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

APPROPRIATION/BUDGET ACTIVITY				R-1 ITEM NOMENCLATURE							
0400: <i>Research, Development, Test & Evaluation, Defense-Wide</i> BA 4: <i>Advanced Component Development & Prototypes (ACD&P)</i>				PE 0603896C: <i>BMD C2BMC</i>							
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	327.074	342.625	364.103	-	364.103	330.337	353.081	338.835	304.217	Continuing	Continuing
BX01: <i>Ballistic Missile Defense C2BMC Block 2.0</i>	25.738	-	-	-	-	-	-	-	-	0.000	25.738
CX01: <i>Ballistic Missile Defense C2BMC Block 3.0</i>	247.801	-	-	-	-	-	-	-	-	0.000	247.801
WX01: <i>BC Capability Development</i>	0.729	-	-	-	-	-	-	-	-	0.000	0.729
XX01: <i>Command & Control, Battle Management, Communications (C2BMC) Sustainment</i>	42.561	-	-	-	-	-	-	-	-	0.000	42.561
MD01: <i>Command & Control, Battle Management, Communications (C2BMC)</i>	-	331.155	286.456	-	286.456	250.406	269.854	241.408	219.247	Continuing	Continuing
MX01: <i>Command & Control, Battle Management, Communications (C2BMC) Development Support</i>	-	-	62.725	-	62.725	66.095	67.386	82.937	72.003	0.000	351.146
ZX40: <i>Program-Wide Support</i>	10.245	-	-	-	-	-	-	-	-	0.000	10.245
MD40: <i>Program-Wide Support</i>	-	11.470	14.922	-	14.922	13.836	15.841	14.490	12.967	Continuing	Continuing

Note

In accordance with the Missile Defense Agency revised budget structure, the content previously planned in Budget Project CX01 is captured in Budget Project MD01 beginning in FY 2011. The content previously planned in Budget Project XX01 is captured in Budget Project MD01 in FY 2011 and MX01 beginning in FY 2012.

A. Mission Description and Budget Item Justification

The Ballistic Missile Defense Command and Control, Battle Management, and Communications (C2BMC) Program establishes the System by linking together the external sensors and weapons of independent Elements into a layered missile defense system such that the whole is more capable and robust than the sum of its parts -- thus increasing the footprint of the BMDS with greater performance and defensive coverage. The C2BMC enables the BMDS to manage complex threats -- near simultaneous enemy missile shots aimed at theater, regional, or homeland assets. The systems linked through C2BMC include Phased Array Tracking Radar Intercept on Target (PATRIOT), Terminal High Altitude Area Defense (THAAD), Aegis Ballistic Missile Defense (BMD), Ground Based Midcourse Defense (GMD); and sensors such as the Army/Navy/Transportable Radar Surveillance model 2 (AN/TPY-2) radar, Sea-Based X-Band Radar (SBX), Space-Based Infrared System (SBIRS), and BMDS Overhead Persistent Infra-Red (OPIR) Architecture (BOA). In FY 2011, deploy to Central Command (CENTCOM) a complete C2BMC capability

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including equipment, communications, and training. The C2BMC Program will ship a C2BMC Deployable Interface Node (CDIN), deploy and set up the CDIN, install a Spiral 6.2 suite, support hardware-in-the-loop (HWIL) integration testing, provide operations and sustainment, and add a training suite in CENTCOM.

One of the best ways to dissuade, deter, and defeat ballistic missile threats is through integrated ballistic missile defense capabilities: weapons; sensors; and command and control, battle management, and communications. A potential or actual attack may cross regions and may fly higher and faster than stand-alone, autonomous capabilities operated by a single Military Service can defend against. Integrated BMD capabilities draw on space-, land-, and sea-based assets operated by multiple Services to provide the best sensor information about the enemy missiles location and track and a more diverse and effective set of weapon options to be used by the Combatant Commander to defeat the attack; with all connected by a unifying C2BMC system. As a result, an effort funded in a Program Element may be critical to the success of efforts in other Program Elements. These connections are referred to as interdependencies.

C2BMC Program provides:

- Communications links and connectivity between BMDS Elements
- Battle management function that allows a shoot/look/shoot approach maximizing BMDS effectiveness while minimizing the number of weapons expended. It is important to note that C2BMC provides a battle management function; it does not have a fire control system
- Control of the BMDS radars, taking data from multiple sensors tracking the same threat, and correlating it into one optimal track for BMDS Element's fire control
- Real-time awareness of the battle as it unfolds to include interoperability with North Atlantic Treaty Organization (NATO) in support of the Phased Adaptive Approach.
- Advanced battle planning capability which enables warfighters to place BMDS assets in ideal locations in anticipation of an upcoming battle.

The C2BMC Program has integrated six BMDS Elements (GMD, Aegis BMD, THAAD, SBIRS, Sensors, and Patriot) and Coalition Partners; is in 33 locations with 12 customers in 17 time zones; has deployed over 800 pieces of equipment and Satellite Communications (SATCOM) using three frequency bands; has stood up over 70 crew positions; trains over 700 operators, maintenance personnel, and testers per year; and is supported by over 48,000 miles of Defense Information Systems Agency (DISA) communication lines.

The C2BMC Program provides quality, safety, and mission assurance operations to ensure compliance with Agency requirements for design, test, manufacturing, quality, safety, and reliability.

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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 0603896C: <i>BMD C2BMC</i>
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C2BMC provides the capabilities for leaders at multiple levels of command to see, assess, and react to ballistic missile threats. C2BMC capabilities, consistent with the Strategic Command (STRATCOM) FY 2010 Prioritized Capabilities List (PCL), are provided through four capability areas: BMD Planner, Situational Awareness, Global Engagement Manager (GEM), and BMD Communications Network.

- BMD Planner: The Planner provides warfighters the capability to explore the effectiveness of various defensive designs in order to plan the most effective defense by optimizing the location and mix/pairing of sensors and interceptors. The Planner is flexible enough to allow the warfighter to function in the three modes of activity: Deliberate Planning (24-36 months before a battle), Crisis Action Planning (hours or days before an attack based on updated information), and Dynamic Planning (near real-time agility for changing situations). System models used in the Planner today include the GMD system used to defend the U.S.; and the AN/TPY-2 radar, Aegis BMD, PATRIOT, and THAAD systems used to defend against theater missile attacks.

- Situational Awareness: This capability is used to turn detailed data into usable information that commanders can act on in the event of a missile defense threat. Situational Awareness information is provided by the Combatant Commands Command and Control (COCOM C2) screens (displays and decision aids). Situational Awareness display emphasizes a common ballistic missile picture and summary screens used at the Presidential level down to the operational level of command. The systems available today include an interface with the Ground Based Midcourse Defense (GMD) fire control, THAAD, Aegis BMD and PATRIOT via Link 16; sensor management control of the AN/TPY-2 radar, and a direct data connection to SBIRS information.

- Global Engagement Manager (GEM): The GEM provides the first true BMDS battle management capability through C2BMC. GEM provides the foundation for various BMD Elements and external sensors and interceptors to work synergistically for optimal performance. The GEM will provide enhanced sensor management control of world-wide X-band radars allowing for the control of multiple AN/TPY-2 radars within a given region beginning in 2011. Currently sensor management control is limited to a single TPY-2 radar. GEM will utilize OPIR data for boost phase cueing on AN/TPY-2. Prototype control concepts to task advanced Airborne Infrared (ABIR) sensors for early intercept cueing using GEM will be matured in the 2011-2012 timeframe. In addition to automated sensor tasking, advanced battle management algorithms will be developed that assign a specific sensor to a specific track, calculate the most likely track of an incoming missile, and display automated battle management decision aides (ABMAs) to the warfighter to assist in determining the highest priority threats in a raid environment. The warfighter operator will have the ability to direct missile engagements with BMD elements on a command by exception basis using these new GEM situational awareness displays, thus maximizing the probability of hit to kill. GEM will utilize existing interfaces and functionality of BMDS weapons and sensors to provide these battle management capabilities.

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- BMD Communications Network: The BMD Communications Network ties together sensors (both BMDS radars and space sensors) and weapons systems via the Combatant Commands Command and Control screens and GEM, thereby enabling the National Command Authority and the commanders at the strategic, theater and tactical levels to optimally engage ballistic missile threats at any range, in any phase of flight, at any time including near simultaneous theater, regional and homeland attacks. The BMD Communications Network builds on existing and new global grid data and communications networks to provide a robust, end-to-end, high availability, operational communications network (COMNET) infrastructure that quickly and unambiguously shares information across the global BMDS. This sharing of information is performed securely with special emphasis on preventing cyber attack via a BMDS Network Operations and Security Center (BNOSC). Effective networking management and operations relies on the ability to manage, coordinate, and integrate a wide variety of equipment platforms, interfaces with other DoD communications systems, existing/evolving information standards and capabilities, and adherence to DoD Information Assurance Certification and Accreditation Process (DIACAP). Defense Information Systems Agency (DISA) services are also highly leveraged in providing world-wide communications.

The C2BMC Program employs a robust incremental development program to deliver enhanced and new capabilities to the warfighter. Each incremental delivery (identified using the generic nomenclature of Spiral x.# (e.g., Spiral 6.4) includes the software, hardware, and network connectivity needed to operate the BMDS.

The C2BMC Program includes support for and analysis of BMDS-level wargames and tests with fielded capabilities. The delivery of a new capability has been replanned to coincide with the new Phased Adaptive Approach (PAA) system architecture. PAA-1 is implemented by Spiral 6.4C and PAA-2 is implemented through future Spirals. Therefore multiple capability increments are in staggered stages of development at any time. Typically one spiral will be in operations with the second spiral in the testing stage and the third spiral in engineering design and development. The key test event for development is start of Cycle 2, Simulation-Based Verification, when software completes internal C2BMC development and begins testing with other BMDS Elements. Completion of Cycle 5, Site Activation Testing, coupled with successful participation in BMDS ground test campaigns, signals delivery of fully functioning operational software. This provides the warfighter with a continuous stream of improvements to meet the evolving threat.

