Missile Defense Agency (MDA) Exhibit R-2 RDT&E Budget Item Justification	Date: May 2009
APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE: 0603896C BMD C2BMC

COST ($ in Thousands)	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015
Total PE Cost	439,997	288,287	340,014					
WX01 BC Capability Development	0	0	776					
AX01 Ballistic Missile Defense C2BMC Block 1.0	103,854	0	0					
BX01 Ballistic Missile Defense C2BMC Block 2.0	107,024	94,660	27,605					
CX01 Ballistic Missile Defense C2BMC Block 3.0	83,770	142,814	253,190					
DX01 Ballistic Missile Defense C2BMC Block 4.0	63,904	0	0					
EX01 Ballistic Missile Defense C2BMC Block 5.0	28,713	0	0					
XX01 Ballistic Missile Defense C2BMC Sustainment	45,608	42,475	46,455					
ZX40 Program-Wide Support	7,124	8,338	11,988					

There is a substantial change in funding from FY08 to FY09 because the FY09 appropriation does not continue the consolidation of C2BMC efforts in the C2BMC PE. MDA believes the C2BMC funds that are being used to develop component and element interfaces for the C2BMC system are more appropriately placed in the respective PEs of the sponsoring programs to reflect the true cost of end products that include C2BMC equipment / interfaces.

A. Mission Description and Budget Item Justification

A.1 System Element Description

Intelligence sources predict an increasing ballistic missile threat with respect to numbers of missiles and launchers, more complex delivery systems consisting of countermeasures, and more lethal warheads. Potential adversaries can employ a coordinated attack of short-, medium-, and intermediate-range ballistic missiles (SRBMs, MRBMs, and IRBMs) as well as intercontinental ballistic missiles (ICBMs) to confound our defenses, create a situation of confusion, and paralyze legacy command and control systems. To protect the United States, our deployed forces, and other critical assets from this growing threat requires a synchronized, layered defense.

The BMDS is a system of Elements -- with sensors, interceptors, and communications to defend against ballistic missiles in all phases of flight. 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 far more capable and robust than the sum of its parts -- thus increasing the footprint of the BMDS resulting in 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 PATRIOT, Theater High Altitude Area Defense (THAAD), Aegis BMD, Ground Based Midcourse Defense (GMD); and sensors such as the AN/TPY-2 radar, Sea-Based X-Band Radar (SBX), and Space-Based Infrared System (SBIRS) and Overhead Persistent Infra-Red (OPIR).

The best way 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 (C2BMC). 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 both the best sensor information on the enemy missiles location and track as well as a more diverse and effective set of weapon options for the Combatant Commander to defeat the attack all connected by a unifying C2BMC system. As a result, an effort funded in a Program Element may be critical to success of efforts in other Program Elements. We refer to these connections as interdependencies. Throughout the budget justification material, we have attempted to highlight interdependencies in order to explain fully the relationship between different parts of the proposed program.

The C2BMC Program provides: 1) the communications links and connectivity between BMD Elements, 2) a battle management function that allows a shoot/look/shoot approach which maximizes 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), 3) control of the BMDS radars, taking data from multiple sensors tracking the same threat, and correlating it into one optimal track, 4) real-time awareness of the battle as it unfolds to include interoperability with NATO, and 5) 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; is in 26 locations with 12 customers in 17 time zones; has deployed over 800 pieces of equipment and three Satellite Communications (SATCOM) links; 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.

MDA has a set of Unifying Missile Defense Functions (UMDFs), which increase the effectiveness of the BMD System (including probability of engagement success, increase in defended area and raid size capacity, additional redundancy of architecture, unity of command) through the integration of MDA developed capabilities. These UMDF efforts are Sensor Registration (reporting of sensor errors/biases), Correlation (ensuring the information from multiple sensors seeing a threat relates to the same object), System Track (creating a single engageable track of a threat from multiple reports provided by different land, sea, and space based multiple sensors), Discrimination (identifying object details to determine the target

from debris or decoys), Battle Management (combining the best sensors and shooters to ensure the highest probability of a kill), Hit/Kill Assessment (determining if the target selected was destroyed after missile impact), and Communications (providing the worldwide connection of sensors and shooters to command authorities). UMDFs are implemented across the BMDS elements to create and utilize system level data and decisions that allow Combatant Commanders the ability to automatically and manually optimize sensor coverage and interceptor inventory to defend against all ranges of ballistic threats.

Each of these UMDFs is led by a single BMDS Element, with participation from the others, to ensure products do not duplicate work. C2BMC is at the heart of these UMDFs and enables integrated system performance of all BMDS elements. It collects the information from all BMDS sensors, understands and considers all data errors/bias, correlates data between sensors, uses specific sensor discriminated data and fuses it between sensors, creates an engageable system track, identifies the best pairing of sensor to shooter for optimal intercept, and quickly communicates information and direction to BMDS Elements and command elements world-wide. As a result, C2BMC leads the Correlation, System Track, Battle Management, and Communications teams.

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

Modeling and Simulation (M&S) activities support all phases of C2BMC development. Models and simulations are tailored to the specific need of a component in its current phase of development, ranging from low-to-medium fidelity analyses supporting concept definition studies, to high-fidelity models used to support engineering development, or testing and are integrated into the BMD Digital Simulations Architecture. Digital simulations support Program Assessment events, which provide critical system level performance data relative to all elements, the system engineer, M&S developers, OTA and Warfighter. Further, the M&S Digital tools are accredited for each application and for specific objectives; tools are put through a rigorous verification and validation process, reviewing coding and specifications, and comparing analyses against actual flight test results. Planning support is required to assist in the V&V plan development, test execution, analysis for V&V reports and program office M&S certification. The Digital End-to-End simulation of the BMDS required a Program Assessment Integrated V&V Plan and Report (at both element and system level), and a Program Assessment-System level Accreditation Plan and Report.

C2BMC will support the BMDS Hardware in the Loop (HWIL) Modeling and Simulation Program by providing and integrating into the BMDS system-level HWIL single simulation framework to support full-envelope BMDS ground test, flight test, and training events based upon Agency and warfighter needs.

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C2BMC will support System Pre Flight predictions for each system level flight test using the test framework set up with the BMDS configuration for a particular flight test. This provides the confidence in Flight Test execution by predicting element performance and exercising element interfaces. This work is also used to proof out the construct of the flight test to ensure if the required data and data management plan will support System Post Flight Reconstruction objectives. System Post Flight Reconstruction (SPFR) will use a HWIL and/or a Digital M&S Environment to replicate the day of flight for the BMDS configuration, modified to represent the actual environmental conditions and target dynamics observed in flight. The results of this testing are used to increase confidence in the models and simulations by anchoring the results with emphasis on the critical engagement conditions (CECs) and empirical measurement events (EMEs) back to the real world event. SPFR is used for validation (anchoring) of models and simulations.

A.2 System Element Budget Justification and Contribution to the Ballistic Missile Defense System (BMDS)

C2BMC provides the capabilities for leaders at multiple levels of command to see, assess, and react to ballistic missile threats. C2BMC capabilities are provided through four capability areas: BMDS Planner, Situational Awareness, Global Engagement Manager (GEM), and BMD Communication Network (BMD Network).

- BMDS 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 Ground Based Midcourse Defense (GMD) system, used to defend the US; and the AN/TPY-2 radar, Aegis BMD, PATRIOT, and Terminal High Altitude Area Defense (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 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 Missile Fire Control and Aegis BMD and PATRIOT via Link 16, sensor management control of the AN/TPY-2 radar, and a direct data connection to Space Based Infrared System (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, assign a specific sensor to track a specific threat, calculate the ”most likely” track of an incoming missile, and then recommend the most effective weapon to target pairing, maximizing probability of hit/kill.

- BMD Network: The BMD Network ties together sensors (both BMDS radars and space sensors) and weapons systems via the COCOM C2 and GEM 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 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 preformed 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, Spiral 8.4)) 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 average timeframe to develop, test, and field the next increment of capability is 24-36 months with new capability fielded every two years. Therefore multiple capability increments are in staggered stages of development at any time. 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 testing, Site Activation Testing, coupled with successful participation in BMDS ground test campaigns, signals delivery of fully functioning operational software.

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.

A.3 Major System Element Goals

Block 1.0 (Defend U.S. from Limited North Korean Long-Range Threats)

- Basic deliberative/crisis action planning
- Enhanced situational awareness capability/displays at the Combatant Commands (COCOMS) and National Military Command Center (NMCC)
- Management of a single AN/TPY-2 radar
- Redundant communication/data paths and connections to Ground Based Midcourse Defense (GMD), Aegis BMD, AN/TPY-2 radar

Block 2.0 (Defend Allies & Deployed Forces from Short- to Medium-Range Threats in One Region/Theater)

- Enhanced deliberative/crisis action planning
- Enhanced situational awareness to perform command and control at COCOMS and National Military Command Center (NMCC)
- Initial fielding of the Global Engagement Manager (GEM) capability at the Kenney Air Operations Center (Hickam Air Force Base, Hawaii)
- Improved system reliability and availability to support test and operations
- Updated C2BMC model, continuously validated for critical engagement conditions, for system-level performance assessments
- Support development of Unifying Missile Defense Functions (UMDF) capabilities

Block 3.0 (Expand Defense of U.S. to Include Limited Iranian Long-Range Threats)

- BMDS Planner and Situational Awareness capability that fully incorporates intelligence information
- Initial interfaces between weapons and sensors compatible with DoD network-centric service-oriented architecture

- Northern Command (NORTHCOM) and European Command (EUCOM) expansion of Global Engagement Manager (GEM) coordination
- Initial Joint Integrated Air and Missile Defense (JIAMD) Planner capability
- Updated C2BMC model, continuously validated for critical engagement conditions, for system-level performance assessments
- Support development of Unifying Missile Defense Functions (UMDF) capabilities

Block 4.0 (Defend Allies & Deployed Forces in Europe from Limited Iranian Long-Range Threats, Expand Protection of U.S.)

