Exhibit R-2, RDT&E Budget Item Justification: PB 2012 Missile Defense Agency										DATE: February 2011	
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*							
COST ($ in Millions)	**FY 2010**	**FY 2011**	**FY 2012 Base**	**FY 2012 OCO**	**FY 2012 Total**	**FY 2013**	**FY 2014**	**FY 2015**	**FY 2016**	**Cost To Complete**	**Total Cost**
Total Program Element	544.352	454.859	222.374	-	222.374	357.271	336.514	318.321	348.944	Continuing	Continuing
BX11: *Ballistic Missile Defense Radars Block 2.0*	2.995	-	-	-	-	-	-	-	-	0.000	2.995
CX11: *Ballistic Missile Defense Radars Block 3.0*	11.658	-	-	-	-	-	-	-	-	0.000	11.658
EX11: *Ballistic Missile Defense Radars Block 5.0*	102.929	-	-	-	-	-	-	-	-	0.000	102.929
WX11: *Ballistic Missile Defense Radars Capability Development*	264.015	-	-	-	-	-	-	-	-	0.000	264.015
XX11: *Ballistic Missile Defense Radars Sustainment*	107.074	-	-	-	-	-	-	-	-	0.000	107.074
MD11: *BMDS Radars*	-	440.023	211.981	-	211.981	342.307	321.416	304.708	334.070	Continuing	Continuing
ZX40: *Program-Wide Support*	55.681	-	-	-	-	-	-	-	-	0.000	55.681
MD40: *Program-Wide Support*	-	14.836	10.393	-	10.393	14.964	15.098	13.613	14.874	Continuing	Continuing

A. Mission Description and Budget Item Justification

The BMDS network of layered Sensors provides essential data for the command and control of BMDS weapon systems, such as Terminal High Altitude Area Defense (THAAD) and Ground-based Midcourse Defense (GMD). These sensors, connected to the BMDS through Command and Control, Battle Management, Communications (C2BMC), enable detection and tracking of targets, and provide fire-control quality ballistic missile position, velocity, and discrimination data to BMDS weapon systems. Overlapping sensor coverage, with a diversity of sensor types, improves target detection, tracking, discrimination and kill assessments, while reducing potential impact of countermeasures. The extended sensor coverage and accuracy provided by a network of layered sensors reduces the number of target engagements required, conserves interceptor inventory, and ensures a high probability of successful engagement.

The BMD Sensors Program contributes to regional missile defense through the following activities:

- Development, delivery and deployment of Army Navy/Transportable Radar Surveillance (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)

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

AN/TPY-2 radars can be configured to operate either as a THAAD Fire Unit Radar (THAAD mode) or Forward-Based Radar. These radars are transportable, adding flexibility to respond to geographical changes in threats. Under this Program Element, six AN/TPY-2 radars have completed manufacturing. 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. In forward-based mode, the AN/TPY-2 also provides acquisition and track data via the Ballistic Missile Defense System Command, Control, Battle Management and Communications (C2BMC) and Link 16 to the Aegis missile defense system for cueing. The AN/TPY-2 used in THAAD mode is an integral component of the THAAD Battery. The THAAD battery radar 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 GMD, THAAD, and the Aegis Weapon System via C2BMC.

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 in the Middle East and in Europe. By leveraging recent advances in sensor and interceptor technologies, the United States will counter this growing regional threat with a flexible and adaptable integration of systems. 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 to and interoperable with those being developed by NATO, and applicable in other theaters around the world. U.S. missile defense 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 AN/TPY-2. Subsequent phases will be implemented based on technical maturity, appropriate testing, and threat driven requirements.

The BMDS Sensors program also includes the Groundbased Radar - Prototype (GBR-P) -- a large, steerable, X-band phased array radar currently located at the Reagan Test Site (RTS), Kwajalein Atoll. This radar is currently maintained in caretaker status and is available to support BMDS testing and X-Band software development efforts.

The BMDS Sensors program contributes to U.S. homeland defense through the following activities:

- Operations and sustainment of the COBRA DANE radar
- Upgrade of the Thule Early Warning Radar (EWR) to add missile defense capability to this sensor
- Upgrade of the Clear, AK Early Warning Radar

The Thule UEWR located at Thule Air Base, Greenland, is an Ultra High Frequency (UHF) radar that has been upgraded (completed in FY 2010) to include missile defense functionality. This capability expands defense of the U.S. to include defense against limited Iranian long-range threats.

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

The Cobra Dane radar located at Eareckson AFS, Shemya, Alaska (AK) is also part of the BMDS Homeland Defense architecture.

The Clear EWR located at Clear Air Force Station, AK, is an Ultra High Frequency (UHF) radar that is being upgraded to include missile defense functionality. The addition of the Clear UEWR into the BMDS sensor architecture will improve BMDS sensor coverage and provide new engagement options against long-range missile threats and reduce reliance on the Cobra Dane asset.

The BMDS Sensors Program also contributes to the testing and proving of the U.S. missile defense systems through the following activities:

- Participation in BMDS flight and ground test campaigns
- Modeling and simulation efforts to include: enhanced sensor models, development of radio frequency (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

To hedge against future ballistic missile threats, the Sensors Program supports the following activities:

- Development of advanced radar discrimination algorithms and Common X-Band software for X-Band radars to address evolving threats
- 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; after FY 2011, the MDA Directorate of Advanced Technology will assume responsibility for the ESL; funding will reside in the Advanced Technology Program Element (0603175C); the ESL technology effort supports evolution and advances for the BMDS Overhead Persistent Infrared (OPIR) Architecture (BOA) capabilities, as well as the development of the Precision Tracking Space System (PTSS) and Airborne Infrared (ABIR) sensor capabilities.

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

B. Program Change Summary ($ in Millions)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total
Previous President's Budget	621.017	454.859	469.589	-	469.589
Current President's Budget	544.352	454.859	222.374	-	222.374
Total Adjustments	-76.665	-	-247.215	-	-247.215
• Congressional General Reductions		-			
• Congressional Directed Reductions		-			
• Congressional Rescissions	-	-			
• Congressional Adds		-			
• Congressional Directed Transfers		-			
• Reprogrammings	9.284	-			
• SBIR/STTR Transfer	-7.730	-			
• Other Adjustment Detail	-78.219	-	-247.215	-	-247.215

Change Summary Explanation

Beginning in FY 2012 funding was realigned from this RDT&E PE to the BMDS Radars O&M line to fund the operation and maintenance of AN/TPY-2 radars. Other adjustments include MDA programmatic changes. This RDT&E program has realized $35.504 million in efficiency savings.

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

COST ($ in Millions)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total	FY 2013	FY 2014	FY 2015	FY 2016	Cost To Complete	Total Cost
BX11: *Ballistic Missile Defense Radars Block 2.0*	2.995	-	-	-	-	-	-	-	-	0.000	2.995
Quantity of RDT&E Articles	0	0	0		0	0	0	0	0		

A. Mission Description and Budget Item Justification

Project BX11 has been transferred to Project MD11.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2010	FY 2011	FY 2012
Title: See Project MD11 for FY 2010 Accomplishments.	2.995	-	-
Articles:	0		
Description: See Description Below			
FY 2010 Accomplishments: NA			
Accomplishments/Planned Programs Subtotals	2.995	-	-

C. Other Program Funding Summary ($ in Millions)

N/A

D. Acquisition Strategy

NA

E. Performance Metrics

NA

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

COST ($ in Millions)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total	FY 2013	FY 2014	FY 2015	FY 2016	Cost To Complete	Total Cost
CX11: *Ballistic Missile Defense Radars Block 3.0*	11.658	-	-	-	-	-	-	-	-	0.000	11.658
Quantity of RDT&E Articles	0	0	0		0	0	0	0	0		

A. Mission Description and Budget Item Justification

Project CX11 has been transferred to Project MD11.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2010	FY 2011	FY 2012
Title: See Project MD11 for FY 2010 Accomplishments	11.658	-	-
Articles:	0		
Description: See Description Below			
FY 2010 Accomplishments:			
Accomplishments/Planned Programs Subtotals	11.658	-	-