The C2BMC Program provides the program office personnel to manage the BMDS Concurrent Test Training and Operations (CTTO) activities. CTTO is responsible for providing warfighters the means to train using high-fidelity simulations of realistic scenarios while using operational (deployed) equipment and networks. The key is to safely separate training events from real-world operations (i.e., allowing the warfighter to train on the same equipment they will use in a real battle).

The C2BMC Program provides the program office personnel to manage the development and implementation of Distributed Multi-Echelon Training System (DMETS), a capability which enables warfighters to train where they fight by generating realistic, interactive, threat scenarios that address all phases of the kill chain and varied sensor/shooter combinations. The system allows for scalable training of the BMDS using a parallel architecture either physically or logically separated from the operational one.

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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 0603896C: <i>BMD C2BMC</i>
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To provide capabilities to defend the territory of the United States against ballistic missile threats from rogue nations and accidental or unauthorized launches, and to enhance missile defense to defend our deployed forces, allies, and friends against regional threats including defeating large raid sizes and intercepting early in flight the C2BMC program will:

- Add 2 EUCOM ground nodes and satellite terminals to support BMD Communications Network for Phased Adaptive Approach (PAA)
- Enhance contingency/crisis action planning for Defended Area, Operating Area, and Scenario analysis, incorporate the effects of earth rotation, update/distribute BMD Element and threat system reference data, import intelligence data from the Modernized Integrated Database (MIDB), trailer radar search sectors, and integrate 3D mapping, display, and analysis tools into a single user interface
- Provide situational awareness to support command and control at Combatant Commands (COCOMs) and the National Military Command Center (NMCC) via a common set of display components with views tailored based on user needs
- Field initial Global Engagement Manager (GEM) capability at the Kenney Air Operations Center (Hickam Air Force Base, Hawaii)
- Improve system reliability and availability to support test and operations by implementing a continuity of operations GEM at the MDIOC
- Provide BMD Planner and Situational Awareness capability that fully incorporates intelligence information
- Provide initial interfaces between weapons and sensors compatible with DoD network-centric service-oriented architecture
- Provide updated C2BMC model (BCM) (key component of the BMD Distributed Simulation Architecture) for system-level performance assessments. Validate BCM represents operational C2BMC performance by utilizing the GT-04 campaign of test events to collect Critical Engagement Conditions (CECs) and Empirical Measurement Events (EMEs) verification data

Sustainment

- Sustain worldwide C2BMC operational capability 24 hours a day, 7 days a week, 365 days a year-- on site personnel supporting 33 locations, across 17 time zones, and over 800 pieces of equipment. Additional Navy Maritime Operating Center installations are planned in FY 2011. EUCOM is planned to be added in FY 2012, in accordance with National Command Authority, Combatant Command requirements, and DoD execution orders.
- The 33 locations supported are:
 - U.S. Forces Korea (USFK); U.S. Forces Japan (USFJ); Shariki, Japan; Pacific Command (PACOM) at Camp Smith, HI; Air Operations Center (AOC) at Hickam Air Force Base (AFB), HI; Defense Information Systems Agency Defense Enterprising Computing Center (DISA DECC) Pacific; U.S. Pacific Fleet (PACFLT), HI; Pacific Missile Range Facility (PMRF), HI; Fort Greely, Alaska (FGA); Alaska Command (ALCOM); Vandenberg AFB, CA; 32nd Army Air and Missile Defense Command (AAMDC), TX; Cheyenne Mountain Air Force Station (CMAFS), CO; Peterson AFB, CO; Missile Defense Integration and Operations Center (MDIOC) at Shriever AFB, CO; Huntsville, AL (Von Braun II); Central Command (CENTCOM), Tampa, FL; South Carolina National Guard (SCNG); Pentagon; White House; MDA; Missile Defense National Team (MDNT); Navy Europe (NAVEUR); Israel; Stuttgart, DE; Ramstein Air Base (AB), DE; Patch and Rhine Ord Barracks, DE; and the United Kingdom (4 sites), Navy Maritime Operating Centers
 - Provide 24 hours a day, 7 days a week, 365 days a year help desk (Control Center at the MDIOC) for real-time issue resolution

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BA 4: <i>Advanced Component Development & Prototypes (ACD&P)</i>	

- Develop curriculum and provide C2BMC operator, maintenance personnel, and tester training on C2BMC equipment and capabilities (approximately 700 people per year)
- Lease communication lines via Defense Information Systems Agency (DISA) for global BMD Network Communications

FY12 budget request recognizes that historical execution rates will result in FY11 funds available to support in FY12. The accomplishments reflect the use of the FY11 funding in addition to the FY12 request.

B. Program Change Summary (\$ in Millions)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total
Previous President's Budget	334.734	342.625	364.085	-	364.085
Current President's Budget	327.074	342.625	364.103	-	364.103
Total Adjustments	-7.660	-	0.018	-	0.018
• Congressional General Reductions		-			
• Congressional Directed Reductions		-			
• Congressional Rescissions	-	-			
• Congressional Adds		-			
• Congressional Directed Transfers		-			
• Reprogrammings	-2.215	-			
• SBIR/STTR Transfer	-4.940	-			
• Other Adjustment Detail	-0.505	-	0.018	-	0.018

Change Summary Explanation

The FY 2012 \$0.018 million increase is the result of \$17.429 million in efficiency savings and MDA programmatic changes.

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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 0603896C: <i>BMD C2BMC</i>	PROJECT BX01: <i>Ballistic Missile Defense C2BMC Block 2.0</i>
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COST (\$ in Millions)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total	FY 2013	FY 2014	FY 2015	FY 2016	Cost To Complete	Total Cost
BX01: <i>Ballistic Missile Defense C2BMC Block 2.0</i>	25.738	-	-	-	-	-	-	-	-	0.000	25.738
Quantity of RDT&E Articles	0	0	0		0	0	0	0	0		

Note

Project BX01 has been transferred to project MD01

A. Mission Description and Budget Item Justification

Project BX01 has been transferred to project MD01

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

	FY 2010	FY 2011	FY 2012
Title: See Project MD01 for FY 2010 Accomplishments	25.738	-	-
Articles:	0	0	0
Description: See Description Below			
FY 2010 Accomplishments: See Project MD01 for FY 2010 Accomplishments			
FY 2011 Plans: N/A			
FY 2012 Plans: N/A			
Accomplishments/Planned Programs Subtotals	25.738	-	-

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

N/A

D. Acquisition Strategy

NA

E. Performance Metrics

NA

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

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 0603896C: <i>BMD C2BMC</i>	PROJECT CX01: <i>Ballistic Missile Defense C2BMC Block 3.0</i>
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COST (\$ in Millions)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total	FY 2013	FY 2014	FY 2015	FY 2016	Cost To Complete	Total Cost
CX01: <i>Ballistic Missile Defense C2BMC Block 3.0</i>	247.801	-	-	-	-	-	-	-	-	0.000	247.801
Quantity of RDT&E Articles	0	0	0		0	0	0	0	0		

A. Mission Description and Budget Item Justification

Project CX01 has been transferred to project MD01

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

	FY 2010	FY 2011	FY 2012
Title: See Project MD01 for FY 2010 Accomplishments	247.801	-	-
Articles:	0	0	0
Description: See Description Below			
FY 2010 Accomplishments: See Project MD01 for FY 2010 Accomplishments			
FY 2011 Plans: FY 2011 Plans are in budget project MD01			
FY 2012 Plans: FY 2012 Plans are in budget project MD01			
Accomplishments/Planned Programs Subtotals	247.801	-	-

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

N/A

D. Acquisition Strategy

NA

E. Performance Metrics

NA

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COST (\$ in Millions)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total	FY 2013	FY 2014	FY 2015	FY 2016	Cost To Complete	Total Cost
WX01: <i>BC Capability Development</i>	0.729	-	-	-	-	-	-	-	-	0.000	0.729
Quantity of RDT&E Articles	0	0	0		0	0	0	0	0		

A. Mission Description and Budget Item Justification

Project WX01 has been transferred to project MD01 for FY 2010

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

	FY 2010	FY 2011	FY 2012
Title: See Project MD01 for FY 2010 Accomplishments	0.729	-	-
Articles:	0	0	0
Description: See Description Below			
FY 2010 Accomplishments: See Project MD01 for FY 2010 Accomplishments			
FY 2011 Plans: N/A			
FY 2012 Plans: N/A			
Accomplishments/Planned Programs Subtotals	0.729	-	-

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

N/A

D. Acquisition Strategy

NA

E. Performance Metrics

NA

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COST (\$ in Millions)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total	FY 2013	FY 2014	FY 2015	FY 2016	Cost To Complete	Total Cost
XX01: <i>Command & Control, Battle Management, Communications (C2BMC) Sustainment</i>	42.561	-	-	-	-	-	-	-	-	0.000	42.561
Quantity of RDT&E Articles	0	0	0		0	0	0	0	0		

Note

Project XX01 has been transferred to project MD01 in FY 2011 and project MX01 in FY 2012 - FY 2016

A. Mission Description and Budget Item Justification

Project XX01 has been transferred to project MD01 in FY 2011 and project MX01 in FY 2012 - FY 2016

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

	FY 2010	FY 2011	FY 2012
Title: See Project MD01 for FY 2010 Accomplishments	42.561	-	-
Articles:	0	0	0
Description: See Description Below			
FY 2010 Accomplishments: See Project MD01 for FY 2010 Accomplishments			
FY 2011 Plans: FY 2011 Plans are in budget project MD01			
FY 2012 Plans: FY 2012 Plans are in budget project MX01			
Accomplishments/Planned Programs Subtotals	42.561	-	-

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

N/A

D. Acquisition Strategy

NA

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E. Performance Metrics

NA

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COST (\$ in Millions)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total	FY 2013	FY 2014	FY 2015	FY 2016	Cost To Complete	Total Cost
MD01: <i>Command & Control, Battle Management, Communications (C2BMC)</i>	-	331.155	286.456	-	286.456	250.406	269.854	241.408	219.247	Continuing	Continuing
Quantity of RDT&E Articles	0	1	0		0	0	0	0	0		

Note

In accordance with the Missile Defense Agency revised budget structure, the content previously planned in Budget Projects CX01 and XX01 is captured in Budget Project MD01 beginning in FY 2011 (FY 2010 - \$316,829).