- European Interceptor Site (EIS) communications procurement
- European Communications Interface (ECI) communications procurement
- European Midcourse Radar (EMR) communications procurement
- Southern radar site (AN/TPY-2) communications procurement

Block 5.0 (Expand Defense of Allies & Deployed Forces in Two Regions/Theaters)

- Incorporate new sensors and weapons systems into the global BMD network
- Improved tools to assist decision makers with command and control (i.e., battle management decision aids to re-direct coordinated engagements)
- BMDS integrated discrimination for boost/early ascent and expanded engagement coordination to include intelligence projections
- Continued BMDS global expansion with addition of C2BMC deployed locations (Global Engagement Manager (GEM) to Central Command (CENTCOM))
- Support development of Unifying Missile Defense Functions (UMDF) capabilities

Sustainment

- Sustain Worldwide C2BMC Operational Capability 24/7/365 -- on site personnel supporting 26 locations, across 17 time zones, and over 800 pieces of equipment
- Provide 24/7/365 help desk (Control Center at the Missile Defense Integration and Operations Center (MDIOC)) for real-time issue resolution
- Develop curriculum and provide C2BMC operator, maintenance, and tester training on C2BMC equipment and capabilities (approximately 700 people per year)
- Lease communication lines via Defense Information Systems Agency (DISA) for global BMDS Communications

Capability Development

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- Assess feasibility and establish requirements for beyond line of sight launch-on / engage-on network capability

A.4 Major Events Schedule and Description

Major Event	Project	Timeframe	Description
Contract Activity			
Development			
Complete Spiral 6.4 Cycle 2 Testing	BX01	2Q FY 2010	• C2BMC functional verification test at the Missile Defense Integration & Operations Center (MDIOC)
Complete Spiral 6.4 Cycle 5 Testing	BX01	2Q FY 2010	• C2BMC software field installation and checkout
Fielding			
Install Spiral 6.4 HW (STRATCOM)	BX01	4Q FY 2008	• Installation of C2BMC hardware
Complete Spiral 6.4 HW Installations (PACOM, NORTHCOM, and Fort Greely, AK)	BX01	2Q FY 2009	• Installation of C2BMC hardware
Initiate Spiral 8.2 HW Installations	CX01	4Q FY 2010	• Installation of C2BMC hardware

MDA Element testing is based on an integrated, comprehensive, and phased test program. Element systems, subsystems, and components are tested early in development and are necessary prior to conducting BMD-System level testing. C2BMC Element Level testing is funded as part of a developmental program and reflected in this Program Element (PE) submission. This PE also provides C2BMC participation in the consolidated MDA-wide System Test Program and the resources for the planning, design, execution, and management of C2BMC in BMD System testing in accordance with the BMDS Test Policy, MDA Directive 3202.03 (Jan 09). This applies to all Flight, Integrated Ground, and Distributed Ground Tests and Post-test analysis and reconstructions listed in the Integrated Master Test Plan (IMTP).

B. Program Change Summary	FY 2008	FY 2009	FY 2010	FY 2011
Previous President's Budget (FY2009 PB)	447,616	289,277	287,194	
Current President's Budget (FY2010 PB)	439,997	288,287	340,014	
Total Adjustments	-7,619	-990	52,820	
Congressional Program Reductions	0	-990	0	
Congressional Rescissions	0	0	0	
Total Congressional Increases	0	0	0	
Total Reprogrammings	-237	0	0	
SBIR/STTR Transfer	-7,382	0	0	
Adjustments to Budget Years	0	0	52,820	

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FY08 decrease of $7.619 million includes SBIR/STTR transfer and MDA adjustments.

FY09 decrease of $990 thousand reflects Congressional undistributed adjustments.

FY10 increase of $52.820 million reflects MDA programmatic changes to support BMDS priorities.

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date: May 2009
APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE: 0603896C BMD C2BMC

COST ($ in Thousands)	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015
WX01 BC Capability Development	0	0	776					
RDT&E Articles Qty	0	0	0					

A. Mission Description and Budget Item Justification

Project WX01 funds a BC Weapon and Sensor Resource Management Study to establish the feasibility and engineering requirements for implementation of a Beyond Line-of-Sight (BLOS) BMDS Launch-On Network and Engage-On Network capability. Network Centric Fire Control - where weapons can be committed and guided in-flight on system level tracks - would allow present-day and advanced interceptors to engage out to the limits of their kinematic envelopes, unconstrained by Earth curvature and the tracking range of local sensors. This capability would enable the defense to prosecute earlier engagements and would significantly expand the battlespace, potentially enabling shoot-look-shoot tactics and reducing overall interceptor inventory requirements. Network Centric Fire Control could also have compelling logistical and readiness implications, where land, sea and airborne shooters could be plugged directly into a global fire control grid and engage even in the absence of organic sensor support. The concept relies upon the redundancy and survivability of the global fire control network, the delivery of trusted system level tracks, and the worldwide management of weapon and sensor resources. It also must be extensible as the BMDS grows. This major study will lay the groundwork for an implementation roadmap and a phased demonstration plan with knowledge points for resolving critical technical and operational issues.

B. Accomplishments/Planned Program

	FY 2008	FY 2009	FY 2010	FY 2011
Flexible Upper Stage	0	0	776	
RDT&E Articles (Quantity)	0	0	0	

FY10 Planned Program:

- BMDS Launch-On Network and Engage-On Network Architecture Definition
- BMDS Network Based Fire Control Performance Assessment
- Network Failure Mode Analysis

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C. Other Program Funding Summary

	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	Total Cost
PE 0603175C Ballistic Missile Defense Technology	106,437	119,308	109,760						-
PE 0603881C Ballistic Missile Defense Terminal Defense Segment	1,034,478	956,686	719,465						-
PE 0603882C Ballistic Missile Defense Midcourse Defense Segment	2,198,664	1,507,481	982,922						-
PE 0603883C Ballistic Missile Defense Boost Defense Segment	503,475	400,751	186,697						-
PE 0603884C Ballistic Missile Defense Sensors	574,231	777,693	636,856						-
PE 0603886C Ballistic Missile Defense System Interceptors	330,874	385,493	0						-
PE 0603888C Ballistic Missile Defense Test and Targets	619,137	919,956	966,752						-
PE 0603890C Ballistic Missile Defense Enabling Programs	416,937	402,778	369,145						-
PE 0603891C Special Programs – MDA	193,157	175,712	301,566						-
PE 0603892C Ballistic Missile Defense Aegis	1,126,337	1,113,655	1,690,758						-
PE 0603893C Space Tracking & Surveillance System	226,499	208,923	180,000						-
PE 0603894C Multiple Kill Vehicle	223,084	283,481	0						-
PE 0603895C BMD System Space Program	16,237	24,686	12,549						-
PE 0603897C BMD Hercules	51,387	55,764	48,186						-
PE 0603898C BMD Joint Warfighter Support	45,400	69,743	60,921						-
PE 0603904C Missile Defense Integration & Operations Center (MDIOC)	77,102	106,040	86,949						-
PE 0603906C Regarding Trench	1,945	2,968	3,164						-
PE 0603907C Sea Based X-Band Radar (SBX)	155,244	146,895	174,576						-
PE 0603908C BMD Europ Intercep Site	0	362,007	0						-
PE 0603909C BMD Europ Midcourse Radar	0	76,537	0						-
PE 0603911C BMD European Capability	0	0	50,504						-
PE 0603912C BMD European Comm Support	0	27,008	0						-
PE 0603913C Israeli Cooperative	0	0	119,634						-
PE 0605502C Small Business Innovative Research BMDO	137,409	0	0						-
PE 0901585C Pentagon Reservation	5,971	19,667	19,709						-
PE 0901598C Management Headquarters – MDA	83,907	81,174	57,403						-

Note: The Ballistic Missile Defense System (BMDS) is an integrated, interoperable, global defense system. The programs which comprise the BMDS are interdependent.

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date: May 2009
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D. Acquisition Strategy

FFRDC/UARC/National Laboratory community, with MDA specialists in support, is to define and quantitatively characterize a reference concept for BMDS Launch-On Network / Engage-On Network that could be tested and demonstrated cooperatively with the BMDS Element Program Offices in the years beyond FY11. Output of this Global Engagement Management and Fire Control Study will be performance specifications, an accounting of critical and operational issues that would have to be resolved on the way to implementation, and a detailed program plan with knowledge points for resolving those issues through simulation, experimentation and demonstration.

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date: May 2009
APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE: 0603896C BMD C2BMC

I. Product Development Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2009 Cost	FY 2009 Award/ Oblg Date	FY 2010 Cost	FY 2010 Award/ Oblg Date	FY 2011 Cost	FY 2011 Award/ Oblg Date	Total Cost
Flexible Upper Stage										
Weapon and Sensor Resource Management Study	MIPR	FFRDC / SETA	0	0	N/A	776	1Q			776
Subtotal Product Development			0	0		776				776

Remarks

II. Support Costs Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2009 Cost	FY 2009 Award/ Oblg Date	FY 2010 Cost	FY 2010 Award/ Oblg Date	FY 2011 Cost	FY 2011 Award/ Oblg Date	Total Cost
Subtotal Support Costs										

Remarks

III. Test and Evaluation Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2009 Cost	FY 2009 Award/ Oblg Date	FY 2010 Cost	FY 2010 Award/ Oblg Date	FY 2011 Cost	FY 2011 Award/ Oblg Date	Total Cost
Subtotal Test and Evaluation										

Remarks

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date: May 2009
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IV. Management Services Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2009 Cost	FY 2009 Award/ Oblg Date	FY 2010 Cost	FY 2010 Award/ Oblg Date	FY 2011 Cost	FY 2011 Award/ Oblg Date	Total Cost
Subtotal Management Services										

Remarks

Project Total Cost			0	0		776				776

Remarks

Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile

Date: **May 2009**

APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**

R-1 NOMENCLATURE: **0603896C BMD C2BMC**

Fiscal Year	2008				2009				2010				2011				2012				2013				2014				2015			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Development																																
BMDS Launch-On Network and Engage-On Network Architecture Definition									△																							
BMDS Network Based Fire Control Performance Assessment										△	—	—	—	—	—	△																
Network Failure Mode Analysis										△	—	—	—	—	—	△																