C. Other Program Funding Summary ($ in Millions)

N/A

D. Acquisition Strategy

NA

E. Performance Metrics

NA

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

COST ($ in Millions)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total	FY 2013	FY 2014	FY 2015	FY 2016	Cost To Complete	Total Cost
EX11: *Ballistic Missile Defense Radars Block 5.0*	102.929	-	-	-	-	-	-	-	-	0.000	102.929
Quantity of RDT&E Articles	0	0	0		0	0	0	0	0		

A. Mission Description and Budget Item Justification

Project EX11 has been transferred to Project MD11.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2010	FY 2011	FY 2012
Title: See Project MD11 for FY 2010 Accomplishments	102.929	-	-
Articles:	0		
Description: See Description Below			
FY 2010 Accomplishments: NA			
Accomplishments/Planned Programs Subtotals	102.929	-	-

C. Other Program Funding Summary ($ in Millions)

N/A

D. Acquisition Strategy

NA

E. Performance Metrics

NA

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

COST ($ in Millions)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total	FY 2013	FY 2014	FY 2015	FY 2016	Cost To Complete	Total Cost
WX11: *Ballistic Missile Defense Radars Capability Development*	264.015	-	-	-	-	-	-	-	-	0.000	264.015
Quantity of RDT&E Articles	0	0	0		0	0	0	0	0		

A. Mission Description and Budget Item Justification

Project WX11 has been transferred to Project MD11.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2010	FY 2011	FY 2012
Title: See Project MD11 for FY 2010 Accomplishments	264.015	-	-
Articles:	0		
Description: See Description Below			
FY 2010 Accomplishments: NA			
Accomplishments/Planned Programs Subtotals	264.015	-	-

C. Other Program Funding Summary ($ in Millions)

N/A

D. Acquisition Strategy

NA

E. Performance Metrics

NA

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

COST ($ in Millions)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total	FY 2013	FY 2014	FY 2015	FY 2016	Cost To Complete	Total Cost
XX11: *Ballistic Missile Defense Radars Sustainment*	107.074	-	-	-	-	-	-	-	-	0.000	107.074
Quantity of RDT&E Articles	0	0	0		0	0	0	0	0		

A. Mission Description and Budget Item Justification

Project XX11 has been transferred to Project MD11.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2010	FY 2011	FY 2012
Title: See Project MD11 for FY 2010 Accomplishments	107.074	-	-
Articles:	0		
Description: See Description Below			
FY 2010 Accomplishments: NA			
Accomplishments/Planned Programs Subtotals	107.074	-	-

C. Other Program Funding Summary ($ in Millions)

N/A

D. Acquisition Strategy

NA

E. Performance Metrics

NA

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

COST ($ in Millions)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total	FY 2013	FY 2014	FY 2015	FY 2016	Cost To Complete	Total Cost
MD11: *BMDS Radars*	-	440.023	211.981	-	211.981	342.307	321.416	304.708	334.070	Continuing	Continuing
Quantity of RDT&E Articles	0	0	0		0	0	0	0	0		

Note

The MD11 R-4/4A depicts only test events for which Sensors participation is ``mandatory``. For a full listing of BMDS test events, see the R-4/4A in the Test and Targets PE (0603888C).

A. Mission Description and Budget Item Justification

Project MD11 continues efforts described for FY 2010 in Projects BX11, CX11, EX11, WX11, and XX11. Activities in this project include:

-Operations and sustainment of deployed radars
-Development, delivery and deployment of AN/TPY-2 radars for either forward-based or THAAD Fire Unit use to meet warfighter needs
-Development of radar discrimination advanced algorithms for X-Band radars and selectable X-Band software for AN/TPY-2 radars to address evolving threats
-System engineering, and software development and testing support
-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 VV&A of radar models
-Participation in BMDS flight and ground test campaigns

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2010	FY 2011	FY 2012
Title: BMDS Level Testing	-	52.318	48.640
Articles:	0	0	0
Description: See Description Below			
FY 2010 Accomplishments: The BMDS sensors test program provides for sensors participation in the execution of BMDS testing described in Project MD04 of PE0603888C Test and Targets, as well as element-level testing focused on BMDS sensors critical engagement conditions (CECs) and empirical measurement events (EMEs) to anchor models and simulations. Reliable models and simulations are essential to reducing design, development and testing costs. BMDS-Level Testing proves the operational effectiveness of the BMDS and its supporting sensors.			

Exhibit R-2A, RDT&E Project Justification: PB 2012 Missile Defense Agency		DATE: February 2011
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 Programs ($ in Millions, Article Quantities in Each)	FY 2010	FY 2011	FY 2012
Funding ($39.597M) for these FY 2010 accomplishments is reported in prior year budget project WX11. FY 2010 funding also included Concurrent Test, Training and Operations (CTTO) and Element Test and Infrastructure, which are reported in discrete paragraphs for FY 2011 and FY2012. -Supported AN/TPY-2 software capability release (CR-2.4) testing and CEC data collection for advanced discrimination techniques -Supported 2-Stage Booster Interceptor Flight Test BVT-01 from VAFB utilizing TPY-2 Forward Based (FB) and SBX -Supported USAF Target of Opportunity Glory Trip 200 utilizing SBX and AN/TPY-2 FB -Supported THAAD Intercept Flight Tests (FTT-11, FTT-12) -Support COBRA DANE flight testing and CECs for scan angles, and mono pulse tracking (FTX-10) -Supported other flight tests as targets of opportunity (FTL-01) -Participated in Regional Focused Hardware In The Loop (HWIL) Tests GTX-04a (support to C2BMC demonstration of dual AN/TPY-2 radar command and control) -Participated in Full BMDS HWIL Test GTI-04b -Planned, developed, integrated and tested a common HWIL stimulation framework (Single Stimulation Framework) with the Elements for the GTX-04a and GTI-04b ground tests, and CTTO demos -Provided Test Site Support at VAFB for AN/TPY-2 testing -Continued CTTO development for TPY-2 and UEWRs -Completed Thule UEWR BMDS integration testing -Demonstrated AN/TPY-2 (Forward Based) performance and integration with host nation systems in support of Contingency Analysis and Activation Team (CAAT) Spiral 2 Technical Capability Declaration To EUCOM ***FY 2011 Plans:*** -Plan and execute sensors participation in BMDS flight tests, including Aegis flight test FTM-15, the first test to demonstrate Phased Adaptive Approach capabilities -Continue to plan and execute sensors participation in BMDS ground test campaign GT-04 -Initiate planning for sensors participation in FY 2012 BMDS flight tests and ground tests ***FY 2012 Plans:*** -Plan and execute sensors participation in BMDS flight tests IAW the BMDS Integrated Master Test Plan (IMTP 11.1) -Plan and execute sensors participation in BMDS ground test campaign in accordance with the BMDS IMTP -Plan and execute AN/TPY-2 support for THAAD flight tests in FY 2012 (previously funded in BMD Terminal Defense PE 0603881C). This accounts for the change in funding levels from FY 2011 to FY 2012.			

Exhibit R-2A, RDT&E Project Justification: PB 2012 Missile Defense Agency		DATE: February 2011
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 Programs ($ in Millions, Article Quantities in Each)	FY 2010	FY 2011	FY 2012
-Initiate planning for sensors participation in FY 2013 BMDS flight tests and ground tests			
Title: Sensors Directorate Operations	-	59.251	54.977
Articles:	0	0	0
Description: See Description Below ***FY 2010 Accomplishments:*** This effort provided operations support across all MDA Sensors projects, including civilian salaries and travel. In addition, it provided 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. Funding ($56.420M) for these FY 2010 accomplishments is reported in prior year budget project EX11. -Provided Program Management support across all BMDS Builds, including Concept Development. ***FY 2011 Plans:*** -Provide Program Management Support across all BMDS Builds, including Concept Development. ***FY 2012 Plans:*** This effort will continue to provide operations support as described for FY 2011, but at reduced costs due to efficiencies from in-sourcing and implementation of a new Missile Defense Agency support services contract.			
Title: Upgrade Clear Early Warning Radar	-	-	28.275
Articles:	0		0
Description: See Description Below ***FY 2010 Accomplishments:*** NA ***FY 2012 Plans:*** -Support engineering for BMDS Communications work at Clear -Purchase Long Lead fiber and SATCOM to support BMDS Communications -Support design and implementation of GCN connectivity and associated Network monitoring for integration into the GMD -Purchase Long Lead UEWR equipment --commercial-off-the-shelf (COTS) items and the UEWR receiver/exciter (REX) -Complete refinement of design, culminating with critical design review			

