to manufacture, test, and deliver AN/TPY-2 #7 to support the Terminal High Altitude Area Defense (THAAD) Fire Units #2. B. Accomplishments/Planned Program (\$ in Millions)											
							FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
AN/TPY-2 #7							71.950	3.173	0.000	0.000	0.000
See Description Below											
FY 2009 Accomplishments: Continued manufacturing and integration of Radar Antenna Continued manufacturing of other Radar Components (Electronics Equipment Unit (EEU), Cooling Equipment Unit (CEU), and Prime Power Units (PPUs)) Delivered two Prime Power Units (PPUs) for Army New Equipment Training											
FY 2010 Plans: Complete radar component integration and check-out Deliver AN/TPY-2 #7 and four Prime Power Units (PPUs) for Theater High Altitude Area Defense (THAAD) Fire Unit Radars (FUR) ;											

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Exhibit R-2A, RDT&E Project Justification: PB 2011 Missile Defense Agency										DATE: February 2010	
APPROPRIATION/BUDGET ACTIVITY 0400: Research, Development, Test & Evaluation, Defense-Wide BA 4: Advanced Component Development & Prototypes (ACD&P)				R-1 ITEM NOMENCLATURE PE 0603884C: Ballistic Missile Defense Sensors				PROJECT BX11: Ballistic Missile Defense Radars Block 2.0			
B. Accomplishments/Planned Program (\$ in Millions)											
						FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total	
FY 2011 Base Plans: NA											
FY 2011 OCO Plans: NA											
Accomplishments/Planned Programs Subtotals						71.950	3.173	0.000	0.000	0.000	
C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total	FY 2012	FY 2013	FY 2014	FY 2015	Cost To Complete	Total Cost
• 0603175C: Ballistic Missile Defense Technology	117.602	189.229	132.220	0.000	132.220	236.875	239.873	197.118	197.852	0	1,310.769
• 0603881C: Ballistic Missile Defense Terminal Defense Segment	951.414	715.732	436.482	0.000	436.482	250.275	336.711	500.983	521.717	0	3,713.314
• 0603882C: Ballistic Missile Defense Mid-Course Segment	1,472.683	1,027.371	1,346.181	0.000	1,346.181	1,112.655	1,291.790	1,099.029	1,033.213	0	8,382.922
• 0603883C: Ballistic Missile Defense Boost Defense Segment	384.365	182.317	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	566.682
• 0603886C: Ballistic Missile Defense System Interceptor	308.869	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	308.869
• 0603888C: Ballistic Missile Defense Test and Targets	906.952	823.333	1,113.425	0.000	1,113.425	1,105.959	951.371	871.929	829.608	0	6,602.577
• 0603890C: Ballistic Missile Defense Enabling Programs	402.776	358.751	402.769	0.000	402.769	468.673	457.745	473.871	488.799	0	3,053.384
• 0603891C: SPECIAL PROGRAMS - MDA	182.998	250.185	270.189	0.000	270.189	269.040	450.645	517.486	601.315	0	2,541.858

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Exhibit R-2A, RDT&E Project Justification: PB 2011 Missile Defense Agency									DATE: February 2010		
APPROPRIATION/BUDGET ACTIVITY				R-1 ITEM NOMENCLATURE			PROJECT				
0400: Research, Development, Test & Evaluation, Defense-Wide BA 4: Advanced Component Development & Prototypes (ACD&P)				PE 0603884C: Ballistic Missile Defense Sensors			BX11: Ballistic Missile Defense Radars Block 2.0				
C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total	FY 2012	FY 2013	FY 2014	FY 2015	Cost To Complete	Total Cost
• 0603892C: BMD AEGIS	1,054.323	1,435.717	1,467.278	0.000	1,467.278	1,021.878	1,112.668	1,076.739	923.316	0	8,091.919
• 0603893C: SPACE TRACKING & SURVEILLANCE SYSTEM	209.831	161.609	112.678	0.000	112.678	98.500	56.424	52.928	34.661	0	726.631
• 0603894C: MULTIPLE KILL VEHICLE	226.027	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	226.027
• 0603895C: BMD SYSTEM SPACE PROGRAM	23.250	12.492	10.942	0.000	10.942	11.182	11.347	11.749	12.155	0	93.117
• 0603896C: BMD C2BMC	275.174	334.734	342.625	0.000	342.625	364.085	289.778	323.922	298.936	0	2,229.254
• 0603897C: BMD HERCULES	51.629	47.932	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	99.561
• 0603898C: BMD JOINT WARFIGHTER SUPPORT	66.283	61.098	68.726	0.000	68.726	62.239	63.451	65.158	67.231	0	454.186
• 0603901C: DIRECTED ENERGY RESEARCH	0.000	0.000	98.688	0.000	98.688	101.371	103.449	104.572	104.141	0	512.221
• 0603904C: MISSILE DEFENSE INTEGRATION & OPERATIONS CENTER (MDIOC)	102.823	86.483	86.198	0.000	86.198	88.181	78.517	80.410	83.087	0	605.699
• 0603906C: REGARDING TRENCH	3.159	6.130	7.529	0.000	7.529	8.295	8.286	8.479	8.675	0	50.553
• 0603907C: SEA BASED X-BAND RADAR (SBX)	143.878	167.153	153.056	0.000	153.056	150.104	159.832	160.163	197.099	0	1,131.285
• 0603908C: BMD EUROPEAN INTERCEPTOR SITE	348.722	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	348.722
• 0603909C: BMD EUROPEAN MIDCOURSE RADAR	73.728	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	73.728
• 0603911C: BMD EUROPEAN CAPABILITY	0.000	50.226	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	50.226
• 0603912C: BMD European Comm Support	26.016	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	26.016
	0.000	201.323	121.735	0.000	121.735	111.100	113.101	116.114	119.172	0	782.545

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Exhibit R-2A, RDT&E Project Justification: PB 2011 Missile Defense Agency									DATE: February 2010		
APPROPRIATION/BUDGET ACTIVITY 0400: Research, Development, Test & Evaluation, Defense-Wide BA 4: Advanced Component Development & Prototypes (ACD&P)				R-1 ITEM NOMENCLATURE PE 0603884C: Ballistic Missile Defense Sensors				PROJECT BX11: Ballistic Missile Defense Radars Block 2.0			
C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total	FY 2012	FY 2013	FY 2014	FY 2015	Cost To Complete	Total Cost
• 0603913C: ISRAELI COOPERATIVE											
• 0604880C: LAND-BASED SM-3	0.000	0.000	281.378	0.000	281.378	345.937	187.062	93.456	139.595	0	1,047.428
• 0604881C: Aegis SM-3 BLOCK IIA CO-DEVELOPMENT	0.000	255.987	318.800	0.000	318.800	405.500	416.300	337.300	227.500	0	1,961.387
• 0604883C: PRECISION TRACKING SPACE SYSTEM	0.000	0.000	66.969	0.000	66.969	123.851	184.800	348.360	482.952	0	1,206.932
• 0604884C: AIRBORNE INFRARED (ABIR)	0.000	0.000	111.671	0.000	111.671	103.636	123.591	103.668	58.773	0	501.339
• 0605502C: Small Business Innovative Research BMDO	124.788	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	124.788
• 0901585C: Pentagon Reservation	20.146	19.709	20.482	0.000	20.482	0.000	0.000	0.000	0.000	0	60.337
• 0901598C: Management Headquarters-MDA	87.151	52.403	29.754	0.000	29.754	29.421	29.974	30.567	31.171	0	290.441
D. Acquisition Strategy											
The BMDS Sensors contract supports X-Band Sensor Development and acquisition of AN/TPY-2 radars. The development effort focuses on discrimination enhancements as well as the development of Common Software for X-Band Radars under a ``Cost Plus Award Fee (CPAF)`` CLIN. Manufacturing of AN/PY-2 #7 and four PPU's is being done on a ``Cost Plus Incentive Fee (CPIF)`` CLIN.											
E. Performance Metrics											
NA											

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Missile Defense Agency											DATE: February 2010		
APPROPRIATION/BUDGET ACTIVITY 0400: Research, Development, Test & Evaluation, Defense-Wide BA 4: Advanced Component Development & Prototypes (ACD&P)				R-1 ITEM NOMENCLATURE PE 0603884C: Ballistic Missile Defense Sensors				PROJECT BX11: Ballistic Missile Defense Radars Block 2.0					
Product Development (\$ in Millions)													
				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 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
AN/TPY-2 #7 AN/TPY-2 #7 Manufacture BX11	SS/CPAF	Raytheon MA	71.950	3.173	Oct 2009	0.000		0.000		0.000	0	75.123	Continuing
Subtotal			71.950	3.173		0.000		0.000		0.000	0.000	75.123	
Remarks NA													
Support (\$ in Millions)													
				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 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
Subtotal			0.000	0.000		0.000		0.000		0.000			
Remarks NA													

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Missile Defense Agency											DATE: February 2010		
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Test and Evaluation (\$ in Millions)													
				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 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
Subtotal			0.000	0.000		0.000		0.000		0.000			
Remarks NA													
Management Services (\$ in Millions)													
				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 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
Subtotal			0.000	0.000		0.000		0.000		0.000			
Remarks NA													
			Total Prior Years Cost	FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			71.950	3.173		0.000		0.000		0.000	0.000	75.123	
Remarks NA													

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Exhibit R-4, RDT&E Schedule Profile: PB 2011 Missile Defense Agency			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 0400: <i>Research, Development, Test & Evaluation, Defense-Wide</i> BA 4: <i>Advanced Component Development & Prototypes (ACD&P)</i>	R-1 ITEM NOMENCLATURE PE 0603884C: <i>Ballistic Missile Defense Sensors</i>	PROJECT BX11: <i>Ballistic Missile Defense Radars Block 2.0</i>	

	FY 2009				FY 2010				FY 2011				FY 2012				FY 2013				FY 2014				FY 2015			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Deliver Prime Power Unit (PPU) #3																												
Deliver PPU #4																												
Deliver PPU #5																												
Manufacture AN/TPY-2 #7 Hardware Complete																												
Deliver PPU #6																												
AN/TPY-2 #7 Delivery to THAAD																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2011 Missile Defense Agency			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 0400: <i>Research, Development, Test & Evaluation, Defense-Wide</i> BA 4: <i>Advanced Component Development & Prototypes (ACD&P)</i>	R-1 ITEM NOMENCLATURE PE 0603884C: <i>Ballistic Missile Defense Sensors</i>	PROJECT BX11: <i>Ballistic Missile Defense Radars Block 2.0</i>	

Schedule Details

Event	Start		End	
	Quarter	Year	Quarter	Year
Deliver Prime Power Unit (PPU) #3	2	2010	2	2010
Deliver PPU #4	3	2010	3	2010
Deliver PPU #5	3	2010	3	2010
Manufacture AN/TPY-2 #7 Hardware Complete	3	2010	3	2010
Deliver PPU #6	4	2010	4	2010
AN/TPY-2 #7 Delivery to THAAD	4	2010	4	2010

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Exhibit R-2A, RDT&E Project Justification: PB 2011 Missile Defense Agency								DATE: February 2010			
APPROPRIATION/BUDGET ACTIVITY 0400: <i>Research, Development, Test & Evaluation, Defense-Wide</i> BA 4: <i>Advanced Component Development & Prototypes (ACD&P)</i>				R-1 ITEM NOMENCLATURE PE 0603884C: <i>Ballistic Missile Defense Sensors</i>				PROJECT CX11: <i>Ballistic Missile Defense Radars Block 3.0</i>			
COST (\$ in Millions)	FY 2009 Actual	FY 2010 Estimate	FY 2011 Base Estimate	FY 2011 OCO Estimate	FY 2011 Total Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
CX11: <i>Ballistic Missile Defense Radars Block 3.0</i>	110.486	12.379	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	122.865
Quantity of RDT&E Articles	0	1	0	0	0	0	0	0	0		
Note RDT&E Article: The Thule Upgraded Early Warning Radar (UEWR) effort began in FY 2006 and will be completed in FY 2010.											
A. Mission Description and Budget Item Justification The Ballistic Missile Defense (BMD) Sensors Project CX11 effort expands defense of the U.S. to include defense against limited Iranian long-range threats. This project includes the upgrade of Thule Early Warning Radar (EWR), the insertion of advanced algorithms into AN/TPY-2 software to enhance discrimination capabilities in X-Band radars, and enhancements to the sensors through the Unifying Missile Defense Functions. The Thule EWR upgrade will be delivered in FY 2010 and will maintain a common configuration with the Beale AFB, CA, and RAF Fylingdales, UK upgrades. These upgrades include hardware and software modifications that enhance capabilities and integrate these Upgraded Early Warning Radars (UEWRs) into the BMDS Architecture. The addition of Thule UEWR into the BMDS sensor architecture will improve BMDS sensor coverage and provide new engagement options against long range missile threats from Iran. Discrimination efforts provide for the development of advanced algorithms, and the integration and verification of enhanced capability. These efforts also support the Unified Missile Defense Functions in the implementation of system wide enhancements to increase the probability of a successful engagement.											
B. Accomplishments/Planned Program (\$ in Millions)											
						FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total	
Thule Early Warning Radar Upgrade						69.106	0.000	0.000	0.000	0.000	
See Description Below											
FY 2009 Accomplishments: Conducted BMDS Integration testing Completed hardware and software installations											

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Exhibit R-2A, RDT&E Project Justification: PB 2011 Missile Defense Agency				DATE: February 2010		
APPROPRIATION/BUDGET ACTIVITY 0400: Research, Development, Test & Evaluation, Defense-Wide BA 4: Advanced Component Development & Prototypes (ACD&P)		R-1 ITEM NOMENCLATURE PE 0603884C: Ballistic Missile Defense Sensors		PROJECT CX11: Ballistic Missile Defense Radars Block 3.0		
B. Accomplishments/Planned Program (\$ in Millions)						
		FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
Completed Thule UEWR development test and evaluation Conducted operational test Force Developers Evaluation (FDE) Completed Thule Op's Acceptance by USAF FY 2010 Plans: NA FY 2011 Base Plans: NA FY 2011 OCO Plans: NA						
Migration to DISN, Long-Haul Comms See Description Below FY 2009 Accomplishments: Supported migration of MDA`s primary mission communications transport onto the DISA Defense Information Systems Network (DISN) Continued replacement of Long-Haul Communications (LHC) transport services between GMD nodes and sensors FY 2010 Plans: NA FY 2011 Base Plans: NA		24.800	0.000	0.000	0.000	0.000

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Exhibit R-2A, RDT&E Project Justification: PB 2011 Missile Defense Agency				DATE: February 2010		
APPROPRIATION/BUDGET ACTIVITY 0400: Research, Development, Test & Evaluation, Defense-Wide BA 4: Advanced Component Development & Prototypes (ACD&P)		R-1 ITEM NOMENCLATURE PE 0603884C: Ballistic Missile Defense Sensors		PROJECT CX11: Ballistic Missile Defense Radars Block 3.0		
B. Accomplishments/Planned Program (\$ in Millions)						
		FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
FY 2011 OCO Plans: NA						
Radar Discrimination Capability Common Advanced Algorithm Insertion See Description Below FY 2009 Accomplishments: Conducted Validation and Verification of near-term discrimination Initiated design of advanced discrimination algorithms Commenced prototype development of integrated discrimination FY 2010 Plans: Assess near-term discrimination response in ground test campaigns GTI-04 and GTD-04 Participate in Performance Assessments (PA-09, PA-10) Evaluate common software capability release CR-2.4 performance using targets of opportunity Integrate prototype designs into TPY-2 digital representation FY 2011 Base Plans: NA FY 2011 OCO Plans: NA		16.580	12.379	0.000	0.000	0.000
Accomplishments/Planned Programs Subtotals		110.486	12.379	0.000	0.000	0.000

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Exhibit R-2A, RDT&E Project Justification: PB 2011 Missile Defense Agency										DATE: February 2010	
APPROPRIATION/BUDGET ACTIVITY				R-1 ITEM NOMENCLATURE				PROJECT			
0400: Research, Development, Test & Evaluation, Defense-Wide BA 4: Advanced Component Development & Prototypes (ACD&P)				PE 0603884C: Ballistic Missile Defense Sensors				CX11: Ballistic Missile Defense Radars Block 3.0			
C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total	FY 2012	FY 2013	FY 2014	FY 2015	Cost To Complete	Total Cost
• 0603175C: Ballistic Missile Defense Technology	117.602	189.229	132.220	0.000	132.220	236.875	239.873	197.118	197.852	0	1,310.769
• 0603881C: Ballistic Missile Defense Terminal Defense Segment	951.414	715.732	436.482	0.000	436.482	250.275	336.711	500.983	521.717	0	3,713.314
• 0603882C: Ballistic Missile Defense Mid-Course Segment	1,472.683	1,027.371	1,346.181	0.000	1,346.181	1,112.655	1,291.790	1,099.029	1,033.213	0	8,382.922
• 0603883C: Ballistic Missile Defense Boost Defense Segment	384.365	182.317	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	566.682
• 0603886C: Ballistic Missile Defense System Interceptor	308.869	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	308.869
• 0603888C: Ballistic Missile Defense Test and Targets	906.952	823.333	1,113.425	0.000	1,113.425	1,105.959	951.371	871.929	829.608	0	6,602.577
• 0603890C: Ballistic Missile Defense Enabling Programs	402.776	358.751	402.769	0.000	402.769	468.673	457.745	473.871	488.799	0	3,053.384
• 0603891C: SPECIAL PROGRAMS - MDA	182.998	250.185	270.189	0.000	270.189	269.040	450.645	517.486	601.315	0	2,541.858
• 0603892C: BMD AEGIS	1,054.323	1,435.717	1,467.278	0.000	1,467.278	1,021.878	1,112.668	1,076.739	923.316	0	8,091.919
• 0603893C: SPACE TRACKING & SURVEILLANCE SYSTEM	209.831	161.609	112.678	0.000	112.678	98.500	56.424	52.928	34.661	0	726.631
• 0603894C: MULTIPLE KILL VEHICLE	226.027	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	226.027
• 0603895C: BMD SYSTEM SPACE PROGRAM	23.250	12.492	10.942	0.000	10.942	11.182	11.347	11.749	12.155	0	93.117
• 0603896C: BMD C2BMC	275.174	334.734	342.625	0.000	342.625	364.085	289.778	323.922	298.936	0	2,229.254
• 0603897C: BMD HERCULES	51.629	47.932	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	99.561
• 0603898C: BMD JOINT WARFIGHTER SUPPORT	66.283	61.098	68.726	0.000	68.726	62.239	63.451	65.158	67.231	0	454.186

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Exhibit R-2A, RDT&E Project Justification: PB 2011 Missile Defense Agency									DATE: February 2010		
APPROPRIATION/BUDGET ACTIVITY				R-1 ITEM NOMENCLATURE				PROJECT			
0400: Research, Development, Test & Evaluation, Defense-Wide BA 4: Advanced Component Development & Prototypes (ACD&P)				PE 0603884C: Ballistic Missile Defense Sensors				CX11: Ballistic Missile Defense Radars Block 3.0			
C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total	FY 2012	FY 2013	FY 2014	FY 2015	Cost To Complete	Total Cost
• 0603901C: DIRECTED ENERGY RESEARCH	0.000	0.000	98.688	0.000	98.688	101.371	103.449	104.572	104.141	0	512.221
• 0603904C: MISSILE DEFENSE INTEGRATION & OPERATIONS CENTER (MDIOC)	102.823	86.483	86.198	0.000	86.198	88.181	78.517	80.410	83.087	0	605.699
• 0603906C: REGARDING TRENCH	3.159	6.130	7.529	0.000	7.529	8.295	8.286	8.479	8.675	0	50.553
• 0603907C: SEA BASED X-BAND RADAR (SBX)	143.878	167.153	153.056	0.000	153.056	150.104	159.832	160.163	197.099	0	1,131.285
• 0603908C: BMD EUROPEAN INTERCEPTOR SITE	348.722	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	348.722
• 0603909C: BMD EUROPEAN MIDCOURSE RADAR	73.728	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	73.728
• 0603911C: BMD EUROPEAN CAPABILITY	0.000	50.226	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	50.226
• 0603912C: BMD European Comm Support	26.016	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	26.016
• 0603913C: ISRAELI COOPERATIVE	0.000	201.323	121.735	0.000	121.735	111.100	113.101	116.114	119.172	0	782.545
• 0604880C: LAND-BASED SM-3	0.000	0.000	281.378	0.000	281.378	345.937	187.062	93.456	139.595	0	1,047.428
• 0604881C: Aegis SM-3 BLOCK IIA CO-DEVELOPMENT	0.000	255.987	318.800	0.000	318.800	405.500	416.300	337.300	227.500	0	1,961.387
• 0604883C: PRECISION TRACKING SPACE SYSTEM	0.000	0.000	66.969	0.000	66.969	123.851	184.800	348.360	482.952	0	1,206.932
• 0604884C: AIRBORNE INFRARED (ABIR)	0.000	0.000	111.671	0.000	111.671	103.636	123.591	103.668	58.773	0	501.339
• 0605502C: Small Business Innovative Research BMDO	124.788	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	124.788
• 0901585C: Pentagon Reservation	20.146	19.709	20.482	0.000	20.482	0.000	0.000	0.000	0.000	0	60.337

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Exhibit R-2A, RDT&E Project Justification: PB 2011 Missile Defense Agency										DATE: February 2010	
APPROPRIATION/BUDGET ACTIVITY 0400: <i>Research, Development, Test & Evaluation, Defense-Wide</i> BA 4: <i>Advanced Component Development & Prototypes (ACD&P)</i>				R-1 ITEM NOMENCLATURE PE 0603884C: <i>Ballistic Missile Defense Sensors</i>				PROJECT CX11: <i>Ballistic Missile Defense Radars Block 3.0</i>			
C. Other Program Funding Summary (\$ in Millions)											
<u>Line Item</u>	<u>FY 2009</u>	<u>FY 2010</u>	<u>FY 2011</u> <u>Base</u>	<u>FY 2011</u> <u>OCO</u>	<u>FY 2011</u> <u>Total</u>	<u>FY 2012</u>	<u>FY 2013</u>	<u>FY 2014</u>	<u>FY 2015</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• 0901598C: <i>Management Headquarters-MDA</i>	87.151	52.403	29.754	0.000	29.754	29.421	29.974	30.567	31.171	0	290.441
D. Acquisition Strategy											
A sole source contract was awarded for the procurement and installation of the Thule Early Warning Radar hardware and software upgrade kits. The contract has Firm Fixed Price (FFP) and Cost Plus Award Fee (CPAF) CLINs. The AN/TPY-2 project uses an existing radar design to minimize development costs and schedule. Design enhancements focus on software changes that provide advanced algorithms for radar discrimination. The AN-TPY-2 is a Cost Plus Award Fee (CPAF) contract.											
E. Performance Metrics											
NA											

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Missile Defense Agency											DATE: February 2010			
APPROPRIATION/BUDGET ACTIVITY 0400: Research, Development, Test & Evaluation, Defense-Wide BA 4: Advanced Component Development & Prototypes (ACD&P)					R-1 ITEM NOMENCLATURE PE 0603884C: Ballistic Missile Defense Sensors				PROJECT CX11: Ballistic Missile Defense Radars Block 3.0					
Product Development (\$ in Millions)														
				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 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	
Thule Early Warning Radar Upgrade Prime Contractor CX11	SS/CPAF	Raytheon MA	40.082	0.000		0.000		0.000		0.000	0	40.082	Continuing	
Thule Early Warning Radar Upgrade Site Activation, Management, Lodging, ISA Services, Transportation CX11	TBD/TBD	MDA-DFW AL	4.373	0.000		0.000		0.000		0.000	0	4.373	Continuing	
Thule Early Warning Radar Upgrade Embedded Test, Engineering Services, GCN Connectivity, SSCO, Lab Upgrades CX11	SS/CPAF	Boeing CA, AL	6.997	0.000		0.000		0.000		0.000	0	6.997	Continuing	
Thule Early Warning Radar Upgrade Integration/Support CX11	TBD/TBD	850 ELSG MA	2.701	0.000		0.000		0.000		0.000	0	2.701	Continuing	
Thule Early Warning Radar Upgrade S/W Deployment & Transition Support CX11	TBD/TBD	ITT Sensor CO	3.076	0.000		0.000		0.000		0.000	0	3.076	Continuing	
Thule Early Warning Radar Upgrade Thule UEWR - C2 High Altitude EMP Room CX11	TBD/TBD	DISA VA	2.002	0.000		0.000		0.000		0.000	0	2.002	Continuing	

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Missile Defense Agency											DATE: February 2010		
APPROPRIATION/BUDGET ACTIVITY 0400: <i>Research, Development, Test & Evaluation, Defense-Wide</i> BA 4: <i>Advanced Component Development & Prototypes (ACD&P)</i>				R-1 ITEM NOMENCLATURE PE 0603884C: <i>Ballistic Missile Defense Sensors</i>				PROJECT CX11: <i>Ballistic Missile Defense Radars Block 3.0</i>					
Product Development (\$ in Millions)													
				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 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
Thule Early Warning Radar Upgrade Thule Communications Equipment CX11	TBD/TBD	DISA MO	9.875	0.000		0.000		0.000		0.000	Continuing	Continuing	Continuing
Communications Migration Migration to DISN, Long-Haul Comms CX11	TBD/TBD	DISA VA	24.800	0.000		0.000		0.000		0.000	Continuing	Continuing	Continuing
Radar Discrimination Capability Common Advanced Algorithm Insertion Near/Far Term Discrimination Efforts CX11	C/CPAF	Raytheon MA	16.580	12.379	Oct 2009	0.000		0.000		0.000	0	28.959	Continuing
Subtotal			110.486	12.379		0.000		0.000		0.000			
Remarks NA													
Support (\$ in Millions)													
				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 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
Subtotal			0.000	0.000		0.000		0.000		0.000			