Legend

▲	Significant Event (complete)	△	Significant Event (planned)
★	Milestone Decision (complete)	☆	Milestone Decision (planned)
◆	Element Test (complete)	◇	Element Test (planned)
▼	System Level Test (complete)	▽	System Level Test (planned)
▲—	Complete Activity	△—	Planned Activity

Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail	Date: May 2009
APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE: **0603896C BMD C2BMC**

Schedule Profile	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015
Development								
BMDS Launch-On Network and Engage-On Network Architecture Definition			1Q					
BMDS Network Based Fire Control Performance Assessment			2Q-4Q					
Network Failure Mode Analysis			2Q-4Q					

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date: May 2009
APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE: **0603896C BMD C2BMC**

COST ($ in Thousands)	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015
AX01 Ballistic Missile Defense C2BMC Block 1.0	103,854	0	0					
RDT&E Articles Qty	0	0	0					

Note:

A. Mission Description and Budget Item Justification

In Block 1.0, the Command and Control, Battle Management, and Communications (C2BMC) Program delivered the initial capability to defend against North Korean long-range threats. C2BMC provided capability in all four capability areas: Ballistic Missile Defense System (BMDS) Planner, Situational Awareness, Battle Management, and BMD Network. BMDS Planner capability provided theater and strategic commanders the ability to plan and analyze placement of weapons in response to potential threats. Situational Awareness capability provided displays and decision aids that allow senior defense officials to quickly see, evaluate, and respond to global missile defense threats. Battle Management capability delivered AN/TPY-2 radar management. BMD Network delivered connectivity between all components of the BMDS, providing a survivable and redundant communications capability.

The C2BMC Program delivered operational capabilities to the Combatant Commands at Northern Command (NORTHCOM), Strategic Command (STRATCOM), and Pacific Command (PACOM), and within the National Capital Region (NCR). In addition, a C2BMC AN/TPY-2 shelter was deployed to Japan and a High Mobility Multipurpose Wheeled Vehicle (HMMWV) Based Communication Node (HBCN) was deployed to Juneau, AK to support the AN/TPY-2 radar for system test purposes.

B. Accomplishments/Planned Program

	FY 2008	FY 2009	FY 2010	FY 2011
C2BMC Development	78,733	0	0	
RDT&E Articles (Quantity)	0	0	0	

C2BMC Development accomplishes Block 1.0 objectives by balancing the development of four principle capability areas: BMDS Planner, Situational Awareness, Battle Management, and BMD Network, enabling capabilities to be integrated and incrementally delivered to the warfighter via spirals. Block 1.0 includes infrastructure development, testing activity, and development support of fielded hardware and software.

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date: May 2009
APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE: **0603896C BMD C2BMC**

FY08 Accomplishments:

- Performed software deficiency analyses and developed solutions
- Performed monthly information assurance scans and corrected deficiencies
- Participated in and analyzed results of tests, exercises, and wargames

	FY 2008	FY 2009	FY 2010	FY 2011
C2BMC Site Activation/Fielding-AN/TPY-2 Communications	25,121	0	0	
RDT&E Articles (Quantity)	0	0	0	

The C2BMC Program completed development, delivery, and fielding of a communications capability that supported an AN/TPY-2 radar which was deployed to Juneau, AK for Flight Test 03 (FTX-03, formerly FTG-04) during FY08. This capability was provided by the High Mobility Multipurpose Wheeled Vehicle (HMMWV) Based Communication Node (HBCN) which provides terrestrial communication control functionalities as well as satellite communications and power supply system.

FY08 Accomplishments:

- Integrated and tested HBCN communications capability with AN/TPY-2 radar at Vandenberg Air Force Base
- Deployed HBCN to Alaska along with AN/TPY-2 to support flight test FTX-03
- Provided engineering support during planning and execution of FTX-03

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date: May 2009
APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE: 0603896C BMD C2BMC

C. Other Program Funding Summary

	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	Total Cost
PE 0603175C Ballistic Missile Defense Technology	106,437	119,308	109,760						-
PE 0603881C Ballistic Missile Defense Terminal Defense Segment	1,034,478	956,686	719,465						-
PE 0603882C Ballistic Missile Defense Midcourse Defense Segment	2,198,664	1,507,481	982,922						-
PE 0603883C Ballistic Missile Defense Boost Defense Segment	503,475	400,751	186,697						-
PE 0603884C Ballistic Missile Defense Sensors	574,231	777,693	636,856						-
PE 0603886C Ballistic Missile Defense System Interceptors	330,874	385,493	0						-
PE 0603888C Ballistic Missile Defense Test and Targets	619,137	919,956	966,752						-
PE 0603890C Ballistic Missile Defense Enabling Programs	416,937	402,778	369,145						-
PE 0603891C Special Programs - MDA	193,157	175,712	301,566						-
PE 0603892C Ballistic Missile Defense Aegis	1,126,337	1,113,655	1,690,758						-
PE 0603893C Space Tracking & Surveillance System	226,499	208,923	180,000						-
PE 0603894C Multiple Kill Vehicle	223,084	283,481	0						-
PE 0603895C BMD System Space Program	16,237	24,686	12,549						-
PE 0603897C BMD Hercules	51,387	55,764	48,186						-
PE 0603898C BMD Joint Warfighter Support	45,400	69,743	60,921						-
PE 0603904C Missile Defense Integration & Operations Center (MDIOC)	77,102	106,040	86,949						-
PE 0603906C Regarding Trench	1,945	2,968	3,164						-
PE 0603907C Sea Based X-Band Radar (SBX)	155,244	146,895	174,576						-
PE 0603908C BMD Europ Intercep Site	0	362,007	0						-
PE 0603909C BMD Europ Midcourse Radar	0	76,537,	0						-
PE 0603911C BMD European Capability	0	0	50,504						-
PE 0603912C BMD European Comm Support	0	27,008	0						-
PE 0603913C Israeli Cooperative	0	0	119,634						-
PE 0605502C Small Business Innovative Research BMDO	137,409	0	0						-
PE 0901585C Pentagon Reservation	5,971	19,667	19,709						-
PE 0901598C Management Headquarters - MDA	83,907	81,174	57,403						-

Note: The Ballistic Missile Defense System (BMDS) is an integrated, interoperable, global defense system. The programs which comprise the BMDS are interdependent.

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date: May 2009
APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE: 0603896C BMD C2BMC

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. 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 Development Center/University Affiliated Research Centers (FFRDC/UARC), and Advisory and Assistance Services (A&AS) personnel are also fully integrated as part of the Prime contractor's team to function in an Integrated Product Team environment.

Missile Defense Agency (MDA) Exhibit R-3 Project Cost Analysis	May 2009
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603896C BMD C2BMC**

I. Product Development Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2009 Cost	FY 2009 Award/ Oblg Date	FY 2010 Cost	FY 2010 Award/ Oblg Date	FY 2011 Cost	FY 2011 Award/ Oblg Date	Total Cost
C2BMC Development										
C2BMC Hardware (HW)/Software (SW) Development/Integration & Test (I&T)	SS/CPAF	Lockheed Martin Team/ Colorado Springs, CO	8,419	0	N/A	0	N/A			8,419
C2BMC HW/SW Development/I&T	SS/CPAF	Lockheed Martin Team/ Huntsville, AL	1,276	0	N/A	0	N/A			1,276
C2BMC Product Engineering & Development	SS/CPAF	Lockheed Martin Team/ Arlington, VA	15,817	0	N/A	0	N/A			15,817
C2BMC Network		Services, DISA, Agencies	11,995	0	N/A	0	N/A			11,995
Federally Funded Research Development Centers	SS/CPAF	MITRE, IDA, ORNL, MIT/LL// Washington, DC	11,717	0	N/A	0	N/A			11,717
MDA Civilian			5,503	0	N/A	0	N/A			5,503
Advisory and Assistance Services (A&AS)		SPARTA/ Arlington, VA	24,006	0	N/A	0	N/A			24,006
C2BMC Site Activation/Fielding-AN/TPY-2 Communications										
AN/TPY-2 Communications	SS/CPAF	Lockheed Martin Team	16,142	0	N/A	0	N/A			16,142
AN/TPY-2 Communications	SS/CPAF	DISA/ Various	8,979	0	N/A	0	N/A			8,979
Subtotal Product Development			103,854	0		0				103,854

Remarks

Missile Defense Agency (MDA) Exhibit R-3 Project Cost Analysis	May 2009
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603896C BMD C2BMC**

II. Support Costs Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2009 Cost	FY 2009 Award/ Oblg Date	FY 2010 Cost	FY 2010 Award/ Oblg Date	FY 2011 Cost	FY 2011 Award/ Oblg Date	Total Cost
Subtotal Support Costs										

Remarks

III. Test and Evaluation Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2009 Cost	FY 2009 Award/ Oblg Date	FY 2010 Cost	FY 2010 Award/ Oblg Date	FY 2011 Cost	FY 2011 Award/ Oblg Date	Total Cost
Subtotal Test and Evaluation										

Remarks

IV. Management Services Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2009 Cost	FY 2009 Award/ Oblg Date	FY 2010 Cost	FY 2010 Award/ Oblg Date	FY 2011 Cost	FY 2011 Award/ Oblg Date	Total Cost
Subtotal Management Services										

Remarks

Project Total Cost			103,854	0		0				103,854

Remarks

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date: May 2009
APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE: **0603896C BMD C2BMC**

COST ($ in Thousands)	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015
BX01 Ballistic Missile Defense C2BMC Block 2.0	107,024	94,660	27,605					
RDT&E Articles Qty	0	0	1					

Note:
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. Block 2 includes one RDT&E Article, Spiral 6.4, which is planned for operational fielding in FY10.

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 systematically plan the fight, see it unfold, and dynamically direct and adjust ballistic missile defense networked sensors and weapons to engage and defeat ballistic missile threats at any range, in any phase of flight, across all theaters. The C2BMC capability will provide the warfighter the ability to optimize ballistic missile defense from a global level by combining the best sensor information with the most efficient weapon.