Exhibit R-2A, RDT&E Project Justification: PB 2012 Missile Defense Agency		DATE: February 2011
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 Programs ($ in Millions, Article Quantities in Each)	FY 2010	FY 2011	FY 2012
(CDR)			
Title: Project Oak	-	-	28.002
Articles:	0	0	0
Description: See Description Below ***FY 2010 Accomplishments:*** N/A ***FY 2011 Plans:*** N/A ***FY 2012 Plans:*** Project Oak details are at a higher classification. This project is reported in accordance with Title 10, United States Code, Section 19 (a)(1) in the Special Access Program Annual Report to Congress.			
Title: X-Band Basic Program	-	50.271	13.146
Articles:	0	0	0
Description: See Description Below ***FY 2010 Accomplishments:*** This effort includes development of common X-Band software, development of mission profiles to support AN/TPY-2 operations worldwide and development of CECs and EMEs. The selectable software CX-1 Build consolidates the AN/TPY-2 forward-based mode capabilities release 2.4 and the AN/TPY-2 THAAD mode release 4.2.4 (THAAD fire unit radar software), providing the flexibility and interchangeability of those two radars. CX-1 also includes baseline THAAD mode and forward-based mode discrimination (Army/STRATCOM interest item), sensor registration, interference monitoring, and acquisition sensor tasking. These capabilities will expand the range window and augment threat handling. Funding ($11.658M) for these FY 2010 accomplishments is reported in prior year budget project CX11. -Assessed discrimination response in ground test campaign GTI-04b -Participated in Performance Assessment (PA-09) -Evaluated selectable AN/TPY-2 software capability release CX-1 performance using targets of opportunity -Integrated prototype designs into AN/TPY-2 digital representation			

Exhibit R-2A, RDT&E Project Justification: PB 2012 Missile Defense Agency		DATE: February 2011
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 Programs ($ in Millions, Article Quantities in Each)	FY 2010	FY 2011	FY 2012
-Initiated sensor model functionality including scan angle bias, debris modeling, and environmental modeling, as required through application of CEC/EME results from flight and ground tests, and satellite tracking campaign (1st QTR FY 2010) -Supported FTG-06 Failure Review Board (FRB) Funding ($119.496M) for these FY 2010 accomplishments is reported in prior year budget project WX11. -Conducted Selectable Software Build CX-1 design reviews -Delivered the first AN/TPY-2 selectable software build for integrated ground testing (CX-1) -Completed AN/TPY-2 CX-1 formal qualification testing (FQT) -Integrated and tested CX-1 on an AN/TPY-2 radar -Supported mission profile and conventional discrimination development to support AN/TPY-2 #3 operations in Israel -Provided systems engineering ``reach-back`` for consolidated contractor logistics support contract -Completed VV&A plan for the RF scene generator (Radar Digital Signal Injection System (RDSIS)) supporting AN/TPY-2 CX-1 -Completed analysis of calibration satellite tracking events to anchor models -Initiated development of X-Band Simulator Test (XST) simulation model based on RDSIS to provide HWIL Service that interfaces with Sea-Based X-Band Radar (SBX) and the X-band family of radars In support of the warfighter Prioritized Capabilities List (PCL), these efforts deliver the following new BMDS capabilities: -Integration of Hercules Suite 1 Algorithms (AN/TPY-2 (FBM) Build CX-1) -C2BMC Sensor Resource Management and Tasking (AN/TPY-2 (FBM) Build CX-1) -C2BMC Multi-Radar Capability (AN/TPY-2 (FBM) Build CX-1) -GMD Utilization of Discriminated Track (AN/TPY-2 (FBM) Build CX-1) -Additional C2BMC Messages and Expanded Threat Set (AN/TPY-2 (FBM) Build CX-1) ***FY 2011 Plans:*** -Complete Verification and Validation of the first selectable software build (CX-1) -Initiate development of the Advanced Processor Platform (APP) -- the next generation processor replacing superdome units in AN/TPY-2 radars ***FY 2012 Plans:*** -Continue development of the APP			

Exhibit R-2A, RDT&E Project Justification: PB 2012 Missile Defense Agency		DATE: February 2011
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 Programs ($ in Millions, Article Quantities in Each)	FY 2010	FY 2011	FY 2012
-Continue development of selectable X-Band software builds.			
Title: AN/TPY-2 Radar Deployment / Site Activation	-	-	17.793
Articles:	0	0	0
Description: See Description Below ***FY 2010 Accomplishments:*** Funding for these FY 2010 accomplishments is reported in prior year budget projects EX11 ($16.403M) and BX11 ($2.995M). -Replace Japanese launch pad site that was removed to accommodate AN/TPY-2 Forward-based Radar Site at Shariki -Joint Spectrum Center (JSC) Siting support for Central Command (CENTCOM) -Conduct site surveys for additional BMDS AN/TPY-2 Forward-based radar deployment ***FY 2011 Plans:*** N/A ***FY 2012 Plans:*** -Package and ship AN/TPY-2 Radar #4 to PAA Forward-based Radar site -Complete site survey, preparation and activation, including preparation of radar and communications equipment for deployment -Complete installation and deployment activities: radar installation, power installation, fuel tank installation -Complete CLS training of operators and maintainers			
Title: Element Test and Infrastructure	-	16.115	15.198
Articles:	0	0	0
Description: See Description Below ***FY 2010 Accomplishments:*** This effort provided development testing not covered under the BMDS Level Testing. Test events are listed below. 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 M&S. FY 2010 accomplishments are reported under BMDS Level Testing above. Funding ($21.795M) for these accomplishments is reported in prior year budget project WX11. ***FY 2011 Plans:***			

Exhibit R-2A, RDT&E Project Justification: PB 2012 Missile Defense Agency		DATE: February 2011
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 Programs ($ in Millions, Article Quantities in Each)	FY 2010	FY 2011	FY 2012
-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 CEC/EMEs -Upgrade sensor interfaces to support Single Stimulation Framework (SSF) integration -Support evolving SSF (software upgrades) integration into Sensors Hardware in the Loop (HWIL) Ground Test Infrastructure -Configure and maintain Sensors HWIL Ground Test Infrastructure to support BMDS Ground Tests ***FY 2012 Plans:*** For FY 2012, Sensors planned 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 CEC/EMEs -Support evolving SSF (software upgrades) integration into Sensors Hardware in the Loop (HWIL) Ground Test Infrastructure -Configure and maintain Sensors HWIL Ground Test Infrastructure to support BMDS Ground Tests			
Title: BMDS Radars Modeling & Simulation (M&S) ***Articles:*** ***Description:*** See Description Below ***FY 2010 Accomplishments:*** SN Modeling and Simulation (M&S) activities support all phases of Sensors development, including development of modifications to the X-Band and UEWR 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. These range from low-fidelity analyses supporting concept definition studies to high-fidelity models integrated into the BMD Digital Simulations Architecture (DSA) and used to support engineering development or testing. Funding ($24.724M) for these FY 2010 accomplishments is reported in prior year budget project WX11 Sensors Engineering. -Completed integration of the next generation AN/TPY-2 digital simulations into the BMD Digital Simulations Architecture for support of Technical Assessment TA-10 -Completed integration of the radio frequency (RF) scene generator for the AN/TPY-2 (CX-1) into the BMDS Hardware in the Loop (HWIL) single stimulation framework in support of GTI-04b (full BMDS HWIL test) -Completed integrated validation and verification (V&V) plan and report for AN/TPY-2 simulations (CRUSHM, CX-1)	- 0	25.971 0	4.900 0