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Missile Defense Agency											DATE: February 2010		
APPROPRIATION/BUDGET ACTIVITY 0400: Research, Development, Test & Evaluation, Defense-Wide BA 4: Advanced Component Development & Prototypes (ACD&P)				R-1 ITEM NOMENCLATURE PE 0603884C: Ballistic Missile Defense Sensors				PROJECT CX11: Ballistic Missile Defense Radars Block 3.0					
Support (\$ in Millions)													
				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 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
Remarks NA													
Test and Evaluation (\$ in Millions)													
				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 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
Subtotal			0.000	0.000		0.000		0.000		0.000			
Remarks NA													
Management Services (\$ in Millions)													
				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 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
Subtotal			0.000	0.000		0.000		0.000		0.000			
Remarks NA													

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Missile Defense Agency							DATE: February 2010				
APPROPRIATION/BUDGET ACTIVITY 0400: <i>Research, Development, Test & Evaluation, Defense-Wide</i> BA 4: <i>Advanced Component Development & Prototypes (ACD&P)</i>			R-1 ITEM NOMENCLATURE PE 0603884C: <i>Ballistic Missile Defense Sensors</i>			PROJECT CX11: <i>Ballistic Missile Defense Radars Block 3.0</i>					
	Total Prior Years Cost	FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	110.486	12.379		0.000		0.000		0.000			
Remarks NA											

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Exhibit R-4, RDT&E Schedule Profile: PB 2011 Missile Defense Agency			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 0400: <i>Research, Development, Test & Evaluation, Defense-Wide</i> BA 4: <i>Advanced Component Development & Prototypes (ACD&P)</i>	R-1 ITEM NOMENCLATURE PE 0603884C: <i>Ballistic Missile Defense Sensors</i>	PROJECT CX11: <i>Ballistic Missile Defense Radars Block 3.0</i>	

	FY 2009				FY 2010				FY 2011				FY 2012				FY 2013				FY 2014				FY 2015			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Complete Thule UEWR DT&E		■																										
Thule Ops Acceptance by USAF				■																								
Performance Assessment PA09					■																							
Conduct V&V of CR-2.4						■	■	■																				
Performance Assessment PA10								■																				

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Exhibit R-4A, RDT&E Schedule Details: PB 2011 Missile Defense Agency			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 0400: <i>Research, Development, Test & Evaluation, Defense-Wide</i> BA 4: <i>Advanced Component Development & Prototypes (ACD&P)</i>	R-1 ITEM NOMENCLATURE PE 0603884C: <i>Ballistic Missile Defense Sensors</i>	PROJECT CX11: <i>Ballistic Missile Defense Radars Block 3.0</i>	

Schedule Details

Event	Start		End	
	Quarter	Year	Quarter	Year
Complete Thule UEWR DT&E	2	2009	2	2009
Thule Ops Acceptance by USAF	4	2009	4	2009
Performance Assessment PA09	1	2010	1	2010
Conduct V&V of CR-2.4	2	2010	4	2010
Performance Assessment PA10	4	2010	4	2010

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Exhibit R-2A, RDT&E Project Justification: PB 2011 Missile Defense Agency								DATE: February 2010			
APPROPRIATION/BUDGET ACTIVITY 0400: <i>Research, Development, Test & Evaluation, Defense-Wide</i> BA 4: <i>Advanced Component Development & Prototypes (ACD&P)</i>				R-1 ITEM NOMENCLATURE PE 0603884C: <i>Ballistic Missile Defense Sensors</i>				PROJECT EX11: <i>Ballistic Missile Defense Radars Block 5.0</i>			
COST (\$ in Millions)	FY 2009 Actual	FY 2010 Estimate	FY 2011 Base Estimate	FY 2011 OCO Estimate	FY 2011 Total Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
EX11: <i>Ballistic Missile Defense Radars Block 5.0</i>	128.838	91.893	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	220.731
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0		
Note NA											
A. Mission Description and Budget Item Justification Project EX11 efforts expand defense of allies and deployed forces from short-to-intermediate-range threats in two regions/theaters. Specifically, the BMD Radars Project EX11 effort provides for: Deployment and site activation for AN/TPY-2 #3 forward-based radar Continue manufacture of transportable Ballistic Missile Defense System (BMDS) Communications System Complex (BCSC-T), High Mobility Multipurpose Wheeled Vehicle (HMMWV) Based Communications Node (HBCN), or the C2BMC Deployable Interface Node (CDIN) as required to support deployment of AN/TPY-2 forward-based radar sites Continue development of the Ballistic Missile Defense Systems (BMDS) Communications Networks (BCN) to support radar communications Continue development of a HBCN and CDIN BCN support system that will fulfill requirements for a rapidly deployable re-configurable BMDS communications suite Continue Program Management support across PE 0603884C. It provides for civilian salaries and travel. In addition, it provides other technical and business operations support services, technical oversight, and performance analysis provided by Federally Funded Research and Development Centers (FFRDCs), University Applied Research Centers (UARCs), and Advisory & Assistance services											
B. Accomplishments/Planned Program (\$ in Millions)											
						FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total	
AN/TPY-2 C2BMC Fielding						58.611	34.937	0.000	0.000	0.000	
See Description Below											

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Exhibit R-2A, RDT&E Project Justification: PB 2011 Missile Defense Agency			DATE: February 2010				
APPROPRIATION/BUDGET ACTIVITY 0400: Research, Development, Test & Evaluation, Defense-Wide BA 4: Advanced Component Development & Prototypes (ACD&P)		R-1 ITEM NOMENCLATURE PE 0603884C: Ballistic Missile Defense Sensors		PROJECT EX11: Ballistic Missile Defense Radars Block 5.0			
B. Accomplishments/Planned Program (\$ in Millions)							
			FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
<i>FY 2009 Accomplishments:</i> The C2BMC program provides network communications to both task AN/TPY-2 radars and pass radar data to BMDS elements. The Ballistic Missile Defense Systems (BMDS) Communications Networks (BCN) provides a survivable, robust, diverse and redundant, end-to-end, high availability operational communications network (COMNET) connectivity that quickly and unambiguously shares information across the global Ballistic Missile Defense System. The BCN will standardize the BMDS communication systems capabilities at all BMDS locations. The transportable BMDS Communications System Complex (BCSC) locations are designated BCSC - Transportable (BCSC-T) to facilitate the transportability inherent with the radars and engagement management facilities it supports. The BCSC-T will be survivable in accordance with the BMDS Core Standards, especially MDA-STD-001. In addition to the BCSC-T, MDA needs to have a rapidly deployable, re-configurable BMDS communications suite to meet the short term specific needs of MDA missions. The High Mobility Multipurpose Wheeled Vehicle (HMMWV) Based Communications Node (HBCN) and the C2BMC Deployable Interface Node (CDIN), a transit case BCN support system, will fulfill this requirement for deployable re-configurable BMDS communications suites. The HBCN is an integrated communication suite consisting of two customized HMMWVs and a Tactical Operations Center (TOC). Its purpose is to enable communications between AN/TPY-2 Radar and the C2BMC suite and the rest of the BMDS. The HBCN contains both mission communication equipment and campus communication equipment. One HMMWV will be dedicated to providing the mission communications consisting of a High Availability Communication Node Equipment (HACNE) C2BMC Network Interface Processor (CNIP) and other supporting equipment. The other HMMWV will be dedicated to providing the campus communications consisting of Defense Information Services Network (DISN) Service Delivery Node, Defense Red Switch Network (DRSN), Secret Internet Protocol Router Network (SIPRNET), Non-secure Internet Protocol Router Network (NIPRNET), organic Satellite Communications (SATCOM) and SATCOM interface. All operations can be performed							

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Exhibit R-2A, RDT&E Project Justification: PB 2011 Missile Defense Agency				DATE: February 2010			
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B. Accomplishments/Planned Program (\$ in Millions)							
			FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
within the HMMWVs or be remoted in a TOC. The TOC is an expandable 20`x20` room capable of supporting the C2BMC operators. The CDIN durable military transit case Ballistic Missile Defense Systems (BMDS) Communications Networks (BCN) support system is both vehicle and facility independent. However, even though it is facility independent it must be installed in some kind of a shelter or building. The recommended facility is the expandable TOC identified for the High Mobility Multipurpose Wheeled Vehicle (HMMWV) Based Communications Node (HBCN). The CDIN system will be capable of providing the mission and campus communications for a rapidly deployed AN/TPY-2 Radar. Also, the Extremely High Frequency (EHF) Teleports will be upgraded to provide AN/TPY-2 data to Ground Based Midcourse (GMD) and Aegis engagements to alleviate the vulnerability of Ultra High Frequency (UHF) communications. This satisfies a Combatant Command (COCOM) requirement for EHF operational capability due to continuous issues with UHF communications supporting the BMDS mission. Locations: United States -- Northwest, VA; Wahiawa, HI. International -- Ramstein; and Bahrain. These teleport terminals provide an entry point (Northwest at Chesapeake, VA) into the US from the European Gateway. These upgrades include an X/Ka-Band capability, and associated baseband equipment. They will provide the BMDS necessary satellite communications connectivity to the European Gateway at Ramstein. This funding supports the BMDS essential minimum communications connectivity provisions for robust, redundant, secure, survivable communications path directly in the BMDS and GMD Fire Control (GFC). These teleports provide multiple diverse network routing paths to ensure no single points of failure. For FY 2009, this effort: Supported AN/TPY-2 Ballistic Missile Defense System (BMDS) Communications networks Provided engineering support for AN/TPY-2/BCSC-T MET SATCOM integration into the overall BMDS Started acquisition of rapidly deployable, re-configurable BMDS communications suites							

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Exhibit R-2A, RDT&E Project Justification: PB 2011 Missile Defense Agency				DATE: February 2010				
APPROPRIATION/BUDGET ACTIVITY 0400: Research, Development, Test & Evaluation, Defense-Wide BA 4: Advanced Component Development & Prototypes (ACD&P)		R-1 ITEM NOMENCLATURE PE 0603884C: Ballistic Missile Defense Sensors		PROJECT EX11: Ballistic Missile Defense Radars Block 5.0				
B. Accomplishments/Planned Program (\$ in Millions)								
				FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
Upgraded EHF Teleports in Wahiawa, HI Continued development, production and fielding of the Protected Anti-Jam/Anti-Scintillation Wide band Net Centric System (PAAWNS) to support the SATCOM and OM-88 modems Supported exercises and testing relative to the AN/TPY-2 radar system with the BMDS Communications Networks (High Mobility Multipurpose Wheeled Vehicle (HMMWV) Based Communications Node (HBCN) and transit case support systems) Deployed C2BMC capability to Israel and Ramstein (Spiral 6.2 capability) in cooperation with C2BMC Deployed and supported communications capabilities to Ramstein and Israel for the Crisis Analysis and Activation Team (CAAT) in cooperation with C2BMC FY 2010 Plans: Acquisition of MET SATCOM X/Ka-band capability for teleport upgrades BMDS Communications Systems integration and certifications Support exercises and tests of the AN/TPY-2 radar system with the BMDS Communications Networks (HBCN and transit case support systems) Initiate communications teleports in the Middle East and Northwest VA FY 2011 Base Plans: FY 2011 Plans are found in Project MD11 FY 2011 OCO Plans: NA								
Program Office Support Across All Blocks See Description Below				51.527	56.956	0.000	0.000	0.000

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Exhibit R-2A, RDT&E Project Justification: PB 2011 Missile Defense Agency				DATE: February 2010		
APPROPRIATION/BUDGET ACTIVITY 0400: Research, Development, Test & Evaluation, Defense-Wide BA 4: Advanced Component Development & Prototypes (ACD&P)		R-1 ITEM NOMENCLATURE PE 0603884C: Ballistic Missile Defense Sensors		PROJECT EX11: Ballistic Missile Defense Radars Block 5.0		
B. Accomplishments/Planned Program (\$ in Millions)						
		FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
FY 2009 Accomplishments: This effort provides Program Management support across all BMDS Radars Blocks where sensors work is performed. It provides for civilian salaries and travel. In addition, it provides other technical and business operations support services, technical oversight, and performance analysis provided by FFRDCs, UARCs, and Advisory & Assistance Services.						
FY 2010 Plans: Continue to provide Program Management support across all Blocks						
FY 2011 Base Plans: FY 2011 Plans are found in Project MD11						
FY 2011 OCO Plans: NA						
AN/TPY-2 #3 Radar Deployment, and Site Activation See Description Below		18.700	0.000	0.000	0.000	0.000
FY 2009 Accomplishments: Continued site activation activities in Israel						
FY 2010 Plans: NA						
FY 2011 Base Plans: NA						

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Exhibit R-2A, RDT&E Project Justification: PB 2011 Missile Defense Agency									DATE: February 2010		
APPROPRIATION/BUDGET ACTIVITY				R-1 ITEM NOMENCLATURE			PROJECT				
0400: Research, Development, Test & Evaluation, Defense-Wide BA 4: Advanced Component Development & Prototypes (ACD&P)				PE 0603884C: Ballistic Missile Defense Sensors			EX11: Ballistic Missile Defense Radars Block 5.0				
B. Accomplishments/Planned Program (\$ in Millions)											
						FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total	
FY 2011 OCO Plans: NA											
Accomplishments/Planned Programs Subtotals						128.838	91.893	0.000	0.000	0.000	
C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total	FY 2012	FY 2013	FY 2014	FY 2015	Cost To Complete	Total Cost
• 0603175C: Ballistic Missile Defense Technology	117.602	189.229	132.220	0.000	132.220	236.875	239.873	197.118	197.852	0	1,310.769
• 0603881C: Ballistic Missile Defense Terminal Defense Segment	951.414	715.732	436.482	0.000	436.482	250.275	336.711	500.983	521.717	0	3,713.314
• 0603882C: Ballistic Missile Defense Mid-Course Segment	1,472.683	1,027.371	1,346.181	0.000	1,346.181	1,112.655	1,291.790	1,099.029	1,033.213	0	8,382.922
• 0603883C: Ballistic Missile Defense Boost Defense Segment	384.365	182.317	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	566.682
• 0603886C: Ballistic Missile Defense System Interceptor	308.869	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	308.869
• 0603888C: Ballistic Missile Defense Test and Targets	906.952	823.333	1,113.425	0.000	1,113.425	1,105.959	951.371	871.929	829.608	0	6,602.577
• 0603890C: Ballistic Missile Defense Enabling Programs	402.776	358.751	402.769	0.000	402.769	468.673	457.745	473.871	488.799	0	3,053.384
• 0603891C: SPECIAL PROGRAMS - MDA	182.998	250.185	270.189	0.000	270.189	269.040	450.645	517.486	601.315	0	2,541.858
• 0603892C: BMD AEGIS	1,054.323	1,435.717	1,467.278	0.000	1,467.278	1,021.878	1,112.668	1,076.739	923.316	0	8,091.919
• 0603893C: SPACE TRACKING & SURVEILLANCE SYSTEM	209.831	161.609	112.678	0.000	112.678	98.500	56.424	52.928	34.661	0	726.631

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Exhibit R-2A, RDT&E Project Justification: PB 2011 Missile Defense Agency									DATE: February 2010		
APPROPRIATION/BUDGET ACTIVITY				R-1 ITEM NOMENCLATURE				PROJECT			
0400: Research, Development, Test & Evaluation, Defense-Wide BA 4: Advanced Component Development & Prototypes (ACD&P)				PE 0603884C: Ballistic Missile Defense Sensors				EX11: Ballistic Missile Defense Radars Block 5.0			
C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total	FY 2012	FY 2013	FY 2014	FY 2015	Cost To Complete	Total Cost
• 0603894C: MULTIPLE KILL VEHICLE	226.027	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	226.027
• 0603895C: BMD SYSTEM SPACE PROGRAM	23.250	12.492	10.942	0.000	10.942	11.182	11.347	11.749	12.155	0	93.117
• 0603896C: BMD C2BMC	275.174	334.734	342.625	0.000	342.625	364.085	289.778	323.922	298.936	0	2,229.254
• 0603897C: BMD HERCULES	51.629	47.932	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	99.561
• 0603898C: BMD JOINT WARFIGHTER SUPPORT	66.283	61.098	68.726	0.000	68.726	62.239	63.451	65.158	67.231	0	454.186
• 0603901C: DIRECTED ENERGY RESEARCH	0.000	0.000	98.688	0.000	98.688	101.371	103.449	104.572	104.141	0	512.221
• 0603904C: MISSILE DEFENSE INTEGRATION & OPERATIONS CENTER (MDIOC)	102.823	86.483	86.198	0.000	86.198	88.181	78.517	80.410	83.087	0	605.699
• 0603906C: REGARDING TRENCH	3.159	6.130	7.529	0.000	7.529	8.295	8.286	8.479	8.675	0	50.553
• 0603907C: SEA BASED X-BAND RADAR (SBX)	143.878	167.153	153.056	0.000	153.056	150.104	159.832	160.163	197.099	0	1,131.285
• 0603908C: BMD EUROPEAN INTERCEPTOR SITE	348.722	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	348.722
• 0603909C: BMD EUROPEAN MIDCOURSE RADAR	73.728	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	73.728
• 0603911C: BMD EUROPEAN CAPABILITY	0.000	50.226	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	50.226
• 0603912C: BMD European Comm Support	26.016	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	26.016
• 0603913C: ISRAELI COOPERATIVE	0.000	201.323	121.735	0.000	121.735	111.100	113.101	116.114	119.172	0	782.545
• 0604880C: LAND-BASED SM-3	0.000	0.000	281.378	0.000	281.378	345.937	187.062	93.456	139.595	0	1,047.428
	0.000	255.987	318.800	0.000	318.800	405.500	416.300	337.300	227.500	0	1,961.387

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Exhibit R-2A, RDT&E Project Justification: PB 2011 Missile Defense Agency									DATE: February 2010		
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C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total	FY 2012	FY 2013	FY 2014	FY 2015	Cost To Complete	Total Cost
• 0604881C: Aegis SM-3 BLOCK IIA CO-DEVELOPMENT											
• 0604883C: PRECISION TRACKING SPACE SYSTEM	0.000	0.000	66.969	0.000	66.969	123.851	184.800	348.360	482.952	0	1,206.932
• 0604884C: AIRBORNE INFRARED (ABIR)	0.000	0.000	111.671	0.000	111.671	103.636	123.591	103.668	58.773	0	501.339
• 0605502C: Small Business Innovative Research BMDO	124.788	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	124.788
• 0901585C: Pentagon Reservation	20.146	19.709	20.482	0.000	20.482	0.000	0.000	0.000	0.000	0	60.337
• 0901598C: Management Headquarters-MDA	87.151	52.403	29.754	0.000	29.754	29.421	29.974	30.567	31.171	0	290.441
D. Acquisition Strategy											
Products and services will be acquired with competitive means to the extent possible and practical.											
AN/TPY-2 #7 radar manufacturing is being done on a Cost Plus Incentive Fee (CPIF) CLIN.											
The HBCN and transit case BMDS Communications Networks (BCN) Program Plans address the design, development, acquisition, testing, integration, activation, and fielding. The overall executing agent is the Defense Information Systems Agency (DISA) via an existing Memorandum of Agreement (MOA) with MDA.											
MDA will transition from legacy System Engineering and Technical Services contracts to an enterprise-wide Advisory & Assistance Services (A&AS) contract. The A&AS contract will be competitive. The objectives are to implement national engineering and support services for the BMDS mission across the agency; enhance the sharing of BMD expertise and knowledge; centralize the acquisition of support services manpower in a more efficient manner; and reduce overhead costs. In addition to engineering and technical services, A&AS includes studies, analysis and evaluation; and management and professional services.											
E. Performance Metrics											
NA											

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Missile Defense Agency											DATE: February 2010		
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Product Development (\$ in Millions)													
				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 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
AN/TPY-2 C2BMC Fielding AN/TPY-2 BMDs Deployable Comms Suites EX11	TBD/TBD	PM DCATS VA	14.801	1.958	Oct 2009	0.000		0.000		0.000	0	16.759	Continuing
AN/TPY-2 C2BMC Fielding AN/TPY-2 US Comms/Teleports EX11	TBD/TBD	NAVSEA VA	3.832	4.000	Oct 2009	0.000		0.000		0.000	0	7.832	Continuing
AN/TPY-2 C2BMC Fielding AN/TPY-2 Teleport SATCOM EX11	TBD/TBD	DISA/PM DCATS/NAVSEA VA	0.480	16.100	Jul 2010	0.000		0.000		0.000	0	16.580	Continuing
AN/TPY-2 C2BMC Fielding AN/TPY-2 US Comms/PAAWNS EX11	TBD/TBD	DISA VA	2.611	4.110	Oct 2009	0.000		0.000		0.000	0	6.721	Continuing
AN/TPY-2 C2BMC Fielding AN/TPY-2 Exercise Support (FTX-03) EX11	TBD/TBD	MDA VA	3.340	0.000		0.000		0.000		0.000	0	3.340	Continuing
AN/TPY-2 C2BMC Fielding AN/TPY-2 Comms Fielding-1 EX11	SS/CPAF	Lockheed Martin Team VA	4.350	0.000		0.000		0.000		0.000	0	4.350	Continuing
AN/TPY-2 C2BMC Fielding AN/TPY-2 Comms Fielding-2 EX11	TBD/TBD	DISA VA	22.807	0.000		0.000		0.000		0.000	0	22.807	Continuing
AN/TPY-2 C2BMC Fielding AN/TPY-2 Comms Fielding-3 EX11	TBD/TBD	DISA VA	6.390	8.769	Oct 2009	0.000		0.000		0.000	0	15.159	Continuing
	TBD/TBD	MDA	6.173	22.406	Jul 2010	0.000		0.000		0.000	0	28.579	Continuing

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Missile Defense Agency											DATE: February 2010		
APPROPRIATION/BUDGET ACTIVITY 0400: Research, Development, Test & Evaluation, Defense-Wide BA 4: Advanced Component Development & Prototypes (ACD&P)					R-1 ITEM NOMENCLATURE PE 0603884C: Ballistic Missile Defense Sensors					PROJECT EX11: Ballistic Missile Defense Radars Block 5.0			
Product Development (\$ in Millions)													
				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 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
Program Office Support Across All Blocks Civilian Salaries/Travel/ Other Support EX11		AL, MA, VA											
Program Office Support Across All Blocks Contractor Support Services EX11	C/CPFF	CSC, NG, BAE, Dynetics AL, VA	28.454	17.132	Jan 2010	0.000		0.000		0.000	0	45.586	Continuing
Program Office Support Across All Blocks Technical Oversight/ Performance Analysis EX11	TBD/TBD	MITRE, MIT-LL, JHU-APL VA, MA, MD	16.900	12.663	Apr 2010	0.000		0.000		0.000	0	29.563	Continuing
Program Office Support Across All Blocks Other Govt Agencies EX11	TBD/TBD	AMRDEC -	0.000	4.755	Apr 2010	0.000		0.000		0.000	0	4.755	Continuing
AN/TPY-2 #3 Radar Deployment, and Site Activation AN/TPY-2 #3 - Deployment, Site Activation EX11	SS/CPAF	Raytheon MA	17.980	0.000		0.000		0.000		0.000	0	17.980	Continuing
AN/TPY-2 #3 Radar Deployment, and Site Activation AN/TPY-2 #3 - EUCOM Operations Support EX11	TBD/TBD	USAEUR, 7A EUR	0.720	0.000		0.000		0.000		0.000	0	0.720	Continuing
Subtotal			128.838	91.893		0.000		0.000		0.000	0.000	220.731	

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Missile Defense Agency											DATE: February 2010		
APPROPRIATION/BUDGET ACTIVITY 0400: <i>Research, Development, Test & Evaluation, Defense-Wide</i> BA 4: <i>Advanced Component Development & Prototypes (ACD&P)</i>				R-1 ITEM NOMENCLATURE PE 0603884C: <i>Ballistic Missile Defense Sensors</i>				PROJECT EX11: <i>Ballistic Missile Defense Radars Block 5.0</i>					
Product Development (\$ in Millions)													
				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 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
Remarks NA													
Support (\$ in Millions)													
				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 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
Subtotal			0.000	0.000		0.000		0.000		0.000			
Remarks NA													
Test and Evaluation (\$ in Millions)													
				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 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
Subtotal			0.000	0.000		0.000		0.000		0.000			
Remarks NA													

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Missile Defense Agency											DATE: February 2010		
APPROPRIATION/BUDGET ACTIVITY 0400: <i>Research, Development, Test & Evaluation, Defense-Wide</i> BA 4: <i>Advanced Component Development & Prototypes (ACD&P)</i>				R-1 ITEM NOMENCLATURE PE 0603884C: <i>Ballistic Missile Defense Sensors</i>				PROJECT EX11: <i>Ballistic Missile Defense Radars Block 5.0</i>					
Management Services (\$ in Millions)													
				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 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
Subtotal			0.000	0.000		0.000		0.000		0.000			
Remarks NA													
			Total Prior Years Cost	FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			128.838	91.893		0.000		0.000		0.000	0.000	220.731	
Remarks NA													

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Exhibit R-4, RDT&E Schedule Profile: PB 2011 Missile Defense Agency			DATE: February 2010		
APPROPRIATION/BUDGET ACTIVITY		R-1 ITEM NOMENCLATURE		PROJECT	
0400: Research, Development, Test & Evaluation, Defense-Wide		PE 0603884C: Ballistic Missile Defense		EX11: Ballistic Missile Defense Radars Block	
BA 4: Advanced Component Development & Prototypes (ACD&P)		Sensors		5.0	

	FY 2009				FY 2010				FY 2011				FY 2012				FY 2013				FY 2014				FY 2015			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
AN/TPY-2 BMDS Deployable Comms Suites																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2011 Missile Defense Agency			DATE: February 2010	
APPROPRIATION/BUDGET ACTIVITY 0400: <i>Research, Development, Test & Evaluation, Defense-Wide</i> BA 4: <i>Advanced Component Development & Prototypes (ACD&P)</i>		R-1 ITEM NOMENCLATURE PE 0603884C: <i>Ballistic Missile Defense Sensors</i>		PROJECT EX11: <i>Ballistic Missile Defense Radars Block 5.0</i>
Schedule Details				
	Start		End	
Event	Quarter	Year	Quarter	Year
AN/TPY-2 BMDS Deployable Comms Suites	4	2010	4	2010

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Exhibit R-2A, RDT&E Project Justification: PB 2011 Missile Defense Agency								DATE: February 2010			
APPROPRIATION/BUDGET ACTIVITY 0400: <i>Research, Development, Test & Evaluation, Defense-Wide</i> BA 4: <i>Advanced Component Development & Prototypes (ACD&P)</i>				R-1 ITEM NOMENCLATURE PE 0603884C: <i>Ballistic Missile Defense Sensors</i>				PROJECT WX11: <i>Ballistic Missile Defense Radars Capability Development</i>			
COST (\$ in Millions)	FY 2009 Actual	FY 2010 Estimate	FY 2011 Base Estimate	FY 2011 OCO Estimate	FY 2011 Total Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
WX11: <i>Ballistic Missile Defense Radars Capability Development</i>	194.532	318.854	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	513.386
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0		
Note NA A. Mission Description and Budget Item Justification Sensors Capability Development includes completion of existing software builds for AN/TPY-2, and consolidation of common software functionality across X-Band radars. Existing software will be migrated to a common software build that will standardize functionality, and minimize software development and maintenance costs. Additional Capability Development efforts include Test & Evaluation, BMDS Architecture engineering, Common Threat engineering, External Sensors Lab (ESL), and Airborne Infrared Surveillance (AIRS) efforts. The T&E effort covers Sensors BMDS-level testing including flight tests, ground tests, and Concurrent Training, Testing and Operations (CTTO). The CTTO capability will allow warfighter and MDA to safely conduct concurrent training, test and operations with BMDS sensors. BMDS Architecture Engineering efforts address two areas: Infrared (IR) Sensor Integration and Advanced Sensor Development and Prototypes. The objective of Infrared (IR) Sensor Integration is to provide a pervasive cueing and early track capability with IR sensors, with a focus on regional defense scenarios. This initiative will accelerate existing efforts to create an operational interface with Overhead Persistent Infrared (OPIR) sensors external to the BMDS as a near-term contingency capability. This will enable interceptor launch on an OPIR track, a capability critical to extending interceptor reach against regional threats, and to controlling the growth of interceptor inventory as regional threats multiply. This effort will also explore the feasibility of fielding unmanned aerial vehicles to augment regional IR sensor coverage. The objective of Advanced Sensor Development and Prototypes is to develop scalable prototypes of advanced options for threat negation; to assess the potential capability in terms of interceptor inventory savings; and, to evaluate the technical and programmatic feasibility toward an increased threat-negation capability.											