Today, the center of gravity for integrated Ballistic Missile Defense System (BMDS) is with C2BMC at the Combatant Command (COCOM) Headquarters, where BMD mission planning, situational awareness, and decisions aids are focused. All data processing is performed at Strategic Command (STRATCOM), Northern Command (NORTHCOM), and Pacific Command (PACOM) headquarters. Users of the system are either collocated with, or directly connected to the equipment suites at these COCOMs. As the system evolves, the center of gravity will shift from the COCOMs to the Air Operations Centers (AOCs) and supporting Service Components (e.g., Army), where real-time, automated battle management will be introduced. While the Area Air Defense Commander's staff focuses on fighting the battle, senior leaders at COCOM Headquarters will be able to watch the battle unfold and guide decisions using C2BMC-provided decision aids. Together, these separate capabilities enable the warfighter to prioritize theater, regional, and homeland defense missions. To accomplish this shift in the center of gravity and meet the C2BMC mission objective to manage all sensors and all weapons, to defeat any threat, in any phase of flight, the C2BMC Program of work in Block 2.0 includes concentrated effort on developing complementary, networked, C2BMC system capabilities (i.e., global BMD planning and situational awareness at the Combatant Commands Headquarters and Global Engagement Manager (GEM) at the Air Operations Center for initial deployment by the end of the Block).

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date: May 2009
APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE: **0603896C BMD C2BMC**

In Block 2.0, the C2BMC program will defend allies and deployed forces from short- to medium-range threats in one region/theater. Block goals are to deliver:

- Improved C2BMC system reliability and availability
- Initial Global Engagement Manager (GEM) capability (automated sensor management, track downselect/forwarding on Link-16, and operator track-level management) at the Kenney Headquarters Air Operations Center which supports multiple AN/TPY-2 radars
- Enhanced BMDS Planner with better user displays, flexible defense designs, and faster analysis
- Enhanced situational awareness in support of command and control decisions at the Combatant Command (COCOM) Headquarters with additional Ground Based Midcourse Defense (GMD) essential elements of information and more informative visual representations
- Enhanced network monitoring and Secret Internet Protocol Router Network (SIPRNET) information assurance
- Activation of communications for C2BMC capability to control AN/TPY-2 radar in European Command (EUCOM)
- Updated C2BMC model, continuously validated for critical engagement conditions, for system-level performance assessments
- Support for development of Unifying Missile Defense Functions (UMDF) capabilities

C2BMC ELEMENT

In Block 2.0, the BMDS Planner will be improved to include updated representations of the capabilities of each BMDS weapon and sensor and Concept of Operations (CONOPS) to increase fidelity in all planning phases. Block 2.0 will also include an initial merging of the BMDS Planner and Joint Engine for Defense Analysis (JEDA) graphical user interface (previously two separately running programs) with Defended Area Analysis to provide a more rapid view of how well a particular plan performs its mission; thus, allowing the analysis of more options in a shorter time.

Situational Awareness improvements in Block 2.0 include enhancements such as inclusion of additional battlespace information to include new tabular and graphical displays of early warning and track information and common threat track identification across BMDS elements to eliminate operator confusion. Also, improvements include additional GMD essential elements of information. Additionally, for Block 2.0, the C2BMC Program is incorporating additional controls (via a web proxy architecture) to protect its applications and hardware from external threats across the Secret Internet Protocol Router Network (SIPRNET).

The first deployment of Global Engagement Manager (GEM) to the Integrated Missile Defense Operations Cell inside the Kenney Air Operations Center (AOC) (Hawaii) is focused on AN/TPY-2 radar control and use of search plans and will continue to grow to allow the warfighter an ability to optimize sensor-weapon pairing. At the end of Block 2.0, GEM will have the primary task of managing multiple AN/TPY-2 radars in a region or theater for threat acquisition and discrimination. It will also allow the operator the ability to modify the execution of the BMDS fight based on real-

time battlefield learning and provide the ability to manipulate individual threat tracks based on other intelligence. GEM also delivers battle management capabilities for the following Unifying Missile Defense Functions (UMDFs): correlation of multiple sensor tracks for a given target, as seen by different sensors, for common track identification (Multi-Hypothesis Correlator/Ballistic Missile Launch Event Association-Global Vision (MHC/BLEA-GV)); initial capability to identify the real threat (i.e., discrimination) by providing the conduit for AN/TPY-2 radar discrimination data to the Ground-Based Missile Defense (GMD) for more accurate fire control solutions; and initial ability to process multiple sensor inputs into a single, engageable system track (for internal C2BMC consumption only).

In Block 2.0, the network portion of C2BMC will provide initial Network Enterprise capabilities, starting with centralized detailed network performance monitoring within the BMDS Network Operations and Security Center (BNOSC) and cryptographic device management This ensures truly integrated Network Operations (Enterprise Management, Network Defense, and Situational Awareness), eliminating seams across the global communications infrastructure and optimizing information flow based on the global vice regional BMD mission. The centralized NetOps approach reduces the global O&S footprint, consolidating resources and reducing O&M costs. The BNOSC establishes centralized network defense, allowing for a consolidated approached to defending the network, identifying network attack trends and initiating a coordinated response across the entire BMD COMNET. Centralized cryptographic device management ensures planned and unplanned crypto changes are tightly coordinated across the Agency elements and COCOMs, reducing network downtime by minimizing outages caused by cross-organization coordination challenges. The BNOSC will evolve to full Quality of Service (QOS) network monitoring to ensure messages and communications are properly routed to avoid bottlenecks. Additionally, a BMDS Communications System Complex-Transportable (BCSC-T) and a High Mobility Multipurpose Wheeled Vehicle (HMMWV) Based Communications Node (HBCN) will continue to be developed, constructed, and fielded concurrent with the AN/TPY-2 to connect it to the BMDS from deployed locations.

Block 2.0 matured products will be included in Spiral 6.4, and then delivered to the field for concurrent development testing and operational use.

B. Accomplishments/Planned Program

	FY 2008	FY 2009	FY 2010	FY 2011
Spiral 6.4/C2BMC Network (C2BMC Development)	97,558	84,437	27,605	
RDT&E Articles (Quantity)	0	0	1	

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. Block 2 includes one RDT&E Article, Spiral 6.4, which is planned for operational fielding in FY10.

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date: May 2009
APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE: **0603896C BMD C2BMC**

The C2BMC Program accomplishes block objectives by integrating work across four capability areas: BMDS Planner, Situational Awareness, Global Engagement Manager (GEM), and BMD Network, so that mature capabilities can be integrated and incrementally delivered to the warfighter. One incremental delivery, Spiral 6.4, is planned in Block 2.0.

FY08 Accomplishments:

- Spiral 6.4 software coding / initial application network integration
- Conducted early C2BMC to AN/TPY-2 development testing
- Performed software deficiency analyses and developed solutions
- Participated in and analyzed results of tests, exercises, and wargames
- BMDS Communications System Complex-Transportable (BCSC-T) at Tobyhanna for integration testing with the AN/TPY-2

FY09 Planned Program:

- Conduct Spiral 6.4 requirements verification testing (Cycle 2)
- Deliver Spiral 6.4 (RDT&E Article) to the field for Cycle 5, site activation and check out testing
- Perform software deficiency analyses and develop solutions
- Perform monthly information assurance scans and correct deficiencies
- Participate in and analyze results of Ballistic Missile Defense System (BMDS) integration, ground and flight tests per the BMDS Integrated Master Test Plan
- Participate in and analyze results of wargames
- Update Space Based Infrared System (SBIRS) interfaces

FY10 Planned Program:

- Participate in BMDS distributed ground (GTI / GTD) and flight tests to verify Spiral 6.4 fielded performance
- Perform software deficiency analyses and developed solutions
- Perform monthly information assurance scans and correct deficiencies
- Participate in and analyze results of Ballistic Missile Defense System integration, ground and flight tests, exercises, and wargames
- Update C2BMC model, validate for critical engagement conditions for system-level performance assessment

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date: May 2009
APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE: **0603896C BMD C2BMC**

	FY 2008	FY 2009	FY 2010	FY 2011
C2BMC Site Activation/Fielding	9,466	10,223	0	
RDT&E Articles (Quantity)	0	0	0	

Block 2.0 Site Activation efforts continue to address the fielding and upgrade of all C2BMC associated hardware and software (Suites, Enterprise Work Stations (EWS), web browsers, and communications equipment) which enable the warfighter to plan, see, and manage the ballistic missile defense battle.

FY08 Accomplishments:

- Updated production and installation drawings for Spiral 6.4 hardware with addition of web proxy
- Installed Web Browsers and Planners
- Installed European Command (EUCOM) Gateway (Command and Control Node, communications equipment only)
- Installed Strategic Command (STRATCOM) track server and hardware upgrades for Spiral 6.4

FY09 Planned Program:

- Acquire and install Northern Command (NORTHCOM) and PACOM track server and hardware upgrades for Spiral 6.4
- Acquire and install Spiral 6.4 COCOM hardware and software at NORTHCOM, STRATCOM, and PACOM
- Acquire and install PACOM Test Gateway
- Acquire and install AN/TPY-2 Spiral 6.4 hardware upgrades
- Acquire and install Spiral 6.4 Global Engagement Manager (GEM) hardware and software at Kenney Headquarters
- Update production drawings and installation procedures
- Acquire and install Enterprise Work Stations, Web Browsers, and Planners
- Acquire and install Ft. Greely, AK (FGA) Spiral 6.4 hardware

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date: May 2009
APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE: 0603896C BMD C2BMC