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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 Programs ($ in Millions, Article Quantities in Each)	FY 2010	FY 2011	FY 2012
-Initiated development of the high fidelity digital models, Open System Architecture (OSA) Sensor Model (OSM) representations of the SBX, CDU, UEWR, and AN/TPY-2 sensors, to support Wargames, Exercises, Training and Performance/Technical Assessments -Supported Assured Response 04X (AR04X) with OSM`s -Completed initial digital simulation of first generation selectable software (CX-1) for the X-band sensors ***FY 2011 Plans:*** -Complete V&V report and Certification Letter for the Common Software Simulation (CXSIM) v1.0 supporting AN/TPY-2 CX1.2 -Continue development of digital simulation of first generation common software for AN/TPY2 CXSIM (CX1.3) for participation in Technical Assessment 04 and Performance Assessment 04 (TA04/PA04) Event -Complete development of XST simulation model based on RDSIS to provide the diffuse cloud model and simple antenna motion -Complete V&V report and Certification Letter for the RDSIS supporting AN/TPY-2 CX1 -Complete development of the Open Systems Architecture Sensor Models (OSM) with a focus on OSM-S version representing tactical software version SBX 3.1 -Support Technical Assessment 04 (TA04) and Performance Assessment 04 (PA04) planning, integration, risk reduction testing, and event execution, using OSM to represent SBX, CDU, and UEWR sensors and CXSIM representing AN/TPY2 -Maintain digital and HWIL representations of the tactical versions of AN/TPY2 (CX1.3), SBX 3.1, UEWR 8.2.3, and CDU 2.6.6 and continue enhancements of these sensor models as required through application of CEC/EMEs ***FY 2012 Plans:*** -Continue to support Technical Assessments and Performance Assessments using OSM -Continue to maintain digital and HWIL representations of the tactical versions of AN/TPY2 (CX1.3), SBX 3.1, UEWR 8.2.3, and CDU 2.6.6 and CEC/EME implementation			
Title: BMDS Radars Concurrent Test, Training & Operations (CTTO) Infrastructure	-	35.860	-
Articles:	0	0	0
Description: See Description Below ***FY 2010 Accomplishments:*** Concurrent Test, Training and Operations (CTTO) capability for AN/TPY-2, SBX and UEWRs provides operational sites the ability to run training and testing while concurrently providing on-going sensor coverage to the BMDS. CTTO allows BMDS warfighters to train in the same environment in which they fight. The overall effort is closely aligned with the Single Stimulation Framework (SSF), which is used to conduct and stimulate the hardware and software used in BMDS ground tests with realistic threat scenarios.			

Exhibit R-2A, RDT&E Project Justification: PB 2012 Missile Defense Agency		DATE: February 2011
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B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2010	FY 2011	FY 2012
Funding ($35.286M) for these FY 2010 accomplishments is reported in prior year budget project WX11 BMDS Test and Evaluation. -Planned, developed, integrated and tested a common HWIL stimulation framework (Single Stimulation Framework) with the Elements for the GTX-04a and GTI-04b ground tests, and CTTO demos -Provided Test Site Support at VAFB for AN/TPY-2 testing -Continued CTTO development for AN/TPY-2 and UEWRs ***FY 2011 Plans:*** -Refine AN/TPY-2 and UEWR Single Stimulation Framework (SSF) interfaces to support BMDS ground test campaigns -Continue delivery of X-Band Simulator Test (XST) simulation model based on RDSIS to provide HWIL service that will interface with the SBX and X-Band family of radars and provide more accurate debris modeling ***FY 2012 Plans:*** This effort is not funded in FY 2012.			
Title: Sensors Engineering	-	16.833	1.050
Articles:	0	0	0
Description: See Description Below ***FY 2010 Accomplishments:*** Sensors engineering activities included 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. Funding ($5.633M) for these FY 2010 accomplishments is reported in prior year budget project WX11. FY 2010 funding also included BMDS Radars modeling and simulation. -Initiated development of mission profiles to enable coordinated tasking/control of multiple AN/TPY-2 radars -Initiated algorithm development to facilitate sensor registration capabilities -Initiated development of X-band sidecar to facilitate the development of integrated BMDS capabilities -Completed initial engineering trade studies for sensor registration, discrimination, system track, battle management and hit/kill assessment ***FY 2011 Plans:*** -Conduct Certification and Accreditation for all Sensors Systems			

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B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2010	FY 2011	FY 2012
-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 2012 Plans:*** -Continue to conduct IA certification and accreditation of all Sensors Systems -Continue to conduct engineering trade studies for sensor registration, discrimination, system track, battle management and other system functions			
Title: BMDS Radars (Sustainment) ***Articles:*** ***Description:*** See Description Below ***FY 2010 Accomplishments:*** This effort provided for the operation and support of AN/TPY-2 Radars until certified operational and transferred to a Service component. MDA uses Consolidated Contractor Logistics Support (C-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 THAAD Battery. Funding ($72.523M) for these FY 2010 accomplishments is reported in prior year budget project XX11. -Operated and sustained seven (7) AN/TPY-2 radars: two (2) forward-based radars outside continental United States (OCONUS), three (3) THAAD battery radars (US), and two (2) AN/TPY-2 test assets (Vandenberg Air Force Base (VAFB) and Pacific Missile Range Facility (PMRF)) -Provided personnel to support forward-based 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 -Completed generator overhaul and replacements in Japan -Provided X-Band Radar (XBR) depot support and spares -Completed Cooling Equipment Unit (CEU) Refurbishment -Completed Limited User Test of AN/TPY-2 Radar #5	- 0	115.039 0	- 0

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B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2010	FY 2011	FY 2012
-Completed Reliability Test Support of AN/TPY-2 Radar #5 -Initiated AN/TPY-2 Radar #4 refurbishment -Maintained the Ground based Radar - Prototype (GBR-P) (currently in caretaker status) -Supported the FTG-06 Failure Review Board (FRB) in developing solutions for SBX FTG-06 performance issues ***FY 2011 Plans:*** -Operate and sustain 7 AN/TPY-2 radars: three (3) forward-based radars (OCONUS), two (2) THAAD battery radars (US), one (1) AN/TPY-2 test asset (PMRF), and refurbishment of 1 AN/TPY-2 -Provide depot level logistics support for seven AN/TPY-2 radars supporting BMDS forward Based Radar Sites and THAAD Batteries -Operate and sustain radar 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) -Provide AN/TPY-2 operational spares, repair, and replacement parts -Provide AN/TPY-2 Forward-based Radar operators/maintainers, site maintenance, fuel, utility, and communications support costs -Operate and sustain the Ground-based Radar - Prototype (GBR-P) in caretaker status -Complete AN/TPY-2 Transition and Transfer Annex -Achieve Material Release of AN/TPY-2 to lead service -- Army -Refurbish AN/TPY-2 Radar #4 -Demonstrate SBX resolution of FTG-06 problems in FTG-06A ***FY 2012 Plans:*** For FY 2012, operations and sustainment (CLS) of the AN/TPY-2 radars moves to O&M appropriation.			
Title: UEWR (Beale, Fylingdales, Thule) & COBRA DANE Sustainment ***Articles:*** ***Description:*** See Description Below ***FY 2010 Accomplishments:*** Funding ($20.650M) for these FY 2010 accomplishments is reported in prior year budget project XX11. -Provided maintenance of the System Program Agency (SPA) UEWR sustainment lab string -Provided sustainment of the Cobra Dane (CD) radar -Continued UEWR/CD Common Mission software sustainment -Achieved Air Force acceptance of Verification Closure Notice 2 (VCN-2 -Beale, Fylingdales, Thule)	- 0	22.661 0	- 0

Exhibit R-2A, RDT&E Project Justification: PB 2012 Missile Defense Agency		DATE: February 2011
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B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2010	FY 2011	FY 2012
-Provided program management office support personnel -Implemented DoD 8500 Information Assurance (IA) Policy/ Guidance ***FY 2011 Plans:*** -Continue UEWR/CD Common Mission software sustainment -Provide for program management office support personnel ***FY 2012 Plans:*** FY 2012 ($15.600M) UEWR and Cobra Dane software sustainment transitioned to O&M. Funding for UEWR/CD program office ($6.655M) support is found under the Sensors Directorate Operations accomplishment paragraph below.			
Title: BMDS Radars Communications (Sustainment) ***Articles:*** ***Description:*** See Description Below ***FY 2010 Accomplishments:*** This Operations and Support (O&S) effort supported 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. AN/TPY-2 communications suites provide the interface between the radar and C2BMC that enables sensor networking for the BMDS. Funding ($13.901M) for these FY 2010 accomplishments is reported in prior year budget project XX11. After FY 2011, these activities are funded in the C2BMC program element 0603896C. -Continued round-the-clock sustainment for Communications capabilities associated with AN/TPY-2 -Continued on-site C2BMC support of fielded sites for hardware and software -Continued C2BMC operator training for fielded capabilities -Continued sustaining engineering support and integrated logistics support for fielded hardware and software ***FY 2011 Plans:*** 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	- 0	13.782 0	- 0