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Exhibit R-2A, RDT&E Project Justification: PB 2011 Missile Defense Agency				DATE: February 2010		
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Common Threat engineering produces common and consistent adversary trajectory and signature data to enable Ballistic Missile Defense (BMD) System and sub-system concept and requirements, design, verification, and assessment. Common Threat data is contained in the Adversary Capability Document (ACD) and Adversary Data Packages (ADP) and drives BMDS ground tests, flight tests, digital simulations, and pre-mission analysis activities. It is also used to develop the BMD System Description Document and BMD System Specification.						
The External Sensors Lab (ESL) provides a research and development test bed to find and assess data sources external to the Agency. As these new sources are brought into the lab, the overall performance of existing capabilities are improved and new capabilities for the BMDS are discovered. Algorithms developed by ESL will contribute to precision radar cueing, system track, and hit/kill assessment. Precision radar cueing by ESL has been successfully demonstrated several times during flight testing. ESL provides engineering-level code to the C2BMC program for maturing the algorithms into robust, operationally suitable code.						
The Airborne Infrared Surveillance (AIRS) program is a proof of concept program to demonstrate and evaluate the potential benefits of airborne infrared sensor systems to the Ballistic Missile Defense System (BMDS). The AIRS program was funded by a Congressional Add in FY 2009.						
Capability Development also includes quality, safety, and mission assurance operations to ensure compliance with Agency requirements for design, test, manufacturing, quality, safety, and reliability. Funding will also provide quality and safety infrastructure support for Agency operations.						
B. Accomplishments/Planned Program (\$ in Millions)						
		FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
X-Band Basic Program		98.187	132.728	0.000	0.000	0.000
See Description Below						
FY 2009 Accomplishments: This effort includes: systems engineering, risk management, configuration control, design reviews, and integrated product teams supporting software algorithms for discrimination, development of common X-Band software, development of mission profiles to support TPY-2 operations worldwide, enhancement of radar availability at operating locations, and development of critical engagement conditions (CECs) and empirical measurement events (EMEs). CEC/EMEs are the conditions and						

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B. Accomplishments/Planned Program (\$ in Millions)						
		FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
events ;where data is obtained from flight and ground tests in order to anchor system models and simulations.						
Completed software Capability Release (CR-2.4) TPY-2 integration and testing at Vandenberg Air Force Base (VAFB) Completed electromagnetic interference (EMI) testing at VAFB and White Sands Missile Range Completed mission profile deliveries to support TPY-2 #3 operations in Israel Delivered baseline discrimination capability for TPY-2 #3 Delivered CR-1.3.7 for TPY-2 #2 at Shariki, Japan Began development of the common software build (CX-1)						
The CX-1 Common Software Build consolidates the AN/TPY-2 forward-based mode capabilities release 2.4 and the AN/TPY-2 terminal mode release 4.2.4, increasing the flexibility and interchangeability of those two radars. CX-1 also includes improved baseline terminal mode and forward-based mode discrimination, sensor registration enhancements, interference monitoring, and acquisition sensor tasking. These capabilities will improve ``search/track/discriminate`` performance, expand the range window, and augment threat handling.						
Began CX-2 requirements development						
The CX-2 Common Software Build consolidates CX-1 functionality with XBR Build 3.0, providing common software for AN/TPY-2 and XBR radars. CX-2 will thus support terminal, forward-based, and midcourse missions. CX-2 also adds a Common X-Band Interface, updates sensor registration bias and covariance, enhances integrated discrimination processing, expands waveform repertoire, and provides environmental sensing and dynamic resource management. These enhancements and commonality improvements support BMDS Integrated Build C and will increase BMDS threat handling and cued search capabilities, and provide integrated discrimination for AN/TPY-2 and XBR radars.						

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B. Accomplishments/Planned Program (\$ in Millions)						
		FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
Initiated TPY-2 availability enhancements at worldwide operating locations Provided systems engineering ``reach-back`` for consolidated contractor logistics support contract Supported critical engagement conditions (CECs) and empirical measurement events (EMEs)** development and traceability to Integrated Master Test Plan (IMTP) ** CEC/EMEs are the conditions and events ;where data is obtained from flight and ground tests in order to anchor models and simulations. <i>FY 2010 Plans:</i> Conduct Common Software Build CX-1 design reviews Deliver the first common software build for integrated ground testing (CX-1) Complete AN/TPY-2 CX-1 formal qualification testing (FQT) Integrate and test CX-1 on TPY-2 radar Support mission profile enhancement to support TPY-2 #3 operations in Israel Support baseline discrimination enhancements for TPY-2 #3 operations in Israel Continue TPY-2 availability enhancements at worldwide operating locations Provide systems engineering ``reach-back`` for consolidated contractor logistics support contract Initiate Common Software Build CX-2 development efforts Initiate CX-3 requirements development These efforts will deliver the following new BMDS Build C capabilities: Integration of Hercules Suite 1 Algorithms (AN/TPY-2 (FBM) Build 2.4) C2BMC Sensor Resource Management and Tasking (AN/TPY-2 (FBM) Build 2.4) C2BMC Multi-Radar Capability (AN/TPY-2 (FBM) Build 2.4) GMD Utilization of Improved Discriminated Track (AN/TPY-2 (FBM) Build 2.4) Increased BMDS Effectiveness and Common Threat (AN/TPY-2 (FBM) Build 2.4)						

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B. Accomplishments/Planned Program (\$ in Millions)						
		FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
FY 2011 Base Plans: FY 2011 Plans are found in Project MD11						
FY 2011 OCO Plans: NA						
BMDS Radars Test & Evaluation See Description Below		53.864	115.445	0.000	0.000	0.000
FY 2009 Accomplishments: The test program covers the full spectrum of sensors testing. For the TPY-2 radar, test activities begin with subcomponents and continue through BMDS system level ground and flight testing of delivered radars. For Upgraded Early Warning Radars (UEWRs) and COBRA DANE, test activities are focused on verification and demonstration of the missile defense functionality. This effort provides for pre and post-flight test analysis, the geographic re-positioning of TPY-2 radars, and development of mission profiles to include search fences for testing and test support positioning for the Sea-Based X-Band Radar (SBX). There is high interdependency within the BMDS for both ground and flight test activities; C2BMC is required to task TPY-2 radars, and pass TPY-2 radar information to Aegis and the Ground-Based Midcourse Defense element. The program also leverages numerous Targets of Opportunity (TOOs) to provide relevant and cost-effective flight test opportunities. MDA Element testing is based on an integrated, comprehensive, and phased test program. Element systems, subsystems, and components are tested early in development and are necessary prior to conducting BMD-System level testing. Sensors Element Level testing is funded as part of a developmental program and reflected in this Program Element (PE) submission. This PE also provides Sensors participation in the consolidated MDA-wide System Test Program and the resources for the planning, design, execution, and management of Sensors in BMD System testing in accordance with the BMDS Test Policy, MDA Directive 3202.03 (Jan 09). This applies to all Flight, Integrated Ground,						

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B. Accomplishments/Planned Program (\$ in Millions)								
				FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
and Distributed Ground Tests and Post-test analysis and reconstructions listed in the Integrated Master Test Plan (IMTP). Sensors will support the BMDS Hardware-In-The-Loop (HWIL) Modeling and Simulation Program by providing and integrating into the BMDS system-level HWIL single stimulation framework to support full-envelope BMDS ground test, flight test, and training events based upon Agency and warfighter needs. Sensors will support System Pre Flight predictions for each system level flight test using the test framework set up with the BMDS configuration for a particular flight test. This provides confidence in Flight Test execution by predicting element performance and exercising element interfaces. This work is also used to proof out the construct of the flight test to ensure if the required data and data management plan will support System Post Flight Reconstruction (SPFR) objectives. SPFR will use a HWIL and/or a Digital M&S Environment to replicate the day of flight for the BMDS configuration, modified to represent the actual environment conditions and target dynamics observed in flight. SPFR focuses on critical engagement conditions (CECs) and empirical measurement events (EMEs) anchored to real world events. CEC/EMEs are the conditions and events where data is obtained from flight and ground tests in order to anchor models and simulations. These CECs and EMEs permit verification and validation of Sensors modeling and simulation, increasing confidence in the models to inform Combatant Command (COCOM) assessment and deployment decisions. For FY 2009, the Sensors test and evaluation program: Planned and executed radar testing, including test site support, during Targets of Opportunity (TOO) and BMDS flight tests Planned and conducted TOO flight tests with the External Sensors Lab (ESL) Planned, prepared scenarios, and conducted ground tests with the AN/TPY-2 Hardware-In-The-Loop (HWIL)								

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B. Accomplishments/Planned Program (\$ in Millions)						
		FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
Provided Test Site Support at VAFB Completed development, and tested the Missile Defense System Exerciser (MDSE) node for AN/TPY-2 HWIL Continued CTTO development and demonstration planning and execution in conjunction with MDSE ground test integration efforts Conducted BMDS ground testing with Thule Upgraded Early Warning Radar (UEWR) Continued Distributed Test SIM (DESIM) maturation of AN/TPY-2 and Thule UEWR for BMDS war games, and C2BMC cycle testing The FY 2009 test program executed 14 critical engagement condition/empirical measurement event (CEC/EME)** required data collections to reach cumulative 34% completion (64 of 190 total) of data collection necessary for validation, verification, and assessment (VV&A) of modeling and simulation. ** CEC/EMEs are the conditions and events where data is obtained from flight and ground tests in order to anchor models and simulations. <i>FY 2010 Plans:</i> Support AN/TPY-2 software capability release (CR-2.4) testing and critical engagement condition (CEC) for advanced discrimination techniques Support 2-Stage Booster Interceptor Flight Test BVT-01 from VAFB utilizing TPY-2 Forward Based (FB) Support USAF Target of Opportunity Glory Trip 200 utilizing SBX and TPY-2 FB Support THAAD Intercept Flight Tests (FTT-11, FTT-12) Support COBRA DANE flight testing and CECs for scan angles, and monopulse tracking (FTX-10) Support other flight tests as targets of opportunity Participate in Regional Focused Hardware In The Loop (HWIL) Tests GTX-04a and Full BMDS HWIL Tests GTX-04b and GTX-04c						

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B. Accomplishments/Planned Program (\$ in Millions)								
				FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
Plan, develop, integrate and test a common HWIL stimulation framework with the Elements for the GTX, GTI, GTD ground tests, and Concurrent Test, Training, and Operations (CTTO) demos Provide Test Site Support at VAFB for AN/TPY-2 testing Continue CTTO development for TPY-2 and UEWRs Complete Thule UEWR BMDS integration testing The FY 2010 test program will execute 13 critical engagement condition/empirical measurement event (CEC/EME)** required data collections to reach a cumulative 41% completion (77 of 190 total) of data collections necessary for verification, validation, and assessment of models and simulations. **CEC/EMEs are the conditions where data is obtained from flight and ground tests in order to anchor models and simulations. <i>FY 2011 Base Plans:</i> FY 2011 Plans are found in Project MD11 <i>FY 2011 OCO Plans:</i> NA								
Sensors System Engineering & UMDF See Description Below <i>FY 2009 Accomplishments:</i> Modeling and simulation (M&S) activities support all phases of Sensors development, including development of modifications to the X-Band, UEWR, and Cobra Dane digital representations, flight test missions, ground tests, war games, exercises, and performance assessment. Models and simulations are tailored to the specific need of a component in its current phase of development, ranging from low-to-medium fidelity analyses supporting concept definition studies, to high-fidelity				17.302	38.821	0.000	0.000	0.000

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B. Accomplishments/Planned Program (\$ in Millions)						
		FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
models used to support engineering development, or testing and are integrated into the BMD Digital Simulations Architecture. Digital simulations support Performance Assessment (PA) events, which provide critical system level performance data relative to all elements, the system engineer, M&S developers, OTA and Warfighter. Further, the M&S Digital tools are accredited for each application and for specific objectives; tools are put through a rigorous verification and validation process, reviewing coding and specifications, and comparing analyses against actual flight test results. Planning support is required to assist in the validation and verification (V&V) plan development, test execution, analysis for V&V reports and program office M&S certification. The Digital End-to-End simulation of the BMDS requires a PA Integrated V&V Plan and Report (at both element and system level), and a PA-system level Accreditation Plan and Report. MDA has a set of Unifying Missile Defense Functions (UMDFs), which increase the effectiveness of the BMD System (including probability of engagement success, increase in defended area and raid size capacity, additional redundancy of architecture, unity of command) through the integration of MDA developed capabilities. These UMDF efforts are Sensor Registration (reporting of sensor errors / biases), Correlation (ensuring the information from multiple sensors seeing a threat relates to the same object), System Track (creating a single engageable track of a threat from multiple reports provided by different land, sea, and space based multiple sensors), Discrimination (identifying object details to determine the target from debris or decoys), Battle Management (combining the best sensors and shooters to ensure the highest probability of a kill), Hit / Kill assessment (determining if the target selected was destroyed after missile impact), and Communications (providing the worldwide connection of sensors and shooters to command authorities). UMDFs are implemented across the BMDS elements to create and utilize system level data and decisions that allow Combatant Commanders the ability to automatically and manually optimize sensor coverage and interceptor inventory to defend against all ranges of ballistic threats. For FY 2009, the Sensors Program: Completed AN/TPY-2 digital simulation representation (Capability Release Upgrade High Fidelity Model (CRUSHM), 2.4) that incorporates advanced discrimination techniques (2nd Qtr FY 2009)						

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B. Accomplishments/Planned Program (\$ in Millions)						
		FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
Completed development of high-performance RF scene generator for flight and ground testing of AN/TPY-2 advance discrimination algorithms in FY09 (3rd QTR FY 2009) Completed demonstration of the integration of AN/TPY-2 RF scene generator into the BMDS Hardware-In-The-Loop (HWIL) single stimulation framework. (1st QTR FY 2009) Completed integration of the AN/TPY-2 digital simulation (CRUSHM, 1.3) into the BMD Digital Simulations Architecture (DSA) for support of Performance Assessment PA-09. (PA09 1st QTR FY 2010) Completed development of critical engagement conditions (CEC) and empirical measurement events (EME)** criteria that address the most significant model uncertainties of the sensor models. (3rd QTR FY 2009) Completed an integrated V&V plan and report for the AN/TPY-2 simulation (CRUSHM, 1.3) as integrated into the BMD Digital Simulations Architecture for PA-09. (3rd QTR FY 2009) Completed post-flight reconstructions (PFR) of BMDS flight tests (FTX-02, FTX-03 and FTG-05) and tracking of calibration satellites to provide detailed empirical evidence of the model suitability to represent the sensor. (4th QTR FY 2009) **CEC/EMEs are the conditions and events where data is obtained from flight and ground tests in order to anchor models and simulations. Unifying Missile Defense Functions (UMDF) (in support of BMDS Integrated Build C) Completed BMDS System Engineering requirement traceability to Unifying Missile Defense Functions (UMDF) (2nd QTR FY 2009) Completed initial UMDF integrated delivery plan for FY 2010 (3rd QTR FY 2009) Completed initial discrimination database development to support Aegis Launch on AN/TPY-2 (3rd QTR FY 2009)						

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B. Accomplishments/Planned Program (\$ in Millions)						
		FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
Demonstrated capability during BMDS ground and flight testing (Full BMDS Distributed Test GTX-03C, Aegis Intercept Flight Test FTM-15) Delivered discrimination database for Aegis Launch on AN/TPY-2 Completed discrimination database for AN/TPY-2 software capability release CR-2.4 to support FY 2010 ground and flight testing of near-term discrimination (4th QTR FY 2009) FY 2010 Plans: Modeling and Simulation (in support of BMDS Integrated Build C) Initiate enhancements of sensor models as required through application of CEC/EME** results from flight and ground tests, and satellite tracking campaign (1st QTR FY 2010) Complete initial digital simulation of first generation common software (CX1) for the X-band sensors (4th QTR FY 2010) Initiate development of Unifying Missile Defense Functions (UMDF) modeling (4th QTR FY10) Implement Sensor registration to include bias and covariance consistency Common messaging and discrimination feature reporting Post-intercept debris and electronic counter-countermeasures (ECCM) Complete integration of the next generation AN/TPY-2 digital simulation (CRUSHM, 2.4) into the BMD Digital Simulations Architecture for support of PA-10 (3rd QTR FY 2010) Complete integration of the RF scene generator for the AN/TPY-2 (CR2.4) into the BMDS Hardware in the Loop (HWIL) single stimulation framework in support of GTI-04 (full BMDS HWIL test) (2nd QTR FY 2010) Complete integrated validation and verification (V&V) plan and report for the AN/TPY-2 simulation (CRUSHM, 2.4) (2nd QTR FY 2010) Complete VV&A plan for the RF scene generator (RDSIS) supporting AN/TPY-2 CR2.4 (3rd QTR FY 2010) Complete PFR of GMD Intercept Flight Test FTG-06 to anchor models (4th QTR FY 2010)						

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B. Accomplishments/Planned Program (\$ in Millions)						
		FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
Complete analysis of calibration satellite tracking events to anchor models. (4th QTR FY 2010) **CEC/EMEs are the conditions and events ;where data is obtained from flight and ground tests in order to anchor models and simulations. Unifying Missile Defense Functions (UMDF) (in support of BMDS Integrated Build C and Build D) Initiate development of mission profiles to enable coordinated tasking/control of multiple AN/TPY-2 radars (1st QTR FY 2010) Initiate algorithm development to facilitate sensor registration capabilities (2nd QTR FY 2010) Initiate development of X-band ``sidecar`` to facilitate the development of integrated BMDS capabilities (2nd QTR FY 2010) Complete initial engineering trade studies for sensor registration, discrimination, system track, battle management and hit/kill assessment (4th QTR FY 2010) FY 2011 Base Plans: FY 2011 Plans are found in Project MD11 FY 2011 OCO Plans: NA						
External Sensors See Description Below FY 2009 Accomplishments: The External Sensors Lab (ESL) provides a test bed to utilize sensor data to enhance the efficiency and effectiveness of the overall BMDS. Algorithms developed by ESL will contribute to precision radar		10.606	18.602	0.000	0.000	0.000

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B. Accomplishments/Planned Program (\$ in Millions)						
		FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
cueing, system track, and hit/kill assessment. Precision radar cueing by ESL has been successfully demonstrated several times during flight testing. ESL provides engineering-level code to the C2BMC program for maturing the algorithms into robust, operationally suitable code. Continued testing and demonstration of External Sensor capabilities Continued External Sensor operations at the Missile Defense Integrated Operations Center (MDIOC) lab Developed software code for operational site Initiated acquisition of hardware equipment and software for operational site Conducted sophisticated sensor/algorithm/CONOPs experiment Initiated acquisition for hardware upgrade for the MDIOC Lab FY 2010 Plans: Continue to develop and deliver algorithm enhancements to utilize sensor data to enhance BMDS efficiency and effectiveness Continue development of software code for operational site FY 2011 Base Plans: FY 2011 Plans are found in Project MD11 FY 2011 OCO Plans: NA						
BMDS Architecture See Description Below FY 2009 Accomplishments: NA		0.000	10.718	0.000	0.000	0.000

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B. Accomplishments/Planned Program (\$ in Millions)						
		FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
FY 2010 Plans: The objective of InfraRed (IR) Sensor Integration is to provide a pervasive cueing and early track capability with IR sensors to facilitate Early Intercept capabilities, with a focus on regional defense scenarios. Early Intercept would allow us to intercept early in the battle space and optimize our ability to execute a shoot-look-shoot tactic, to force less effective deployment of counter-measures, minimize the potential impact of debris, and reduce the number of interceptors required to defeat a raid of threat missiles. By leveraging Unmanned Aerial Vehicles (UAVs) and space assets for pervasive over-the-horizon sensor netting, the engagement zone of current Standard Missile-3 interceptors can be extended to the pre-apogee portion of a missile`s trajectory. Early Intercept can provide an extended engagement layer that avoids wasteful salvos by shooting an interceptor, assessing the attempted intercept, and shooting again if unsuccessful. The mobility/transportability of early intercept capability, the flexibility of UAV and space-based sensor support, and lower Operation and Sustainment (O&S) costs make early intercepts more appealing than midcourse systems. Forward-basing AN/TPY-2 radars comes with diplomatic challenges and significant O&S costs, making the use of current Overhead Persistent Infrared (OPIR) and less expensive operations of UAVs an appealing near-term option. We will undertake several demonstrations to more sharply define the requirements for sensor netting, fire control, and integration to accomplish Early Intercept. This initiative will accelerate existing efforts to create an operational interface with high fidelity Overhead Persistent Infrared (OPIR) sensors external to the BMDS as a near-term contingency capability. This will enable interceptor launch on an OPIR track, a capability critical to extending interceptor reach against regional threats, and to controlling the growth of interceptor inventory as regional threats multiply. This effort would also explore the feasibility of using an existing airborne platform and sensors with slight modifications to augment regional IR sensor coverage.						