C. Other Program Funding Summary

	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	Total Cost
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PE 0603882C Ballistic Missile Defense Midcourse Defense Segment	2,198,664	1,507,481	982,922						-
PE 0603883C Ballistic Missile Defense Boost Defense Segment	503,475	400,751	186,697						-
PE 0603884C Ballistic Missile Defense Sensors	574,231	777,693	636,856						-
PE 0603886C Ballistic Missile Defense System Interceptors	330,874	385,493	0						-
PE 0603888C Ballistic Missile Defense Test and Targets	619,137	919,956	966,752						-
PE 0603890C Ballistic Missile Defense Enabling Programs	416,937	402,778	369,145						-
PE 0603891C Special Programs – MDA	193,157	175,712	301,566						-
PE 0603892C Ballistic Missile Defense Aegis	1,126,337	1,113,655	1,690,758						-
PE 0603893C Space Tracking & Surveillance System	226,499	208,923	180,000						-
PE 0603894C Multiple Kill Vehicle	223,084	283,481	0						-
PE 0603895C BMD System Space Program	16,237	24,686	12,549						-
PE 0603897C BMD Hercules	51,387	55,764	48,186						-
PE 0603898C BMD Joint Warfighter Support	45,400	69,743	60,921						-
PE 0603904C Missile Defense Integration & Operations Center (MDIOC)	77,102	106,040	86,949						-
PE 0603906C Regarding Trench	1,945	2,968	3,164						-
PE 0603907C Sea Based X-Band Radar (SBX)	155,244	146,895	174,576						-
PE 0603908C BMD Europ Intercep Site	0	362,007	0						-
PE 0603909C BMD Europ Midcourse Radar	0	76,537	0						-
PE 0603911C BMD European Capability	0	0	50,504						-
PE 0603912C BMD European Comm Support	0	27,008	0						-
PE 0603913C Israeli Cooperative	0	0	119,634						-
PE 0605502C Small Business Innovative Research BMDO	137,409	0	0						-
PE 0901585C Pentagon Reservation	5,971	19,667	19,709						-
PE 0901598C Management Headquarters – MDA	83,907	81,174	57,403						-

Note: The Ballistic Missile Defense System (BMDS) is an integrated, interoperable, global defense system. The programs which comprise the BMDS are interdependent.

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date: May 2009
APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE: 0603896C BMD C2BMC

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 emphasizing testing, incremental development, evolutionary acquisition, and knowledge-based funding. Lockheed Martin Mission Systems is the C2BMC prime contractor via an Other Transaction Agreement. 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 Development Center/University Affiliated Research Centers (FFRDC/UARC), and Advisory and Assistance Services (A&AS) personnel are also fully integrated as part of the Prime contractor's team to function in an Integrated Product Team environment.

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date: May 2009
APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE: 0603896C BMD C2BMC

I. Product Development Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2009 Cost	FY 2009 Award/ Oblg Date	FY 2010 Cost	FY 2010 Award/ Oblg Date	FY 2011 Cost	FY 2011 Award/ Oblg Date	Total Cost
Spiral 6.4/C2BMC Network (C2BMC Development)										
C2BMC Hardware (HW)/Software (SW) Development/Integration & Test (I&T)	SS/CPAF	Lockheed Martin Team/ Colorado Springs, CO	30,641	25,921	1Q	8,862	1Q			65,424
C2BMC HW/SW Development/I&T	SS/CPAF	Lockheed Martin Team/ Huntsville, AL	4,643	3,927	1Q	1,343	1Q			9,913
C2BMC Product Engineering & Development	SS/CPAF	Lockheed Martin Team/ Arlington, VA	57,570	48,698	1Q	16,649	1Q			122,917
C2BMC Network		Services, DISA, Agencies	4,704	5,891	1Q	751	1Q			11,346
C2BMC Site Activation/Fielding										
Suites and Communications Gateways	SS/CPAF	Lockheed Martin Team	9,466	10,223	1Q	0	N/A			19,689
Subtotal Product Development			107,024	94,660		27,605				229,289

Remarks

II. Support Costs Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2009 Cost	FY 2009 Award/ Oblg Date	FY 2010 Cost	FY 2010 Award/ Oblg Date	FY 2011 Cost	FY 2011 Award/ Oblg Date	Total Cost
Subtotal Support Costs										

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date: May 2009
APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE: 0603896C BMD C2BMC

Remarks

III. Test and Evaluation Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2009 Cost	FY 2009 Award/ Oblg Date	FY 2010 Cost	FY 2010 Award/ Oblg Date	FY 2011 Cost	FY 2011 Award/ Oblg Date	Total Cost
Subtotal Test and Evaluation										

Remarks

IV. Management Services Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2009 Cost	FY 2009 Award/ Oblg Date	FY 2010 Cost	FY 2010 Award/ Oblg Date	FY 2011 Cost	FY 2011 Award/ Oblg Date	Total Cost
Subtotal Management Services										

Remarks

Project Total Cost			107,024	94,660		27,605				229,289

Remarks

Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile

Date: **May 2009**

APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**

R-1 NOMENCLATURE: **0603896C BMD C2BMC**

Fiscal Year	2008				2009				2010				2011				2012				2013				2014				2015			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Development																																
Spiral 6.4 Content Agreement	▲																															
Complete Spiral 6.4 Cycle 2 Testing										△																						
Complete Spiral 6.4 Cycle 5 Testing										△																						
Fielding																																
Install Spiral 6.4 HW (STRATCOM)				▲																												
Complete Spiral 6.4 HW Installations (PACOM, NORTHCOM, and Fort Greely, AK)						▲																										

Legend

▲	Significant Event (complete)	△	Significant Event (planned)
★	Milestone Decision (complete)	☆	Milestone Decision (planned)
◆	Element Test (complete)	◇	Element Test (planned)
▼	System Level Test (complete)	▽	System Level Test (planned)
▲▬▲	Complete Activity	△▬△	Planned Activity

Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail	Date: May 2009
APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE: **0603896C BMD C2BMC**

Schedule Profile	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015
Development								
Spiral 6.4 Content Agreement	1Q							
Complete Spiral 6.4 Cycle 2 Testing			2Q					
Complete Spiral 6.4 Cycle 5 Testing			2Q					
Fielding								
Install Spiral 6.4 HW (STRATCOM)	4Q							
Complete Spiral 6.4 HW Installations (PACOM, NORTHCOM, and Fort Greely, AK)		2Q						

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date: May 2009
APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE: **0603896C BMD C2BMC**

COST ($ in Thousands)	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015
CX01 Ballistic Missile Defense C2BMC Block 3.0	83,770	142,814	253,190					
RDT&E Articles Qty	0	0	0					

Note:
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. Block 3.0 includes two RDT&E Articles: Spirals 8.2 and 8.4.

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 Block 3.0 Program expands defense of the United States to include limited Iranian Long-Range Threats. Specific Block goals are to deliver:

- Fully integrated BMDS Planner and situational awareness displays with integrated intelligence information and defended asset priority schemes
- Initial interfaces between weapons and sensors compatible with DoD network-centric service-oriented architecture
- Northern Command (NORTHCOM) and European Command (EUCOM) expansion of Global Engagement Manager (GEM)
- Joint Integrated Air and Missile Defense (JIAMD) Planner capability
- Incorporation of Overhead Persistent Infra-Red (OPIR) sensor data for radar cueing
- Update C2BMC model, continuously validated for critical engagement conditions, for system-level performance assessment
- Improved network monitoring and computer network defense at the BNOSC

C2BMC ELEMENT

The Block 3.0 BMDS Planner will evolve to a net centric capability and add integrated air and missile defense capability. The system will be designed to interface with the service components and their evolving systems and enable cross planning between the Combatant Commanders. The

Planner will continue to initialize the Global Engagement Manager (GEM) capability as it comes on line and will continue to be the initialization source for situational awareness.

Situational Awareness improvements in Block 3.0 include the migration to evolving Department of Defense command and control architecture to take advantage of evolving command and control architectures and hardware, enhanced Protection Capability (PROCAP) to give the warfighter an assessment of how the BMDS architecture is protecting a specific defended area, display of individual weapon system engagements and information coordination, updates of command authority decision information (Essential Elements of Information) with new Ground Based Midcourse Defense (GMD) data, display of debris fields (consequence management) based on Element provided data, and an integrated common operating picture across the Combatant Commands.

At the end of Block 3.0, C2BMC battle management, via the Global Engagement Manager (GEM), delivers X-Band radar (AN/TPY-2 and Sea-Based X-Band - SBX) sensor control and capabilities for the following Unifying Missile Defense Functions (UMDFs): improved threat/object correlation, by accounting for sensor bias and threat features to calculate a common threat track from multiple sensors, incorporation of Overhead Non-imaging Infra-Red (OPIR) and Space Based Infra-Red System (SBIRS) sensor data for improved radar cueing, and improved engageable system threat tracks for regional elements (e.g., Theater High Altitude Area Defense (THAAD) and Aegis BMD) and Ground Based Midcourse Defense Fire Control (GFC); integrated BMDS system discrimination via data fusion; sensor registration to assess the quality of radar data received in the BMDS; system track generation and publishing to all Ballistic Missile Defense System (BMDS) elements using multiple (geographically filterable) sensors, with ability to create a Target Object Map for use in the GMD interceptor end-game; and sensor management and weapons engagement coordination aids to direct the BMDS fight and make efficient use of limited inventory. Additionally, BMDS battle management will operate in two regions as well as across regions while preoviding global situational awareness.

In Block 3.0, the network portion of C2BMC includes upgrades to its Parallel Staging Network, a dedicated Secret Internet Protocol Router Network (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 Operations and Security (BNOSC). Development, construction and integration of the BMDS Communications System Complex-Transportable (BCSC-T) and High Mobility Multipurpose Wheeled Vehicle (HMMWV) Based Communications Node (HBCN) also continue during Block 3.0. The BCSC-T is a relocatable standardized communication complex. The HBCN is a rapidly deployable standardized communication complex. Both the BCSC-T and HBCN provide terrestrial communication control functionalities as well as satellite communications and power supply system.

Block 3.0 also includes common threat engineering efforts beginning in FY10. Common threat engineering produces common and consistent adversary trajectory and signature data to enable Ballistic Missile Defense System and sub-system concept and requirements, design, verification,

and assessment. Common Threat data is contained in the Adversary Capability Document (ACD) and Adversary Data Packages (ADP) and drives BMDS ground tests, flight tests, digital simulations, and pre-mission analysis activities. It is also is used to develop the BMD System Description Document and BMD System Specification.

Block 3.0 matured products will be included in Spirals 8.2, and 8.4 and then delivered to the field for concurrent development testing and operational use.