RDT&E Articles are defined as major C2BMC capability increments (identified as a specific Spiral) which are fielded at multiple locations including Combatant Commands and other operational sites. Budget Project MD01 includes one RDT&E article, Spiral 6.4C, which is planned for operational fielding in FY 2011.

The key test event for development is start of Cycle 2, Simulation-Based Verification, when software completes internal C2MBC development and begins testing with other BMDS Elements. Completion of Cycle 5, Site Activation Testing, coupled with successful participation in BMDS ground test campaigns, signals delivery of fully functioning operational software.

A. Mission Description and Budget Item Justification

Based on the Missile Defense Agency`s defined architectures and system specifications, the Command and Control, Battle Management and Communications (C2BMC) Program will provide the warfighter the capability to plan the Ballistic Missile Defense (BMD) fight while concurrently tracking all potential ballistic missile threats, and pairing any sensor with any shooter to defeat ballistic missile threats at any range, in any phase, in all theaters. The C2BMC Program will also work to increase coalition partners` capabilities.

The C2BMC Program will expand defense of the United States, allies, and deployed forces by continuing the work initiated in Budget Project BX01 which has focused on limited Iranian long-range threats by enabling a coordinated defense against short-to intermediate- range threats in two regions/theaters.

Specific goals are to deliver the following, which include BMDS planning, situational awareness, sensor management, and engagement coordination functions incorporated in BMDS Integrated Build C and D approved content:

- Fully integrated BMD Planner and situational awareness displays with integrated intelligence information and defended asset priority schemes
- Continuity of Operations GEM at NORTHCOM (MDIOC) and initial Global Engagement Manager (GEM) at Ramstein AB
- Incorporate CENTCOM into the C2BMC operational architecture
- Incorporate BMDS Overhead Persistent Infra-Red (OPIR) Architecture (BOA) sensor data for X-Band radar cueing

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<ul style="list-style-type: none"> -Update C2BMC model (BCM), for system-level performance assessments that have been validated against operational C2BMC performance by utilizing the GT-04 campaign of test events to collect Critical Engagement Condition (CEC) and Empirical Measurement Event (EME) verification data -Installed more effective network monitoring and computer network defense software and hardware at the BMDS Network Operations and Security Center (BNOSC) -Continued BMDS global expansion with C2BMC deployment to CENTCOM -Information Assurance (IA) monitoring and modifications of global network devices at all C2BMC locations <p>C2BMC ELEMENT</p> <p>The Ballistic Missile Defense (BMD) Planner, Situational Awareness, Global Engagement Manager (GEM), and Ballistic Missile Defense (BMD) Network will all be expanded to include additional BMDS sensors and weapons. The BMD Planner and Situational Awareness will continue to be upgraded for ease of use and understanding based upon warfighter feedback and lessons learned from wargames and exercises. C2BMC will move to a blade-based computing architecture to support reliability, maintainability, and modularity. C2BMC will provide a regional situational awareness and engagement management capability at PACOM, NORTHCOM, EUCOM and CENTCOM.</p> <p>In the near term capability increments the BMD Planner will evolve to a net enabled capability. The system will be designed to interface with the service components and their evolving systems and enable cross planning between the Combatant Commanders. Future BMD Planner improvements include support for rapid re-planning/plan load on the fly, mapping products and services, and updating the Air and Missile defense Workstation (AMDWS) interface to exchange planning information with THAAD, and initial non-real time planning interface with North Atlantic Treaty Organization (NATO) interface improvements.</p> <p>Situational Awareness improvements include the addition of network centric data exposure over the Secret Internet Protocol Router Network (SIPRNET) which ties in with evolving Department of Defense command and control architectures. This capability includes display of individual weapon system engagement and information coordination, along with updates of command authority decision information will result in an integrated common operating picture across the Combatant Commands.</p> <p>C2BMC battle management, via the Global Engagement Manager (GEM), will deliver Full X-Band radar sensor control and capabilities for the following, which are included in BMDS Integrated Build D approved content:</p> <ul style="list-style-type: none"> -Initial engineering for improved threat/object correlation, by accounting for sensor bias and threat features to calculate a common threat track from multiple sensors, incorporation of BMDS Overhead Persistent Infra-Red (OPIR) Architecture (BOA) and Space Based Infra-Red System (SBIRS) sensor data for improved radar cueing, and improved engageable system threat tracks, and sufficient data accuracy and low enough latency- for BMDS Element's fire control to enable successful ballistic missile engagements, for regional elements via Link-16 and EHF (e.g., THAAD and Aegis BMD and Ground Based Midcourse Defense Fire Control (GFC)) this will be incorporated into Spiral 8.2 -BMDS system discrimination logic to assign object type based on evaluation of multiple sensor discrimination results -Sensor registration to assess the quality of radar data received in the BMDS -Multi-sensor system track generation and publishing to BMDS Elements using multiple, filterable sensors to ensure common situational awareness and allow cueing of weapon systems 		

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<p>-Sensor management and weapons engagement coordination aids to direct the BMDS fight and make use of efficient use of limited inventory</p> <p>-Engagement coordination and engagement direction with sensor-weapon system target pairing</p> <p>Additionally, GEM will add engagement coordination to include intelligence projections and BMDS battle management will operate in two regions as well as across regions while providing global situational awareness.</p> <p>The BMD Communications Network portion of C2BMC includes upgrades to the Parallel Staging Network, a dedicated SIPRNET point-of-presence for greater network service and security, computer network defense, and continued improvement in network monitoring for information assurance via the BMDS Network Operation and Security Center (BNOSC). The BMD Communications Network will feature a more redundant, high availability network with diverse paths and increased communications support to the BMDS elements to include added sensors and weapons to the overall BMDS. Other improvements such as dynamic real-time network management and monitoring will enable the warfighter to monitor the connection to BMDS weapons and anticipate and remedy any issues as they occur, vice having to wait for a human-in-the-loop to report a problem and provide a correction. Additionally, an expanded network centric capability (worldwide connectivity of separately developed sensors and weapon systems) supporting Internet Protocol Version 6 will extend BMDS mission success by providing information management to the individual user.</p> <p>The BMD Communications Network ties together sensors (both BMDS radars and space sensors) and weapons systems via the Combatant Commands Command and Control screens and GEM, thereby enabling the National Command Authority and the commanders at the strategic, theater and tactical levels to optimally engage ballistic missile threats at any range, in any phase of flight, at any time including near simultaneous theater, regional and homeland attacks. The BMD Communications Network builds on existing and new global grid data and communications networks to provide a robust, end-to-end, high availability, operational communications network (COMNET) infrastructure that quickly and unambiguously shares information across the global BMDS. This sharing of information is performed securely with special emphasis on preventing cyber attack via a BMDS Network Operations and Security Center (BNOSC). Effective networking management and operations relies on the ability to manage, coordinate, and integrate a wide variety of equipment platforms, interfaces with other DoD communications systems, existing/evolving information standards and capabilities, adherence to DoD Information Assurance Certification and Accreditation Process (DIACAP). Defense Information Systems Agency (DISA) services are also highly leveraged in providing world-wide communications.</p> <p>SITE ACTIVATION</p> <p>C2BMC capabilities (hardware and software) will be deployed to NORTHCOM, STRATCOM, PACOM, and EUCOM with existing sites receiving Spiral software and hardware upgrades as needed. Current capabilities will be expanded with numerous BMD Planner, web browser, and Enterprise Workstation installations per warfighter requirements. Planning for future BMDS operations and site installations include Global Engagement Manager (GEM) at European Command (EUCOM), GEM on the Parallel Support Network (PSN) at Northern Command (NORTHCOM), and network enabled capability at various locations. Deployment to these Combatant Commands continues to expand BMDS on a global scale, providing increased protection to the U.S., and its friends and Allies. Deployment to stand up Central Command (CENTCOM) for operations is in process to incorporate CENTCOM into the C2BMC architecture. Site Activation also includes participation in planning for future BMDS operations and site installations.</p>		

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OPERATIONS AND SUSTAINMENT C2BMC Program Operations and Sustainment (O&S) consists of 1) sustaining C2BMC operational capability worldwide; 2) on-site sub-systems maintenance for all C2BMC including COCOM suites, GEM Suites planners, remote Enterprise Work Stations (EWS), and GEM Work Stations (GWS), web browsers, and communication site(s) associated with the AN/TPY-2 radar(s); 3) the C2BMC Control Center that provides real-time resolution of operational issues; 4) vendor support which includes coordination and resolution of problems that occur with Commercial-off-the-Shelf (COTS) equipment; 5) training of operator, maintenance personnel, and testers (approximately 700 per year); 6) hardware and software maintenance and upgrade installation to ensure continuity of C2BMC operations. On-site support provides: -Assistance to the System Administrator of each Combatant Command -Prime contractor support to operational users -On-site maintenance of hardware and software on a 8 hours a day 5 days a week basis -Security support for the C2BMC equipment, hardware and software and auxiliary communication capabilities -24 hours a day, 7 days a week, 365 days a year network and equipment operations monitoring -Support to operators and testers during test, exercises, and wargames Off-site support provides: -C2BMC Control Center (help desk) in Colorado Springs, CO provides -Real-time resolution of operational issues -The schedule for maintenance, systems upgrades, tests, exercises, and wargames, coordinated across all users -Collection of data regarding system/sub-system failures and prioritization of corrective actions -Review of hardware/software problems and coordination of Commercial-Off-the-Shelf (COTS) developer/vendor service calls -Integrated logistics support planning and management -Hardware and software maintenance and logistics functions that are beyond the capability of on-site support personnel -Inventory and spares management -Sustaining engineering support from the prime contractor and government activities -Maintenance of software licenses and vendor support agreements -Hardware and software maintenance agreements -Vendor depot support services Training support includes:		