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		FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
The objective of advanced sensor development and prototypes is to develop scalable prototypes of advanced options for threat negation; to assess the potential capability in terms of interceptor inventory savings; and, to evaluate the technical and programmatic feasibility toward an increased threat-negation capability. Determine and characterize OPIR interface requirements Execute initial development of regionally-tailored OPIR processing and connectivity; assess for performance via simulation Execute planning and coordination for real-time track demonstrations using a UAV (associated with scheduled BMDS test events) using an existing airborne platform Execute advanced sensor small-scale laboratory testing; initiate mid-scale prototype design; initiate design of mission-representative support hardware Develop UAV and space-based sensor tracking algorithms FY 2011 Base Plans: FY 2011 BMDS Architecture Plans were moved to the Advanced Technology PE (0603175C, Project MD25) FY 2011 OCO Plans: NA						
Common Threat See Description Below FY 2009 Accomplishments: Threat Systems Engineering supports the planning, design and specification, integration and implementation, and test verification and assessment phases of the systems engineering process.		0.000	2.540	0.000	0.000	0.000

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B. Accomplishments/Planned Program (\$ in Millions)						
		FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
The Threat Systems Engineering uses intelligence community data to define the BMDS threat space and directly supports the development of the BMD System Description Document and System and Element Specifications. This threat space is documented in the Adversary Data Packages (ADP), which includes common and consistent representation of Missile Systems and countermeasures to drive BMDS requirements, designs, and directly supports the execution of Integrated Master Test Plan (IMTP) (i.e. flight test targets, ground tests & digital simulations, and pre-mission analysis). Threat Systems Engineering also develops scenarios (trajectory and signature) for system and element utilization for compliance and assessment evaluations of BMDS capability to defend homeland, deployed forces, and friends and allies. For FY 2009, MDA: Developed an agency-wide Common Threat baseline in support of BMDS design, verification, and assessment Completed the BMDS Integrated Build D ADP update to document adversary missile capabilities and characterizations consistent with projected threat environment for the BMDS Produced all the threat definition and scenario data required to support the BMDS Integrated Master Test Plan, including several Flight Tests, BMDS Ground Test 03 (GT-03), BMDS Performance Assessment 09 (PA-09), FY09 wargames and exercises (Fast Shield II, JDIE-08), and the implementation of Improved BMDS discrimination Produced scenario data to support Element and Component design and assessment for BMDS Integrated Build D, Aegis BMD 5.1, and Far Term Sea-based Terminal Developed threat data for special projects Validated that BMDS test targets are threat representative (FTM-15, FTG-06, FTT-10a) <i>FY 2010 Plans:</i> Maintain and update the agency-wide Common and consistent BMDS threat descriptions Continue to update adversary missile capabilities and characterizations consistent with projected threat environment for BMDS Integrated Builds						

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APPROPRIATION/BUDGET ACTIVITY 0400: Research, Development, Test & Evaluation, Defense-Wide BA 4: Advanced Component Development & Prototypes (ACD&P)		R-1 ITEM NOMENCLATURE PE 0603884C: Ballistic Missile Defense Sensors		PROJECT WX11: Ballistic Missile Defense Radars Capability Development				
B. Accomplishments/Planned Program (\$ in Millions)								
				FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
Produce all the threat definition and scenario data required to support the BMDS Integrated Master Test Plan, including several Flight Tests, Ground Tests (GTX-04b, GTX-04c), BMDS Performance Assessment 2009 (PA-09) and Technical Assessment 2010 (TA-10), and FY 2010 wargames and exercises Produce scenario data to support Element and Component analysis of alternatives, requirements development, design and assessment for BMDS Integrated Build D updates and all phases of Phased Adaptive Approach (PAA) including: THAAD, Precision Tracking Space System (PTSS), Air-Borne Infra-Red (ABIR), Aegis BMD Ashore, Aegis BMD 5.1, Far Term Sea-based Terminal, Early Intercept, TPY-2, C2BMC, and Space Tracking and Surveillance System (STSS) Develop threat data for special projects Validate BMDS test targets are threat representative (JFTM-03, FTG-06, FTT-11, FTT-12) FY 2011 Base Plans: FY 2011 Common Threat Plans were moved to the Enabling PE (0603890C, Project MD24) FY 2011 OCO Plans: NA								
Operations and Maintenance of Core IT Services See Description Below FY 2009 Accomplishments: Project funds ;supported dedicated information technology services for mission specific research and test efforts to include classified and unclassified networks, software licenses, sustainment and information assurance certification. FY 2010 Plans: NA				9.773	0.000	0.000	0.000	0.000

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Exhibit R-2A, RDT&E Project Justification: PB 2011 Missile Defense Agency				DATE: February 2010		
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B. Accomplishments/Planned Program (\$ in Millions)						
		FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
FY 2011 Base Plans: NA						
FY 2011 OCO Plans: NA						
Mobile Sensors Enhancement See Description Below FY 2009 Accomplishments: Mobile Sensors enhancement is funded by a Congressional add in FY09. MDA`s BMDS architecture intends to close existing sensor coverage gaps by deploying a global sensor network. Today, the AN/TPY-2 forward based X-Band radar and sea based X-Band radar (SBX) are selectively deployed in the Pacific region and planned for Europe. A subset of AEGIS ships, modified for ballistic missile defense (BMD), provide long-range search and track for theater ballistic missile defense. A mobile maritime sensor (MMS), leveraging radar technology from the COBRA JUDY Replacement program, will enhance BMDS capability, increasing threat coverage and availability to the BMDS global sensor network and providing continuous X-band radar coverage throughout the threat`s trajectory. The MMS could also provide a dual-use, multi-mission capability to perform BMD concurrently with support to the intelligence community by performing technical treaty verification. The MMS produces significant cost savings to future Navy platforms, with networked MMSs providing a path to optimize future Navy ship radars for fleet and theater BMD and Anti-Air Warfare. FY 2009 tasks refined MMS performance predictions to optimize platform deployment FY 2010 Plans: NA		4.000	0.000	0.000	0.000	0.000

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B. Accomplishments/Planned Program (\$ in Millions)						
		FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
FY 2011 Base Plans: NA						
FY 2011 OCO Plans: NA						
EO/IR Sensors See Description Below FY 2009 Accomplishments: The Airborne Infrared Surveillance (AIRS) program is a proof of concept program to demonstrate and evaluate the potential benefits of airborne infrared sensor systems to the Ballistic Missile Defense System (BMDS). This program evaluates the AIRS ability to operate as the primary sensor in an engagement (i.e. use AIRS data to engage ballistic missile threats.) The AIRS program was funded by a Congressional Add in FY 2008 and FY 2009. Continued to demonstrate AIRS capabilities during flight tests FY 2010 Plans: NA FY 2011 Base Plans: NA FY 2011 OCO Plans: NA		0.800	0.000	0.000	0.000	0.000
Accomplishments/Planned Programs Subtotals		194.532	318.854	0.000	0.000	0.000

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Exhibit R-2A, RDT&E Project Justification: PB 2011 Missile Defense Agency										DATE: February 2010	
APPROPRIATION/BUDGET ACTIVITY				R-1 ITEM NOMENCLATURE				PROJECT			
0400: Research, Development, Test & Evaluation, Defense-Wide BA 4: Advanced Component Development & Prototypes (ACD&P)				PE 0603884C: Ballistic Missile Defense Sensors				WX11: Ballistic Missile Defense Radars Capability Development			
C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total	FY 2012	FY 2013	FY 2014	FY 2015	Cost To Complete	Total Cost
• 0603175C: Ballistic Missile Defense Technology	117.602	189.229	132.220	0.000	132.220	236.875	239.873	197.118	197.852	0	1,310.769
• 0603881C: Ballistic Missile Defense Terminal Defense Segment	951.414	715.732	436.482	0.000	436.482	250.275	336.711	500.983	521.717	0	3,713.314
• 0603882C: Ballistic Missile Defense Mid-Course Segment	1,472.683	1,027.371	1,346.181	0.000	1,346.181	1,112.655	1,291.790	1,099.029	1,033.213	0	8,382.922
• 0603883C: Ballistic Missile Defense Boost Defense Segment	384.365	182.317	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	566.682
• 0603886C: Ballistic Missile Defense System Interceptor	308.869	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	308.869
• 0603888C: Ballistic Missile Defense Test and Targets	906.952	823.333	1,113.425	0.000	1,113.425	1,105.959	951.371	871.929	829.608	0	6,602.577
• 0603890C: Ballistic Missile Defense Enabling Programs	402.776	358.751	402.769	0.000	402.769	468.673	457.745	473.871	488.799	0	3,053.384
• 0603891C: SPECIAL PROGRAMS - MDA	182.998	250.185	270.189	0.000	270.189	269.040	450.645	517.486	601.315	0	2,541.858
• 0603892C: BMD AEGIS	1,054.323	1,435.717	1,467.278	0.000	1,467.278	1,021.878	1,112.668	1,076.739	923.316	0	8,091.919
• 0603893C: SPACE TRACKING & SURVEILLANCE SYSTEM	209.831	161.609	112.678	0.000	112.678	98.500	56.424	52.928	34.661	0	726.631
• 0603894C: MULTIPLE KILL VEHICLE	226.027	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	226.027
• 0603895C: BMD SYSTEM SPACE PROGRAM	23.250	12.492	10.942	0.000	10.942	11.182	11.347	11.749	12.155	0	93.117
• 0603896C: BMD C2BMC	275.174	334.734	342.625	0.000	342.625	364.085	289.778	323.922	298.936	0	2,229.254
• 0603897C: BMD HERCULES	51.629	47.932	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	99.561
• 0603898C: BMD JOINT WARFIGHTER SUPPORT	66.283	61.098	68.726	0.000	68.726	62.239	63.451	65.158	67.231	0	454.186

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0400: Research, Development, Test & Evaluation, Defense-Wide BA 4: Advanced Component Development & Prototypes (ACD&P)				PE 0603884C: Ballistic Missile Defense Sensors				WX11: Ballistic Missile Defense Radars Capability Development			
C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total	FY 2012	FY 2013	FY 2014	FY 2015	Cost To Complete	Total Cost
• 0603901C: DIRECTED ENERGY RESEARCH	0.000	0.000	98.688	0.000	98.688	101.371	103.449	104.572	104.141	0	512.221
• 0603904C: MISSILE DEFENSE INTEGRATION & OPERATIONS CENTER (MDIOC)	102.823	86.483	86.198	0.000	86.198	88.181	78.517	80.410	83.087	0	605.699
• 0603906C: REGARDING TRENCH	3.159	6.130	7.529	0.000	7.529	8.295	8.286	8.479	8.675	0	50.553
• 0603907C: SEA BASED X-BAND RADAR (SBX)	143.878	167.153	153.056	0.000	153.056	150.104	159.832	160.163	197.099	0	1,131.285
• 0603908C: BMD EUROPEAN INTERCEPTOR SITE	348.722	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	348.722
• 0603909C: BMD EUROPEAN MIDCOURSE RADAR	73.728	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	73.728
• 0603911C: BMD EUROPEAN CAPABILITY	0.000	50.226	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	50.226
• 0603912C: BMD European Comm Support	26.016	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	26.016
• 0603913C: ISRAELI COOPERATIVE	0.000	201.323	121.735	0.000	121.735	111.100	113.101	116.114	119.172	0	782.545
• 0604880C: LAND-BASED SM-3	0.000	0.000	281.378	0.000	281.378	345.937	187.062	93.456	139.595	0	1,047.428
• 0604881C: Aegis SM-3 BLOCK IIA CO-DEVELOPMENT	0.000	255.987	318.800	0.000	318.800	405.500	416.300	337.300	227.500	0	1,961.387
• 0604883C: PRECISION TRACKING SPACE SYSTEM	0.000	0.000	66.969	0.000	66.969	123.851	184.800	348.360	482.952	0	1,206.932
• 0604884C: AIRBORNE INFRARED (ABIR)	0.000	0.000	111.671	0.000	111.671	103.636	123.591	103.668	58.773	0	501.339
• 0605502C: Small Business Innovative Research BMDO	124.788	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	124.788
• 0901585C: Pentagon Reservation	20.146	19.709	20.482	0.000	20.482	0.000	0.000	0.000	0.000	0	60.337

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C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total	FY 2012	FY 2013	FY 2014	FY 2015	Cost To Complete	Total Cost
• 0901598C: Management Headquarters-MDA	87.151	52.403	29.754	0.000	29.754	29.421	29.974	30.567	31.171	0	290.441
D. Acquisition Strategy											
Products and services will be acquired with competitive means to the extent possible and practical.											
Test & Evaluation projects use multiple existing development contracts depending on the system(s) involved in the testing.											
The BMDS radar (AN/TPY-2) project used an existing radar design to minimize development costs and schedule. Design enhancements focus on software changes for the forward based algorithms and C2BMC connectivity. The Common Software work will begin on the existing AN/TPY-2 development contract.											
E. Performance Metrics											
NA											

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Missile Defense Agency											DATE: February 2010		
APPROPRIATION/BUDGET ACTIVITY					R-1 ITEM NOMENCLATURE				PROJECT				
0400: Research, Development, Test & Evaluation, Defense-Wide BA 4: Advanced Component Development & Prototypes (ACD&P)					PE 0603884C: Ballistic Missile Defense Sensors				WX11: Ballistic Missile Defense Radars Capability Development				
Product Development (\$ in Millions)													
				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 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
X-Band Basic Program X-Band Software, String, Development WX11	SS/CPAF	Raytheon MA	98.187	132.728	Jul 2010	0.000		0.000		0.000	0	230.915	Continuing
Sensors System Engineering & UMDF Advanced Sensor Tech Demo WX11	TBD/TBD	TBD -	0.000	4.468	Oct 2009	0.000		0.000		0.000	0	4.468	Continuing
Sensors System Engineering & UMDF BMDS Sensor Integration WX11	Various/ Various	APL,MIT, Raytheon MD, MA, VA, AL	0.000	18.874	Oct 2009	0.000		0.000		0.000	0	18.874	Continuing
Sensors System Engineering & UMDF BMD Sensor M&S WX11	Various/ Various	Raytheon, APL, NGC, NTB MA, MD, VA, AL	0.000	10.553	Oct 2009	0.000		0.000		0.000	0	10.553	Continuing
Sensors System Engineering & UMDF BMDS Sensors V&V WX11	TBD/TBD	TBD -	0.000	3.298	Oct 2009	0.000		0.000		0.000	0	3.298	Continuing
Sensors System Engineering & UMDF Advanced Sensor Technology WX11	Various/ Various	DARPA, APL, MIT VA, MD, MA, AL	0.000	1.628	Oct 2009	0.000		0.000		0.000	0	1.628	Continuing
Sensors System Engineering & UMDF RDSIS WX11	SS/CPAF	Lockheed Martin AL	1.700	0.000		0.000		0.000		0.000	0	1.700	Continuing
Sensors System Engineering & UMDF	SS/CPAF	Boeing AL	0.947	0.000		0.000		0.000		0.000	0	0.947	Continuing

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Missile Defense Agency											DATE: February 2010		
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0400: Research, Development, Test & Evaluation, Defense-Wide					PE 0603884C: Ballistic Missile Defense Sensors				WX11: Ballistic Missile Defense Radars Capability Development				
BA 4: Advanced Component Development & Prototypes (ACD&P)													
Product Development (\$ in Millions)													
				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 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
XBR Boost State Using WX11													
Sensors System Engineering & UMDF UMDF Integration with ES WX11	Various/ Various	SIDC-XIR, SCITEC, SAF-FMBIB CO, VA	1.651	0.000		0.000		0.000		0.000	0	1.651	Continuing
Sensors System Engineering & UMDF UMDF (Correlation & Sys Track) WX11	SS/CPAF	Raytheon MA	3.511	0.000		0.000		0.000		0.000	0	3.511	Continuing
Sensors System Engineering & UMDF UMDF Sidecar Demo WX11	TBD/TBD	MIT-LL MA	0.760	0.000		0.000		0.000		0.000	0	0.760	Continuing
Sensors System Engineering & UMDF UMDF (Sensor Registration, Trade Study) WX11	TBD/TBD	JHU-APL MD	0.390	0.000		0.000		0.000		0.000	0	0.390	Continuing
Sensors System Engineering & UMDF Sensors Engineering WX11	TBD/TBD	DXSS AL	8.343	0.000		0.000		0.000		0.000	Continuing	Continuing	Continuing
External Sensors Prime Contractor WX11	SS/CPAF	Northrop Grumman (RaPID) CO	3.914	4.778	Oct 2009	0.000		0.000		0.000	0	8.692	Continuing

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Product Development (\$ in Millions)													
				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 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
External Sensors Systems Engineering/ Aerospace Analysis WX11	TBD/TBD	MITRE/AERO Space VA	0.365	0.372	Oct 2009	0.000		0.000		0.000	0	0.737	Continuing
External Sensors Live Test Support/Algorithm Development & Analysis WX11	TBD/TBD	NASIC (WPAFB) OH	0.500	0.798	Jan 2010	0.000		0.000		0.000	0	1.298	Continuing
External Sensors Analysis, Test Support, Aegis Support WX11	TBD/TBD	NSWC-DD VA	0.906	0.798	Jan 2010	0.000		0.000		0.000	0	1.704	Continuing
External Sensors Lab Development, Integration, and Accreditation WX11	TBD/TBD	Various VA	0.521	0.532		0.000		0.000		0.000	0	1.053	Continuing
External Sensors Accreditation WX11	TBD/TBD	MDIOC (JRDC-NG) CO	0.813	1.064	Oct 2009	0.000		0.000		0.000	0	1.877	Continuing
External Sensors Operations Migration WX11	SS/CPAF	Northrop Grumman CO	3.352	10.260	Apr 2010	0.000		0.000		0.000	0	13.612	Continuing
External Sensors Algorithm Development and Ops WX11	TBD/TBD	FMBMB CO	0.235	0.000		0.000		0.000		0.000	0	0.235	Continuing
BMDS Architecture Overhead Persistent	TBD/TBD	FFRDC -	0.000	10.718	Oct 2009	0.000		0.000		0.000	0	10.718	Continuing

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Missile Defense Agency											DATE: February 2010																																																																																																																									
APPROPRIATION/BUDGET ACTIVITY 0400: <i>Research, Development, Test & Evaluation, Defense-Wide</i> BA 4: <i>Advanced Component Development & Prototypes (ACD&P)</i>				R-1 ITEM NOMENCLATURE PE 0603884C: <i>Ballistic Missile Defense Sensors</i>				PROJECT WX11: <i>Ballistic Missile Defense Radars Capability Development</i>																																																																																																																												
Product Development (\$ in Millions) <table border="1" style="width:100%; border-collapse: collapse; margin-top: 10px;"> <thead> <tr> <th rowspan="2">Cost Category Item</th> <th rowspan="2">Contract Method & Type</th> <th rowspan="2">Performing Activity & Location</th> <th rowspan="2">Total Prior Years Cost</th> <th colspan="2">FY 2010</th> <th colspan="2">FY 2011 Base</th> <th colspan="2">FY 2011 OCO</th> <th>FY 2011 Total</th> <th rowspan="2">Cost To Complete</th> <th rowspan="2">Total Cost</th> <th rowspan="2">Target Value of Contract</th> </tr> <tr> <th>Cost</th> <th>Award Date</th> <th>Cost</th> <th>Award Date</th> <th>Cost</th> <th>Award Date</th> <th>Cost</th> </tr> </thead> <tbody> <tr> <td>Infrared (OPIR) Interface Development WX11</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Common Threat Contractor Support Services (CSS) WX11</td> <td>C/CPFF</td> <td>Cobham VA</td> <td align="right">0.000</td> <td align="right">0.468</td> <td>Apr 2010</td> <td align="right">0.000</td> <td></td> <td align="right">0.000</td> <td></td> <td align="right">0.000</td> <td align="right">0</td> <td align="right">0.468</td> <td>Continuing</td> </tr> <tr> <td>Common Threat SMDC Support WX11</td> <td>TBD/TBD</td> <td>SAIC VA</td> <td align="right">0.000</td> <td align="right">2.072</td> <td>Apr 2010</td> <td align="right">0.000</td> <td></td> <td align="right">0.000</td> <td></td> <td align="right">0.000</td> <td align="right">0</td> <td align="right">2.072</td> <td>Continuing</td> </tr> <tr> <td>Mobile Sensors Enhancement Mobile Sensors Prime Contractor WX11</td> <td>SS/CPAF</td> <td>LS/Aeromet OK</td> <td align="right">4.000</td> <td align="right">0.000</td> <td></td> <td align="right">0.000</td> <td></td> <td align="right">0.000</td> <td></td> <td align="right">0.000</td> <td align="right">0</td> <td align="right">4.000</td> <td>Continuing</td> </tr> <tr> <td>EO/IR Sensors AIRS Prime Contractor WX11</td> <td>SS/CPFF</td> <td>LS/Aeromet OK</td> <td align="right">0.780</td> <td align="right">0.000</td> <td></td> <td align="right">0.000</td> <td></td> <td align="right">0.000</td> <td></td> <td align="right">0.000</td> <td align="right">0</td> <td align="right">0.780</td> <td>Continuing</td> </tr> <tr> <td>EO/IR Sensors SIMS CARD for AIRS WX11</td> <td>TBD/TBD</td> <td>DISA-Scott AFB IL</td> <td align="right">0.020</td> <td align="right">0.000</td> <td></td> <td align="right">0.000</td> <td></td> <td align="right">0.000</td> <td></td> <td align="right">0.000</td> <td align="right">0</td> <td align="right">0.020</td> <td>Continuing</td> </tr> <tr> <td align="right" colspan="3">Subtotal</td><td align="right">130.895</td><td align="right">203.409</td><td></td><td align="right">0.000</td><td></td><td align="right">0.000</td><td></td><td align="right">0.000</td><td></td><td></td><td></td> </tr> </tbody> </table>														Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total	Cost To Complete	Total Cost	Target Value of Contract	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Infrared (OPIR) Interface Development WX11														Common Threat Contractor Support Services (CSS) WX11	C/CPFF	Cobham VA	0.000	0.468	Apr 2010	0.000		0.000		0.000	0	0.468	Continuing	Common Threat SMDC Support WX11	TBD/TBD	SAIC VA	0.000	2.072	Apr 2010	0.000		0.000		0.000	0	2.072	Continuing	Mobile Sensors Enhancement Mobile Sensors Prime Contractor WX11	SS/CPAF	LS/Aeromet OK	4.000	0.000		0.000		0.000		0.000	0	4.000	Continuing	EO/IR Sensors AIRS Prime Contractor WX11	SS/CPFF	LS/Aeromet OK	0.780	0.000		0.000		0.000		0.000	0	0.780	Continuing	EO/IR Sensors SIMS CARD for AIRS WX11	TBD/TBD	DISA-Scott AFB IL	0.020	0.000		0.000		0.000		0.000	0	0.020	Continuing	Subtotal			130.895	203.409		0.000		0.000		0.000			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total	Cost To Complete	Total Cost	Target Value of Contract																																																																																																																							
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Common Threat SMDC Support WX11	TBD/TBD	SAIC VA	0.000	2.072	Apr 2010	0.000		0.000		0.000	0	2.072	Continuing																																																																																																																							
Mobile Sensors Enhancement Mobile Sensors Prime Contractor WX11	SS/CPAF	LS/Aeromet OK	4.000	0.000		0.000		0.000		0.000	0	4.000	Continuing																																																																																																																							
EO/IR Sensors AIRS Prime Contractor WX11	SS/CPFF	LS/Aeromet OK	0.780	0.000		0.000		0.000		0.000	0	0.780	Continuing																																																																																																																							
EO/IR Sensors SIMS CARD for AIRS WX11	TBD/TBD	DISA-Scott AFB IL	0.020	0.000		0.000		0.000		0.000	0	0.020	Continuing																																																																																																																							
Subtotal			130.895	203.409		0.000		0.000		0.000																																																																																																																										
Remarks NA																																																																																																																																				

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Missile Defense Agency											DATE: February 2010		
APPROPRIATION/BUDGET ACTIVITY				R-1 ITEM NOMENCLATURE				PROJECT					
0400: Research, Development, Test & Evaluation, Defense-Wide BA 4: Advanced Component Development & Prototypes (ACD&P)				PE 0603884C: Ballistic Missile Defense Sensors				WX11: Ballistic Missile Defense Radars Capability Development					
Support (\$ in Millions)													
				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 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
Operations and Maintenance of Core IT Services O&M of Core IT Services WX11	TBD/TBD	TBD -	9.773	0.000		0.000		0.000		0.000	0	9.773	Continuing
Subtotal			9.773	0.000		0.000		0.000		0.000	0.000	9.773	
Remarks													
NA													
Test and Evaluation (\$ in Millions)													
				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 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
BMDS Radars Test & Evaluation AN/TPY-2 Flt/Grnd Test Support WX11	SS/CPAF	Raytheon, MDA MA, VA	48.517	0.000		0.000		0.000		0.000	0	48.517	Continuing
BMDS Radars Test & Evaluation AN/TPY-2 VAFB & PMRF WX11	TBD/TBD	VAFB, PMRF CA, HI	0.128	0.000		0.000		0.000		0.000	0	0.128	Continuing
BMDS Radars Test & Evaluation Operational Test Agency Support WX11	TBD/TBD	OTA Various	0.000	2.800	Oct 2009	0.000		0.000		0.000	0	2.800	Continuing

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Missile Defense Agency											DATE: February 2010		
APPROPRIATION/BUDGET ACTIVITY					R-1 ITEM NOMENCLATURE				PROJECT				
0400: Research, Development, Test & Evaluation, Defense-Wide BA 4: Advanced Component Development & Prototypes (ACD&P)					PE 0603884C: Ballistic Missile Defense Sensors				WX11: Ballistic Missile Defense Radars Capability Development				
Test and Evaluation (\$ in Millions)													
				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 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
BMDS Radars Test & Evaluation Government Testing Oversight/ Accreditation WX11	TBD/TBD	NSWC-PHD, NSWC-DD CA, VA	1.055	0.000		0.000		0.000		0.000	0	1.055	Continuing
BMDS Radars Test & Evaluation Forward Based Flight/Ground Test Support WX11	SS/CPAF	Raytheon MA, VA	0.000	27.478	Jul 2010	0.000		0.000		0.000	0	27.478	Continuing
BMDS Radars Test & Evaluation Inter Sensor Testing WX11	TBD/TBD	TBD -	0.000	3.221	Jul 2010	0.000		0.000		0.000	0	3.221	Continuing
BMDS Radars Test & Evaluation Warfighter Exercises WX11	SS/CPAF	Raytheon MA	0.000	1.596	Jul 2010	0.000		0.000		0.000	0	1.596	Continuing
BMDS Radars Test & Evaluation Digital Signal Injection WX11	SS/CPAF	Raytheon MA	0.000	15.626	Jul 2010	0.000		0.000		0.000	0	15.626	Continuing
BMDS Radars Test & Evaluation Thule Testing WX11	SS/CPAF	Raytheon MA	0.000	3.700	Oct 2009	0.000		0.000		0.000	0	3.700	Continuing
BMDS Radars Test & Evaluation Thule CTTO Infrastructure WX11	SS/CPAF	Raytheon MA	0.000	10.638	Oct 2009	0.000		0.000		0.000	0	10.638	Continuing
BMDS Radars Test & Evaluation UEWR CTTO Infrastructure WX11	TBD/TBD	TBD TBD	0.000	12.766	Oct 2009	0.000		0.000		0.000	0	12.766	Continuing
	TBD/TBD	TBD	0.000	5.851	Oct 2009	0.000		0.000		0.000	0	5.851	Continuing