SITE ACTIVATION

C2BMC capabilities (hardware and software) will be deployed to Northern Command (NORTHCOM), Strategic Command (STRATCOM), Pacific Command (PACOM), and European Command (EUCOM) with existing sites receiving upgrades as needed. A Global Engagement Manager (GEM) suite will be deployed in EUCOM with back-up suite added at NORTHCOM. Deployment to these Combatant Commands continues to expand Ballistic Missile Defense System (BMDS) on a global scale, providing increased protection to the U.S., and its friends and Allies. Block 3.0 expands current capability with numerous BMDS Planner, web browser, and Enterprise Workstation installations per warfighter requirements. Site Activation also includes participation in planning for future BMDS operations and site installations.

B. Accomplishments/Planned Program

	FY 2008	FY 2009	FY 2010	FY 2011
Spirals 8.2/8.4 C2BMC Network (C2BMC Development)	44,572	142,814	227,310	
RDT&E Articles (Quantity)	0	0	0	

The C2BMC Program accomplishes block objectives by integrating work across four capability areas: BMDS Planner, Situational Awareness, Global Engagement Manager (GEM), and BMD Network, so mature capabilities are integrated and incrementally delivered to the warfighter. Spirals 8.2 and 8.4 are planned in Block 3.0.

FY08 Accomplishments:

- Derived/contributed requirements for BMDS Block 3.0 System Specification and Communication Specification
- Established Block 3.0 requirements with initial allocation to Spirals 8.2 and 8.4
- Established Spiral 8.2 architecture

- Conducted and exchanged plans between US and North Atlantic Treaty Organization (NATO) Active Layered Theater Ballistic Missile Defense (ALTBMD) Integration Test Bed (ITB)

FY09 Planned Program

- Establish detailed Spiral 8.2 C2BMC requirements
- Establish Spiral 8.2 Content Agreement specifically defining those capabilities to be developed in the software
- Conduct Spiral 8.2 application and network engineering
- Initiate Spiral 8.2 BMD Planner, Situational Awareness, Global Engagement Manager (GEM), and network software development, coding, and integration
- Initiate integration of Overhead Persistent Infra-Red (OPIR) sensor data into operational C2BMC sensor management schema
- Participate in and analyze results of ground and flight tests, wargames, and exercises
- Continue maturation and integration of US BMDS with North Atlantic Treaty Organization (NATO) Active Layered Theater Ballistic Missile Defense (ALTBMD)
- Incorporate Common Integrated XML Schema (CIXS) standard in C2BMC architecture to ensure interoperability across the Services and NATO
- Participate with other BMDS Elements in transitioning GMD Communications Network (GCN) to Defense Information System Network (DISN)

FY10 Planned Program:

- Complete Spiral 8.2 BMD Planner, Situational Awareness, Global Engagement Manager (GEM), and network software development, coding, and integration (FY10 is the height of Spiral 8.2 hardware and software development, integration, and component testing)
- Upgrade development labs with hardware and software
- Perform lab to lab testing between C2BMC, AN/TPY-2 and GMD to reduce risk of system track/correlation/discrimination development
- Incrementally integrate and test Spiral 8.2 Situational Awareness, Global Engagement Manager (GEM), and network software and hardware prior to integration in the Missile Defense Integration & Operations Center (MDIOC) - (C2BMC infrastructure for MDIOC testing provided in MDIOC Program Element 0603904C)
- Develop GEM hardware/software for deployment to EUCOM
- Incorporate Overhead Non-imaging Infra-Red (OPIR) boost phase cueing algorithm in Spiral 8.2 software design and test
- Complete Spiral 8.4 architecture design
- Establish Spiral 8.4 detailed element requirements
- Establish Spiral 8.4 Content Agreement specifically defining those capabilities to be developed in the software

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date: May 2009
APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE: **0603896C BMD C2BMC**

- Spiral 8.4 application and network software engineering
- Perform Spiral 8.4 Situational Awareness, GEM, and network software development, coding, and integration
- Initiate C2BMC Concurrent Test, Training, and Operations (CTTO) with modifications of C2BMC Network Interface Processors (CNIP) for activity identifiers and element registration
- Initiate common threat engineering
- Participate in and analyze results of ground and flight tests, wargames, and exercises
- Continue maturation and integration of US BMDS with NATO Active Layered Theater Ballistic Missile Defense (ALTBMD)
- Continue incorporating Common Integrated XML Schema (CIXS) into C2BMC architecture for Services and NATO situational awareness interoperability
- Update C2BMC model, validate for critical engagement conditions, for system-level performance assessments

	FY 2008	FY 2009	FY 2010	FY 2011
C2BMC Testbed	21,927	0	0	
RDT&E Articles (Quantity)	0	0	0	

The C2BMC Testbed functions as the core integration activity for exercising, evaluating, analyzing and refining advanced missile defense concepts that can then be used to improve follow-on blocks to the BMDS. It does this by planning, providing technical support, and executing Operator-in-the-Loop and Element-in-the-Loop wargames; joint warfighter exercises and experiments; missile defense ground tests; C2BMC integration testing and experiments, and system level missile defense analyses. These activities allow the developer, tester, and operator to assess capabilities in the same operationally representative environment. The C2BMC Testbed supports all Blocks. For ease of understanding and reporting, the entire C2BMC Testbed effort is included in Block 3. For FY09-10, the C2BMC Testbed efforts are included in PE 0603904C, Missile Defense Integration and Operations Center (MDIOC), Project CX22, MDIOC-Block 3.

FY08 Accomplishments:

- Planned, collected data, assessed, examined, and reported on MDA-directed C2BMC Spiral integration testing
- Supported integration and testing of Distributed Track Processing
- Supported integration and testing of the Global Engagement Manager (GEM)
- Supported integration and testing of the BMD Network and Parallel Staging Network
- Supported experimentation, integration and testing of the C2BMC Net Centric Architecture
- Continued to support the integration of missile defense elements into the BMDS command and control structure

- Built out and upgraded the Missile Defense Integration and Operations Center (MDIOC) C2BMC Testbed facilities to support integration and testing of C2BMC functionality and architecture
- Planned, prepared for, and conducted FY08 BMDS tests, wargames, and exercises in accordance with the Integrated Master Test Plan
- Conducted C2BMC X-lab events and experimentation such as: Network Enabled Capability Development/Prototyping/Integration, Overhead Persistent Infra-Red (OPIR) Sensors; matured and transitioned technologies to development and operations
- Refined C2BMC interfaces to BMDS elements and space-based sensors

	FY 2008	FY 2009	FY 2010	FY 2011
Thule C2BMC Fielding	3,300	0	0	
RDT&E Articles (Quantity)	0	0	0	

For FY09, the C2BMC Thule Fielding efforts are included in PE 0603884C, Ballistic Missile Defense Sensors, Project CX11, BMD Radars Block 3.0.

FY08 Accomplishments:

- Initiated single, consolidated Command and Control (C2) shielded communications room with site C2 systems
- Initiated collocation of all C2 equipment to include data switches (Secret Internet Protocol Router / Non-secure Internet Protocol Router (SIPR/NIPR) equipment, Ground Based Midcourse Defense (GMD) node equipment, C2BMC Communications Network Interface Processor (CNIP) and voice switches (Plain Old Telephone Service (POTS) and Defense Red Switch Network (DRSN))
-

	FY 2008	FY 2009	FY 2010	FY 2011
C2BMC Joint Early Warning Laboratory (JEWL)	2,073	0	0	
RDT&E Articles (Quantity)	0	0	0	

The C2BMC Joint Early Warning Lab (JEWL) is a computing and analysis resource located at the Missile Defense Integration and Operations Center (MDIOC). The JEWL conducts analysis and studies to assess and improve theater Early Warning (EW) and Ballistic Missile Defense (BMD) performance.

The JEWL is the Strategic Command (STRATCOM) designated facility for testing all changes or additions to the Theater Event System (TES) architecture. JEWL replicates all known theater Early Warning (EW) architecture and maintains a replay capability for fault isolation, anomaly

identification, and can modify data to isolate anomalies. JEWL supports the Ballistic Missile Defense System (BMDS) by providing timely analysis and comparisons of BMD legacy EW data. For FY09-11, the C2BMC JEWL efforts are included in PE 0603904C, Missile Defense Integration and Operations Center (MDIOC), Project CX22, MDIOC-Block 3.

FY08 Accomplishments:

- Performed Early Warning Target of Opportunity (TOO) comparative analysis
- Provided C2BMC test support
- Provided Theater Auto Release (TAR) test planning and execution
- Provided C2BMC early warning integration support

	FY 2008	FY 2009	FY 2010	FY 2011
C2BMC Technology	11,898	0	0	
RDT&E Articles (Quantity)	0	0	0	

For FY09-10 the C2BMC Technology efforts are included in PE 0603175C, Ballistic Missile Defense Technology, Project WX25, Advanced Technology Effort.

FY08 Accomplishments:

- Commenced/continued activities to enable the integration of advanced C2BMC capabilities into new BMDS subsystems
- Integrated the C2BMC X-Lab and Missile Defense Space Experimentation Center (MDSEC) at a level higher than SECRET to enable demonstration of advanced C2BMC capabilities
- Supported development testing and integration of Overhead Persistent Infra Red (OPIR) sensors with C2BMC
- Transitioned network enabled capability pilot project to the operational C2BMC system
- Conducted sensor netting experiments associated with BMDS registration, sensor tracking (local), network tracking, discrimination, sensor resource tasking, and communications/bandwidth constraints
- Conducted assessments of expanded distributed track processing capabilities for the BMDS, to include measurement and track-level sensor information

	FY 2008	FY 2009	FY 2010	FY 2011
C2BMC Site Activation/Fielding	0	0	25,880	

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date: May 2009
APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE: **0603896C BMD C2BMC**

RDT&E Articles (Quantity)	0	0	0	

Block 3.0 site activation efforts continue to address the fielding and upgrade of all C2BMC associated hardware and software (COCOM suites, Global Engagement Manager suites, Enterprise Work Stations (EWS), web browsers, and communications equipment) which enable the warfighter to plan, see, and manage the ballistic missile defense battle.