Exhibit R-2A, RDT&E Project Justification: PB 2012 Missile Defense Agency		DATE: February 2011
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 Programs ($ in Millions, Article Quantities in Each)	FY 2010	FY 2011	FY 2012
-Continue sustaining engineering support and integrated logistics support for fielded hardware and software ***FY 2012 Plans:*** Funds ($13.988M) and plans are described in C2BMC PE 0603896C, Project MD01			
Title: AN/TPY-2 C2BMC Fielding	-	12.980	-
Articles:	0	0	0
Description: See Description Below			
FY 2010 Accomplishments: The C2BMC program provides network communications to both task AN/TPY-2 radars and pass radar data to BMDS elements. The BCN provides a survivable, robust, diverse and redundant, end-to-end, high availability operational communications network (COMNET) that quickly and unambiguously shares information across the global BMDS. The BCN standardizes BMDS communication systems capabilities at all BMDS locations. 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 shelterized or 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 within the HMMWVs or be remoted in a TOC. The TOC is an expandable 20`x20` room capable of supporting the C2BMC operators. MDA has two HBCN systems: one is supporting Site 512; the second is designated for emergency deployments and disaster recovery.			

Exhibit R-2A, RDT&E Project Justification: PB 2012 Missile Defense Agency		DATE: February 2011
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B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2010	FY 2011	FY 2012
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 for engagement to alleviate the issues associated with 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. 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 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 to the BMDS and GMD Fire Control (GFC). These teleports provide multiple diverse network routing paths to ensure no single points of failure. Funding for FY 2010 accomplishments is reported in prior year budget projects EX11 ($30.106M). After FY 2011, funds and plans for these activities are reported in the C2BMC program element 0603896C. -Acquired Modernization of Enterprise (MET) SATCOM X/Ka-band capability for teleport upgrades in EUCOM -Continued BMDS Communications Systems integration and certifications -Supported exercises and tests of the AN/TPY-2 radar system with the BMDS Communications Networks (HBCN and CDIN transit case support systems) -Initiated communications teleports in the Middle East ***FY 2011 Plans:*** -Complete the development of the Protected Anti-Jam/Anti-Scintillation Net-Centric System (PAAWNS) -Transport and install the first Modernization of Enterprise Terminal (MET) to EUCOM -Integrate and certify BMDS Communications Systems			

Exhibit R-2A, RDT&E Project Justification: PB 2012 Missile Defense Agency		DATE: February 2011
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B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2010	FY 2011	FY 2012
-Support exercises and tests of the AN/TPY-2 radar system with the BMDS Communications Networks (BCN) support systems (HBCN and CDIN) -Continue upgrades to support BCN at the teleports in the EUCOM and CENTCOM AOR`s; Lago Patria, and Ramstein ***FY 2012 Plans:*** Funds ($13.175M) and plans are described in PE 0603896C, Project MD01 -Continue round-the-clock sustainment for Communications capabilities 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			
Title: External Sensors	-	18.942	-
Articles:	0	0	0
Description: See Description Below ***FY 2010 Accomplishments:*** Funding ($17.484M) for these FY 2010 accomplishments is reported in prior year budget project WX11. For FY 2011, funding for the External Sensors Lab remains in the Sensors program element, but is managed by the MDA Directorate of Advanced Technology as the office of primary responsibility (OPR). After 2011, funding for this effort resides in the Advanced Technology program element 0603175C. -Continued to develop and deliver algorithms to utilize sensor data: demonstrated automated reverse cue capability for hit/kill assessment; integrated STSS data as a source into the ESL data stream and demonstrated fusion of STSS data on target of opportunity -Continued to develop software code for operational site -- delivered ESL Baseline Release (EBR) 5.0 code to C2BMC for verification testing: delivered code included Pre-Planned Product Improvement (P3I) upgrade to accommodate the move from obsolete SGI based machine to Linux based machine -Demonstrated precision cue to AN/TPY-2 via C2BMC ***FY 2011 Plans:*** -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			

Exhibit R-2A, RDT&E Project Justification: PB 2012 Missile Defense Agency		DATE: February 2011
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 Programs ($ in Millions, Article Quantities in Each)	FY 2010	FY 2011	FY 2012
-Add capability for Midcourse Radar Cue -Demonstrate fusion of Airborne Infrared (ABIR) data with OPIR data for early intercept ***FY 2012 Plans:*** Funds ($17.560M) and plans are described in Advanced Technology PE 0603175C			
Accomplishments/Planned Programs Subtotals	-	440.023	211.981

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total	FY 2013	FY 2014	FY 2015	FY 2016	Cost To Complete	Total Cost
• 0603175C: *Ballistic Missile Defense Technology*	164.670	132.220	75.003		75.003	103.844	111.712	164.378	170.851	Continuing	Continuing
• 0603881C: *Ballistic Missile Defense Terminal Defense Segment*	690.054	436.482	290.452		290.452	318.745	309.894	340.969	320.638	Continuing	Continuing
• 0603888C: *Ballistic Missile Defense Test and Targets*	737.863	1,113.425	1,071.039		1,071.039	898.680	790.906	787.113	878.215	Continuing	Continuing
• 0603890C: *Ballistic Missile Defense Enabling Programs*	355.870	402.769	373.563		373.563	331.203	314.193	336.749	346.560	Continuing	Continuing
• 0603896C: *BMD C2BMC*	327.074	342.625	364.103		364.103	330.337	353.081	338.835	304.217	Continuing	Continuing
• 0603907C: *SEA BASED X-BAND RADAR (SBX)*	157.739	153.056	177.058		177.058	172.622	162.628	185.934	173.587	Continuing	Continuing
• 0603911C: *BMD EUROPEAN CAPABILITY*	47.342	0.000	0.000		0.000	0.000	0.000	0.000	0.000	0.000	47.342
• 0604884C: *AIRBORNE INFRARED (ABIR)*	0.000	111.671	46.877		46.877	49.948	49.173	33.035	34.249	Continuing	Continuing
• Line Number 35: *BMDS AN/ TPY-2 Radars*	191.081	0.000	380.195		380.195	365.559	376.844	380.715	380.250	Continuing	Continuing

D. Acquisition Strategy

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.

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

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.

MDA will assess the appropriateness of competition for the Clear EWR Upgrade. The Agency has issued a Request for Information (RFI) on performance of this effort.

The Selectable Software work will be performed on the existing AN/TPY-2 development contract.

The BMDS Communications System Complex-Transportable (BCSC-T) Program Plan addresses the design, development, acquisition, testing, integration, activation, and fielding of the BCSC-T. 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.

E. Performance Metrics

NA

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

Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	FY 2011 Cost	FY 2011 Award Date	FY 2012 Base Cost	FY 2012 Base Award Date	FY 2012 OCO Cost	FY 2012 OCO Award Date	FY 2012 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Sensors Directorate Operations Govt Salaries, Travel, Training (MDA Sensors) MD11	MIPR	MDA:AL, VA	12.883	16.784	Oct 2010	15.750	Oct 2011	-		15.750	Continuing	Continuing	Continuing
Sensors Directorate Operations Contractor Support Services, FFRDC/UARC MD11	SS/CPAF	CSS, APL, LL, OGA:AL/ MA/VA/MD	41.155	37.982	Oct 2010	31.580	Oct 2011	-		31.580	Continuing	Continuing	Continuing
Sensors Directorate Operations Other Govt Agencies MD11	MIPR	SMDC:AL	2.382	4.485	Oct 2010	7.647	Oct 2011	-		7.647	Continuing	Continuing	Continuing
Upgrade Clear Early Warning Radar Design Refinement MD11	C/CPAF	Raytheon, Boeing, or Other:MA, AK, AL	-	-		2.497	Dec 2011	-		2.497	0.000	2.497	8.276
Upgrade Clear Early Warning Radar Radar Upgrade -- Prime Contractor MD11	C/CPAF	Raytheon, Boeing, or Other:MA, AK, AL	-	-		3.910	Dec 2011	-		3.910	115.260	119.170	121.960
Upgrade Clear Early Warning Radar Program Office - OGA MD11	MIPR	USAF:Hanscom AFB, MA	-	-		1.755	Dec 2011	-		1.755	10.422	12.177	13.430
Upgrade Clear Early Warning Radar SPA Upgrade MD11	MIPR	USAF:Hanscom AFB, MA	-	-		1.848	Dec 2011	-		1.848	3.741	5.589	6.907
Upgrade Clear Early Warning Radar BCN Upgrades MD11	MIPR	MDA C2BMC / DISA:MA, AK	-	-		15.600	Dec 2011	-		15.600	10.000	25.600	39.479
Upgrade Clear Early Warning Radar DPW Site Activation/ Admin Comms MD11	MIPR	MDA C2BMC:MA, AK	-	-		1.299	Dec 2011	-		1.299	6.316	7.615	9.566
Upgrade Clear Early Warning Radar GMD Fire Control Integration MD11	SS/CPAF	Boeing/Raytheon:MA, AK, AL	-	-		1.366	Nov 2011	-		1.366	12.548	13.914	14.890
Project Oak Project Oak MD11	MIPR	Various:Various	-	-		28.002	Nov 2011	-		28.002	Continuing	Continuing	Continuing
X-Band Basic Program X-Band Software	SS/CPAF	Raytheon:MA	99.854	38.271	Oct 2010	11.216	Oct 2011	-		11.216	0.000	149.341	65.363