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Missile Defense Agency											DATE: February 2010		
APPROPRIATION/BUDGET ACTIVITY					R-1 ITEM NOMENCLATURE				PROJECT				
0400: Research, Development, Test & Evaluation, Defense-Wide BA 4: Advanced Component Development & Prototypes (ACD&P)					PE 0603884C: Ballistic Missile Defense Sensors				WX11: Ballistic Missile Defense Radars Capability Development				
Test and Evaluation (\$ in Millions)													
				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 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
BMDS Radars Test & Evaluation COBRA DANE CTTO Infrastructure WX11		TBD											
BMDS Radars Test & Evaluation COBRA DANE Flight/Ground Test Support WX11	TBD/ Various	OGA/Raytheon MA	0.000	2.861	Oct 2009	0.000		0.000		0.000	0	2.861	Continuing
BMDS Radars Test & Evaluation SBX CTTO Infrastructure WX11	SS/CPAF	Raytheon MA	0.000	6.276	Oct 2009	0.000		0.000		0.000	0	6.276	Continuing
BMDS Radars Test & Evaluation SBX Flight/ Ground Test Support WX11	SS/CPAF	Raytheon MA	0.000	17.313	Oct 2009	0.000		0.000		0.000	0	17.313	Continuing
BMDS Radars Test & Evaluation SBX MDSE Infrastructure WX11	SS/CPAF	Raytheon MA	0.000	5.319	Oct 2009	0.000		0.000		0.000	0	5.319	Continuing
BMDS Radars Test & Evaluation ESL Testing WX11	SS/CPAF	NG (RaPID), SIDC/XIR (NG Azusa CO	2.042	0.000		0.000		0.000		0.000	0	2.042	Continuing
BMDS Radars Test & Evaluation GT Support WX11	TBD/TBD	JHU-APL MD	0.800	0.000		0.000		0.000		0.000	0	0.800	Continuing
	SS/CPAF	COLSA Inc. MA	0.060	0.000		0.000		0.000		0.000	0	0.060	Continuing

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Missile Defense Agency											DATE: February 2010		
APPROPRIATION/BUDGET ACTIVITY 0400: <i>Research, Development, Test & Evaluation, Defense-Wide</i> BA 4: <i>Advanced Component Development & Prototypes (ACD&P)</i>				R-1 ITEM NOMENCLATURE PE 0603884C: <i>Ballistic Missile Defense Sensors</i>				PROJECT WX11: <i>Ballistic Missile Defense Radars Capability Development</i>					
Test and Evaluation (\$ in Millions)													
				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 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
BMDS Radars Test & Evaluation CTTO Support WX11													
BMDS Radars Test & Evaluation CCC Satellite Test Campaign WX11	SS/CPAF	Boeing AL	0.490	0.000		0.000		0.000		0.000	Continuing	Continuing	Continuing
BMDS Radars Test & Evaluation FTG-06 Mission Support OPE WX11	SS/CPAF	LM AL	0.772	0.000		0.000		0.000		0.000	Continuing	Continuing	Continuing
Subtotal			53.864	115.445		0.000		0.000		0.000			
Remarks NA													
Management Services (\$ in Millions)													
				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 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
Subtotal			0.000	0.000		0.000		0.000		0.000			
Remarks NA													

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Missile Defense Agency							DATE: February 2010				
APPROPRIATION/BUDGET ACTIVITY 0400: <i>Research, Development, Test & Evaluation, Defense-Wide</i> BA 4: <i>Advanced Component Development & Prototypes (ACD&P)</i>			R-1 ITEM NOMENCLATURE PE 0603884C: <i>Ballistic Missile Defense Sensors</i>			PROJECT WX11: <i>Ballistic Missile Defense Radars Capability Development</i>					
	Total Prior Years Cost	FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	194.532	318.854		0.000		0.000		0.000			
Remarks NA											

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Exhibit R-4, RDT&E Schedule Profile: PB 2011 Missile Defense Agency

DATE: February 2010

APPROPRIATION/BUDGET ACTIVITY

0400: Research, Development, Test & Evaluation, Defense-Wide
BA 4: Advanced Component Development & Prototypes (ACD&P)

R-1 ITEM NOMENCLATURE

PE 0603884C: *Ballistic Missile Defense Sensors*

PROJECT

WX11: Ballistic Missile Defense Radars Capability Development

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Exhibit R-4A, RDT&E Schedule Details: PB 2011 Missile Defense Agency			DATE: February 2010	
APPROPRIATION/BUDGET ACTIVITY 0400: Research, Development, Test & Evaluation, Defense-Wide BA 4: Advanced Component Development & Prototypes (ACD&P)		R-1 ITEM NOMENCLATURE PE 0603884C: Ballistic Missile Defense Sensors		PROJECT WX11: Ballistic Missile Defense Radars Capability Development
Schedule Details				
	Start		End	
Event	Quarter	Year	Quarter	Year
Complete TPY-2 Digital Simulation CRUSHM 2.4	2	2009	2	2009
Complete RF Scene Generator for TPY-2 Advanced Discrimination	3	2009	3	2009
Complete V&V of TPY-2 Simulation in Performance Assessment FY 2009 (PA-09)	4	2009	4	2009
Complete AN/TPY-2 CX-1 Formal Qualification Test (FQT)	2	2010	4	2010
Complete Initial Dev of CECs/EMEs	4	2010	4	2010

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Exhibit R-2A, RDT&E Project Justification: PB 2011 Missile Defense Agency								DATE: February 2010			
APPROPRIATION/BUDGET ACTIVITY 0400: <i>Research, Development, Test & Evaluation, Defense-Wide</i> BA 4: <i>Advanced Component Development & Prototypes (ACD&P)</i>				R-1 ITEM NOMENCLATURE PE 0603884C: <i>Ballistic Missile Defense Sensors</i>				PROJECT XX11: <i>Ballistic Missile Defense Radars Sustainment</i>			
COST (\$ in Millions)	FY 2009 Actual	FY 2010 Estimate	FY 2011 Base Estimate	FY 2011 OCO Estimate	FY 2011 Total Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
XX11: <i>Ballistic Missile Defense Radars Sustainment</i>	129.649	159.611	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	289.260
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0		
Note NA											
A. Mission Description and Budget Item Justification This effort provides for the operation and support of BMDS Radars until transferred to a Service component. Sustainment also includes MDA support for maintenance of radar missile defense software after transition. This includes: AN/TPY-2s Thule Upgraded Early Warning Radar (UEWR) COBRA DANE radar Beale and Fylingdales UEWRs											
B. Accomplishments/Planned Program (\$ in Millions)											
						FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total	
BMDS Radars (Sustainment)						87.475	117.231	0.000	0.000	0.000	
See Description Below											
FY 2009 Accomplishments: MDA uses Contractor Logistics Support (CLS) to operate and sustain the AN/TPY-2 radars. The forward-based radar effort includes:											

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Exhibit R-2A, RDT&E Project Justification: PB 2011 Missile Defense Agency				DATE: February 2010		
APPROPRIATION/BUDGET ACTIVITY 0400: Research, Development, Test & Evaluation, Defense-Wide BA 4: Advanced Component Development & Prototypes (ACD&P)		R-1 ITEM NOMENCLATURE PE 0603884C: Ballistic Missile Defense Sensors		PROJECT XX11: Ballistic Missile Defense Radars Sustainment		
B. Accomplishments/Planned Program (\$ in Millions)						
		FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
Depot level logistics support Operations and sustainment during testing at Vandenberg Air Force Base (VAFB), CA Operational spares, repair, and replacement Radar operators/maintainers, site maintenance, fuel, utility, and communications support costs For FY 2009, Sensors O&S accomplished the following: Operated and sustained AN/TPY-2 forward-based radars (2) overseas and at other locations supporting BMDS ground/flight testing Provided personnel to support radar operations in Israel and Japan Provided training, facility maintenance, depot support, and spares Provided superdome computer maintenance Operated and maintained site power in Japan Provided generator overhaul and replacements in Japan Supported transition and transfer of TPY-2 forward based radars Provided X-Band Radar (XBR) depot support and spares FY 2010 Plans: Operate and sustain AN/TPY-2 forward-based radars (2) overseas and at other locations supporting BMDS ground/flight testing Provide personnel to support radar operations in Israel and Japan Provide training, facility maintenance, depot support, and spares Provide superdome computer maintenance						

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Exhibit R-2A, RDT&E Project Justification: PB 2011 Missile Defense Agency				DATE: February 2010		
APPROPRIATION/BUDGET ACTIVITY 0400: Research, Development, Test & Evaluation, Defense-Wide BA 4: Advanced Component Development & Prototypes (ACD&P)		R-1 ITEM NOMENCLATURE PE 0603884C: Ballistic Missile Defense Sensors		PROJECT XX11: Ballistic Missile Defense Radars Sustainment		
B. Accomplishments/Planned Program (\$ in Millions)						
		FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
Operate and maintain site power in Japan Provide generator overhaul and replacements in Japan Support transition and transfer of TPY-2 forward based radars Provide XBR depot support and spares Maintain the Groundbased Radar - Prototype (GBR-P) (currently in caretaker status) FY 2011 Base Plans: FY 2011 plans are included in project MD11. FY 2011 OCO Plans: NA						
Upgraded Early Warning Radars (Beale, Fylingdales, COBRA DANE) See Description Below FY 2009 Accomplishments: For UEWR, this program provides for hardware replacement of decades old processing technology and new communications equipment, and the development of new software that supports these missions. For CDU, the program provides for minor changes to existing hardware and new communications equipment, and the development of missile defense software integrated into the existing legacy software. Transferred COBRA DANE to USAF Provided sustainment transition support to the USAF for Beale and Fylingdales Provided maintenance of the System Programming Agency (SPA) sustainment string Installed UEWR software enhancements (VCN-2) Provided sustainment of the upgraded COBRA DANE radar Provided for program management office support personnel		24.113	28.479	0.000	0.000	0.000

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Exhibit R-2A, RDT&E Project Justification: PB 2011 Missile Defense Agency				DATE: February 2010		
APPROPRIATION/BUDGET ACTIVITY 0400: Research, Development, Test & Evaluation, Defense-Wide BA 4: Advanced Component Development & Prototypes (ACD&P)		R-1 ITEM NOMENCLATURE PE 0603884C: Ballistic Missile Defense Sensors		PROJECT XX11: Ballistic Missile Defense Radars Sustainment		
B. Accomplishments/Planned Program (\$ in Millions)						
		FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
FY 2010 Plans: Provide maintenance of the SPA sustainment string Provide sustainment of the upgraded COBRA DANE radar Continue UEWR/CDU Common Mission software sustainment Achieve Air Force acceptance of VCN-2 (Beale, Fylingdales, Thule) Provide for program management office support personnel FY 2011 Base Plans: FY 2011 plans are included in project MD11. FY 2011 OCO Plans: NA						
BMDS Radars Communications (Sustainment) See Description Below FY 2009 Accomplishments: This operations and support (O&S) effort supports the AN/TPY-2 Communications suites. It includes communications suite operational spares, repair, and replacement; communications operators/maintainers; communications support costs; and sustains 24 hours a day, 365 days a year C2BMC operations. Provided round-the-clock sustainment for C2BMC Communications capabilities associated with AN/TPY-2 Provided on-site C2BMC support of fielded sites for hardware and software Provided C2BMC operator training for fielded capabilities Provided sustaining engineering support and integrated logistics support for fielded hardware and software		18.061	13.901	0.000	0.000	0.000

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Exhibit R-2A, RDT&E Project Justification: PB 2011 Missile Defense Agency									DATE: February 2010		
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B. Accomplishments/Planned Program (\$ in Millions)											
						FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total	
FY 2010 Plans: Continue round-the-clock sustainment for Communications capabilities associated with AN/TPY-2 Continue on-site C2BMC support of fielded sites for hardware and software Continue C2BMC operator training for fielded capabilities Continue sustaining engineering support and integrated logistics support for fielded hardware and software FY 2011 Base Plans: FY 2011 plans are included in project MD11. FY 2011 OCO Plans: NA											
Accomplishments/Planned Programs Subtotals						129.649	159.611	0.000	0.000	0.000	
C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total	FY 2012	FY 2013	FY 2014	FY 2015	Cost To Complete	Total Cost
• 0603175C: Ballistic Missile Defense Technology	117.602	189.229	132.220	0.000	132.220	236.875	239.873	197.118	197.852	0	1,310.769
• 0603881C: Ballistic Missile Defense Terminal Defense Segment	951.414	715.732	436.482	0.000	436.482	250.275	336.711	500.983	521.717	0	3,713.314
• 0603882C: Ballistic Missile Defense Mid-Course Segment	1,472.683	1,027.371	1,346.181	0.000	1,346.181	1,112.655	1,291.790	1,099.029	1,033.213	0	8,382.922
• 0603883C: Ballistic Missile Defense Boost Defense Segment	384.365	182.317	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	566.682
	308.869	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	308.869

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Exhibit R-2A, RDT&E Project Justification: PB 2011 Missile Defense Agency									DATE: February 2010		
APPROPRIATION/BUDGET ACTIVITY				R-1 ITEM NOMENCLATURE				PROJECT			
0400: Research, Development, Test & Evaluation, Defense-Wide BA 4: Advanced Component Development & Prototypes (ACD&P)				PE 0603884C: Ballistic Missile Defense Sensors				XX11: Ballistic Missile Defense Radars Sustainment			
C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total	FY 2012	FY 2013	FY 2014	FY 2015	Cost To Complete	Total Cost
• 0603886C: Ballistic Missile Defense System Interceptor											
• 0603888C: Ballistic Missile Defense Test and Targets	906.952	823.333	1,113.425	0.000	1,113.425	1,105.959	951.371	871.929	829.608	0	6,602.577
• 0603890C: Ballistic Missile Defense Enabling Programs	402.776	358.751	402.769	0.000	402.769	468.673	457.745	473.871	488.799	0	3,053.384
• 0603891C: SPECIAL PROGRAMS - MDA	182.998	250.185	270.189	0.000	270.189	269.040	450.645	517.486	601.315	0	2,541.858
• 0603892C: BMD AEGIS	1,054.323	1,435.717	1,467.278	0.000	1,467.278	1,021.878	1,112.668	1,076.739	923.316	0	8,091.919
• 0603893C: SPACE TRACKING & SURVEILLANCE SYSTEM	209.831	161.609	112.678	0.000	112.678	98.500	56.424	52.928	34.661	0	726.631
• 0603894C: MULTIPLE KILL VEHICLE	226.027	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	226.027
• 0603895C: BMD SYSTEM SPACE PROGRAM	23.250	12.492	10.942	0.000	10.942	11.182	11.347	11.749	12.155	0	93.117
• 0603896C: BMD C2BMC	275.174	334.734	342.625	0.000	342.625	364.085	289.778	323.922	298.936	0	2,229.254
• 0603897C: BMD HERCULES	51.629	47.932	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	99.561
• 0603898C: BMD JOINT WARFIGHTER SUPPORT	66.283	61.098	68.726	0.000	68.726	62.239	63.451	65.158	67.231	0	454.186
• 0603901C: DIRECTED ENERGY RESEARCH	0.000	0.000	98.688	0.000	98.688	101.371	103.449	104.572	104.141	0	512.221
• 0603904C: MISSILE DEFENSE INTEGRATION & OPERATIONS CENTER (MDIOC)	102.823	86.483	86.198	0.000	86.198	88.181	78.517	80.410	83.087	0	605.699
• 0603906C: REGARDING TRENCH	3.159	6.130	7.529	0.000	7.529	8.295	8.286	8.479	8.675	0	50.553
• 0603907C: SEA BASED X-BAND RADAR (SBX)	143.878	167.153	153.056	0.000	153.056	150.104	159.832	160.163	197.099	0	1,131.285
	348.722	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	348.722

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Exhibit R-2A, RDT&E Project Justification: PB 2011 Missile Defense Agency									DATE: February 2010		
APPROPRIATION/BUDGET ACTIVITY 0400: Research, Development, Test & Evaluation, Defense-Wide BA 4: Advanced Component Development & Prototypes (ACD&P)				R-1 ITEM NOMENCLATURE PE 0603884C: Ballistic Missile Defense Sensors				PROJECT XX11: Ballistic Missile Defense Radars Sustainment			
C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total	FY 2012	FY 2013	FY 2014	FY 2015	Cost To Complete	Total Cost
• 0603908C: BMD EUROPEAN INTERCEPTOR SITE										0	73.728
• 0603909C: BMD EUROPEAN MIDCOURSE RADAR	73.728	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	73.728
• 0603911C: BMD EUROPEAN CAPABILITY	0.000	50.226	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	50.226
• 0603912C: BMD European Comm Support	26.016	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	26.016
• 0603913C: ISRAELI COOPERATIVE	0.000	201.323	121.735	0.000	121.735	111.100	113.101	116.114	119.172	0	782.545
• 0604880C: LAND-BASED SM-3	0.000	0.000	281.378	0.000	281.378	345.937	187.062	93.456	139.595	0	1,047.428
• 0604881C: Aegis SM-3 BLOCK IIA CO-DEVELOPMENT	0.000	255.987	318.800	0.000	318.800	405.500	416.300	337.300	227.500	0	1,961.387
• 0604883C: PRECISION TRACKING SPACE SYSTEM	0.000	0.000	66.969	0.000	66.969	123.851	184.800	348.360	482.952	0	1,206.932
• 0604884C: AIRBORNE INFRARED (ABIR)	0.000	0.000	111.671	0.000	111.671	103.636	123.591	103.668	58.773	0	501.339
• 0605502C: Small Business Innovative Research BMDO	124.788	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	124.788
• 0901585C: Pentagon Reservation	20.146	19.709	20.482	0.000	20.482	0.000	0.000	0.000	0.000	0	60.337
• 0901598C: Management Headquarters-MDA	87.151	52.403	29.754	0.000	29.754	29.421	29.974	30.567	31.171	0	290.441
D. Acquisition Strategy											
Products and services will be acquired through competitive means to the extent possible and practical.											
A Contractor Logistics Support (CLS) contract was awarded to operate and maintain the AN/TPY-2 radars. This is an Indefinite Delivery Indefinite Quantity (IDIQ) task order contract.											

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Exhibit R-2A, RDT&E Project Justification: PB 2011 Missile Defense Agency		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 0400: <i>Research, Development, Test & Evaluation, Defense-Wide</i> BA 4: <i>Advanced Component Development & Prototypes (ACD&P)</i>	R-1 ITEM NOMENCLATURE PE 0603884C: <i>Ballistic Missile Defense Sensors</i>	PROJECT XX11: <i>Ballistic Missile Defense Radars Sustainment</i>
Beale and Fylingdales UEWR software development will be completed under a follow-on Ground-Based Midcourse Defense (GMD) contract. Long term sustainment will be performed through a USAF radar sustainment activity. The BMDS Communications System Complex - Transportable (BCSC-T) Program Plan addresses the design, development, acquisition, testing, integration, activation, and fielding. The overall executing agent is the Defense Information Systems Agency (DISA) via an existing Memorandum of Agreement (MOA) with MDA. <u>E. Performance Metrics</u> NA		

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Missile Defense Agency											DATE: February 2010			
APPROPRIATION/BUDGET ACTIVITY 0400: Research, Development, Test & Evaluation, Defense-Wide BA 4: Advanced Component Development & Prototypes (ACD&P)					R-1 ITEM NOMENCLATURE PE 0603884C: Ballistic Missile Defense Sensors					PROJECT XX11: Ballistic Missile Defense Radars Sustainment				
Product Development (\$ in Millions)														
				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 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	
BMDS Radars (Sustainment) AN/TPY-2 #2 - Radar Ops, Manning, Depot Support, Site Maintenance, Superdome Maintenance, Training XX11	SS/Various	Raytheon MA	30.200	33.407	Oct 2009	0.000		0.000		0.000	0	63.607	Continuing	
BMDS Radars (Sustainment) AN/TPY-2 #2 - Replenishment Spares; Repair and Replace XX11	SS/FPI	Raytheon MA	6.357	4.093	Jul 2010	0.000		0.000		0.000	0	10.450	Continuing	
BMDS Radars (Sustainment) AN/TPY-2 #2 - Fuel for Generators, Vehicles, and Security Equipment XX11	TBD/TBD	US Army Japan	3.387	3.590	Oct 2009	0.000		0.000		0.000	0	6.977	Continuing	
BMDS Radars (Sustainment) AN/TPY-2 - Warfighter Support XX11	TBD/TBD	BMDSM AL	0.000	3.282	Oct 2009	0.000		0.000		0.000	0	3.282	Continuing	
BMDS Radars (Sustainment) AN/TPY-2 #3 - Radar Ops, Manning, Depot Support, Site Maintenance, Superdome	SS/Various	Raytheon MA	29.877	21.730	Apr 2010	0.000		0.000		0.000	0	51.607	Continuing	

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APPROPRIATION/BUDGET ACTIVITY 0400: Research, Development, Test & Evaluation, Defense-Wide BA 4: Advanced Component Development & Prototypes (ACD&P)						R-1 ITEM NOMENCLATURE PE 0603884C: Ballistic Missile Defense Sensors				PROJECT XX11: Ballistic Missile Defense Radars Sustainment				
Product Development (\$ in Millions)														
				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 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	
Maintenance, Training XX11														
BMDS Radars (Sustainment) AN/TPY-2 #3 - Replenishment Spares; Repair and Replace, Site Depot Spares XX11	SS/TBD	Raytheon MA	3.784	4.093	Oct 2009	0.000		0.000		0.000	0	7.877	Continuing	
BMDS Radars (Sustainment) AN/TPY-2 - International Transportation XX11	TBD/TBD	TRANSCOM CA	0.690	0.000		0.000		0.000		0.000	0	0.690	Continuing	
BMDS Radars (Sustainment) AN/TPY-2 #6 - Spares XX11	SS/FPI	Raytheon MA	0.000	6.395	Jul 2010	0.000		0.000		0.000	0	6.395	Continuing	
BMDS Radars (Sustainment) BMDSM Manager Support XX11	TBD/TBD	SMDC AL	2.970	3.000	Oct 2009	0.000		0.000		0.000	0	5.970	Continuing	
BMDS Radars (Sustainment) AN/TPY-2 #2 - Replacement Generators XX11	SS/CPAF	Raytheon MA	0.000	5.195	Oct 2009	0.000		0.000		0.000	0	5.195	Continuing	
BMDS Radars (Sustainment) AN/TPY-2 #6 - Radar Ops, Manning, Depot Support, Site Maintenance, Superdome	SS/Various	Raytheon MA	0.000	9.361	Jul 2010	0.000		0.000		0.000	0	9.361	Continuing	

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Missile Defense Agency											DATE: February 2010		
APPROPRIATION/BUDGET ACTIVITY						R-1 ITEM NOMENCLATURE				PROJECT			
0400: Research, Development, Test & Evaluation, Defense-Wide BA 4: Advanced Component Development & Prototypes (ACD&P)						PE 0603884C: Ballistic Missile Defense Sensors				XX11: Ballistic Missile Defense Radars Sustainment			
Product Development (\$ in Millions)													
				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 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
Maintenance, Training XX11													
BMDS Radars (Sustainment) AN/TPY-2 #5 - Initial Spares (FUR#1) XX11	SS/FPI	Raytheon MA	1.800	7.387	Oct 2009	0.000		0.000		0.000	0	9.187	Continuing
BMDS Radars (Sustainment) Fire Unit Radars Logistical Support XX11	SS/FPI	Raytheon MA	7.762	10.652	Jul 2010	0.000		0.000		0.000	0	18.414	Continuing
BMDS Radars (Sustainment) AN/TPY-2 #3 - EUCOM Operations Support XX11	C/Various	TANADGUSIX AK	0.648	2.046		0.000		0.000		0.000	0	2.694	Continuing
BMDS Radars (Sustainment) GBR-P Caretaker XX11	SS/CPAF	Raytheon CA	0.000	3.000	Oct 2009	0.000		0.000		0.000	0	3.000	Continuing
Upgraded Early Warning Radars (Beale, Fylingdales, COBRA DANE) Cobra Dane System Trainer/CTTO XX11	SS/CPAF	Raytheon MA	2.000	0.000		0.000		0.000		0.000	0	2.000	Continuing
Upgraded Early Warning Radars (Beale, Fylingdales, COBRA DANE) Common Mission	TBD/TBD	Boeing, Raytheon AL, MA	4.685	6.343	Oct 2009	0.000		0.000		0.000	0	11.028	Continuing

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Missile Defense Agency											DATE: February 2010		
APPROPRIATION/BUDGET ACTIVITY 0400: Research, Development, Test & Evaluation, Defense-Wide BA 4: Advanced Component Development & Prototypes (ACD&P)					R-1 ITEM NOMENCLATURE PE 0603884C: Ballistic Missile Defense Sensors				PROJECT XX11: Ballistic Missile Defense Radars Sustainment				
Product Development (\$ in Millions)													
				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 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
Software Sustainment XX11													
Upgraded Early Warning Radars (Beale, Fylingdales, COBRA DANE) COBRA DANE Sustainment XX11	SS/CPAF	OGA/Boeing/ Raytheon MA	7.160	8.191	Oct 2009	0.000		0.000		0.000	0	15.351	Continuing
Upgraded Early Warning Radars (Beale, Fylingdales, COBRA DANE) Government Support XX11	TBD/TBD	850 ELSG/KD (UEWR/CD Program Office) MA	7.339	10.221	Oct 2009	0.000		0.000		0.000	0	17.560	Continuing
Upgraded Early Warning Radars (Beale, Fylingdales, COBRA DANE) UEWR Information Assurance XX11	TBD/TBD	TBD TBD	0.000	0.532	Oct 2009	0.000		0.000		0.000	0	0.532	Continuing
Upgraded Early Warning Radars (Beale, Fylingdales, COBRA DANE) Thule Sustainment XX11	SS/CPAF	Raytheon MA	0.000	3.192	Oct 2009	0.000		0.000		0.000	0	3.192	Continuing
Upgraded Early Warning Radars (Beale, Fylingdales, COBRA DANE) S/W Deployment	TBD/TBD	ITT Sensor CO	1.931	0.000		0.000		0.000		0.000	Continuing	Continuing	Continuing