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- Developing and maintaining operator, maintenance personnel, and testers training material for C2BMC components/capabilities
- Training tailored to each deployment and/or test
- Training curriculum/courses provided for BMD Planner, Situational Awareness, GEM, and the C2BMC Executive Course
- Warfighter sustainment training and skill proficiency
- Assistance to warfighter in development and execution of the Radar Management Course
- New equipment training to end-users and training organizations

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

	FY 2010	FY 2011	FY 2012
<p>Title: Spiral Development</p> <p style="text-align: right;">Articles:</p> <p>Description: See Description Below</p> <p>FY 2010 Accomplishments: Funding for these FY 2010 accomplishments are reported in prior year budget projects BX01 (\$25,738) and CX01 (\$224,061)</p> <p>-Participated in BMDS distributed ground (GTX) and flight tests to verify Spiral 6.4C operational performance. Tests included GTX-04a, GTI-04b, FTT-14, and FTG-06A</p> <p>-Performed software deficiency analyses and developed solutions that were incorporated in three engineering software releases leading to the Spiral 6.4C baseline</p> <p>-Performed monthly information assurance scans and corrected deficiencies</p> <p>-Continued development and acquisition of C2BMC Deployable Interface Nodes (CDIN) (C2BMC Element funded software capability and project management; Sensors Element funded hardware, installation, and checkout)</p> <p>-Conducted engineering to support demonstration of incorporating Airborne Infra-Red (ABIR) and its integrated ground processor data into the C2BMC command and control and battle management architecture</p> <p>-Upgraded development labs with hardware and software</p> <p>-Performed lab to lab testing between C2BMC, AN/TPY-2 and GMD to reduce risk in development of system track/correlation/discrimination development</p> <p>-Developed Global Engagement Manager (GEM) hardware/software for deployment to European Command (EUCOM)</p> <p>-Initiated engineering for C2BMC Concurrent Test, Training, and Operations (CTTO) modifications of C2BMC Network Interface Processors (CNIP) for activity identifiers and element registration</p> <p>-Participated in and analyzed results of ground and flight tests, wargames, and exercises in accordance with the BMDS Integrated Master Test Plan (IMTP)</p>	<p>-</p> <p>0</p>	<p>216.973</p> <p>1</p>	<p>222.644</p> <p>0</p>

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B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2010	FY 2011
<p>-Delivered Spiral 6.4C C2BMC Model (BCM) to be utilized in upcoming system-level performance assessment. Collected initial Critical Engagement Condition (CEC) and Empirical Measurement Event (EME) data from GTX-04z and GTI-04b to support model accreditation in FY 2011</p> <p>-By the close of FY 2010, with the completion of BMD System tests, the C2BMC Program collected the planned CECs data collection points to verify models and simulations</p> <p>-Supported initial U.S. BMDS interface testing with NATO Active Layered Theater Ballistic Missile Defense (ALTBMD) to demonstrate interoperability</p> <p>-Continued incorporating Command and Control Integrated Air and Missile Defense XML Schema (CIXS) into C2BMC architecture for Services and NATO situational awareness interoperability</p> <p>-Continued the upgrade of DOD teleports in PACOM and EUCOM to include new satellite communication super high frequency (SATCOM SHF) (X/Ka Band) capability. Provided BMDS extra high frequency (EHF) SATCOM connectivity to CENTCOM teleport. (C2BMC Element funds software capability and project management; Sensors Element funds hardware, installation, and checkout)</p> <p>-Continued design and development of Protected Antijam/Antiscintillation Net-Centric System (PAAWNS) to increase bandwidth by a factor of ten (C2BMC Element funds software capability and project management; Sensors Element funds hardware, installation, and checkout)</p> <p>-Maintained and updated the agency-wide Ballistic Missile Defense System (BMDS) threat to provide data for future BMDS design, verification, and assessment</p> <p>-Updated adversary missile capabilities and characterizations consistent with projected threat environment for BMDS Phased Adaptive Approach</p> <p>-Produced all the threat data required to support the BMDS Ground Tests, BMDS Performance/Technical Assessment FY 2009 and FY 2010, and FY 2010 wargames and exercises as documented in the BMDS IMTP</p> <p>FY 2011 Plans:</p> <p>-Systems engineering will provide the System Description Document and the Integrated Build C and Build D specifications for the Elements to design, build, integrate and test BMDS components. The BMDS Integrated Build C specification directs limited peer-to-peer engagement coordination, sensor, resource management, initial multi-radar capability, warfighter planning, warfighter enhancements and improved situational awareness</p> <p>-BMDS Integrated Build D specification will continue the communications enhancements adding improved correlation, initial BMDS system track and expanded BMDS C2BMC interfaces with Friends and Allies</p> <p>-Initiate Spiral 8.2 engineering and design and BMD Planner, Situational Awareness, Global Engagement Manager (GEM), and BMD Communications Network software development, coding, and integration</p>			

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B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2010	FY 2011
<p>-Continue engineering to demonstrate the incorporation of ABIR and its integrated ground processor data into the C2BMC architecture</p> <p>-Participate in and analyze results of ground and flight tests, wargames, and exercises in accordance with the BMDS Integrated Master Test Plan (IMTP). Tests include GTD-04b, FTG-06a, FTM-15, GTI-04d, GTD-04d, and GTX-04e</p> <p>-Update C2BMC model, validated by Critical Engagement Conditions (CECs) and Empirical Measurement Events (EMEs), for system-level performance assessments. CEC/EMEs are the conditions and events where data is obtained from flight and ground tests in order to anchor system models and simulations</p> <p>-By the close of FY 2011, with the completion of BMD System tests, the C2BMC Program will collect the CEC data collection points to verify models and simulations</p> <p>-Upgrade the BMD Communications Network capability (development, integration and test)</p> <p>-Upgrade of DoD teleports to enhance satellite communications (SATCOM) connectivity</p> <p>-Incorporate Enhanced C2BMC advanced technologies and prototypes into the C2BMC architecture</p> <p>FY 2012 Plans:</p> <p>-Continue systems engineering to provide the System Description Document and the Integrated Build C and Build D specifications for the Elements to design, build, integrate and test BMDS components. The BMDS Integrated Build C specification directs limited peer-to-peer engagement coordination, sensor, resource management, initial multi-radar capability, warfighter planning, warfighter enhancements and improved situational awareness</p> <p>-Continue BMDS Integrated Build D specification to continue the communications enhancements adding improved correlation, initial BMDS system track and expanded BMDS C2BMC interfaces with Friends and Allies</p> <p>-Award follow on contract to continue development by Dec 2011</p> <p>-Continue Spiral 8.2 engineering and design and BMD Planner, Situational Awareness, Global Engagement Manager (GEM), and BMD Communications Network software development, coding, and integration</p> <p>-Continue engineering to incorporate Enhanced C2BMC capability into the C2BMC Command and Control (C2) and battle management architecture</p> <p>-Update C2BMC model, validated by Critical Engagement Conditions (CECs) and Empirical Measurement Events (EMEs), for system-level performance assessments. CEC/EMEs are the conditions and events where data is obtained from flight and ground tests in order to anchor system models and simulations</p> <p>-By the close of FY 2012, with the completion of BMD System tests, the C2BMC Program will collect the CEC data collection points to verify models and simulations for Spiral 6.4C operations and Spiral 8.2 development.</p> <p>-Continue to upgrade the BMD Communications Network capability (development, integration and test) to support PAA</p>			

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B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)				FY 2010
<ul style="list-style-type: none"> -Upgrade of DoD teleports to enhance satellite communications (SATCOM) connectivity and add additional Combat Commands to operations -Incorporate Enhanced C2BMC advanced technologies and prototypes into the C2BMC architecture -Update production drawings and installation procedures -Acquire and install Enterprise Work Stations (EWS), web browsers, and BMD Planners -Operate Spiral 6.2 and initiate upgrade to Spiral 6.4C at Central Command (CENTCOM) -Operate the new Spiral 6.4C Global Engagement Manager (GEM) hardware at European Command (EUCOM), Northern Command (NORTHCOM), Strategic Command (STRATCOM), Pacific Command (PACOM) -Continue to incorporate C2BMC Advanced Technologies and prototypes into the enhanced C2BMC architecture -Identify and acquire the long-haul terrestrial communications circuits to support the Phased Adaptive Approach (PAA) Phase 1 AN/TPY-2 site in EUCOM -Upgrade the BCN communications systems at the Pacific Missile Range Facility to support the testing of the PAA Phase 2 concept -Initiate Cyber Net Defense (CND) requirements for PAA Phases 1 and 2 				FY 2011
<p>Title: Operations and Support</p> <p align="right">Articles:</p> <p>Description: See Description Below</p> <p>FY 2010 Accomplishments: Funding for these FY 2010 accomplishments are reported in prior year budget project XX01 (\$42,561)</p> <ul style="list-style-type: none"> -Sustained C2BMC 24 hours a day, 7 days a week, 365 days worldwide -Provided hardware and software maintenance for the C2BMC training suite in European Command (EUCOM) -Sustained Global Engagement Manager (GEM) trainer at PACOM and at EUCOM -Developed curriculum for and trained over 400 operators, maintenance personnel, and testers on Spiral 6.2 -Developed curriculum for and trained over 60 operators, maintenance personnel, and testers on Spiral 6.4 -Resolved real-time operational issues through the C2BMC Control Center and BMDS Network Operation and Security Center (BNOSC) -Provided global BMDS communications via leased Defense Information Systems Agency (DISA) circuit lines -Provided and supported communications circuits for fielded C2BMC locations -Provided integrated logistics support planning and management and sustaining engineering support for fielded hardware and software 				-
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B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2010	FY 2011	FY 2012
<ul style="list-style-type: none"> -Provided support of AN/TPY-2 radar communications nodes -Provided operations and sustainment personnel to support test and special operations for AN/TPY-2 at 3 deployed operational test sites in support of major MDA test events -Supported Host Nation operations, demonstrations, and tests -Supported warfighter during wargames and other events -Provided sustainment training/skills proficiency to C2BMC operations -Stood up 24 hours a day, 7 days a week, 365 days a year enterprise-level operations in the C2BMC Control Center (CUBE) -Operated BNOSC 24 hours a day, 7 days a week, 365 days a year -Continued operation and support of communications capabilities to Israel for the Contingency Architecture Activation Team (CAAT) -Provided training and operations and support for emergent CENTCOM Suite -Installed and provided operations and support for C2BMC equipment in Navy Mission Operations Centers <p>FY 2011 Plans: Additional O&S funding is reported in Program Element 0603884C, Budget Project MD11 (\$13,782)</p> <ul style="list-style-type: none"> -Maintain C2BMC training suites -Sustain Global Engagement Manager (GEM) trainers -Develop curriculum for and train operators, maintenance personnel, and testers -Resolve real-time operational issues through the C2BMC Control Center and BMDS Network Operation and Security Center (BNOSC) -Provide global BMDS communications via leased Defense Information Systems Agency (DISA) circuit lines -Provide and support communications circuits for fielded C2BMC locations -Provide integrated logistics support planning and management and sustaining engineering support for fielded hardware and software, including support to Navy Maritime Operations Centers where C2BMC equipment resides -Provide support of AN/TPY-2 radar communications nodes -Provide operations and sustainment personnel to support test and special operations for AN/TPY-2 at 4 deployed operational test sites -Support Host Nation operations, demonstrations, and tests -Provide sustainment training/skills proficiency to C2BMC operations -Upgrade and maintain computer network defense and network monitoring in the BNOSC -Operate the BNOSC 24 hours a day, 7 days a week, 365 days a year 			