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

Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	FY 2011 Cost	FY 2011 Award Date	FY 2012 Base Cost	FY 2012 Base Award Date	FY 2012 OCO Cost	FY 2012 OCO Award Date	FY 2012 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Enhancements/Development MD11													
X-Band Basic Program Wildcat Software Development MD11	SS/CPAF	Raytheon:MA	-	12.000	Oct 2010	-		-		-	0.000	12.000	12.000
X-Band Basic Program Radar Discrimination Capability Common Advanced Algorithm Insertion (Budg Proj CX11) MD11	C/CPAF	Raytheon/Boeing:MA/ AL	11.658	-		-		-		-	0.000	11.658	12.447
X-Band Basic Program DESIM Phase 2&# Spt to TA10, SW mod for SRR MD11	SS/CPAF	Boeing:AL	8.583	-		-		-		-	0.000	8.583	8.583
X-Band Basic Program DESIM Phase 2&3, OSA Sensor model MD11	SS/CPAF	NG:AL	9.362	-		-		-		-	0.000	9.362	9.362
X-Band Basic Program TPY-2 RAFU Kit Install, Production readiness MD11	SS/CPAF	LM, RDEC:AL	0.697	-		-		-		-	0.000	0.697	0.697
X-Band Basic Program Army Hybrid Program Office MD11	MIPR	SMDC:AL	-	-		1.930	Oct 2011	-		1.930	Continuing	Continuing	Continuing
AN/TPY-2 Radar Deployment / Site Activation Site Activation & Deployment MD11	SS/CPAF	Raytheon:OCONUS	16.403	-		14.500	Dec 2011	-		14.500	0.000	30.903	16.382
AN/TPY-2 Radar Deployment / Site Activation DPW Primary Facilities MD11	MIPR	MDA DPW:OCONUS, AL	-	-		3.293	Dec 2011	-		3.293	3.398	6.691	7.120
BMDS Radars Modeling & Simulation (M&S) M&S Program Support MD11	SS/CPAF	Raytheon:MA	-	12.213	Jan 2011	2.650	Nov 2011	-		2.650	99.466	114.329	99.466
BMDS Radars Modeling & Simulation (M&S) VV&A of Models MD11	SS/CPAF	Raytheon:MA	-	11.200	Jan 2011	2.250	Nov 2011	-		2.250	89.401	102.851	89.401

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

Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	FY 2011 Cost	FY 2011 Award Date	FY 2012 Base Cost	FY 2012 Base Award Date	FY 2012 OCO Cost	FY 2012 OCO Award Date	FY 2012 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
BMDS Radars Modeling & Simulation (M&S) Legacy Models Support MD11	SS/CPAF	Raytheon, Boeing:MA, AL	-	0.962	Jan 2011	-		-		-	0.000	0.962	0.962
BMDS Radars Modeling & Simulation (M&S) Warfighter Exercises MD11	SS/CPAF	Raytheon:MA	-	1.596	Jan 2011	-		-		-	6.417	8.013	6.417
Sensors Engineering Sensor Registration MD11	SS/CPAF	Raytheon, Torch:MA, AL	17.053	4.748	Oct 2010	-		-		-	0.000	21.801	4.748
Sensors Engineering Sys Integration & Tech Assessments MD11	SS/CPAF	Raytheon:MA, AL	-	10.085	Oct 2010	1.050	Nov 2011	-		1.050	14.317	25.452	14.317
Sensors Engineering Information Assurance AN/ TPY-2 (C-CLS/GMD CCC/ X00047) MD11	SS/CPAF	Raytheon:MA	-	1.750	Oct 2010	-		-		-	7.000	8.750	7.000
Sensors Engineering Information Assurance SBX (C-CLS/GMD CCC/X00047) MD11	SS/CPAF	Raytheon:MA	-	0.250	Oct 2010	-		-		-	0.000	0.250	0.250
Sensors Engineering BMD Sensor M&S MD11	SS/CPAF	Raytheon, APL, NGC, NTB:MA, MD, VA, AL	10.006	-		-		-		-	0.000	10.006	10.553
Sensors Engineering BMDS Sensors V&V MD11	SS/CPAF	APL, MIT, Raytheon:MD, MA, VA, AL	3.298	-		-		-		-	0.000	3.298	3.298
AN/TPY-2 C2BMC Fielding AN/TPY-2 Teleport MD11	MIPR	DISA, SPAWAR:VA	2.335	7.487	Oct 2010	-		-		-	0.000	9.822	7.487
AN/TPY-2 C2BMC Fielding AN/TPY-2 US Comms/ PAAWNS MD11	MIPR	DISA:VA	-	2.387	Oct 2010	-		-		-	0.000	2.387	2.387
AN/TPY-2 C2BMC Fielding AN/TPY-2 Comms Fielding MD11	MIPR	DISA:VA	3.700	3.106	Oct 2010	-		-		-	0.000	6.806	3.106
	MIPR	PM DCATS, WIN-T, NRDEC, PMRF:VA, CA	9.123	-		-		-		-	0.000	9.123	9.123

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

Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	FY 2011 Cost	FY 2011 Award Date	FY 2012 Base Cost	FY 2012 Base Award Date	FY 2012 OCO Cost	FY 2012 OCO Award Date	FY 2012 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
AN/TPY-2 C2BMC Fielding AN/TPY-2 BMDS Deployable Interface Nodes MD11													
AN/TPY-2 C2BMC Fielding AN/TPY-2 Teleport SATCOM MD11	MIPR	DISA/PM DCATS/ NAVSEA:VA	23.479	-		-		-		-	0.000	23.479	15.669
AN/TPY-2 C2BMC Fielding AN/TPY-2 Comms Modems MD11	MIPR	DISA:VA	4.110	-		-		-		-	0.000	4.110	4.110
External Sensors External Sensors - Prime MD11	SS/CPAF	NG (RaPID):CO	13.920	13.148	Oct 2010	-		-		-	0.000	27.068	13.148
External Sensors Independent Analysis for ESL MD11	MIPR	NSWC-DD:VA	0.798	1.103	Oct 2010	-		-		-	0.000	1.901	1.103
External Sensors Truth Sources / Advanced Algorithms MD11	MIPR	NASIC (WPAFB):OH	0.798	0.552	Oct 2010	-		-		-	0.000	1.350	0.552
External Sensors ESL Support MD11	SS/CPAF	MDIOC:CO	1.064	1.324	Oct 2010	-		-		-	0.000	2.388	1.324
External Sensors Site 2 MD11	MIPR	Site 2:CO	-	1.103	Oct 2010	-		-		-	0.000	1.103	1.103
External Sensors Technical Expertise MD11	SS/CPAF	SCITEC STTR:CO	0.532	0.717	Oct 2010	-		-		-	0.000	1.249	0.717
External Sensors Site 15 MD11	MIPR	Site 15:CO	-	0.552	Oct 2010	-		-		-	0.000	0.552	0.552
External Sensors FFRDC MD11	SS/CPAF	FFRDC:CO	0.372	0.443	Oct 2010	-		-		-	0.000	0.815	0.443
		Subtotal	293.565	184.248		148.143		-		148.143			

Remarks

Note: Project Oak is described at a higher level of classification.