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Missile Defense Agency										DATE: February 2010			
APPROPRIATION/BUDGET ACTIVITY 0400: Research, Development, Test & Evaluation, Defense-Wide BA 4: Advanced Component Development & Prototypes (ACD&P)						R-1 ITEM NOMENCLATURE PE 0603884C: Ballistic Missile Defense Sensors				PROJECT XX11: Ballistic Missile Defense Radars Sustainment			
Product Development (\$ in Millions)													
				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 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
& Transition Support XX11													
Upgraded Early Warning Radars (Beale, Fylingdales, COBRA DANE) UEWR Object Classification XX11	SS/CPAF	Raytheon MA	0.998	0.000		0.000		0.000		0.000	Continuing	Continuing	Continuing
BMDS Radars Communications (Sustainment) AN/TPY-2 - Communications O&S XX11	TBD/CPAF	Lockheed Martin Team VA	13.066	11.121	Oct 2009	0.000		0.000		0.000	0	24.187	Continuing
BMDS Radars Communications (Sustainment) AN/TPY-2 - Comms O&S Support XX11	TBD/TBD	DISA VA	4.995	2.780	Oct 2009	0.000		0.000		0.000	0	7.775	Continuing
Subtotal			129.649	159.611		0.000		0.000		0.000			
Remarks NA													

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Missile Defense Agency											DATE: February 2010		
APPROPRIATION/BUDGET ACTIVITY 0400: <i>Research, Development, Test & Evaluation, Defense-Wide</i> BA 4: <i>Advanced Component Development & Prototypes (ACD&P)</i>				R-1 ITEM NOMENCLATURE PE 0603884C: <i>Ballistic Missile Defense Sensors</i>				PROJECT XX11: <i>Ballistic Missile Defense Radars Sustainment</i>					
Support (\$ in Millions)													
				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 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
Subtotal			0.000	0.000		0.000		0.000		0.000			
Remarks NA													
Test and Evaluation (\$ in Millions)													
				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 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
Subtotal			0.000	0.000		0.000		0.000		0.000			
Remarks NA													
Management Services (\$ in Millions)													
				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 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
Subtotal			0.000	0.000		0.000		0.000		0.000			

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Missile Defense Agency											DATE: February 2010		
APPROPRIATION/BUDGET ACTIVITY 0400: <i>Research, Development, Test & Evaluation, Defense-Wide</i> BA 4: <i>Advanced Component Development & Prototypes (ACD&P)</i>				R-1 ITEM NOMENCLATURE PE 0603884C: <i>Ballistic Missile Defense Sensors</i>				PROJECT XX11: <i>Ballistic Missile Defense Radars Sustainment</i>					
Management Services (\$ in Millions)													
				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 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
Remarks NA													
			Total Prior Years Cost	FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			129.649	159.611		0.000		0.000		0.000			
Remarks NA													

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APPROPRIATION/BUDGET ACTIVITY
0400: *Research, Development, Test & Evaluation, Defense-Wide*
BA 4: *Advanced Component Development & Prototypes (ACD&P)*

DATE: February 2010

R-1 ITEM NOMENCLATURE
PE 0603884C: *Ballistic Missile Defense Sensors*

PROJECT
XX11: *Ballistic Missile Defense Radars Sustainment*

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Exhibit R-4A, RDT&E Schedule Details: PB 2011 Missile Defense Agency			DATE: February 2010	
APPROPRIATION/BUDGET ACTIVITY 0400: Research, Development, Test & Evaluation, Defense-Wide BA 4: Advanced Component Development & Prototypes (ACD&P)	R-1 ITEM NOMENCLATURE PE 0603884C: Ballistic Missile Defense Sensors	PROJECT XX11: Ballistic Missile Defense Radars Sustainment		
Schedule Details				
	Start		End	
Event	Quarter	Year	Quarter	Year
Transfer COBRA DANE to USAF	2	2009	2	2009
Air Force Acceptance of VCN-2 (Beale, Fylingdales, Thule)	1	2010	1	2010

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Exhibit R-2A, RDT&E Project Justification: PB 2011 Missile Defense Agency								DATE: February 2010			
APPROPRIATION/BUDGET ACTIVITY 0400: <i>Research, Development, Test & Evaluation, Defense-Wide</i> BA 4: <i>Advanced Component Development & Prototypes (ACD&P)</i>				R-1 ITEM NOMENCLATURE PE 0603884C: <i>Ballistic Missile Defense Sensors</i>				PROJECT MD11: <i>BMDS Radars</i>			
COST (\$ in Millions)	FY 2009 Actual	FY 2010 Estimate	FY 2011 Base Estimate	FY 2011 OCO Estimate	FY 2011 Total Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
MD11: <i>BMDS Radars</i>	0.000	0.000	440.023	0.000	440.023	452.561	659.538	630.408	595.040	Continuing	Continuing
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0		
Note NA											
A. Mission Description and Budget Item Justification Project MD11 continues efforts described for FY 2009 and 2010 in Projects EX11, WX11, and XX11. These efforts contribute to all four budget objectives of the BMDS: Enhancing Regional Defense, Continuing Viable Homeland Defense, Proving Missile Defense, and Hedging Against Future Threats. Activities in this project include: Development, delivery and deployment of AN/TPY-2 radars for either forward-based or Terminal High Altitude Area Defense (THAAD) Fire Unit use to meet warfighter needs (Regional Defense) Development of radar discrimination advanced algorithms and Common X-Band software for SBX and AN/TPY-2 radars to address evolving threats (Regional Defense, Homeland Defense) System engineering, and software development and testing support (Hedge Against Future Threats) Modeling and simulation efforts to include: enhanced sensor models, development of RF scene generators, integration of digital simulations into the BMDS modeling and simulation architecture, and verification, validation, and accreditation (VV&A) of radar models (Proving Missile Defense) Implementation of BMDS Unifying Missile Defense Functions (UMDF) to improve BMDS efficiency and effectiveness (Hedging Against Future Threats) Participation in BMDS flight and ground test campaigns (Proving Missile Defense) Sustainment of deployed radars (Regional Defense, Homeland Defense) Continuation of the External Sensors Laboratory (ESL), a test bed to utilize metric sensor data to enhance the efficiency and effectiveness of the overall BMDS (Hedge Against Future Threats)											
B. Accomplishments/Planned Program (\$ in Millions)											
						FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total	
BMDS Radars (Sustainment)						0.000	0.000	115.039	0.000	115.039	

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Exhibit R-2A, RDT&E Project Justification: PB 2011 Missile Defense Agency				DATE: February 2010		
APPROPRIATION/BUDGET ACTIVITY 0400: Research, Development, Test & Evaluation, Defense-Wide BA 4: Advanced Component Development & Prototypes (ACD&P)		R-1 ITEM NOMENCLATURE PE 0603884C: Ballistic Missile Defense Sensors		PROJECT MD11: BMDS Radars		
B. Accomplishments/Planned Program (\$ in Millions)						
		FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
See Description Below						
FY 2009 Accomplishments: FY 2009 accomplishments are found in Project XX11.						
FY 2010 Plans: FY 2010 plans are found in Project XX11.						
FY 2011 Base Plans: This effort provides for the operation and support of AN/TPY-2 Radars until transferred to a Service component. MDA uses Contractor Logistics Support (CLS) to operate and sustain the AN/TPY-2 Forward Based radars. AN/TPY-2 Fire Unit Radars are operated by the military as part of a Terminal High Altitude Area Defense (THAAD) Battery or Fire Unit. The effort includes:						
Depot level logistics support for seven AN/TPY-2 radars supporting BMDS forward Based Radar Sites and THAAD Batteries Radar operation & sustainment during integration testing at Vandenberg Air Force Base (VAFB), White Sands Missile Range (WSMR), and Pacific Missile Range Facility (PMRF) or Reagan Test Site (RTS)						
AN/TPY-2 operational spares, repair, and replacement parts						
AN/TPY-2 Forward-based Radar operators/maintainers, site maintenance, fuel, utility, and communications support costs						
Operate and sustain AN/TPY-2 Forward Based Radar sites located in Japan and Israel						

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B. Accomplishments/Planned Program (\$ in Millions)						
		FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
FY 2011 OCO Plans: NA						
Sensors Directorate Operations See Description Below FY 2009 Accomplishments: FY09 accomplishments are found in Project EX11. FY 2010 Plans: FY 2010 Plans are found in Project EX11. FY 2011 Base Plans: This effort provides operations support across all MDA Sensors projects. It provides for civilian salaries and travel. In addition, it provides other technical and business operations support services, technical oversight, and performance analysis provided by Federally Funded Research and Development Centers (FFRDCs), University Applied Research Centers (UARCs), and Advisory & Assistance Services. FY 2011 OCO Plans: NA		0.000	0.000	59.251	0.000	59.251
BMDS Level Testing See Description Below FY 2009 Accomplishments: FY 2009 accomplishments are found in Project WX11.		0.000	0.000	52.318	0.000	52.318

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B. Accomplishments/Planned Program (\$ in Millions)								
				FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
<i>FY 2010 Plans:</i> FY 2010 plans are found in Project WX11. <i>FY 2011 Base Plans:</i> A rigorous test program builds confidence among system stakeholders and sends a powerful message to our adversaries. Working with the Services` Operational Test Agencies (OTA), with the support of the Director of Operational Test and Evaluation (DOT&E), MDA has restructured its test program to improve confidence in the missile defense capabilities under development and ensure the capabilities transferred to the warfighter are operationally effective, suitable, and survivable. The BMDS sensors test program provides for sensors participation in the execution of BMDS testing described in Project MD04 of PE060388C, as well as element-level testing focused on BMDS sensors critical engagement conditions (CEC) and empirical measurement events (EME). CEC/EMEs are the conditions and events where data is obtained from flight and ground tests in order to anchor system models and simulations. BMDS sensors include AN/TPY-2 (Forward Based Mode), Sea Based X-Band Radar (SBX), COBRA DANE Upgrade (CDU), Upgraded Early Warning Radars (UEWR), and External Sensors Laboratory (ESL). The sensors test organization activities involve two functional areas: Test Planning and Design; and Test Operations. The MDA Directorate for Test provides functional support to the sensors test organization in the areas of: Test Resources; Test Policy, Budget, and Personnel; and Test Readiness and Truth. For FY 2011, the Sensors Program plans to: Plan and execute sensors participation in BMDS flight tests, including Aegis flight test FTM-15, the first test to demonstrate Phased Adaptive Approach capabilities Plan and execute sensors participation in BMDS ground test campaign GT-04								

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B. Accomplishments/Planned Program (\$ in Millions)						
		FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
Initiate planning for sensors participation in FY 2012 BMDs flight tests and ground tests The FY 2011 test program will execute 68 critical engagement condition/empirical measurement event (CEC/EME)** required data collections to reach a cumulative 76% completion (145 of 190 total) of data collection necessary for verification, validation, and assessment (VV&A) of modeling and simulation. The following table illustrates the CEC/EME data collection schedule for FY 2011 and beyond: Total Collection Opportunities: 190 Pre-FY09: 50 FY09: 14 FY10: 13 FY11: 68 FY12: 9 FY13: 8 FY14: 20 FY15: 5 FY16: 3 Cum Total: Pre-FY09: 50 FY09: 64 FY10: 77 FY11: 145 FY12: 154 FY13: 162 FY14: 182 FY15: 187 FY16: 190 % Executed Cum: Pre-FY09: 26% FY09: 34% FY10: 41% FY11: 76% FY12: 81% FY13: 85% FY14: 96% FY15:98% FY16: 100% **CEC/EMEs are the conditions and events where data is obtained from flight and ground tests in order to anchor system models and simulations. FY 2011 OCO Plans: NA						
X-Band Basic Program See Description Below FY 2009 Accomplishments: FY 2009 accomplishments are found in Project WX11.		0.000	0.000	50.271	0.000	50.271

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B. Accomplishments/Planned Program (\$ in Millions)						
		FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
FY 2010 Plans: FY 2010 plans are found in Project WX11.						
FY 2011 Base Plans: This effort includes risk management, configuration control, design reviews, and integrated product teams supporting software algorithms for discrimination, development of common X-Band software, development of mission profiles to support AN/TPY-2 operations worldwide, enhancement of radar availability at operating locations, and development of critical engagement conditions (CECs) and empirical measurement events (EMEs). CEC/EMEs are the conditions and events where data is obtained from flight and ground tests in order to anchor system models and simulations. For FY 2011, the Sensors Program plans to: Complete Verification and Validation of the first common software build (CX-1) The common software CX-1 Build consolidates the AN/TPY-2 forward-based mode capabilities release 2.4 and the AN/TPY-2 terminal mode release 4.2.4, increasing the flexibility and interchangeability of those two radars. CX-1 also includes improved baseline terminal mode and forward-based mode discrimination, sensor registration enhancements, interference monitoring, and acquisition sensor tasking. These capabilities will improve ``search/track/discriminate`` performance, expand the range window, and augment threat handling. Continue development of the second common software build (CX-2) for integrated ground testing The common software CX-2 Build consolidates CX-1 functionality with XBR Build 3.0, providing common software for AN/TPY-2 and XBR radars. CX-2 will thus support terminal, forward-based, and midcourse missions. CX-2 also adds a Common X-Band Interface, updates sensor registration bias and covariance, enhances integrated discrimination processing, expands waveform repertoire,						

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B. Accomplishments/Planned Program (\$ in Millions)						
		FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
and provides environmental sensing and dynamic resource management. These enhancements and commonality improvements support BMDS Integrated Build C and will improve BMDS threat handling and cued search capabilities, and provide integrated discrimination for AN/TPY-2 and XBR radars. Begin development of the third common software build spiral (CX-3) The CX-3 Build updates the Common X-Band Interface, improves hit assessment and environmental sensing capabilities, and provides additional discrimination features. This build also enhances threat handling and self-monitoring sensor registration functionality. CX-3 also adds multi-mode concurrent operations capability and provides generic interceptor support to include the land-based SM-3. These functions support BMDS Integrated Build D. FY 2011 OCO Plans: NA						
BMDS Radars Concurrent Test, Training & Operations (CTTO) Infrastructure See Description Below FY 2009 Accomplishments: FY 2009 accomplishments are found in Project WX11. FY 2010 Plans: FY 2010 plans are found in Project WX11. FY 2011 Base Plans: Concurrent Test, Training and Operations (CTTO) capability for AN/TPY-2, SBX, COBRA DANE, and UEWRs provides operational sites the ability to run training and testing while concurrently providing on-going sensor coverage to the BMDS. The overall effort is closely aligned with the Single		0.000	0.000	35.860	0.000	35.860

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B. Accomplishments/Planned Program (\$ in Millions)					
	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
Stimulation Framework (SSF), which is used to conduct and stimulate the hardware and software used in BMDS ground tests with realistic threat scenarios. The SSF utilizes Hardware-in-the-Loop (HWIL) assets to support primarily BMDS ground testing, pre and post flight test mission construction and reconstruction, portions of the training capability, wargames, exercises and BMDS contingency studies, as well as various other use cases to enable BMDS performance in a simulated environment. Each BMDS Element supports the Modeling and Simulation (M&S) Program by providing HWIL representations ready for integration into the BMDS system-level framework to support full-envelope BMDS ground test, flight test, and training events based upon Agency and Warfighter needs. For FY 2011, the Sensors Program plans to: Refine AN/TPY-2, COBRA DANE Upgrade (CDU) and UEWR Single Stimulation Framework (formerly MDSE) interfaces to support BMDS Ground Test campaigns Begin development of XBR Concurrent Test, Training and Operations (CTTO) as part of Common X-Band Software (CX-2) Install AN/TPY-2 CTTO Support Unit (CSU) at PACOM for early Warfighter interface and GTD-04 participation FY 2011 OCO Plans: NA					
BMDS Radars Modeling & Simulation (M&S) See Description Below FY 2009 Accomplishments: FY 2009 accomplishments are found in Project WX11.	0.000	0.000	25.971	0.000	25.971

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B. Accomplishments/Planned Program (\$ in Millions)						
		FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
<i>FY 2010 Plans:</i> FY 2010 plans are found in Project WX11. <i>FY 2011 Base Plans:</i> The BMD Digital Simulations Architecture (DSA) is the primary M&S System framework used to integrate Element baselines prior to flight or ground testing, facilitate technical tradeoffs, concept analysis and trade studies, as well as providing support for wargames and exercises within the BMDS Program. The DSA-performance architecture and Element and component high fidelity models support performance assessment (PA) events, which provide critical system level performance data relative to all elements, system engineers, M&S developers, the OTA and Warfighters. The DSA-virtual architecture supports Element baseline integration, training, and portions of ground testing and exercises. SN Modeling and Simulation (M&S) activities support all phases of Sensors development, including development of modifications to the X-Band, UEWR, and COBRA DANE digital representations, flight test missions, ground tests, wargames, exercises, and program assessment. Models and Simulations are tailored to the specific need of a component in its current phase of development, ranging from low-to-medium fidelity analyses supporting concept definition studies, to high-fidelity models used to support engineering development, or testing and are integrated into the BMD Digital Simulations Architecture. For FY 2011, the Sensors Program plans to: Develop Capability Release Upgrade Simulation High Fidelity Model (CRUSHM) & Radar Digital Signal Injection System (RDSIS) Models consistent with Common X-band Evolution CX-2 (Common X-Band with Integrated Discrimination)						

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B. Accomplishments/Planned Program (\$ in Millions)						
		FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
Integrate these into Common BMDS M&S Architectures: (Digital Simulation Architecture (DSA) & Single Stimulation Framework(SSF)) Implement advanced Modeling and Simulation (M&S) improvements identified by the BMDS Verification and Test Design Phase I, II, and III Integrated Planning Exercise to X-Band and UEWR/CDU Digital and Hardware in the Loop (HWIL) models Deliver Verified, Validated and Accredited High Fidelity Digital Radar Models for participation in Program Assessment FY 2011 (PA11) Enhance the Optimistic Modeling Framework Sensor Model (OSM) (formerly DESIM) for Program Assessment (PA) Fidelity for the SBX, COBRA DANE Upgrade (CDU) and UEWR (OSM-S, OSM-C, & OSM-U) FY 2011 OCO Plans: NA						
UEWR (Beale, Fylingdales, Thule) & COBRA DANE Sustainment See Description Below FY 2009 Accomplishments: FY 2009 accomplishments are found in Project XX11. FY 2010 Plans: FY 2010 plans are found in Project XX11. FY 2011 Base Plans: This effort funds the operations and sustainment of the Upgraded Early Warning Radars and the COBRA DANE radar. For the UEWRs, this program provides for hardware replacement of decades		0.000	0.000	22.661	0.000	22.661

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B. Accomplishments/Planned Program (\$ in Millions)						
		FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
old processing technology and new communications equipment, and the development of new software that supports these missions. For CDU, the program provides for minor changes to existing hardware and new communications equipment, and the development of missile defense software integrated into the existing legacy software. This effort also funds UEWR/CDU Program Office personnel and support staff: salaries, travel, and training. For FY 2011, this program plans to: Provide sustainment of the upgraded COBRA DANE radar Continue UEWR/CDU Common Mission software sustainment Provide for program management office support personnel FY 2011 OCO Plans: NA						
External Sensors See Description Below FY 2009 Accomplishments: FY 2009 accomplishments are found in Project WX11. FY 2010 Plans: FY 2010 plans are found in Project WX11. FY 2011 Base Plans: The External Sensors Lab (ESL) provides a test bed to utilize satellite, airborne and terrestrial sensor data to enhance the efficiency and effectiveness of the overall BMDS. Algorithms developed by ESL will contribute to precision radar cueing, system track, early intercept, and hit/kill assessment. Precision radar cueing by ESL has been successfully demonstrated several times during flight testing.		0.000	0.000	18.942	0.000	18.942

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B. Accomplishments/Planned Program (\$ in Millions)						
		FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
ESL provides engineering-level code to the C2BMC program for maturing the algorithms into robust, operationally suitable code. Full funding for ESL will ensure this precision cue capability is transitioned and fully integrated into the operational BMDS by early 2011 and sets the path for additional capability to be spiraled in to support Early Intercept (EI), mid-course radars, Aegis, and other situational awareness capability. For FY 2011, Sensors plans to: Complete ESL Baseline Release (EBR) 6.0, which adds GEO1 and 3GIRS (Third Generation Infrared Sensor) data as another source to generate improved ESL tracks Develop, deliver, and demonstrate new Overhead Persistent Infrared (OPIR) sensors capability to the BMDS Add capability for Midcourse Radar Cue Demonstrate fusion of Airborne Infrared (ABIR) data with OPIR data for early intercept P3I: Upgrade ESL from obsolete SGI-based hardware to Linux-based hardware <i>FY 2011 OCO Plans:</i> NA						
Sensors Engineering & UMDF See Description Below		0.000	0.000	16.833	0.000	16.833

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B. Accomplishments/Planned Program (\$ in Millions)						
		FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
<i>FY 2009 Accomplishments:</i> FY 2009 accomplishments are found in Project WX11. <i>FY 2010 Plans:</i> FY 2010 plans are found in Project WX11. <i>FY 2011 Base Plans:</i> Ballistic Missile Defense System integration is accomplished through the centralized development of seven common missile defense functions called the BMDS ``Unifying Missile Defense Functions`` -- Communications, Sensor Registration, Correlation, System Track, System Discrimination, Battle Management, and Hit-To-Kill Assessment. These unifying functions allow Combatant Commanders to automatically and manually optimize sensor coverage and interceptor inventory to defend against all ranges of ballistic missile threats. For FY 2011, in support of BMDS Integrated Build C and Build D, Sensors plans to: Define hit and kill assessment capability for the CX-3 software build and continue development of post-intercept radar scenarios to support hit/kill assessment classifier training and performance testing Complete sensor registration definition; develop real-time sensor bias monitoring and reporting for X-Band Sensors; develop sensor registration for UEWRs and COBRA DANE Improve use of sensor discrimination data, assess correlation feature ability to enhance weapon engagements and improve discrimination on all radars in the Sensors portfolio Support insertion of Integrated Discrimination Processing architecture in the CX-2 common software build Develop sensor control strategies to improve sensor resource management Accomplish Next Generation prototyping and development through delivery of an open architecture sidecar integrated into a tactical string located in the contractor facility						

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B. Accomplishments/Planned Program (\$ in Millions)					
	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
Complete Unifying Missile Defense Functions (UMDF) Sidecar (SBX STRING) initial capability Incorporate Integrated Discrimination Processing Implement M&S Improvements to incorporate UMDF functionality to support trade studies for future capabilities Sensors engineering activities also include implementation of Information Assurance, a critical component to ensuring success of the Sensors Mission. The Sensors Information Assurance Program manages the IA process from development through sustainment. For FY 2011, the Program plans to: Conduct Certification and Accreditation for all Sensors Systems Implement DoD 8500 Information Assurance (IA) Policy/ Guidance Conduct Information Assurance/Computer Network Defense (IA/CND) Engineering Requirements Development and Architecture Integration Support Bi-Annual Information Assurance testing for vulnerabilities and Third Party Information Assurance assessments of the Systems FY 2011 OCO Plans: NA					
Element Test and Infrastructure See Description Below FY 2009 Accomplishments: NA FY 2010 Plans: NA	0.000	0.000	16.115	0.000	16.115

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B. Accomplishments/Planned Program (\$ in Millions)						
		FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
FY 2011 Base Plans: FY 2011 Plans This effort provides development testing not covered under the BMDS Level Testing. Test events are listed below. Testing is focused on BMDS sensors critical engagement conditions (CEC) and empirical measurement events (EME). CEC/EMEs are the conditions and events where data is obtained from flight and ground tests in order to anchor system models and simulations. BMDS sensors include AN/TPY-2 (Forward Based Mode), Sea Based X-Band Radar (SBX), COBRA DANE Upgrade (CDU), and Upgraded Early Warning Radars (UEWR). For FY 2011, Sensors testing includes: Plan and execute sensors participation in flight tests for additional data collection opportunities to support development progress Execute element-level ground test campaign to support anchoring M&S for various Critical Engagement Conditions (CEC) and Empirical Measurement Events (EME) ** Upgrade sensor interfaces to support Single Stimulation Framework (SSF) integration ** CEC/EMEs are the conditions and events where data is obtained from flight and ground tests in order to anchor system models and simulations.						
FY 2011 OCO Plans: NA						
BMDS Radars Communications (Sustainment) See Description Below FY 2009 Accomplishments: FY 2009 accomplishments are found in Project XX11.		0.000	0.000	13.782	0.000	13.782

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B. Accomplishments/Planned Program (\$ in Millions)						
		FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
FY 2010 Plans: FY 2010 plans are found in Project XX11.						
FY 2011 Base Plans: This Operations and Support (O&S) effort supports the AN/TPY-2 Communications suites. It includes communications suite operational spares, repair, and replacement; communications operators/maintainers; communications support costs; and sustains C2BMC operations 24 hours a day, 365 days a year. For FY 2011, this program plans to: Continue round-the-clock sustainment for Communications capabilities associated with AN/TPY-2 Continue on-site C2BMC support of fielded sites for hardware and software Continue C2BMC operator training for fielded capabilities Continue sustaining engineering support and integrated logistics support for fielded hardware and software						
FY 2011 OCO Plans: NA						
AN/TPY-2 C2BMC Fielding See Description Below		0.000	0.000	12.980	0.000	12.980
FY 2009 Accomplishments: FY 2009 accomplishments are found in Project EX11.						
FY 2010 Plans: FY 2010 plans are found in Project EX11.						