FY10 Planned Program:

- Begin acquisition and initial installation of Spiral 8.2 Combatant Command (COCOM) hardware at Northern Command (NORTHCOM), Strategic Command (STRATCOM), and Pacific Command (PACOM)
- Update production drawings and installation procedures
- Acquire and install Enterprise Work Stations, Web Browsers, and Planners
- Initial network enabled capability installation at Combatant Commands (COCOMS)

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date: May 2009
APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE: 0603896C BMD C2BMC

C. Other Program Funding Summary

	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	Total Cost
PE 0603175C Ballistic Missile Defense Technology	106,437	119,308	109,760						-
PE 0603881C Ballistic Missile Defense Terminal Defense Segment	1,034,478	956,686	719,465						-
PE 0603882C Ballistic Missile Defense Midcourse Defense Segment	2,198,664	1,507,481	982,922						-
PE 0603883C Ballistic Missile Defense Boost Defense Segment	503,475	400,751	186,697						-
PE 0603884C Ballistic Missile Defense Sensors	574,231	777,693	636,856						-
PE 0603886C Ballistic Missile Defense System Interceptors	330,874	385,493	0						-
PE 0603888C Ballistic Missile Defense Test and Targets	619,137	919,956	966,752						-
PE 0603890C Ballistic Missile Defense Enabling Programs	416,937	402,778	369,145						-
PE 0603891C Special Programs – MDA	193,157	175,712	301,566						-
PE 0603892C Ballistic Missile Defense Aegis	1,126,337	1,113,655	1,690,758						-
PE 0603893C Space Tracking & Surveillance System	226,499	208,923	180,000						-
PE 0603894C Multiple Kill Vehicle	223,084	283,481	0						-
PE 0603895C BMD System Space Program	16,237	24,686	12,549						-
PE 0603897C BMD Hercules	51,387	55,764	48,186						-
PE 0603898C BMD Joint Warfighter Support	45,400	69,743	60,921						-
PE 0603904C Missile Defense Integration & Operations Center (MDIOC)	77,102	106,040	86,949						-
PE 0603906C Regarding Trench	1,945	2,968	3,164						-
PE 0603907C Sea Based X-Band Radar (SBX)	155,244	146,895	174,576						-
PE 0603908C BMD Europ Intercep Site	0	362,007	0						-
PE 0603909C BMD Europ Midcourse Radar	0	76,537	0						-
PE 0603911C BMD European Capability	0	0	50,504						-
PE 0603912C BMD European Comm Support	0	27,008	0						-
PE 0603913C Israeli Cooperative	0	0	119,634						-
PE 0605502C Small Business Innovative Research BMDO	137,409	0	0						-
PE 0901585C Pentagon Reservation	5,971	19,667	19,709						-
PE 0901598C Management Headquarters – MDA	83,907	81,174	57,403						-

Note: The Ballistic Missile Defense System (BMDS) is an integrated, interoperable, global defense system. The programs which comprise the BMDS are interdependent.

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date: May 2009
APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE: 0603896C BMD C2BMC

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, which ends 1QFY12. A follow-on contracting strategy will be developed during the Block 3.0 timeframe. 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 Development Center/University Affiliated Research Centers (FFRDC/UARC), and Advisory and Assistance Services (A&AS) personnel are also fully integrated as part of the Prime contractor's team to function in an Integrated Product Team environment.

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date: May 2009
APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE: 0603896C BMD C2BMC

I. Product Development Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2009 Cost	FY 2009 Award/ Oblg Date	FY 2010 Cost	FY 2010 Award/ Oblg Date	FY 2011 Cost	FY 2011 Award/ Oblg Date	Total Cost
Spirals 8.2/8.4 C2BMC Network (C2BMC Development)										
C2BMC Hardware (HW)/Software (SW) Development, Integration & Test (I&T)	SS/CPAF	Lockheed Martin Team/ Col. Springs, Co	7,241	22,246	1Q	47,811	1Q			77,298
C2BMC HW/SW Development, I&T	SS/CPAF	Lockheed Martin Team/ Huntsville, AL	1,097	3,370	1Q	7,243	1Q			11,710
C2BMC Product Engineering & Development	SS/CPAF	Lockheed Martin Team/ Arlington, VA	13,605	41,796	1Q	89,831	1Q			145,232
Advisory and Assistance Services (A&AS)	SS/FFP	SPARTA/ Arlington, VA	0	24,114	1Q	24,843	1Q			48,957
Federally Funded Research Development Centers	SS/CPAF	MITRE, IDA, ORNL, MIL/LL/ Arlington, VA	0	11,963	1Q	12,215	1Q			24,178
MDA Civilian, Military Salaries, Travel, and PCS		Arlington, VA/ Huntsville, AL	0	5,618	1Q	5,736	1Q			11,354
C2BMC Network		Services, DISA, Agencies	14,629	18,707	1Q	22,938	1Q			56,274
C2BMC Program Office Move			0	15,000	1Q	15,000	1Q			30,000
GCN Transition		DISA	8,000	0	N/A	0	N/A			8,000
Common Threat Engineering	Various	Various	0	0	N/A	1,693	1Q			1,693
C2BMC Testbed										

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date: May 2009
APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE: 0603896C BMD C2BMC

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2009 Cost	FY 2009 Award/ Oblg Date	FY 2010 Cost	FY 2010 Award/ Oblg Date	FY 2011 Cost	FY 2011 Award/ Oblg Date	Total Cost
C2BMC Testbed	C/CPFF	MDIOC / Northrop Grumman Mission Systems/ Colorado Springs, CO	20,226	0	N/A	0	N/A			20,226
C2BMC Testbed	C/FFP	MDIOC / SRS / Mantech/ Colorado Springs, CO	1,051	0	N/A	0	N/A			1,051
C2BMC Testbed	C/FFRDC	IDA/ Colorado Springs, CO	650	0	N/A	0	N/A			650
Thule C2BMC Fielding										
C2BMC Thule Fielding	SS/CPAF	DISA	3,300	0	N/A	0	N/A			3,300
C2BMC Joint Early Warning Laboratory (JEWL)										
JEWL	Various	MULT/ Colorado Springs, CO	2,073	0	N/A	0	N/A			2,073
C2BMC Technology										
Benchmark	SS/CPAF	GTRI via ONR	1,600	0	N/A	0	N/A			1,600
Sensor Netting Experiments	SS/CPAF	MIT/LL	1,400	0	N/A	0	N/A			1,400
MLS Engineering and X-Lab Experiments Support	SS/CPAF	MDIOC	1,991	0	N/A	0	N/A			1,991
Sensor Registration Health/Status	SS/CPAF	Torch via THAAD/ SPARTA	807	0	N/A	0	N/A			807
Advanced Technology Efforts	SS/CPAF	Lockheed Martin Team/IDA/Modus Operandi	6,100	0	N/A	0	N/A			6,100

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date: May 2009
APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE: 0603896C BMD C2BMC

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2009 Cost	FY 2009 Award/ Oblg Date	FY 2010 Cost	FY 2010 Award/ Oblg Date	FY 2011 Cost	FY 2011 Award/ Oblg Date	Total Cost
C2BMC Site Activation/Fielding										
Suites and Communications Gateways	SS/CPAF	Lockheed Martin Team	0	0	N/A	25,880	1Q			25,880
Subtotal Product Development			83,770	142,814		253,190				479,774

Remarks

II. Support Costs Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2009 Cost	FY 2009 Award/ Oblg Date	FY 2010 Cost	FY 2010 Award/ Oblg Date	FY 2011 Cost	FY 2011 Award/ Oblg Date	Total Cost
Subtotal Support Costs										

Remarks

III. Test and Evaluation Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2009 Cost	FY 2009 Award/ Oblg Date	FY 2010 Cost	FY 2010 Award/ Oblg Date	FY 2011 Cost	FY 2011 Award/ Oblg Date	Total Cost
Subtotal Test and Evaluation										

Remarks

IV. Management Services Cost ($ in Thousands)

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date: May 2009
APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE: **0603896C BMD C2BMC**

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2009 Cost	FY 2009 Award/ Oblg Date	FY 2010 Cost	FY 2010 Award/ Oblg Date	FY 2011 Cost	FY 2011 Award/ Oblg Date	Total Cost
Subtotal Management Services										
Remarks										
Project Total Cost			83,770	142,814		253,190				479,774
Remarks										

Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile

Date: **May 2009**

APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**

R-1 NOMENCLATURE: **0603896C BMD C2BMC**

Fiscal Year	2008				2009				2010				2011				2012				2013				2014				2015			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Development																																
Initial Allocation of Block 3 Requirements to Spirals 8.2 and 8.4	▲	▬	▲																													
Spiral 8.2 Content Agreement							△																									
Spiral 8.4 Content Agreement												△																				
Fielding																																
Initiate Spiral 8.2 HW Installations												△																				

Legend

▲	Significant Event (complete)	△	Significant Event (planned)
★	Milestone Decision (complete)	☆	Milestone Decision (planned)
◆	Element Test (complete)	◇	Element Test (planned)
▼	System Level Test (complete)	▽	System Level Test (planned)
▲▬▲	Complete Activity	△▬△	Planned Activity

Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail	Date: May 2009
APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE: **0603896C BMD C2BMC**

Schedule Profile	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015
Development								
Initial Allocation of Block 3 Requirements to Spirals 8.2 and 8.4	1Q-2Q							
Spiral 8.2 Content Agreement		3Q						
Spiral 8.4 Content Agreement			4Q					
Fielding								
Initiate Spiral 8.2 HW Installations			4Q					

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date: May 2009
APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE: 0603896C BMD C2BMC

COST ($ in Thousands)	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015
DX01 Ballistic Missile Defense C2BMC Block 4.0	63,904	0	0					
RDT&E Articles Qty	0	0	0					

Note:

A. Mission Description and Budget Item Justification

BMDS Block 4.0 defends allies and deployed forces in Europe from limited Iranian long-range threats; and continues to expand protection in the U.S. The increase in C2BMC capability developed under Blocks 1.0, 2.0, and 3.0 also supports the defense of allies and deployed forces in Europe. The focus in this block is primarily on infrastructure.