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B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2010	FY 2011	FY 2012	
-Provide support/sustainment for C2BMC installations FY 2012 Plans: FY 2012 Plans are reported in budget project MX01					
Title: Site Activation and Fielding Description: See Description Below FY 2010 Accomplishments: Funding for these FY 2010 accomplishments are reported in prior year budget project CX01 (\$23,740) -Acquired and installed Spiral 6.4C Combatant Command (COCOM) hardware on Parallel Staging Networks (PSNs) at Northern Command (NORTHCOM), Strategic Command (STRATCOM), and Pacific Command (PACOM) -Updated production drawings and installation procedures for Spiral 6.4C -Acquired and installed Enterprise Work Stations, Web Browsers, and Planners -Installed initial net-centric operational pilot capability at NORTHCOM -Deployed 3 CDINs to support testing and operations for AN/TPY-2 and THAAD (C2BMC Element funds software capability and project management; Sensors Element funds hardware, installation, and checkout) (CDIN #1 - PMRF, CDIN #2 - Vandenberg AFB, CDIN #4 - Wake Island; CDIN #3 will deploy to EUCOM to support GTD-04 and PAA Phase 1 in FY2011) -Fielded NORTHCOM GEM which is the back-up for the GEM at PACOM FY 2011 Plans: -Update production drawings and installation procedures -Acquire and install Enterprise Work Stations (EWS), web browsers, and BMD Planners -Install Spiral 6.4C Global Engagement Manager (GEM) hardware at European Command (EUCOM) FY 2012 Plans: FY 2012 Plans are captured in Spiral Development Plans (\$18,222)		Articles:	- 0	31.825 0	- 0
Title: Integrated Master Test Plan Description: See Description Below FY 2010 Accomplishments:		Articles:	- 0	- 0	29.111 0

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B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2010	FY 2011	FY 2012
<p>FY 2010 Accomplishments are in Budget Project CX01 and in Program Element 0603904C, Budget Project CX22 (\$21,942)</p> <p>FY 2011 Plans: FY 2011 Plans are in the Spiral Development Plans (\$13,748) and in Program Element 0603904C, Budget Project MD22 (\$23,803)</p> <p>FY 2012 Plans: -Participate in and analyze results of ground and flight tests, wargames, and exercises in accordance with the BMDS Integrated Master Test Plan (IMTP) -Plan, collect data, assess, examine, and report on C2BMC spiral integration testing -Support interoperability and integration of the BMDS program elements -Support the field testing of the European Deployment -Sustain the C2BMC Components of the Distributed Multi-Echelon Distributed Training system (DMETS) in the conduct of BMDS-level wargames, exercises, and training -Provide infrastructure, network, and troubleshooting support to:</p> <ul style="list-style-type: none"> -C2BMC Control Center (CCC) -System Test and Operations Center (STOC) -BMDS Communications Network (BCN) -Parallel Staging Network (PSN) -BMDS Network Operations and Security Center (BNOSC) -Continue BMD OPIR Architecture (BOA) performance assessments, integration, and testing -Conduct concept development for virtualized C2BMC services, service oriented architectures, ABIR integration -CTTO Network Architectures <p>-Conduct initial prototypes and associated operations with CTTO interfaces and architectures</p>				
<p>Title: X-Lab</p> <p align="right">Articles:</p> <p>Description: See Description Below</p> <p>FY 2010 Accomplishments: FY 2010 Accomplishments are in Program Element 0603175C, Budget Project WX25 (\$11,479)</p> <p>FY 2011 Plans:</p>		-	-	7.311
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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 0603896C: <i>BMD C2BMC</i>	PROJECT MD01: <i>Command & Control, Battle Management, Communications (C2BMC)</i>	
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2010	FY 2011
<p>FY 2011 Plans are in Program Element 0603175C, Budget Project MD25 (\$12,846)</p> <p>FY 2012 Plans: The Advanced Communications effort focuses on developing the next generation command and control and battle management concepts and the enabling technologies required to implement them among the BMDS. These activities will develop, integrate, and demonstrate advanced Command and Control, Battle Management and Communications (C2BMC) concepts and enabling technologies for improving BMDS performance across all mission areas and layers of defense including Early Intercept (EI) to include defense of friends and allies. Advanced BMDS integration concepts and techniques are demonstrated and evaluated in system-wide flight tests to facilitate the transition to the operational C2BMC.</p> <ul style="list-style-type: none"> -Continue activities to enable the integration of advanced C2BMC capabilities into BMDS subsystems -Demonstrate and evaluate advanced C2BMC capabilities in live-flight test events using the C2BMC X-Lab -Continue to evolve war fighter concept of operations (CONOPS) to insert new subsystems and capabilities into the BMDS in the areas of boost phase tracking and classification, sensor resource management, weapons resource management, post-intercept debris information flow, and communication with allies and friendly nations. Note: This is a Phased Adaptive Approach Phase 2 capability -Continue to develop and demonstrate next generation sensor netting and sensor resource management techniques -Conduct sensor netting experiments associated with tracking, integrated discrimination, sensor resource tasking, and Communications/bandwidth constraints -Continue to support the efforts of the Enhanced C2BMC program to develop the Infra-Red Sensor Manager and to prototype the interface between C2BMC and the Infra-Red Sensor Manager. Capability improvements will be demonstrated through a series of integrated experiments (simulation events, hardware-in-the-loop tests, and system-wide flight tests) -Continue to develop and demonstrate advanced battle management (BM) and integrated fire control capabilities -Conduct architecture assessments of BM functions federated within C2BMC and various allied/coalition partners and friendly nations -Integrate the CONOPS information and BMS integration priorities for advanced and emerging BMDS capabilities (such as Early Intercept and Space Tracking and Surveillance System (STSS)) into battle management constructs -Conduct C2BMC X-Lab events and experimentation 			

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Exhibit R-2A, RDT&E Project Justification: PB 2012 Missile Defense Agency		DATE: February 2011		
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 0603896C: <i>BMD C2BMC</i>	PROJECT MD01: <i>Command & Control, Battle Management, Communications (C2BMC)</i>		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2010	FY 2011	FY 2012
-Refine C2BMC interfaces to BMDS Elements and Sensors Title: C2BMC Communications Description: See Description Below FY 2010 Accomplishments: FY 2010 Accomplishments are in Program Element 0603884C, Budget Project EX11 (\$32,626) FY 2011 Plans: FY 2011 Plans are in Program Element 0603884C, Budget Project MD11 (\$12,980) FY 2012 Plans: -Transport and install the second Modernization of Enterprise Terminal (MET) in EUCOM -Perform First Article Testing (FAT) of the Protected Antijam/Antiscintillation Net-Centric System (PAAWNS) -Support exercises and tests of the AN/TPY-2 radar system with BMDS Communications Networks (BCN) support systems (HBCN and CDIN) -Continue BMDS communications systems integration and certifications		-	-	27.390
		Articles:	0	0
Title: Comms for Phased Adaptive Approach Description: See Description Below FY 2010 Accomplishments: N/A (PAA initiated in FY 2011 PB) FY 2011 Plans: -Develop, test, and field all communications node equipment and long-haul communications necessary to operate the global BMDS. Based on existing tested designs, develop a mix of communications capabilities to support remote radars and/or THAAD -Upgrade DoD teleports to enhance Satellite Communication (SATCOM) connectivity (C2BMC Element funds software capability and project management; Sensors Element funds hardware, installation, and checkout) -Define, develop and start acquisition of C2BMC Deployable Interface Nodes (CDINs) (C2BMC Element funded software capability and project management; Sensors Element funded hardware, installation, and checkout)		-	34.850	-
		Articles:	0	0