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B. Accomplishments/Planned Program (\$ in Millions)						
		FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
FY 2011 Base Plans: The C2BMC program provides network communications to both task AN/TPY-2 radars and pass radar data to BMDS elements. The Ballistic Missile Defense Systems (BMDS) Communications Networks (BCN) provides a survivable, robust, diverse and redundant, end-to-end, high availability operational communications network (COMNET) connectivity that quickly and unambiguously shares information across the global Ballistic Missile Defense System. The BCN will standardize the BMDS communication systems capabilities at all BMDS locations.						
The transportable BMDS Communications System Complex (BCSC) locations are designated BCSC - Transportable (BCSC-T) to facilitate the transportability inherent with the radars and engagement management facilities it supports. The BCSC-T will be survivable in accordance with the BMDS Core Standards, especially MDA-STD-001. In addition to the BCSC-T, MDA needs to have a rapidly deployable, re-configurable BMDS communications suite to meet the short term specific needs of MDA missions. The High Mobility Multipurpose Wheeled Vehicle (HMMWV) Based Communications Node (HBCN) and the C2BMC Deployable Interface Node (CDIN), a transit case BCN support system will fulfill this requirement for deployable re-configurable BMDS communications suites.						
The HBCN is an integrated communication suite consisting of two customized HMMWVs and a Tactical Operations Center (TOC). Its purpose is to enable communications between AN/TPY-2 Radar and the C2BMC suite and the rest of the BMDS. The HBCN contains both mission communication equipment and campus communication equipment. One HMMWV will be dedicated to providing the mission communications consisting of a High Availability Communication Node Equipment (HACNE) C2BMC Network Interface Processor (CNIP) and other supporting equipment. The other HMMWV will be dedicated to providing the campus communications consisting of Defense Information Services Network (DISN) Service Delivery Node, Defense Red Switch Network (DRSN), Secret Internet						

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B. Accomplishments/Planned Program (\$ in Millions)						
		FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
Protocol Router Network (SIPRNET), Non-secure Internet Protocol Router Network (NIPRNET), organic Satellite Communications (SATCOM) and SATCOM interface. All operations can be performed within the HMMWVs or be remotored in a TOC. The TOC is an expandable 20`x20` room capable of supporting the C2BMC operators. The CDIN durable military transit case Ballistic Missile Defense Systems (BMDS) Communications Networks (BCN) support system is both vehicle and facility independent. However, even though it is facility independent it must be installed in some kind of a shelter or building. The recommended facility is the expandable TOC identified for the High Mobility Multipurpose Wheeled Vehicle (HMMWV) Based Communications Node (HBCN). The CDIN system will be capable of providing the mission and campus communications for a rapidly deployed AN/TPY-2 Radar. Also, the Extremely High Frequency (EHF) Teleports will be upgraded to provide AN/TPY-2 data to Ground Based Midcourse (GMD) and Aegis ;engagement to alleviate the vulnerability of Ultra High Frequency (UHF) communications. This satisfies a Combatant Command (COCOM) requirement for EHF operational capability due to continuous issues with UHF communications supporting the BMDS mission. Locations: United States -- Northwest, VA; Wahiawa, HI. International -- Ramstein; and Bahrain. These teleport terminals provide an entry point (Northwest at Chesapeake, VA) into the US from the European Gateway. These upgrades include an X/Ka-Band capability, and associated baseband equipment. They will provide the BMDS necessary satellite communications connectivity to the European Gateway at Ramstein. This funding supports the BMDS essential minimum communications connectivity provisions for robust, redundant, secure, survivable communications path directly in the BMDS and GMD Fire Control (GFC). These teleports provide multiple diverse network routing paths to ensure no single points of failure. For FY 2011, this program plans to:						

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APPROPRIATION/BUDGET ACTIVITY 0400: Research, Development, Test & Evaluation, Defense-Wide BA 4: Advanced Component Development & Prototypes (ACD&P)				R-1 ITEM NOMENCLATURE PE 0603884C: Ballistic Missile Defense Sensors				PROJECT MD11: BMDS Radars			
B. Accomplishments/Planned Program (\$ in Millions)						FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total	
Acquisition of MET SATCOM X/Ka-band capability for teleport upgrades BMDS Communications Systems integration and certifications Support exercises and tests of the AN/TPY-2 radar system with the BMDS Communications Networks (HBCN and transit case support systems) Complete communications teleports in the Middle East and Northwest VA FY 2011 OCO Plans: NA											
Accomplishments/Planned Programs Subtotals						0.000	0.000	440.023	0.000	440.023	
C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total	FY 2012	FY 2013	FY 2014	FY 2015	Cost To Complete	Total Cost
• 0603175C: Ballistic Missile Defense Technology	117.602	189.229	132.220	0.000	132.220	236.875	239.873	197.118	197.852	0	1,310.769
• 0603881C: Ballistic Missile Defense Terminal Defense Segment	951.414	715.732	436.482	0.000	436.482	250.275	336.711	500.983	521.717	0	3,713.314
• 0603882C: Ballistic Missile Defense Mid-Course Segment	1,472.683	1,027.371	1,346.181	0.000	1,346.181	1,112.655	1,291.790	1,099.029	1,033.213	0	8,382.922
• 0603883C: Ballistic Missile Defense Boost Defense Segment	384.365	182.317	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	566.682
• 0603886C: Ballistic Missile Defense System Interceptor	308.869	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	308.869
• 0603888C: Ballistic Missile Defense Test and Targets	906.952	823.333	1,113.425	0.000	1,113.425	1,105.959	951.371	871.929	829.608	0	6,602.577
	402.776	358.751	402.769	0.000	402.769	468.673	457.745	473.871	488.799	0	3,053.384

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Exhibit R-2A, RDT&E Project Justification: PB 2011 Missile Defense Agency									DATE: February 2010		
APPROPRIATION/BUDGET ACTIVITY				R-1 ITEM NOMENCLATURE			PROJECT				
0400: Research, Development, Test & Evaluation, Defense-Wide BA 4: Advanced Component Development & Prototypes (ACD&P)				PE 0603884C: Ballistic Missile Defense Sensors			MD11: BMDS Radars				
C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total	FY 2012	FY 2013	FY 2014	FY 2015	Cost To Complete	Total Cost
• 0603890C: Ballistic Missile Defense Enabling Programs											
• 0603891C: SPECIAL PROGRAMS - MDA	182.998	250.185	270.189	0.000	270.189	269.040	450.645	517.486	601.315	0	2,541.858
• 0603892C: BMD AEGIS	1,054.323	1,435.717	1,467.278	0.000	1,467.278	1,021.878	1,112.668	1,076.739	923.316	0	8,091.919
• 0603893C: SPACE TRACKING & SURVEILLANCE SYSTEM	209.831	161.609	112.678	0.000	112.678	98.500	56.424	52.928	34.661	0	726.631
• 0603894C: MULTIPLE KILL VEHICLE	226.027	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	226.027
• 0603895C: BMD SYSTEM SPACE PROGRAM	23.250	12.492	10.942	0.000	10.942	11.182	11.347	11.749	12.155	0	93.117
• 0603896C: BMD C2BMC	275.174	334.734	342.625	0.000	342.625	364.085	289.778	323.922	298.936	0	2,229.254
• 0603897C: BMD HERCULES	51.629	47.932	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	99.561
• 0603898C: BMD JOINT WARFIGHTER SUPPORT	66.283	61.098	68.726	0.000	68.726	62.239	63.451	65.158	67.231	0	454.186
• 0603901C: DIRECTED ENERGY RESEARCH	0.000	0.000	98.688	0.000	98.688	101.371	103.449	104.572	104.141	0	512.221
• 0603904C: MISSILE DEFENSE INTEGRATION & OPERATIONS CENTER (MDIOC)	102.823	86.483	86.198	0.000	86.198	88.181	78.517	80.410	83.087	0	605.699
• 0603906C: REGARDING TRENCH	3.159	6.130	7.529	0.000	7.529	8.295	8.286	8.479	8.675	0	50.553
• 0603907C: SEA BASED X-BAND RADAR (SBX)	143.878	167.153	153.056	0.000	153.056	150.104	159.832	160.163	197.099	0	1,131.285
• 0603908C: BMD EUROPEAN INTERCEPTOR SITE	348.722	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	348.722
• 0603909C: BMD EUROPEAN MIDCOURSE RADAR	73.728	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	73.728
	0.000	50.226	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	50.226

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C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total	FY 2012	FY 2013	FY 2014	FY 2015	Cost To Complete	Total Cost
• 0603911C: BMD EUROPEAN CAPABILITY											
• 0603912C: BMD European Comm Support	26.016	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	26.016
• 0603913C: ISRAELI COOPERATIVE	0.000	201.323	121.735	0.000	121.735	111.100	113.101	116.114	119.172	0	782.545
• 0604880C: LAND-BASED SM-3	0.000	0.000	281.378	0.000	281.378	345.937	187.062	93.456	139.595	0	1,047.428
• 0604881C: Aegis SM-3 BLOCK IIA CO-DEVELOPMENT	0.000	255.987	318.800	0.000	318.800	405.500	416.300	337.300	227.500	0	1,961.387
• 0604883C: PRECISION TRACKING SPACE SYSTEM	0.000	0.000	66.969	0.000	66.969	123.851	184.800	348.360	482.952	0	1,206.932
• 0604884C: AIRBORNE INFRARED (ABIR)	0.000	0.000	111.671	0.000	111.671	103.636	123.591	103.668	58.773	0	501.339
• 0605502C: Small Business Innovative Research BMDO	124.788	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	124.788
• 0901585C: Pentagon Reservation	20.146	19.709	20.482	0.000	20.482	0.000	0.000	0.000	0.000	0	60.337
• 0901598C: Management Headquarters-MDA	87.151	52.403	29.754	0.000	29.754	29.421	29.974	30.567	31.171	0	290.441
D. Acquisition Strategy											
Products and services will be acquired with competitive means to the extent possible and practical.											
The Consolidated - Contractor Logistics Support (C-CLS) contract was awarded in FY08 to operate and maintain the AN/TPY-2 radars and provide logistical support for other radars in the BMDS Radars PE. The C-CLS contract provides the operations and support activities required for site surveys, planning, relocation, depot maintenance, forward-based system operations, repair, and replacement. The contract is an Indefinite Delivery/Indefinite Quantity (IDIQ) task order contract.											
AN/TPY-2 #7 radar manufacturing is being done on a Cost Plus Incentive Fee (CPIF) CLIN.											

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Exhibit R-2A, RDT&E Project Justification: PB 2011 Missile Defense Agency		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 0400: <i>Research, Development, Test & Evaluation, Defense-Wide</i> BA 4: <i>Advanced Component Development & Prototypes (ACD&P)</i>	R-1 ITEM NOMENCLATURE PE 0603884C: <i>Ballistic Missile Defense Sensors</i>	PROJECT MD11: <i>BMDs Radars</i>
Test & Evaluation projects use multiple existing development contracts depending on the system(s) involved in the testing. The BMDs radar (AN/TPY-2, Forward-Based) project used an existing radar design to minimize development costs and schedule. Design enhancements focus on software changes for the forward based algorithms and C2BMC connectivity. The Common Software work will begin on the existing AN/TPY-2 development contract. The BCSC-T Program Plan addresses the design, development, acquisition, testing, integration, activation, and fielding. The overall executing agent is the Program Manager - Communications and Transmission Systems (PMDCATS). Lockheed Martin Mission Systems, C2BMC prime contractor via an Other Transaction Agreement, provides on-site support. MDA will transition from legacy System Engineering and Technical Services contracts to an enterprise-wide Advisory & Assistance Services (A&AS) contract. The A&AS contract will be competitive. The objectives are to implement national engineering and support services for the BMDs mission across the agency; enhance the sharing of BMD expertise and knowledge; centralize the acquisition of support services manpower in a more efficient manner; and reduce overhead costs. In addition to engineering and technical services, A&AS includes studies, analysis and evaluation; and management and professional services. <u>E. Performance Metrics</u> NA		

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Missile Defense Agency											DATE: February 2010		
APPROPRIATION/BUDGET ACTIVITY 0400: Research, Development, Test & Evaluation, Defense-Wide BA 4: Advanced Component Development & Prototypes (ACD&P)					R-1 ITEM NOMENCLATURE PE 0603884C: Ballistic Missile Defense Sensors				PROJECT MD11: BMDS Radars				
Product Development (\$ in Millions)													
				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 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
Sensors Directorate Operations Govt Salaries, Travel, Training (MDA Sensors) MD11	TBD/TBD	MDA AL, VA	0.000	0.000		24.335	Jul 2011	0.000		24.335	Continuing	Continuing	Continuing
Sensors Directorate Operations Contractor Support Services, FFRDC/UARC MD11	Various/ Various	CSS, APL, LL, OGA AL/MA/VA/MD	0.000	0.000		30.144	Jul 2011	0.000		30.144	Continuing	Continuing	Continuing
Sensors Directorate Operations Other Govt Agencies MD11	TBD/TBD	SMDC AL	0.000	0.000		4.772	Jul 2011	0.000		4.772	Continuing	Continuing	Continuing
X-Band Basic Program X-Band Software Enhancements/ Development MD11	SS/CPAF	Raytheon MA	0.000	0.000		38.271	Jan 2011	0.000		38.271	Continuing	Continuing	Continuing
X-Band Basic Program Wildcat Software Development MD11	SS/CPAF	Raytheon MA	0.000	0.000		12.000	Oct 2010	0.000		12.000	Continuing	Continuing	Continuing
BMDS Radars Modeling & Simulation (M&S) M&S Program Support MD11	SS/CPAF	Raytheon MA	0.000	0.000		12.213	Oct 2010	0.000		12.213	Continuing	Continuing	Continuing
BMDS Radars Modeling & Simulation (M&S) VV&A of Models MD11	SS/CPAF	Raytheon MA	0.000	0.000		11.200	Jan 2011	0.000		11.200	Continuing	Continuing	Continuing
BMDS Radars Modeling & Simulation (M&S)	SS/Various	Raytheon, Boeing MA, AL	0.000	0.000		0.962	Jan 2011	0.000		0.962	Continuing	Continuing	Continuing

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APPROPRIATION/BUDGET ACTIVITY 0400: Research, Development, Test & Evaluation, Defense-Wide BA 4: Advanced Component Development & Prototypes (ACD&P)					R-1 ITEM NOMENCLATURE PE 0603884C: Ballistic Missile Defense Sensors				PROJECT MD11: BMDS Radars				
Product Development (\$ in Millions)													
				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 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
Legacy Models Support MD11													
BMDS Radars Modeling & Simulation (M&S) Warfighter Exercises MD11	SS/CPAF	Raytheon MA	0.000	0.000		1.596		0.000		1.596	Continuing	Continuing	Continuing
External Sensors External Sensors - Prime MD11	SS/CPAF	NG (RaPID) CO	0.000	0.000		13.148	Oct 2010	0.000		13.148	Continuing	Continuing	Continuing
External Sensors Independent Analysis for ESL MD11	TBD/TBD	NSWC-DD VA	0.000	0.000		1.103	Oct 2010	0.000		1.103	Continuing	Continuing	Continuing
External Sensors Truth Sources / Advanced Algorithms MD11	TBD/TBD	NASIC (WPAFB) OH	0.000	0.000		0.552	Oct 2010	0.000		0.552	Continuing	Continuing	Continuing
External Sensors ESL Support MD11	SS/CPAF	MDIOC CO	0.000	0.000		1.324	Oct 2010	0.000		1.324	Continuing	Continuing	Continuing
External Sensors Site 2 MD11	TBD/TBD	Site 2 TBD	0.000	0.000		1.103	Oct 2010	0.000		1.103	Continuing	Continuing	Continuing
External Sensors Technical Expertise MD11	SS/CPAF	SCITEC STTR CO	0.000	0.000		0.717	Oct 2010	0.000		0.717	Continuing	Continuing	Continuing
External Sensors Site 15 MD11	TBD/TBD	Site 15 TBD	0.000	0.000		0.552	Oct 2010	0.000		0.552	Continuing	Continuing	Continuing
External Sensors FFRDC MD11	SS/CPAF	FFRDC CO	0.000	0.000		0.443	Oct 2010	0.000		0.443	Continuing	Continuing	Continuing

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Product Development (\$ in Millions)													
				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 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
Sensors Engineering & UMDF UMDF (Correlation & System Track) MD11	SS/CPAF	Raytheon MA	0.000	0.000		2.748	Oct 2010	0.000		2.748	Continuing	Continuing	Continuing
Sensors Engineering & UMDF UMDF (Hit/Kill Assessment) MD11	SS/CPAF	Raytheon MA	0.000	0.000		1.000	Oct 2010	0.000		1.000	Continuing	Continuing	Continuing
Sensors Engineering & UMDF UMDF (Sensor Registration) MD11	SS/Various	Raytheon, Torch, Various MA, Various	0.000	0.000		1.000	Oct 2010	0.000		1.000	Continuing	Continuing	Continuing
Sensors Engineering & UMDF Radar Roadmap Tech Demos/Studies MD11	SS/Various	Raytheon, Various MA, Various	0.000	0.000		5.800	Jan 2011	0.000		5.800	Continuing	Continuing	Continuing
Sensors Engineering & UMDF SBX Sidecar & Demonstrations MD11	SS/CPAF	Raytheon MA	0.000	0.000		1.500	Jan 2011	0.000		1.500	Continuing	Continuing	Continuing
Sensors Engineering & UMDF Technology Assessments MD11	SS/Various	Raytheon MA	0.000	0.000		2.785	Jan 2011	0.000		2.785	Continuing	Continuing	Continuing
Sensors Engineering & UMDF Information Assurance AN/TPY-2 (C-CLS/GMD CCC/ X00047) MD11	SS/CPAF	Raytheon MA	0.000	0.000		1.750	Oct 2010	0.000		1.750	Continuing	Continuing	Continuing
Sensors Engineering & UMDF Information	SS/CPAF	Raytheon MA	0.000	0.000		0.250	Oct 2010	0.000		0.250	Continuing	Continuing	Continuing

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Product Development (\$ in Millions)														
				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 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	
Assurance SBX (C-CLS/ GMD CCC/X00047) MD11														
AN/TPY-2 C2BMC Fielding AN/TPY-2 Teleport MD11	TBD/TBD	DISA, SPAWAR VA	0.000	0.000		7.487	Oct 2010	0.000		7.487	Continuing	Continuing	Continuing	
AN/TPY-2 C2BMC Fielding AN/TPY-2 US Comms/PAAWNS MD11	TBD/TBD	DISA VA	0.000	0.000		2.387	Oct 2010	0.000		2.387	Continuing	Continuing	Continuing	
AN/TPY-2 C2BMC Fielding AN/TPY-2 Comms Fielding MD11	TBD/TBD	DISA VA	0.000	0.000		3.106	Oct 2010	0.000		3.106	Continuing	Continuing	Continuing	
Subtotal			0.000	0.000		184.248		0.000		184.248				
Remarks NA														
Support (\$ in Millions)														
				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 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	
BMDS Radars (Sustainment) AN/TPY-2	SS/CPAF	Raytheon MA	0.000	0.000		18.971	Oct 2010	0.000		18.971	Continuing	Continuing	Continuing	

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Support (\$ in Millions)														
				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 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	
Infrastructure/Depot Support MD11														
BMDS Radars (Sustainment) AN/TPY-2 #2 Operations and Sustainment MD11	SS/CPAF	Raytheon MA	0.000	0.000		17.623	Oct 2010	0.000		17.623	Continuing	Continuing	Continuing	
BMDS Radars (Sustainment) AN/TPY-2 International Transport for R&R MD11	TBD/TBD	DFAS IN	0.000	0.000		1.104	Jul 2011	0.000		1.104	Continuing	Continuing	Continuing	
BMDS Radars (Sustainment) AN/TPY-2 #2 Fuel/Commercial Power MD11	SS/Various	DESC, USARJ VA, Japan	0.000	0.000		2.080	Jul 2011	0.000		2.080	Continuing	Continuing	Continuing	
BMDS Radars (Sustainment) AN/TPY-2 #2 Site & Facility Maintenance MD11	SS/Various	Raytheon, 94th AAMDC MA, HI	0.000	0.000		2.673	Oct 2010	0.000		2.673	Continuing	Continuing	Continuing	
BMDS Radars (Sustainment) AN/TPY-2 Generator Replacement MD11	SS/CPAF	Raytheon MA	0.000	0.000		5.302	Oct 2010	0.000		5.302	Continuing	Continuing	Continuing	
BMDS Radars (Sustainment) AN/TPY-2 #3 Operations & Sustainment MD11	SS/CPAF	Raytheon MA	0.000	0.000		16.464	Oct 2010	0.000		16.464	Continuing	Continuing	Continuing	
	TBD/TBD	DESC	0.000	0.000		2.530	Jul 2011	0.000		2.530	Continuing	Continuing	Continuing	

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Support (\$ in Millions)														
				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 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	
BMDS Radars (Sustainment) AN/TPY-2 #3 Generator & Fuel MD11		Israel												
BMDS Radars (Sustainment) AN/ TPY-2 #3 Site & Facility Maintenance MD11	SS/Various	Raytheon, US Army MA, Europe	0.000	0.000		5.220	Oct 2010	0.000		5.220	Continuing	Continuing	Continuing	
BMDS Radars (Sustainment) AN/ TPY-2 #6 Operations & Sustainment MD11	SS/CPAF	Raytheon MA	0.000	0.000		16.334	Oct 2010	0.000		16.334	Continuing	Continuing	Continuing	
BMDS Radars (Sustainment) AN/TPY-2 #6 Fuel/Commercial Power MD11	TBD/TBD	DES Center TBD	0.000	0.000		1.039	Jul 2011	0.000		1.039	Continuing	Continuing	Continuing	
BMDS Radars (Sustainment) AN/ TPY-2 #6 Site & Facility Maintenance MD11	SS/Various	Raytheon, US Army MA	0.000	0.000		5.246	Oct 2010	0.000		5.246	Continuing	Continuing	Continuing	
BMDS Radars (Sustainment) Army Hybrid Program Office MD11	TBD/TBD	SMDC AL	0.000	0.000		2.000	Oct 2010	0.000		2.000	Continuing	Continuing	Continuing	
BMDS Radars (Sustainment) AN/TPY-2 FUR CLS MD11	SS/Various	Raytheon MA	0.000	0.000		17.114		0.000		17.114	Continuing	Continuing	Continuing	

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APPROPRIATION/BUDGET ACTIVITY					R-1 ITEM NOMENCLATURE				PROJECT				
0400: Research, Development, Test & Evaluation, Defense-Wide BA 4: Advanced Component Development & Prototypes (ACD&P)					PE 0603884C: Ballistic Missile Defense Sensors				MD11: BMDS Radars				
Support (\$ in Millions)													
				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 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
BMDS Radars (Sustainment) AN/TPY-2 Transition & Transfer MD11	TBD/TBD	SMDC AL	0.000	0.000		1.339		0.000		1.339	Continuing	Continuing	Continuing
UEWR (Beale, Fylingdales, Thule) & COBRA DANE Sustainment COBRA DANE Upgrade Sustainment MD11	SS/FFP	Raytheon MA	0.000	0.000		8.404	Jan 2011	0.000		8.404	Continuing	Continuing	Continuing
UEWR (Beale, Fylingdales, Thule) & COBRA DANE Sustainment UEWR-CD Common Mission Software Sustainment MD11	SS/CPAF	Raytheon MA	0.000	0.000		6.110	Jan 2011	0.000		6.110	Continuing	Continuing	Continuing
UEWR (Beale, Fylingdales, Thule) & COBRA DANE Sustainment UEWR-CD Program Office Support MD11	TBD/TBD	Hanscom AFB MA	0.000	0.000		8.147	Jul 2011	0.000		8.147	Continuing	Continuing	Continuing
BMDS Radars Communications (Sustainment) AN/TPY-2 Comms Sustainment MD11	Various/ Various	Lockheed Martin Team, DISA VA	0.000	0.000		13.782	Oct 2010	0.000		13.782	Continuing	Continuing	Continuing

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Missile Defense Agency											DATE: February 2010			
APPROPRIATION/BUDGET ACTIVITY 0400: Research, Development, Test & Evaluation, Defense-Wide BA 4: Advanced Component Development & Prototypes (ACD&P)				R-1 ITEM NOMENCLATURE PE 0603884C: Ballistic Missile Defense Sensors				PROJECT MD11: BMDS Radars						
Support (\$ in Millions)														
				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 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	
Subtotal			0.000	0.000		151.482		0.000		151.482				
Remarks NA														
Test and Evaluation (\$ in Millions)														
				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 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	
BMDS Level Testing AN/TPY-2 FT & GT MD11	SS/CPAF	Raytheon MA	0.000	0.000		23.052	Oct 2010	0.000		23.052	Continuing	Continuing	Continuing	
BMDS Level Testing UEWR/CD FT & GT MD11	SS/Various	Raytheon, Boeing MA,AL	0.000	0.000		10.313	Oct 2010	0.000		10.313	Continuing	Continuing	Continuing	
BMDS Level Testing Thule Upgrade FT & GT MD11	C/Various	Raytheon, Boeing MA/AL	0.000	0.000		2.260	Oct 2010	0.000		2.260	Continuing	Continuing	Continuing	
BMDS Level Testing SBX FT & GT MD11	SS/Various	Raytheon, Boeing MA/AL	0.000	0.000		15.445	Oct 2010	0.000		15.445	Continuing	Continuing	Continuing	
BMDS Level Testing External Sensors Lab FT & GT Support MD11	Various/ Various	NG, MDIOC CA, CO	0.000	0.000		1.248		0.000		1.248	Continuing	Continuing	Continuing	
	SS/CPAF	Raytheon	0.000	0.000		11.604	Oct 2010	0.000		11.604	Continuing	Continuing	Continuing	