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

Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	FY 2011 Cost	FY 2011 Award Date	FY 2012 Base Cost	FY 2012 Base Award Date	FY 2012 OCO Cost	FY 2012 OCO Award Date	FY 2012 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
BMDS Radars (Sustainment) AN/TPY-2 #2 CLS (Shariki) MD11	SS/CPAF	Raytheon:MA	-	27.937	Dec 2010	-		-		-	164.703	192.640	223.021
BMDS Radars (Sustainment) AN/TPY-2 #3 CLS (Site 512) MD11	SS/CPAF	Raytheon:MA	-	27.671	Dec 2010	-		-		-	157.435	185.106	215.003
BMDS Radars (Sustainment) AN/TPY-2 #4 CLS (PAA) MD11	SS/CPAF	Raytheon:MA	-	-		-		-		-	128.535	128.535	155.452
BMDS Radars (Sustainment) AN/TPY-2 #4 Refurbishment MD11	SS/CPAF	Raytheon:MA	12.758	12.442	Dec 2010	-		-		-	0.000	25.200	12.442
BMDS Radars (Sustainment) AN/TPY-2 #6 CLS (FBM @site TBD) MD11	SS/CPAF	Raytheon:MA	-	22.530	Dec 2010	-		-		-	163.851	186.381	220.208
BMDS Radars (Sustainment) AN/TPY-2 #1 CLS (Test Asset) MD11	SS/CPAF	Raytheon:MA	-	-		-		-		-	33.761	33.761	40.642
BMDS Radars (Sustainment) AN/TPY-2 #5 CLS (THAAD) MD11	SS/CPFF	Raytheon:MA	-	11.523	Dec 2010	-		-		-	91.347	102.870	116.105
BMDS Radars (Sustainment) AN/TPY-2 #7 CLS (THAAD) MD11	SS/CPAF	Raytheon:MA	-	11.356	Dec 2010	-		-		-	85.287	96.643	109.878
BMDS Radars (Sustainment) Army Hybrid Program Office MD11	MIPR	SMDC:AL	0.750	1.580	Dec 2010	-		-		-	7.802	10.132	11.563
BMDS Radars (Sustainment) AN/TPY-2 Radars Operation & Sustainment MD11	SS/CPAF	Raytheon:MA	47.182	-		-		-		-	0.000	47.182	68.301
BMDS Radars (Sustainment) AN/TPY-2 #2 Shariki Site Support MD11	MIPR	US Army:Japan	0.800	-		-		-		-	0.000	0.800	0.800
	SS/FPIF	Raytheon:MA	8.800	-		-		-		-	0.000	8.800	8.800

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

Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	FY 2011 Cost	FY 2011 Award Date	FY 2012 Base Cost	FY 2012 Base Award Date	FY 2012 OCO Cost	FY 2012 OCO Award Date	FY 2012 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
BMDS Radars (Sustainment) AN/TPY-2 PPU Refurbishment/Retrofit MD11													
BMDS Radars (Sustainment) AN/TPY-2 Parts International Transportation MD11	MIPR	TACS HDAC Distro:CA	1.779	-		-		-		-	0.000	1.779	1.830
BMDS Radars (Sustainment) AN/TPY-2 Fire Unit Radar Compliance Validation MD11	SS/CPAF	GDIT:AL	0.176	-		-		-		-	0.000	0.176	0.176
BMDS Radars (Sustainment) GBR-P Caretaker MD11	SS/CPAF	Raytheon:CA	1.112	-		-		-		-	0.000	1.112	1.112
UEWR (Beale, Fylingdales, Thule) & COBRA DANE Sustainment COBRA DANE Upgrade Sustainment MD11	SS/FFP	Raytheon:MA	5.267	7.900	Jan 2011	-		-		-	0.000	13.167	7.900
UEWR (Beale, Fylingdales, Thule) & COBRA DANE Sustainment UEWR-CD Common Mission Software Sustainment MD11	SS/CPAF	Raytheon:MA	7.792	7.184	Jan 2011	-		-		-	0.000	14.976	7.184
UEWR (Beale, Fylingdales, Thule) & COBRA DANE Sustainment UEWR-CD Program Office Support MD11	MIPR	Hanscom AFB:MA	6.591	7.577	Jan 2011	-		-		-	34.106	48.274	49.202
UEWR (Beale, Fylingdales, Thule) & COBRA DANE Sustainment Thule Sustainment MD11	SS/CPAF	Raytheon:MA	1.000	-		-		-		-	0.000	1.000	1.000
BMDS Radars Communications (Sustainment) AN/TPY-2 Comms Sustainment MD11	SS/CPAF	Lockheed Martin Team, DISA:VA	13.067	13.782	Oct 2010	-		-		-	0.000	26.849	27.683
		Subtotal	107.074	151.482		-		-		-	866.827	1,125.383	1,278.302

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

Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	FY 2011 Cost	FY 2011 Award Date	FY 2012 Base Cost	FY 2012 Base Award Date	FY 2012 OCO Cost	FY 2012 OCO Award Date	FY 2012 Total Cost	Cost To Complete	Total Cost	Target Value of Contract

Remarks

In FY 2012, operations and sustainment of UEWR/CD and AN/TPY-2 Radars (CLS) move to O&M appropriation.

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	FY 2011 Cost	FY 2011 Award Date	FY 2012 Base Cost	FY 2012 Base Award Date	FY 2012 OCO Cost	FY 2012 OCO Award Date	FY 2012 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
BMDS Level Testing AN/ TPY-2 FT & GT MD11	SS/CPAF	Raytheon:MA	23.907	23.052	Dec 2010	24.715	Dec 2011	-		24.715	186.639	258.313	244.936
BMDS Level Testing UEWR/ CD FT & GT MD11	SS/CPAF	Raytheon, Boeing:MA,AL	5.347	10.313	Dec 2010	15.500	Dec 2011	-		15.500	122.539	153.699	155.189
BMDS Level Testing Thule Upgrade FT & GT MD11	SS/CPAF	Raytheon, Boeing:MA/ AL	4.370	2.260	Dec 2010	1.120	Dec 2011	-		1.120	5.331	13.081	8.881
BMDS Level Testing SBX FT & GT MD11	SS/CPAF	Raytheon, Boeing:MA/ AL	12.630	15.445	Dec 2010	6.328	Dec 2011	-		6.328	27.753	62.156	50.483
BMDS Level Testing External Sensors Lab FT & GT Support MD11	SS/CPAF	NG, MDIOC:CA, CO	-	1.248	Dec 2010	0.977	Dec 2011	-		0.977	5.106	7.331	7.479
BMDS Level Testing Digital Signal Injection MD11	SS/CPAF	Raytheon:MA	12.898	-		-		-		-	0.000	12.898	12.898
BMDS Level Testing Warfighter Exercises MD11	SS/CPAF	Raytheon:MA	1.317	-		-		-		-	0.000	1.317	1.317
BMDS Level Testing Thule CTTO Infrastructure MD11	SS/CPAF	Boeing:AL	8.781	-		-		-		-	0.000	8.781	8.781
BMDS Level Testing UEWR CTTO Infrastructure MD11	SS/CPAF	Boeing:AL	4.037	-		-		-		-	0.000	4.037	10.537
BMDS Level Testing X-Band Simulator Tester MD11	SS/CPAF	Raytheon :MA	5.180	-		-		-		-	0.000	5.180	5.180
BMDS Level Testing SBX Infrastructure MD11	SS/CPAF	Raytheon:MA	4.390	-		-		-		-	0.000	4.390	4.390
Element Test and Infrastructure TPY-2 SSF	SS/CPAF	Raytheon:MA	-	6.368	Dec 2010	7.382	Dec 2011	-		7.382	43.228	56.978	57.937