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

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 0603896C: <i>BMD C2BMC</i>	PROJECT MD01: <i>Command & Control, Battle Management, Communications (C2BMC)</i>
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B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2010	FY 2011	FY 2012
-Establish a Host Nation Situation Awareness (HN SA) liaison presence with the Host Nations government and particularly within their defense structure FY 2012 Plans: FY 2012 plans are captured in Spiral Development Plans (\$5,208). Title: Common Threat Description: See Description Below FY 2010 Accomplishments: Funding for FY 2010 accomplishments is reported in prior year budget project WX01 (\$729) and ends in FY 2010: -BMDS Launch-On Network and Engage-On Network Architecture Definition for Early Intercept -BMDS Network Based Fire Control Performance Assessment -Network Failure Mode Analysis -Build battle manager interfaces for Unmanned Aerial Vehicle (UAV), space-based sensors, and fire control	-	-	-
Articles:	0	-	-
Accomplishments/Planned Programs Subtotals	-	331.155	286.456

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: <i>Ballistic Missile Defense Technology</i>	164.670	132.220	75.003		75.003	103.844	111.712	164.378	170.851	Continuing	Continuing
• 0603881C: <i>Ballistic Missile Defense Terminal Defense Segment</i>	690.054	436.482	290.452		290.452	318.745	309.894	340.969	320.638	Continuing	Continuing
• 0603882C: <i>Ballistic Missile Defense Mid-Course Segment</i>	1,022.019	1,346.181	1,161.001		1,161.001	1,040.949	925.943	856.839	875.969	Continuing	Continuing
• 0603884C: <i>Ballistic Missile Defense Sensors</i>	544.352	454.859	222.374		222.374	357.271	336.514	318.321	348.944	Continuing	Continuing
• 0603888C: <i>Ballistic Missile Defense Test and Targets</i>	737.863	1,113.425	1,071.039		1,071.039	898.680	790.906	787.113	878.215	Continuing	Continuing
	355.870	402.769	373.563		373.563	331.203	314.193	336.749	346.560	Continuing	Continuing

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

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 0603896C: <i>BMD C2BMC</i>	PROJECT MD01: <i>Command & Control, Battle Management, Communications (C2BMC)</i>
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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
<i>• 0603890C: Ballistic Missile Defense Enabling Programs</i>											
<i>• 0603892C: BMD AEGIS</i>	1,418.992	1,467.278	960.267		960.267	957.992	1,001.510	970.607	1,033.710	Continuing	Continuing
<i>• 0603893C: SPACE TRACKING & SURVEILLANCE SYSTEM</i>	148.506	112.678	96.353		96.353	53.577	47.592	32.289	34.308	Continuing	Continuing
<i>• 0603904C: MISSILE DEFENSE INTEGRATION & OPERATIONS CENTER (MDIOC)</i>	82.926	86.198	69.325		69.325	64.514	55.808	56.769	54.621	Continuing	Continuing
<i>• 0603907C: SEA BASED X-BAND RADAR (SBX)</i>	157.739	153.056	177.058		177.058	172.622	162.628	185.934	173.587	Continuing	Continuing
<i>• 0603911C: BMD EUROPEAN CAPABILITY</i>	47.342	0.000	0.000		0.000	0.000	0.000	0.000	0.000	0.000	47.342
<i>• 0603913C: ISRAELI COOPERATIVE</i>	195.652	121.735	106.100		106.100	99.873	95.819	96.840	103.977	Continuing	Continuing
<i>• 0604884C: AIRBORNE INFRARED (ABIR)</i>	0.000	111.671	46.877		46.877	49.948	49.173	33.035	34.249	Continuing	Continuing

D. Acquisition Strategy

The Command and Control, Battle Management, and Communications (C2BMC) acquisition strategy is consistent with the Missile Defense Agency's capability-based acquisition strategy that emphasizes testing, incremental development, evolutionary acquisition, and knowledge-based funding. Lockheed Martin Mission Systems is the C2BMC prime contractor via an Other Transaction Agreement contract vehicle, which ends 1Q FY 2012. Major team members to Lockheed are Northrop-Grumman, Boeing, Raytheon, and General Dynamics. They are charged with the development, testing, fielding, training, and operations and sustainment support of the C2BMC system. They perform development and testing of C2BMC products in Arlington, VA; Huntsville, AL; and Colorado Springs, CO; and provide worldwide on-site operations and maintenance support. Additionally, the Defense Information Systems Agency (DISA) supports C2BMC worldwide long-haul communications. C2BMC Program Office government, Federally Funded Research and Development Center/University Affiliated Research Center (FFRDC/UARC), and Contract Support Services (CSS) personnel are also fully integrated as part of the Prime contractor's team to function in an Integrated Product Team environment. Competition will be conducted for CSS follow-on effort.

E. Performance Metrics

NA

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

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 0603896C: <i>BMD C2BMC</i>	PROJECT MD01: <i>Command & Control, Battle Management, Communications (C2BMC)</i>
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Product Development (\$ in Millions)				FY 2011		FY 2012 Base		FY 2012 OCO		FY 2012 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Spiral Development C2BMC Hardware(HW)/Software(SW) Development, Integration & Test (I&T) MD01	SS/CPAF	Lockheed Martin Team:Colorado Springs, CO	190.692	46.718	Oct 2010	14.177	Oct 2011	-		14.177	0.000	251.587	251.587
Spiral Development C2BMC HW/SW Development, I&T MD01	SS/CPAF	Lockheed Martin Team:Huntsville, AL	28.892	7.078	Oct 2010	2.148	Oct 2011	-		2.148	0.000	38.118	38.118
Spiral Development C2BMC Product Engineering & Development MD01	SS/CPAF	Lockheed Martin Team:Arlington, VA	357.344	88.090	Oct 2010	26.636	Oct 2011	-		26.636	0.000	472.070	471.752
Spiral Development C2BMC Integration MD01	Various	Services, DISA, Agencies:-	87.776	23.180	Oct 2010	14.091	Oct 2011	-		14.091	Continuing	Continuing	Continuing
Spiral Development Contract Support Services MD01	SS/FFP	Cobham Analytic Solutions, Paradigm, CACI, CSC:Arlington, VA/Huntsville, VA	93.104	19.392	Oct 2010	20.193	Oct 2011	-		20.193	Continuing	Continuing	Continuing
Spiral Development Federally Funded Research & Development Centers / University Affiliated Research Center MD01	MIPR	MITRE, IDA, ORNL, Aerospace, JHU/APL, GTRI:Arlington, VA/ Huntsville, AL/Colorado Springs, CO	50.542	12.200	Oct 2010	15.745	Oct 2011	-		15.745	Continuing	Continuing	Continuing
Spiral Development MDA Civilian, Travel & PCS MD01	Various	-:Arlington, VA/ Huntsville, AL/Colorado Springs, CO	26.798	6.885	Oct 2010	11.095	Oct 2011	-		11.095	Continuing	Continuing	Continuing
Spiral Development C2BMC Hardware(HW)/Software(SW) Development, Integration & Test (I&T) MD01	SS/IDIQ	Lockheed Martin Team:Arlington, VA	-	-		118.559	Jan 2012	-		118.559	Continuing	Continuing	Continuing
Spiral Development Common Threat Engineering MD01	C/CR	Various:Various	1.684	-		-		-		-	0.000	1.684	1.684
Operations and Support Unit Personnel, Cont System Improvement, Sustaining Support MD01	SS/CPAF	Lockheed Martin Team:Arlington, VA	139.602	31.953	Oct 2010	-		-		-	Continuing	Continuing	Continuing

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

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 0603896C: <i>BMD C2BMC</i>	PROJECT MD01: <i>Command & Control, Battle Management, Communications (C2BMC)</i>
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Product Development (\$ in Millions)				FY 2011		FY 2012 Base		FY 2012 OCO		FY 2012 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Operations and Support Indirect Support MD01	MIPR	DISA DECC:-	14.249	4.816	Oct 2010	-		-		-	Continuing	Continuing	Continuing
Operations and Support Communications Leases MD01	IA	DISA:-	27.118	7.573	Oct 2010	-		-		-	Continuing	Continuing	Continuing
Operations and Support DOTMLPF MD01	IA	SETAC:-	1.500	0.500	Oct 2010	-		-		-	Continuing	Continuing	Continuing
Operations and Support Warfighter Training MD01	SS/CPAF	Lockheed Martin Team:Arlington, VA	-	2.665	Oct 2010	-		-		-	Continuing	Continuing	Continuing
Operations and Support Teleport Sustainment MD01	MIPR	SPAWAR:San Diego, CA	-	-		-		-		-	Continuing	Continuing	Continuing
Operations and Support Unit Personnel, Contr System Improvement, Sustaining Support MD01	SS/IDIQ	Lockheed Martin Team:Arlington, VA	-	-		-		-		-	Continuing	Continuing	Continuing
Site Activation and Fielding Suites and Communications Gateways MD01	SS/CPAF	Lockheed Martin Team:-	78.263	31.825	Oct 2010	-		-		-	Continuing	Continuing	Continuing
X-Lab X-Lab MD01	SS/CPAF	Various / Northrop Grumman Mission Systems:Colorado Springs, CO	11.898	-		7.311	Oct 2011	-		7.311	Continuing	Continuing	Continuing
C2BMC Communications Communication Leases MD01	SS/CR	DISA:Arlington, VA	-	-		6.200	Oct 2011	-		6.200	Continuing	Continuing	Continuing
C2BMC Communications Communication Equipment and Fielding MD01	SS/CR	DISA:Various	34.994	-		7.959	Oct 2011	-		7.959	Continuing	Continuing	Continuing
C2BMC Communications BNOSC MD01	SS/CPAF	Lockheed Martin Team / JRDC:Colorado Springs, CO	-	-		6.761	Oct 2011	-		6.761	Continuing	Continuing	Continuing
C2BMC Communications EUCOM Communications MD01	MIPR	USAFE :Ramstein, DE	-	-		6.470	Oct 2011	-		6.470	Continuing	Continuing	Continuing

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

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 0603896C: <i>BMD C2BMC</i>	PROJECT MD01: <i>Command & Control, Battle Management, Communications (C2BMC)</i>
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Product Development (\$ in Millions)				FY 2011		FY 2012 Base		FY 2012 OCO		FY 2012 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
C2BMC Communications EMR, EIS, ECI Communications MD01	MIPR	Various:Various	63.904	-		-		-		-	0.000	63.904	63.904
C2BMC Communications GCN Transition MD01	IA	DISA:Various	18.000	-		-		-		-	Continuing	Continuing	Continuing
Comms for Phased Adaptive Approach Phased Adaptive Approach MD01	SS/CPAF	Lockheed Martin Team:Arlington, VA/Huntsville, AL/Colorado Springs, CO	-	34.850	Oct 2010	-		-		-	Continuing	Continuing	Continuing
Subtotal			1,226.360	317.725		257.345		-		257.345			

Remarks

Funding for Operations and Sustainment is captured in Budget Project MX01 starting in FY 2012

In order to more accurately capture the aggregate program of work for C2BMC, starting in FY 2012 the PE is consolidating communications support and equipment funding that traditionally was aligned to other program elements planned activities (i.e., communications in support of AN/TPY-2 fielding). A similar funding consolidation was implemented in FY 2008 as directed by Congress. As a result of the FY 2008 and FY 2012 funding consolidations, several R-3 line items will have a non-standard phasing such that there is prior year funding and FY 2012 funding, however no FY 2011 funding. This is due to the fact that during FY 2009, FY 2010, and FY 2011 communications work supporting other elements was captured in their respective PE lines.