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Missile Defense Agency											DATE: February 2010		
APPROPRIATION/BUDGET ACTIVITY					R-1 ITEM NOMENCLATURE				PROJECT				
0400: Research, Development, Test & Evaluation, Defense-Wide BA 4: Advanced Component Development & Prototypes (ACD&P)					PE 0603884C: Ballistic Missile Defense Sensors				MD11: BMDS Radars				
Test and Evaluation (\$ in Millions)													
				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 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
BMDS Radars Concurrent Test, Training & Operations (CTTO) Infrastructure AN/TPY-2 SSF/CTTO/ RDSIS Upgrade MD11		MA											
BMDS Radars Concurrent Test, Training & Operations (CTTO) Infrastructure Thule UEWR CTTO Infrastructure MD11	SS/CPAF	Raytheon MA	0.000	0.000		0.426	Oct 2010	0.000		0.426	Continuing	Continuing	Continuing
BMDS Radars Concurrent Test, Training & Operations (CTTO) Infrastructure SBX CTTO Infrastructure MD11	SS/CPAF	Raytheon MA	0.000	0.000		12.128		0.000		12.128	Continuing	Continuing	Continuing
BMDS Radars Concurrent Test, Training & Operations (CTTO) Infrastructure UEWR/CD CTTO Infrastructure MD11	SS/CPAF	Raytheon MA	0.000	0.000		11.702		0.000		11.702	Continuing	Continuing	Continuing
Element Test and Infrastructure TPY-2 SSF Integration & Infrastructure, Sys Test Lab MD11	SS/CPAF	Raytheon MA	0.000	0.000		6.368	Apr 2011	0.000		6.368	Continuing	Continuing	Continuing

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Missile Defense Agency											DATE: February 2010		
APPROPRIATION/BUDGET ACTIVITY 0400: <i>Research, Development, Test & Evaluation, Defense-Wide</i> BA 4: <i>Advanced Component Development & Prototypes (ACD&P)</i>				R-1 ITEM NOMENCLATURE PE 0603884C: <i>Ballistic Missile Defense Sensors</i>				PROJECT MD11: <i>BMDs Radars</i>					
Test and Evaluation (\$ in Millions)													
				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 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
Element Test and Infrastructure UEWR/ CD SSF Integration & Infrastructure, Sys Test Lab MD11	SS/Various	Boeing, Raytheon AL, MA	0.000	0.000		1.170	Apr 2011	0.000		1.170	Continuing	Continuing	Continuing
Element Test and Infrastructure ESL SSF Integration MD11	TBD/TBD	AFSPC CO	0.000	0.000		0.646		0.000		0.646	Continuing	Continuing	Continuing
Element Test and Infrastructure SBX SSF Integration & Infrastructure, Sys Test Lab MD11	SS/CPAF	Boeing AL	0.000	0.000		6.431		0.000		6.431	Continuing	Continuing	Continuing
Element Test and Infrastructure Thule SSF Integration & Sys Test Lab MD11	SS/CPAF	Boeing AL	0.000	0.000		1.500		0.000		1.500	Continuing	Continuing	Continuing
Subtotal			0.000	0.000		104.293		0.000		104.293			
Remarks NA													

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Missile Defense Agency											DATE: February 2010																																												
APPROPRIATION/BUDGET ACTIVITY 0400: <i>Research, Development, Test & Evaluation, Defense-Wide</i> BA 4: <i>Advanced Component Development & Prototypes (ACD&P)</i>				R-1 ITEM NOMENCLATURE PE 0603884C: <i>Ballistic Missile Defense Sensors</i>				PROJECT MD11: <i>BMDs Radars</i>																																															
Management Services (\$ in Millions) <table border="1" style="width:100%; border-collapse: collapse; margin-top: 10px;"> <thead> <tr> <th colspan="4"></th> <th colspan="2">FY 2010</th> <th colspan="2">FY 2011 Base</th> <th colspan="2">FY 2011 OCO</th> <th>FY 2011 Total</th> <th colspan="3"></th> </tr> <tr> <th>Cost Category Item</th> <th>Contract Method & Type</th> <th>Performing Activity & Location</th> <th>Total Prior Years Cost</th> <th>Cost</th> <th>Award Date</th> <th>Cost</th> <th>Award Date</th> <th>Cost</th> <th>Award Date</th> <th>Cost</th> <th>Cost To Complete</th> <th>Total Cost</th> <th>Target Value of Contract</th> </tr> </thead> <tbody> <tr> <td align="right" colspan="3">Subtotal</td> <td align="right">0.000</td> <td align="right">0.000</td> <td></td> <td align="right">0.000</td> <td></td> <td align="right">0.000</td> <td></td> <td align="right">0.000</td> <td></td> <td></td> <td></td> </tr> </tbody> </table> Remarks NA																		FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 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	Subtotal			0.000	0.000		0.000		0.000		0.000			
				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 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																																										
Subtotal			0.000	0.000		0.000		0.000		0.000																																													
<table border="1" style="width:100%; border-collapse: collapse; margin-top: 10px;"> <thead> <tr> <th colspan="3"></th> <th>Total Prior Years Cost</th> <th colspan="2">FY 2010</th> <th colspan="2">FY 2011 Base</th> <th colspan="2">FY 2011 OCO</th> <th>FY 2011 Total</th> <th>Cost To Complete</th> <th>Total Cost</th> <th>Target Value of Contract</th> </tr> </thead> <tbody> <tr> <td align="right" colspan="3">Project Cost Totals</td> <td align="right">0.000</td> <td align="right">0.000</td> <td></td> <td align="right">440.023</td> <td></td> <td align="right">0.000</td> <td></td> <td align="right">440.023</td> <td></td> <td></td> <td></td> </tr> </tbody> </table> Remarks NA																	Total Prior Years Cost	FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total	Cost To Complete	Total Cost	Target Value of Contract	Project Cost Totals			0.000	0.000		440.023		0.000		440.023																	
			Total Prior Years Cost	FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total	Cost To Complete	Total Cost	Target Value of Contract																																										
Project Cost Totals			0.000	0.000		440.023		0.000		440.023																																													

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Exhibit R-4, RDT&E Schedule Profile: PB 2011 Missile Defense Agency																				DATE: February 2010					
APPROPRIATION/BUDGET ACTIVITY 0400: Research, Development, Test & Evaluation, Defense-Wide BA 4: Advanced Component Development & Prototypes (ACD&P)										R-1 ITEM NOMENCLATURE PE 0603884C: Ballistic Missile Defense Sensors										PROJECT MD11: BMDS Radars					
										FY 2009		FY 2010		FY 2011		FY 2012		FY 2013		FY 2014		FY 2015			
										1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
UEWR Simulator Tester (Beale, Fylingdales, Thule) Delivered																									
CTTO AN/TPY-2 Initial Capability Delivered																									
External Sensors Lab (ESL) Baseline Software Release 6.0 Delivered																									
UMDF Sidecar for SBX Delivered (Software Delivery)																									
Prime Power Units (PPU) #7 & #8 Delivered																									
Refurbished AN/TPY-2 Radar #4 Delivered																									
External Sensors Lab (ESL) Baseline Software Release 7.0 Delivered																									
Common X-Band Radar Software (CX-2) Delivered																									
External Sensors Lab (ESL) Baseline Software Release 8.0 Delivered																									
External Sensors Lab (ESL) Baseline Software Release 9.0 Delivered																									
Common X-Band Radar Software (CX-3) Delivered																									
External Sensors Lab (ESL) Baseline Software Release 10.0 Delivered																									

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Exhibit R-4A, RDT&E Schedule Details: PB 2011 Missile Defense Agency			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 0400: <i>Research, Development, Test & Evaluation, Defense-Wide</i> BA 4: <i>Advanced Component Development & Prototypes (ACD&P)</i>	R-1 ITEM NOMENCLATURE PE 0603884C: <i>Ballistic Missile Defense Sensors</i>	PROJECT MD11: <i>BMDs Radars</i>	

Schedule Details

Event	Start		End	
	Quarter	Year	Quarter	Year
UEWR Simulator Tester (Beale, Fylingdales, Thule) Delivered	1	2011	1	2011
CTTO AN/TPY-2 Initial Capability Delivered	4	2011	4	2011
External Sensors Lab (ESL) Baseline Software Release 6.0 Delivered	4	2011	4	2011
UMDF Sidecar for SBX Delivered (Software Delivery)	4	2011	4	2011
Prime Power Units (PPU) #7 & #8 Delivered	3	2012	3	2012
Refurbished AN/TPY-2 Radar #4 Delivered	4	2012	4	2012
External Sensors Lab (ESL) Baseline Software Release 7.0 Delivered	4	2012	4	2012
Common X-Band Radar Software (CX-2) Delivered	2	2013	2	2013
External Sensors Lab (ESL) Baseline Software Release 8.0 Delivered	4	2013	4	2013
External Sensors Lab (ESL) Baseline Software Release 9.0 Delivered	4	2014	4	2014
Common X-Band Radar Software (CX-3) Delivered	3	2015	3	2015
External Sensors Lab (ESL) Baseline Software Release 10.0 Delivered	4	2015	4	2015

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Exhibit R-2A, RDT&E Project Justification: PB 2011 Missile Defense Agency								DATE: February 2010			
APPROPRIATION/BUDGET ACTIVITY 0400: <i>Research, Development, Test & Evaluation, Defense-Wide</i> BA 4: <i>Advanced Component Development & Prototypes (ACD&P)</i>				R-1 ITEM NOMENCLATURE PE 0603884C: <i>Ballistic Missile Defense Sensors</i>				PROJECT ZX40: <i>Program-Wide Support</i>			
COST (\$ in Millions)	FY 2009 Actual	FY 2010 Estimate	FY 2011 Base Estimate	FY 2011 OCO Estimate	FY 2011 Total Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
ZX40: <i>Program-Wide Support</i>	44.602	35.107	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	79.709
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0		
Note In accordance with the Missile Defense Agency revised budget structure, the content previously planned in Project ZX40 is now captured in Project MD40 beginning in FY11.											
A. Mission Description and Budget Item Justification Program-Wide Support provides funding for common non-headquarters support functions across the entire program. Includes costs for both government civilians performing these functions, as well as outside services and support contractors that augment government staff in these areas. Other costs included provide facility capabilities for MDA Executing Agent locations (with the exception of Federal Office Building 2), such as physical and technical security, legal services, travel and training, office and equipment leases, utilities and communications, supplies and maintenance, and similar operating expenses. Also includes funding for charges on canceled appropriations in accordance with Public Law 101-510, legal settlements, and foreign currency fluctuations on a limited number of foreign contracts.											
B. Accomplishments/Planned Program (\$ in Millions)											
						FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total	
Civilian Salaries and Support See Description Below <i>FY 2009 Accomplishments:</i> See Section A: Mission Description and Budget Item Justification <i>FY 2010 Plans:</i> NA						44.602	35.107	0.000	0.000	0.000	

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Exhibit R-2A, RDT&E Project Justification: PB 2011 Missile Defense Agency										DATE: February 2010	
APPROPRIATION/BUDGET ACTIVITY 0400: Research, Development, Test & Evaluation, Defense-Wide BA 4: Advanced Component Development & Prototypes (ACD&P)				R-1 ITEM NOMENCLATURE PE 0603884C: Ballistic Missile Defense Sensors				PROJECT ZX40: Program-Wide Support			
B. Accomplishments/Planned Program (\$ in Millions)											
						FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total	
FY 2011 Base Plans: NA											
FY 2011 OCO Plans: NA											
Accomplishments/Planned Programs Subtotals						44.602	35.107	0.000	0.000	0.000	
C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total	FY 2012	FY 2013	FY 2014	FY 2015	Cost To Complete	Total Cost
• 0603175C: Ballistic Missile Defense Technology	117.602	189.229	132.220	0.000	132.220	236.875	239.873	197.118	197.852	0	1,310.769
• 0603881C: Ballistic Missile Defense Terminal Defense Segment	951.414	715.732	436.482	0.000	436.482	250.275	336.711	500.983	521.717	0	3,713.314
• 0603882C: Ballistic Missile Defense Mid-Course Segment	1,472.683	1,027.371	1,346.181	0.000	1,346.181	1,112.655	1,291.790	1,099.029	1,033.213	0	8,382.922
• 0603883C: Ballistic Missile Defense Boost Defense Segment	384.365	182.317	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	566.682
• 0603886C: Ballistic Missile Defense System Interceptor	308.869	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	308.869
• 0603888C: Ballistic Missile Defense Test and Targets	906.952	823.333	1,113.425	0.000	1,113.425	1,105.959	951.371	871.929	829.608	0	6,602.577
• 0603890C: Ballistic Missile Defense Enabling Programs	402.776	358.751	402.769	0.000	402.769	468.673	457.745	473.871	488.799	0	3,053.384
• 0603891C: SPECIAL PROGRAMS - MDA	182.998	250.185	270.189	0.000	270.189	269.040	450.645	517.486	601.315	0	2,541.858

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Exhibit R-2A, RDT&E Project Justification: PB 2011 Missile Defense Agency									DATE: February 2010		
APPROPRIATION/BUDGET ACTIVITY				R-1 ITEM NOMENCLATURE				PROJECT			
0400: Research, Development, Test & Evaluation, Defense-Wide BA 4: Advanced Component Development & Prototypes (ACD&P)				PE 0603884C: Ballistic Missile Defense Sensors				ZX40: Program-Wide Support			
C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total	FY 2012	FY 2013	FY 2014	FY 2015	Cost To Complete	Total Cost
• 0603892C: BMD AEGIS	1,054.323	1,435.717	1,467.278	0.000	1,467.278	1,021.878	1,112.668	1,076.739	923.316	0	8,091.919
• 0603893C: SPACE TRACKING & SURVEILLANCE SYSTEM	209.831	161.609	112.678	0.000	112.678	98.500	56.424	52.928	34.661	0	726.631
• 0603894C: MULTIPLE KILL VEHICLE	226.027	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	226.027
• 0603895C: BMD SYSTEM SPACE PROGRAM	23.250	12.492	10.942	0.000	10.942	11.182	11.347	11.749	12.155	0	93.117
• 0603896C: BMD C2BMC	275.174	334.734	342.625	0.000	342.625	364.085	289.778	323.922	298.936	0	2,229.254
• 0603897C: BMD HERCULES	51.629	47.932	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	99.561
• 0603898C: BMD JOINT WARFIGHTER SUPPORT	66.283	61.098	68.726	0.000	68.726	62.239	63.451	65.158	67.231	0	454.186
• 0603901C: DIRECTED ENERGY RESEARCH	0.000	0.000	98.688	0.000	98.688	101.371	103.449	104.572	104.141	0	512.221
• 0603904C: MISSILE DEFENSE INTEGRATION & OPERATIONS CENTER (MDIOC)	102.823	86.483	86.198	0.000	86.198	88.181	78.517	80.410	83.087	0	605.699
• 0603906C: REGARDING TRENCH	3.159	6.130	7.529	0.000	7.529	8.295	8.286	8.479	8.675	0	50.553
• 0603907C: SEA BASED X-BAND RADAR (SBX)	143.878	167.153	153.056	0.000	153.056	150.104	159.832	160.163	197.099	0	1,131.285
• 0603908C: BMD EUROPEAN INTERCEPTOR SITE	348.722	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	348.722
• 0603909C: BMD EUROPEAN MIDCOURSE RADAR	73.728	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	73.728
• 0603911C: BMD EUROPEAN CAPABILITY	0.000	50.226	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	50.226
• 0603912C: BMD European Comm Support	26.016	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	26.016
	0.000	201.323	121.735	0.000	121.735	111.100	113.101	116.114	119.172	0	782.545

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Exhibit R-2A, RDT&E Project Justification: PB 2011 Missile Defense Agency									DATE: February 2010		
APPROPRIATION/BUDGET ACTIVITY 0400: Research, Development, Test & Evaluation, Defense-Wide BA 4: Advanced Component Development & Prototypes (ACD&P)				R-1 ITEM NOMENCLATURE PE 0603884C: Ballistic Missile Defense Sensors				PROJECT ZX40: Program-Wide Support			
C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total	FY 2012	FY 2013	FY 2014	FY 2015	Cost To Complete	Total Cost
• 0603913C: ISRAELI COOPERATIVE											
• 0604880C: LAND-BASED SM-3	0.000	0.000	281.378	0.000	281.378	345.937	187.062	93.456	139.595	0	1,047.428
• 0604881C: Aegis SM-3 BLOCK IIA CO-DEVELOPMENT	0.000	255.987	318.800	0.000	318.800	405.500	416.300	337.300	227.500	0	1,961.387
• 0604883C: PRECISION TRACKING SPACE SYSTEM	0.000	0.000	66.969	0.000	66.969	123.851	184.800	348.360	482.952	0	1,206.932
• 0604884C: AIRBORNE INFRARED (ABIR)	0.000	0.000	111.671	0.000	111.671	103.636	123.591	103.668	58.773	0	501.339
• 0605502C: Small Business Innovative Research BMDO	124.788	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	124.788
• 0901585C: Pentagon Reservation	20.146	19.709	20.482	0.000	20.482	0.000	0.000	0.000	0.000	0	60.337
• 0901598C: Management Headquarters-MDA	87.151	52.403	29.754	0.000	29.754	29.421	29.974	30.567	31.171	0	290.441
D. Acquisition Strategy											
NA											
E. Performance Metrics											
NA											

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Exhibit R-2A, RDT&E Project Justification: PB 2011 Missile Defense Agency								DATE: February 2010			
APPROPRIATION/BUDGET ACTIVITY 0400: <i>Research, Development, Test & Evaluation, Defense-Wide</i> BA 4: <i>Advanced Component Development & Prototypes (ACD&P)</i>				R-1 ITEM NOMENCLATURE PE 0603884C: <i>Ballistic Missile Defense Sensors</i>				PROJECT MD40: <i>Program-Wide Support</i>			
COST (\$ in Millions)	FY 2009 Actual	FY 2010 Estimate	FY 2011 Base Estimate	FY 2011 OCO Estimate	FY 2011 Total Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
MD40: <i>Program-Wide Support</i>	0.000	0.000	14.836	0.000	14.836	17.028	21.859	20.117	21.302	Continuing	Continuing
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0		
Note NA											
A. Mission Description and Budget Item Justification Program-Wide Support provides funding for common non-headquarters support functions across the entire program. Includes costs for both government civilians performing these functions, as well as outside services and support contractors that augment government staff in these areas. Other costs included provide facility capabilities for MDA Executing Agent locations (with the exception of Federal Office Building 2), such as physical and technical security, legal services, travel and training, office and equipment leases, utilities and communications, supplies and maintenance, and similar operating expenses. Also includes funding for charges on canceled appropriations in accordance with Public Law 101-510, legal settlements, and foreign currency fluctuations on a limited number of foreign contracts.											
B. Accomplishments/Planned Program (\$ in Millions)											
						FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total	
Civilian Salaries and Support See Description Below <i>FY 2009 Accomplishments:</i> NA <i>FY 2010 Plans:</i> NA <i>FY 2011 Base Plans:</i> NA						0.000	0.000	14.836	0.000	14.836	

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Exhibit R-2A, RDT&E Project Justification: PB 2011 Missile Defense Agency									DATE: February 2010		
APPROPRIATION/BUDGET ACTIVITY 0400: Research, Development, Test & Evaluation, Defense-Wide BA 4: Advanced Component Development & Prototypes (ACD&P)				R-1 ITEM NOMENCLATURE PE 0603884C: Ballistic Missile Defense Sensors			PROJECT MD40: Program-Wide Support				
B. Accomplishments/Planned Program (\$ in Millions)											
							FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
FY 2011 OCO Plans: NA											
Accomplishments/Planned Programs Subtotals							0.000	0.000	14.836	0.000	14.836
C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total	FY 2012	FY 2013	FY 2014	FY 2015	Cost To Complete	Total Cost
• 0603175C: Ballistic Missile Defense Technology	117.602	189.229	132.220	0.000	132.220	236.875	239.873	197.118	197.852	0	1,310.769
• 0603881C: Ballistic Missile Defense Terminal Defense Segment	951.414	715.732	436.482	0.000	436.482	250.275	336.711	500.983	521.717	0	3,713.314
• 0603882C: Ballistic Missile Defense Mid-Course Segment	1,472.683	1,027.371	1,346.181	0.000	1,346.181	1,112.655	1,291.790	1,099.029	1,033.213	0	8,382.922
• 0603883C: Ballistic Missile Defense Boost Defense Segment	384.365	182.317	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	566.682
• 0603886C: Ballistic Missile Defense System Interceptor	308.869	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	308.869
• 0603888C: Ballistic Missile Defense Test and Targets	906.952	823.333	1,113.425	0.000	1,113.425	1,105.959	951.371	871.929	829.608	0	6,602.577
• 0603890C: Ballistic Missile Defense Enabling Programs	402.776	358.751	402.769	0.000	402.769	468.673	457.745	473.871	488.799	0	3,053.384
• 0603891C: SPECIAL PROGRAMS - MDA	182.998	250.185	270.189	0.000	270.189	269.040	450.645	517.486	601.315	0	2,541.858
• 0603892C: BMD AEGIS	1,054.323	1,435.717	1,467.278	0.000	1,467.278	1,021.878	1,112.668	1,076.739	923.316	0	8,091.919
• 0603893C: SPACE TRACKING & SURVEILLANCE SYSTEM	209.831	161.609	112.678	0.000	112.678	98.500	56.424	52.928	34.661	0	726.631

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Exhibit R-2A, RDT&E Project Justification: PB 2011 Missile Defense Agency									DATE: February 2010		
APPROPRIATION/BUDGET ACTIVITY				R-1 ITEM NOMENCLATURE				PROJECT			
0400: Research, Development, Test & Evaluation, Defense-Wide BA 4: Advanced Component Development & Prototypes (ACD&P)				PE 0603884C: Ballistic Missile Defense Sensors				MD40: Program-Wide Support			
C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total	FY 2012	FY 2013	FY 2014	FY 2015	Cost To Complete	Total Cost
• 0603894C: MULTIPLE KILL VEHICLE	226.027	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	226.027
• 0603895C: BMD SYSTEM SPACE PROGRAM	23.250	12.492	10.942	0.000	10.942	11.182	11.347	11.749	12.155	0	93.117
• 0603896C: BMD C2BMC	275.174	334.734	342.625	0.000	342.625	364.085	289.778	323.922	298.936	0	2,229.254
• 0603897C: BMD HERCULES	51.629	47.932	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	99.561
• 0603898C: BMD JOINT WARFIGHTER SUPPORT	66.283	61.098	68.726	0.000	68.726	62.239	63.451	65.158	67.231	0	454.186
• 0603901C: DIRECTED ENERGY RESEARCH	0.000	0.000	98.688	0.000	98.688	101.371	103.449	104.572	104.141	0	512.221
• 0603904C: MISSILE DEFENSE INTEGRATION & OPERATIONS CENTER (MDIOC)	102.823	86.483	86.198	0.000	86.198	88.181	78.517	80.410	83.087	0	605.699
• 0603906C: REGARDING TRENCH	3.159	6.130	7.529	0.000	7.529	8.295	8.286	8.479	8.675	0	50.553
• 0603907C: SEA BASED X-BAND RADAR (SBX)	143.878	167.153	153.056	0.000	153.056	150.104	159.832	160.163	197.099	0	1,131.285
• 0603908C: BMD EUROPEAN INTERCEPTOR SITE	348.722	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	348.722
• 0603909C: BMD EUROPEAN MIDCOURSE RADAR	73.728	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	73.728
• 0603911C: BMD EUROPEAN CAPABILITY	0.000	50.226	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	50.226
• 0603912C: BMD European Comm Support	26.016	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	26.016
• 0603913C: ISRAELI COOPERATIVE	0.000	201.323	121.735	0.000	121.735	111.100	113.101	116.114	119.172	0	782.545
• 0604880C: LAND-BASED SM-3	0.000	0.000	281.378	0.000	281.378	345.937	187.062	93.456	139.595	0	1,047.428
	0.000	255.987	318.800	0.000	318.800	405.500	416.300	337.300	227.500	0	1,961.387

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Exhibit R-2A, RDT&E Project Justification: PB 2011 Missile Defense Agency									DATE: February 2010		
APPROPRIATION/BUDGET ACTIVITY 0400: Research, Development, Test & Evaluation, Defense-Wide BA 4: Advanced Component Development & Prototypes (ACD&P)				R-1 ITEM NOMENCLATURE PE 0603884C: Ballistic Missile Defense Sensors				PROJECT MD40: Program-Wide Support			
C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total	FY 2012	FY 2013	FY 2014	FY 2015	Cost To Complete	Total Cost
• 0604881C: Aegis SM-3 BLOCK IIA CO-DEVELOPMENT											
• 0604883C: PRECISION TRACKING SPACE SYSTEM	0.000	0.000	66.969	0.000	66.969	123.851	184.800	348.360	482.952	0	1,206.932
• 0604884C: AIRBORNE INFRARED (ABIR)	0.000	0.000	111.671	0.000	111.671	103.636	123.591	103.668	58.773	0	501.339
• 0605502C: Small Business Innovative Research BMDO	124.788	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	124.788
• 0901585C: Pentagon Reservation	20.146	19.709	20.482	0.000	20.482	0.000	0.000	0.000	0.000	0	60.337
• 0901598C: Management Headquarters-MDA	87.151	52.403	29.754	0.000	29.754	29.421	29.974	30.567	31.171	0	290.441
D. Acquisition Strategy											
MDA will transition from the existing legacy, project-oriented Systems Engineering and Technical Assistance (SETA) contractor construct to an enterprise-wide Advisory and Assistance Services (A&AS) approach to support the Ballistic Missile Defense System (BMDS) mission. The objectives are to implement national engineering and support services for the BMDS mission across the enterprise, enhance the sharing of ballistic missile defense expertise and knowledge across the agency, centralize the acquisition of support services manpower in a more efficient manner and reduce agency overhead costs enterprise-wide. A&AS support includes engineering and technical services; studies, analyses, and evaluation; and management and professional services.											
E. Performance Metrics											
NA											

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