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

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	FY 2011 Cost	FY 2011 Award Date	FY 2012 Base Cost	FY 2012 Base Award Date	FY 2012 OCO Cost	FY 2012 OCO Award Date	FY 2012 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Integration & Infrastructure, Sys Test Lab MD11													
Element Test and Infrastructure UEWR/CD SSF Integration & Infrastructure, Sys Test Lab MD11	SS/CPAF	Boeing, Raytheon:AL, MA	-	1.170	Nov 2010	4.215	Nov 2011	-		4.215	27.090	32.475	33.022
Element Test and Infrastructure ESL SSF Integration MD11	MIPR	AFSPC:CO	-	0.646	Dec 2010	0.343	Dec 2011	-		0.343	1.709	2.698	2.742
Element Test and Infrastructure SBX SSF Integration & Infrastructure, Sys Test Lab MD11	SS/CPAF	Boeing:AL	-	6.431	Dec 2010	2.660	Dec 2011	-		2.660	11.426	20.517	20.862
Element Test and Infrastructure Thule SSF Integration & Sys Test Lab MD11	SS/CPAF	Boeing:AL	-	1.500	Dec 2010	0.598	Dec 2011	-		0.598	2.473	4.571	4.649
BMDS Radars Concurrent Test, Training & Operations (CTTO) Infrastructure AN/TPY-2 SSF/CTTO/RDSIS Upgrade MD11	SS/CPAF	Raytheon:MA	-	29.860	Jan 2011	-		-		-	5.587	35.447	39.962
BMDS Radars Concurrent Test, Training & Operations (CTTO) Infrastructure X-Band Simulator Tester (XST) MD11	SS/CPAF	Raytheon:MA	-	6.000	Jan 2011	-		-		-	53.761	59.761	59.761
		Subtotal	82.857	104.293		63.838		-		63.838	492.642	743.630	729.006

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	FY 2011 Cost	FY 2011 Award Date	FY 2012 Base Cost	FY 2012 Base Award Date	FY 2012 OCO Cost	FY 2012 OCO Award Date	FY 2012 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
		Subtotal	-	-		-		-		-	0.000	0.000	0.000

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

	Total Prior Years Cost	FY 2011		FY 2012 Base		FY 2012 OCO		FY 2012 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	483.496	440.023		211.981		-		211.981			

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2012 Missile Defense Agency		DATE: February 2011
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*

Exhibit R-4, RDT&E Schedule Profile: PB 2012 Missile Defense Agency		DATE: February 2011
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*

Exhibit R-4, RDT&E Schedule Profile: PB 2012 Missile Defense Agency		DATE: February 2011
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*

Exhibit R-4A, RDT&E Schedule Details: PB 2012 Missile Defense Agency		DATE: February 2011
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*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
Performance Assessment PA09	1	2010	1	2010
Air Force Acceptance of VCN-2 (Beale, Fylingdales, Thule)	1	2010	1	2010
Deliver Prime Power Unit (PPU) #3	2	2010	2	2010
AN/TPY-2 CEU Refurbishment	2	2010	3	2010
Complete AN/TPY-2 CX-1 Formal Qualification Test (FQT)	2	2010	4	2010
Conduct V&V of CX-1	2	2010	4	2010
Deliver PPU #4	3	2010	3	2010
Deliver PPU #5	3	2010	3	2010
AN/TPY-2 #5 Limited User Test	3	2010	3	2010
Begin Refurbishment of AN/TPY-2 Radar #4	3	2010	3	2010
Manufacture AN/TPY-2 #7 Hardware Complete	3	2010	3	2010
AN/TPY-2 #7 Delivery to THAAD	4	2010	4	2010
AN/TPY-2 #5 Reliability Test	4	2010	4	2010
Technical Assessment TA10	4	2010	4	2010
Deliver PPU #6	4	2010	4	2010
AN/TPY-2 BMDS Deployable Comms Suites	4	2010	4	2010
Initiate Development of Advanced Processor Platform	2	2011	2	2011
Deliver UEWR Simulator Tester (Beale, Fylingdales, Thule)	4	2011	4	2011
Sidecar for SBX Delivered (Software Delivery)	4	2011	4	2011
Complete AN/TPY-2 Radar #4 Refurbishment	4	2011	4	2011
GMD Intercept Flight Test FTG-08 (SBX, AN/TPY-2, UEWR/CD)	2	2012	2	2012
Aegis Flight Test FTM-23 (AN/TPY-2)	3	2012	3	2012

Exhibit R-4A, RDT&E Schedule Details: PB 2012 Missile Defense Agency		DATE: February 2011
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*

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
THAAD Flight Test FTT-13 (SBX, AN/TPY-2)	3	2012	3	2012
FTO-1	4	2012	4	2012
THAAD Flight Test FTT-15	2	2013	2	2013
Aegis Flight Test FTM-19E1 (AN/TPY-2)	3	2013	3	2013
THAAD Flight Test FTT-16 (AN/TPY-2)	4	2013	4	2013
Aegis Flight Test FTM-20E1 (AN/TPY-2)	4	2013	4	2013
GMD Intercept Flight Test FTG-13 (SBX, AN/TPY-2)	4	2013	4	2013
THAAD Flight Test FTT-17 (AN/TPY-2)	2	2014	2	2014
Aegis Flight Test A FTM 01 E2 (AN/TPY-2)	3	2014	3	2014
Flight Test Experiment FTX-10 (CD)	3	2014	3	2014
GMD Intercept Flight Test FTG-11 (SBX)	4	2014	4	2014
Flight Test Experiment FTX-14 (AN/TPY-2)	1	2015	1	2015
FTO-2 (SBX, AN/TPY-2)	3	2015	3	2015
Aegis Flight Test FTM-24 (AN/TPY-2)	4	2015	4	2015
GMD Intercept Flight Test FTG-17 (SBX, AN/TPY-2)	3	2016	3	2016
THAAD Flight Test FTT-19 (AN/TPY-2)	3	2016	3	2016

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

COST ($ in Millions)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total	FY 2013	FY 2014	FY 2015	FY 2016	Cost To Complete	Total Cost
ZX40: *Program-Wide Support*	55.681	-	-	-	-	-	-	-	-	0.000	55.681
Quantity of RDT&E Articles	0	0	0		0	0	0	0	0		

A. Mission Description and Budget Item Justification

Project ZX40 has been transferred project MD40.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2010	FY 2011	FY 2012
Title: Civilian Salaries and Support	55.681	-	-
Articles:	0		
Description: See Description Below			
FY 2010 Accomplishments: NA			
Accomplishments/Planned Programs Subtotals	55.681	-	-

C. Other Program Funding Summary ($ in Millions)

N/A

D. Acquisition Strategy

NA

E. Performance Metrics

NA

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

COST ($ in Millions)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total	FY 2013	FY 2014	FY 2015	FY 2016	Cost To Complete	Total Cost
MD40: *Program-Wide Support*	-	14.836	10.393	-	10.393	14.964	15.098	13.613	14.874	Continuing	Continuing
Quantity of RDT&E Articles	0	0	0		0	0	0	0	0		

A. Mission Description and Budget Item Justification

Program-Wide Support (PWS) contains non-headquarters management costs in support of MDA functions and activities across the entire Ballistic Missile Defense System (BMDS). Includes Government Civilians, Advisory and Assistance Services, and Federally Funded Research and Development Contracts (FFRDC) providing integrity and oversight of the BMDS as well as supporting MDA in enabling the development and evaluation of technologies that will respond to the changing threat. Other costs included provide facility capabilities for MDA Executing Agent locations (with the exception of Federal Office Building 2 after FY 2011), such as physical and technical security, legal services, travel and agency training, office and equipment leases, rents and utilities, data and unified communications support, supplies and maintenance, and similar operating expenses. Also includes legal settlements, and foreign currency fluctuations on a limited number of foreign contracts.
In keeping with congressional intent, PWS is allocated among the PEs on a pro-rata basis and therefore fluctuates by year based on the total MDA budget and the individual PE`s budget amount.

Funding for the FY 2010 accomplishments is reported in prior year budget project ZX40 ($56,621).

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2010	FY 2011	FY 2012
Title: Civilian Salaries and Support	-	14.836	10.393
Articles:	0	0	0
Description: See Description Below			
FY 2010 Accomplishments: Funding for the FY 2010 accomplishments is reported in prior year budget project ZX40 ($56,621).			
FY 2011 Plans: See paragraph A, Mission Description and Budget Item Justification			
FY 2012 Plans: See paragraph A, Mission Description and Budget Item Justification			
Accomplishments/Planned Programs Subtotals	-	14.836	10.393

Exhibit R-2A, RDT&E Project Justification: PB 2012 Missile Defense Agency		DATE: February 2011
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)

N/A

D. Acquisition Strategy

N/A

E. Performance Metrics

NA