Growth in MDA Civilian is driven by insourcing and the addition of MDA Career Development Program.

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

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

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 0603896C: <i>BMD C2BMC</i>	PROJECT MD01: <i>Command & Control, Battle Management, Communications (C2BMC)</i>
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Test and Evaluation (\$ in Millions)				FY 2011		FY 2012 Base		FY 2012 OCO		FY 2012 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Spiral Development BMDS Level Testing MD01	SS/CPAF	Lockheed Martin Team:Arlington, VA/Huntsville, AL/Colorado Springs, CO	-	13.430		-		-		-	Continuing	Continuing	Continuing
Integrated Master Test Plan BMDS Level Testing MD01	SS/CPAF	Lockheed Martin Team:Arlington, VA/Huntsville, AL/Colorado Springs, CO	-	-		3.020	Oct 2011	-		3.020	0.000	3.020	3.020
Integrated Master Test Plan BMDS Level Testing (Element/System Test Lab Facilities) MD01	SS/CPAF	JRDC:Colorado Springs, CO	20.226	-		17.027	Oct 2011	-		17.027	Continuing	Continuing	Continuing
Integrated Master Test Plan BMDS Level Testing- MD01	SS/IDIQ	Lockheed Martin Team:Arlington, VA/Huntsville, AL/Colorado Springs, CO	-	-		9.064	Jan 2012	-		9.064	Continuing	Continuing	Continuing
Subtotal			20.226	13.430		29.111		-		29.111			

Remarks

In order to more accurately capture the aggregate program of work for C2BMC, starting in FY 2012 the PE is consolidating communications support and equipment funding that traditionally was aligned to other program elements planned activities (i.e., communications in support of AN/TPY-2 fielding). A similar funding consolidation was implemented in FY 2008 as directed by Congress. As a result of the FY 2008 and FY 2012 funding consolidations, several R-3 line items will have a non-standard phasing such that there is prior year funding and FY 2012 funding, however no FY 2011 funding. This is due to the fact that during FY 2009, FY 2010, and FY 2011 communications work supporting other elements was captured in their respective PE lines.

Management Services (\$ in Millions)				FY 2011		FY 2012 Base		FY 2012 OCO		FY 2012 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Subtotal			-	-		-		-		-	0.000	0.000	0.000

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2012 Missile Defense Agency							DATE: February 2011		
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 0603896C: <i>BMD C2BMC</i>			PROJECT MD01: <i>Command & Control, Battle Management, Communications (C2BMC)</i>			
	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	1,246.586	331.155		286.456	-	286.456			

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2012 Missile Defense Agency		DATE: February 2011
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 0603896C: <i>BMD C2BMC</i>	PROJECT MD01: <i>Command & Control, Battle Management, Communications (C2BMC)</i>

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Exhibit R-4, RDT&E Schedule Profile: PB 2012 Missile Defense Agency		DATE: February 2011
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 0603896C: <i>BMD C2BMC</i>	PROJECT MD01: <i>Command & Control, Battle Management, Communications (C2BMC)</i>

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Exhibit R-4A, RDT&E Schedule Details: PB 2012 Missile Defense Agency		DATE: February 2011
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 0603896C: <i>BMD C2BMC</i>	PROJECT MD01: <i>Command & Control, Battle Management, Communications (C2BMC)</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
BMDS Launch-On Network and Engage-On Network Architecture Definition	1	2010	1	2010
Spiral 6.4 GEM Hardware Install at NORTHCOM	3	2010	3	2010
BMDS Network Based Fire Control Performance Assessment	3	2010	4	2010
Network Failure Mode Analysis	3	2010	4	2010
GTI-04b (BMDS Integrated HWIL Ground Test)	2	2010	4	2010
Spiral 6.4C Cycle 5 Testing	4	2010	1	2011
FTG-06a	1	2011	1	2011
Spiral 6.4 GEM HW Installation at EUCOM	2	2011	2	2011
GTD-04b (BMDS Distributed Ground Test)	4	2010	2	2011
FTM-15 (Aegis Intercept Flight Test)	3	2011	3	2011
PAA-1 Capability Declaration	1	2012	1	2012
FTM-19 E2 (Aegis Intercept Flight Test)	3	2012	3	2012
FTM-20 E2 (Aegis Intercept Flight Test)	3	2012	3	2012
GTX-04e (BMDS Focused Ground Test)	2	2011	2	2012
FTG-08 (GM Intercept Flight Test) (Two-Stage)	4	2014	4	2014
FTT-13 (THAAD Intercept Flight Test)	3	2012	3	2012
Install Spiral 8.2 Mission Node - Ground Test	4	2013	1	2014
Install Spiral 8.2 Mission Nodes (2) - C2BMC Testbed	4	2013	2	2014
Install Spiral 8.2 Management Node - C2BMC Testbed	4	2013	2	2014
Install Spiral 8.2 Element and User Gateway Nodes (5) - C2BMC Testbed	4	2013	2	2014
Spiral 8.4 Testbed Upgrades	4	2015	1	2016
Spiral 8.4 DMETS Upgrades	4	2016	4	2016

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

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 0603896C: <i>BMD C2BMC</i>	PROJECT MX01: <i>Command & Control, Battle Management, Communications (C2BMC) Development Support</i>
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COST (\$ in Millions)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total	FY 2013	FY 2014	FY 2015	FY 2016	Cost To Complete	Total Cost
MX01: <i>Command & Control, Battle Management, Communications (C2BMC) Development Support</i>	-	-	62.725	-	62.725	66.095	67.386	82.937	72.003	0.000	351.146
Quantity of RDT&E Articles	0	0	0		0	0	0	0	0		

A. Mission Description and Budget Item Justification

OPERATIONS AND SUSTAINMENT

C2BMC Program Operations and Sustainment (O&S) consists of 1) sustaining C2BMC operational capability worldwide; 2) on-site sub-systems maintenance for all C2BMC including COCOM suites, GEM Suites planners, remote Enterprise Work Stations (EWS), and GEM Work Stations (GWS), web browsers, and communication site(s) associated with the AN/TPY-2 radar(s); 3) the C2BMC Control Center that provides real-time resolution of operational issues; 4) vendor support which includes coordination and resolution of problems that occur with Commercial-off-the-Shelf (COTS) equipment; 5) training of operator, maintenance personnel, and testers (approximately 700 per year); 6) hardware and software maintenance and upgrade installation to ensure continuity of C2BMC operations.

On-site support provides:

- Assistance to the System Administrator of each Combatant Command
- Prime contractor support to operational users
- On-site maintenance of hardware and software on a 8 hours a day 5 days a week basis
- Security support for the C2BMC equipment, hardware and software and auxiliary communication capabilities 24 hours a day, 7 days a week, 365 days a year network and equipment operations monitoring
- Support to operators and testers during test, exercises, and wargames

Off-site support provides:

- C2BMC Control Center (help desk) in Colorado Springs, CO provides
- Real-time resolution of operational issues
- The schedule for maintenance, systems upgrades, tests, exercises, and wargames, coordinated across all users

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

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 0603896C: <i>BMD C2BMC</i>	PROJECT MX01: <i>Command & Control, Battle Management, Communications (C2BMC) Development Support</i>
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- Collection of data regarding system/sub-system failures and prioritization of corrective actions
- Review of hardware/software problems and coordination of Commercial-Off-the-Shelf (COTS) developer/vendor service calls
- Integrated logistics support planning and management
- Hardware and software maintenance and logistics functions that are beyond the capability of on-site support personnel
- Inventory and spares management
- Sustaining engineering support from the prime contractor and government activities
- Maintenance of software licenses and vendor support agreements
- Hardware and software maintenance agreements
- Vendor depot support services

Training support includes:

- Developing and maintaining operator, maintenance personnel, and testers training material for C2BMC components/capabilities
- Training tailored to each deployment and/or test
- Training curriculum/courses provided for BMD Planner, Situational Awareness, GEM, and the C2BMC Executive Course
- Warfighter sustainment training and skill proficiency
- Assistance to warfighter in development and execution of the Radar Management Course
- New equipment training to end-users and training organizations

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

	FY 2010	FY 2011	FY 2012
<p>Title: Operations and Support</p> <p style="text-align: right;">Articles:</p> <p>Description: See Description Below</p> <p>FY 2010 Accomplishments: Funding for these FY 2010 accomplishments are reported in prior year budget project XX01 (\$42,561), content previously reported in budget project MD01.</p> <p>FY 2011 Plans: FY 2011 plans are reported in budget project MD01</p> <p>FY 2012 Plans: -Maintain C2BMC training suites</p>	<p>-</p> <p>0</p>	<p>-</p> <p>0</p>	<p>62.725</p> <p>0</p>

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Exhibit R-2A, RDT&E Project Justification: PB 2012 Missile Defense Agency		DATE: February 2011
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 0603896C: <i>BMD C2BMC</i>	PROJECT MX01: <i>Command & Control, Battle Management, Communications (C2BMC) Development Support</i>

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2010	FY 2011	FY 2012
<ul style="list-style-type: none"> -Sustain Global Engagement Manager (GEM) trainers -Develop curriculum for and train operators, maintenance personnel, and testers -Resolve real-time operational issues through the C2BMC Control Center and BMDS Network Operation and Security Center (BNOSC) at FY 2010 level -Provide global BMDS communications via leased Defense Information Systems Agency (DISA) circuit lines -Provide and support communications circuits for fielded C2BMC locations -Provide integrated logistics support planning and management and sustaining engineering support for fielded hardware and software, including support to Navy Maritime Operations Centers where C2BMC equipment resides -Provide support of AN/TPY-2 radar communications nodes -Provide operations and sustainment personnel to support test and special operations for AN/TPY-2 at 5 deployed operational test sites -Support Host Nation operations, demonstrations, and tests -Provide sustainment training/skills proficiency to C2BMC operations -Upgrade and maintain computer network defense and network monitoring in the BNOSC -Operate the BNOSC 24 hours a day, 7 days a week, 365 days a year -Provide support/sustainment for C2BMC installations -Provide sustainment of the BCN Teleport Gateway (BTG) at the DoD teleports: Lago Patria, IT; Ramstein, DE; Fort Buckner, JP; Camp Roberts, CA; Wahiawa, HI; Northwest, VA -Support the installation and integration of the second Modernization of Enterprise Terminal (MET) in EUCOM -Continue round-the-clock sustainment for Communications capabilities with AN/TPY-2 (previously in Program Element 0603884C, Project MD11) -Continue on-site C2BMC support of fielded sites for hardware and software (previously in Program Element 0603884C, Project MD11) -Continue C2BMC operator training for fielded capabilities (previously in Program Element 0603884C, Project MD11) -Continue sustaining engineering support and integrated logistics support for fielded hardware and software (previously in Program Element 0603884C, Project MD11) 			
Accomplishments/Planned Programs Subtotals	-	-	62.725

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Exhibit R-2A, RDT&E Project Justification: PB 2012 Missile Defense Agency		DATE: February 2011
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 0603896C: <i>BMD C2BMC</i>	PROJECT MX01: <i>Command & Control, Battle Management, Communications (C2BMC) Development Support</i>

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

<u>Line Item</u>	<u>FY 2010</u>	<u>FY 2011</u>	<u>FY 2012</u> <u>Base</u>	<u>FY 2012</u> <u>OCO</u>	<u>FY 2012</u> <u>Total</u>	<u>FY 2013</u>	<u>FY 2014</u>	<u>FY 2015</u>	<u>FY 2016</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• 0603175C: <i>Ballistic Missile Defense Technology</i>	164.670	132.220	75.003		75.003	103.844	111.712	164.378	170.851	Continuing	Continuing
• 0603881C: <i>Ballistic Missile Defense Terminal Defense Segment</i>	690.054	436.482	290.452		290.452	318.745	309.894	340.969	320.638	Continuing	Continuing
• 0603882C: <i>Ballistic Missile Defense Mid-Course Segment</i>	1,022.019	1,346.181	1,161.001		1,161.001	1,040.949	925.943	856.839	875.969	Continuing	Continuing
• 0603884C: <i>Ballistic Missile Defense Sensors</i>	544.352	454.859	222.374		222.374	357.271	336.514	318.321	348.944	Continuing	Continuing
• 0603888C: <i>Ballistic Missile Defense Test and Targets</i>	737.863	1,113.425	1,071.039		1,071.039	898.680	790.906	787.113	878.215	Continuing	Continuing
• 0603890C: <i>Ballistic Missile Defense Enabling Programs</i>	355.870	402.769	373.563		373.563	331.203	314.193	336.749	346.560	Continuing	Continuing
• 0603892C: <i>BMD AEGIS</i>	1,418.992	1,467.278	960.267		960.267	957.992	1,001.510	970.607	1,033.710	Continuing	Continuing
• 0603893C: <i>SPACE TRACKING & SURVEILLANCE SYSTEM</i>	148.506	112.678	96.353		96.353	53.577	47.592	32.289	34.308	Continuing	Continuing
• 0603904C: <i>MISSILE DEFENSE INTEGRATION & OPERATIONS CENTER (MDIOC)</i>	82.926	86.198	69.325		69.325	64.514	55.808	56.769	54.621	Continuing	Continuing
• 0603907C: <i>SEA BASED X-BAND RADAR (SBX)</i>	157.739	153.056	177.058		177.058	172.622	162.628	185.934	173.587	Continuing	Continuing
• 0603911C: <i>BMD EUROPEAN CAPABILITY</i>	47.342	0.000	0.000		0.000	0.000	0.000	0.000	0.000	0.000	47.342
• 0603913C: <i>ISRAELI COOPERATIVE</i>	195.652	121.735	106.100		106.100	99.873	95.819	96.840	103.977	Continuing	Continuing
• 0604884C: <i>AIRBORNE INFRARED (ABIR)</i>	0.000	111.671	46.877		46.877	49.948	49.173	33.035	34.249	Continuing	Continuing

D. Acquisition Strategy

The Command and Control, Battle Management, and Communications (C2BMC) acquisition strategy is consistent with the Missile Defense Agency's capability-based acquisition strategy that emphasizes testing, incremental development, evolutionary acquisition, and knowledge-based funding. Lockheed Martin Mission Systems

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Exhibit R-2A, RDT&E Project Justification: PB 2012 Missile Defense Agency		DATE: February 2011
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 0603896C: <i>BMD C2BMC</i>	PROJECT MX01: <i>Command & Control, Battle Management, Communications (C2BMC) Development Support</i>
<p>is the C2BMC prime contractor via an Other Transaction Agreement contract vehicle, which ends 1Q FY 2012. Major team members to Lockheed are Northrop-Grumman, Boeing, Raytheon, and General Dynamics. They are charged with the development, testing, fielding, training, and operations and sustainment support of the C2BMC system. They perform development and testing of C2BMC products in Arlington, VA; Huntsville, AL; and Colorado Springs, CO; and provide worldwide on-site operations and maintenance support.</p>		
<u>E. Performance Metrics</u> NA		

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

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 0603896C: <i>BMD C2BMC</i>	PROJECT MX01: <i>Command & Control, Battle Management, Communications (C2BMC) Development Support</i>
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Product Development (\$ in Millions)				FY 2011		FY 2012 Base		FY 2012 OCO		FY 2012 Total			Target Value of Contract
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	
Operations and Support Unit Personnel, Cont System Improvement, Sustaining Support MX01	SS/CPAF	Lockheed Martin Team:Arlington, VA	-	-		13.001	Oct 2011	-		13.001	0.000	13.001	13.001
Operations and Support Indirect Support MX01	MIPR	DISA DECC:-	-	-		4.761	Oct 2011	-		4.761	Continuing	Continuing	Continuing
Operations and Support DOTMLPF MX01	IA	SETAC:-	-	-		0.500	Oct 2011	-		0.500	Continuing	Continuing	Continuing
Operations and Support Warfighter Training MX01	IA	Lockheed Martin Team:Arlington, VA	-	-		2.661	Oct 2011	-		2.661	Continuing	Continuing	Continuing
Operations and Support Teleport Sustainment MX01	MIPR	SPAWAR:San Diego, CA	-	-		2.799	Oct 2011	-		2.799	Continuing	Continuing	Continuing
Operations and Support Unit Personnel, Contr System Improvement, Sustaining Support MX01	SS/IDIQ	Lockheed Martin Team:Arlington, VA	-	-		39.003	Jan 2012	-		39.003	Continuing	Continuing	Continuing
Subtotal			-	-		62.725		-		62.725			

Support (\$ in Millions)				FY 2011		FY 2012 Base		FY 2012 OCO		FY 2012 Total			Target Value of Contract
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	
Subtotal			-	-		-		-		-	0.000	0.000	0.000

Test and Evaluation (\$ in Millions)				FY 2011		FY 2012 Base		FY 2012 OCO		FY 2012 Total			Target Value of Contract
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	
Subtotal			-	-		-		-		-	0.000	0.000	0.000

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

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 0603896C: <i>BMD C2BMC</i>	PROJECT ZX40: <i>Program-Wide Support</i>
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COST (\$ in Millions)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total	FY 2013	FY 2014	FY 2015	FY 2016	Cost To Complete	Total Cost
ZX40: <i>Program-Wide Support</i>	10.245	-	-	-	-	-	-	-	-	0.000	10.245
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			
Articles:	10.245 0	-	-
Description: See Description Below			
FY 2010 Accomplishments: NA			
Accomplishments/Planned Programs Subtotals	10.245	-	-

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

N/A

D. Acquisition Strategy

NA

E. Performance Metrics

NA

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

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 0603896C: <i>BMD C2BMC</i>	PROJECT MD40: <i>Program-Wide Support</i>
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COST (\$ in Millions)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total	FY 2013	FY 2014	FY 2015	FY 2016	Cost To Complete	Total Cost
MD40: <i>Program-Wide Support</i>	-	11.470	14.922	-	14.922	13.836	15.841	14.490	12.967	Continuing	Continuing
Quantity of RDT&E Articles	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 (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 (\$11,988).

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

	FY 2010	FY 2011	FY 2012
Title: Civilian Salaries and Support	-	11.470	14.922
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 (\$11,988).			
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	-	11.470	14.922

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Exhibit R-2A, RDT&E Project Justification: PB 2012 Missile Defense Agency		DATE: February 2011
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 0603896C: <i>BMD C2BMC</i>	PROJECT MD40: <i>Program-Wide Support</i>

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

N/A

D. Acquisition Strategy

N/A

E. Performance Metrics

NA