Major goals include:

- Establish European Interceptor Site (EIS) communications
- Establish European Communications Interface (ECI) communications
- Establish European Midcourse Radar (EMR) communications
- Establish Southern radar site AN/TPY-2 #6 BMDS communications

For FY09 the C2BMC Block 4.0 efforts are included in the Ballistic Missile Defense (BMD) European Interceptor Site PE 0603908C, BMD European Midcourse Radar PE 0603909C, and European Communications Support PE 0603912C. For FY10 and out, the C2BMC Block 4.0 efforts are included in the European Capability PE 0603911C.

B. Accomplishments/Planned Program

	FY 2008	FY 2009	FY 2010	FY 2011
European Midcourse Radar (EMR) Communications	14,100	0	0	
RDT&E Articles (Quantity)	0	0	0	

The BMDS Communications System Complex (BCSC) in support of the European Midcourse Radar (EMR) consolidates all of the communications systems in one facility: Satellite Communications (SATCOM), Defense Information Systems Network (DISN) core, campus communications, gateway, communications management, and wide area networks. This capability will provide the communications connectivity from the radar site to the BMDS Network.

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date: May 2009
APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE: 0603896C BMD C2BMC

FY08 Accomplishments:

- Initiated design and procured long-lead items for the BMDS Communications System Complex (BCSC)
- Initiated design and long lead acquisition for the Modernization Enterprise Terminal (Ka and X band)
- Initiated long lead procurement for the auxiliary Communications Power System for BCSC
- Initiated procurement of the Defense Red Switch Network (DRSN) and baseband equipment to be installed in BCSC
- Initiated planning and design for terrestrial communications capability (fiber optic cable, microwave, etc.)
- Initiated engineering support to ensure the European Midcourse Radar (EMR) BCSC integration into the overall BMDS

	FY 2008	FY 2009	FY 2010	FY 2011
AN/TPY-2 #6 Communications	20,700	0	0	
RDT&E Articles (Quantity)	0	0	0	

The BMDS Communications System Complex - Transportable (BCSC-T) in support of AN/TPY-2 consolidates all of the communications systems in a transportable configuration: Satellite Communications (SATCOM), Defense Information Systems Network (DISN) core, campus communications, Gateway, communications management, and wide area networks. This capability will provide the communications connectivity from the AN/TPY-2 site to the BMDS Network.

FY08 Accomplishments:

- Initiated design and procured long-lead items for the BCSC-T
- Initiated procurement of the DRSN and baseband equipment to be installed in the BCSC-T
- Initiated engineering support to ensure the AN/TPY-2/BCSC-T integration into the overall BMDS

	FY 2008	FY 2009	FY 2010	FY 2011
European Interceptor Site (EIS) Communications	16,704	0	0	
RDT&E Articles (Quantity)	0	0	0	

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date: May 2009
APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE: **0603896C BMD C2BMC**

The BMDS Communications System Complex (BCSC) in support of the European Interceptor Site (EIS) consolidates all of the communications systems in one facility: Satellite Communication (SATCOM), Defense Information Systems Network (DISN) core, campus communications, Gateway, communications management, and wide area networks. This capability will provide the communications connectivity from the interceptor site to the BMDS Network.

FY08 Accomplishments:

- Initiated design and procured long-lead items for the BCSC
- Initiated design and long-lead acquisition for the Modernization Enterprise Terminal (Ka and X band)
- Initiated long lead procurement for the auxiliary Communications Power System for the BCSC
- Initiated procurement of the Defense Red Switch Network (DRSN) and baseband equipment to be installed in the BCSC
- Initiated planning and design for terrestrial communications capability (fiber optic cable, microwave, etc.)
- Initiated engineering support to ensure the EIS BCSC integration into the overall BMDS

	FY 2008	FY 2009	FY 2010	FY 2011
European Communications Interface (ECI) Communications	12,400	0	0	
RDT&E Articles (Quantity)	0	0	0	

The European Communications Interface (ECI) located in Ramstein, Germany will provide an integrated layered defense by networking and unifying (common purpose) individual element components (sensors, weapon systems, fire control) with all military echelons across the globe. This will allow the President, the Secretary of Defense and the commanders at strategic and tactical levels to systematically plan the fight (BMD Planner), commonly see it unfold (situational awareness), and dynamically direct/adjust (Global Engagement Manager (GEM)/Battle Management) networked sensors and weapons systems (BMD Network) to optimally engage (one shot - one kill) ballistic missile threats at any range, in any phase of flight, at any time. The C2BMC system provides the means to move information and data from theater and regional to a global missile defense. This communications network, part of the larger U.S. command and control system, transmits and receives data on threat missile launches, missile flight profiles, and projected target locations, enabling political and military leaders to determine when and where to launch weapons to intercept them. The system is designed to rapidly provide a wide range of information to decision-makers because of the short distances in Europe and the great speed of ballistic missiles that require threat assessment and interceptor launch decisions in just minutes.

FY08 Accomplishments:

- Initiated design and long lead acquisition for the Modernization Enterprise Terminal (Ka and X band)

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date: May 2009
APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE: **0603896C BMD C2BMC**

- Initiated long lead procurement for the auxiliary Communications Power System for the BMDS Communications System Complex (BCSC)
- Initiated procurement of the Defense Red Switch Network (DRSN) and baseband equipment to be installed in the BCSC
- Initiated engineering support to ensure European Communication Interface (ECI) integration into the overall BMDS

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date: May 2009
APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE: 0603896C BMD C2BMC

C. Other Program Funding Summary

	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	Total Cost
PE 0603175C Ballistic Missile Defense Technology	106,437	119,308	109,760						-
PE 0603881C Ballistic Missile Defense Terminal Defense Segment	1,034,478	956,686	719,465						-
PE 0603882C Ballistic Missile Defense Midcourse Defense Segment	2,198,664	1,507,481	982,922						-
PE 0603883C Ballistic Missile Defense Boost Defense Segment	503,475	400,751	186,697						-
PE 0603884C Ballistic Missile Defense Sensors	574,231	777,693	636,856						-
PE 0603886C Ballistic Missile Defense System Interceptors	330,874	385,493	0						-
PE 0603888C Ballistic Missile Defense Test and Targets	619,137	919,956	966,752						-
PE 0603890C Ballistic Missile Defense Enabling Programs	416,937	402,778	369,145						-
PE 0603891C Special Programs – MDA	193,157	175,712	301,566						-
PE 0603892C Ballistic Missile Defense Aegis	1,126,337	1,113,655	1,690,758						-
PE 0603893C Space Tracking & Surveillance System	226,499	208,923	180,000						-
PE 0603894C Multiple Kill Vehicle	223,084	283,481	0						-
PE 0603895C BMD System Space Program	16,237	24,686	12,549						-
PE 0603897C BMD Hercules	51,387	55,764	48,186						-
PE 0603898C BMD Joint Warfighter Support	45,400	69,743	60,921						-
PE 0603904C Missile Defense Integration & Operations Center (MDIOC)	77,102	106,040	86,949						-
PE 0603906C Regarding Trench	1,945	2,968	3,164						-
PE 0603907C Sea Based X-Band Radar (SBX)	155,244	146,895	174,576						-
PE 0603908C BMD Europ Intercep Site	0	362,007	0						-
PE 0603909C BMD Europ Midcourse Radar	0	76,537	0						-
PE 0603911C BMD European Capability	0	0	50,504						-
PE 0603912C BMD European Comm Support	0	27,008	0						-
PE 0603913C Israeli Cooperative	0	0	119,634						-
PE 0605502C Small Business Innovative Research BMDO	137,409	0	0						-
PE 0901585C Pentagon Reservation	5,971	19,667	19,709						-
PE 0901598C Management Headquarters – MDA	83,907	81,174	57,403						-

Note: The Ballistic Missile Defense System (BMDS) is an integrated, interoperable, global defense system. The programs which comprise the BMDS are interdependent.

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date: May 2009
APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE: 0603896C BMD C2BMC

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 Transactions Agreement, which ends 1QFY12. A follow-on contracting strategy will be developed during the Block 3.0 timeframe. 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 Development Center/University Affiliated Research Centers (FFRDC/UARC), and Advisory and Assistance Services (A&AS) personnel are also fully integrated as part of the Prime contractor's team to function in an Integrated Product Team environment.

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date: May 2009
APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE: 0603896C BMD C2BMC

I. Product Development Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2009 Cost	FY 2009 Award/ Oblg Date	FY 2010 Cost	FY 2010 Award/ Oblg Date	FY 2011 Cost	FY 2011 Award/ Oblg Date	Total Cost
European Midcourse Radar (EMR) Communications										
European Midcourse Radar (EMR) Communications	SS/CPAF	Lockheed Martin Team	1,900	0	N/A	0	N/A			1,900
European Midcourse Radar (EMR) Communications	SS/CPAF	DISA/ Various	12,200	0	N/A	0	N/A			12,200
AN/TPY-2 #6 Communications										
AN/TPY-2 #6 Communications	SS/CPAF	Lockheed Martin Team	9,600	0	N/A	0	N/A			9,600
AN/TPY-2 #6 Communications	SS/CPAF	DISA/ Various	11,100	0	N/A	0	N/A			11,100
European Interceptor Site (EIS) Communications										
European Interceptor Site (EIS) Communications	SS/CPAF	Lockheed Martin Team	4,504	0	N/A	0	N/A			4,504
European Interceptor Site (EIS) Communications	SS/CPAF	DISA/ Various	12,200	0	N/A	0	N/A			12,200
European Communications Interface (ECI) Communications										
European Communications Interface (ECI) Communications	SS/CPAF	Lockheed Martin Team	3,400	0	N/A	0	N/A			3,400
European Communications Interface (ECI) Communications	SS/CPAF	DISA/ Various	9,000	0	N/A	0	N/A			9,000
Subtotal Product Development			63,904	0		0				63,904

Remarks

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date: May 2009
APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE: 0603896C BMD C2BMC

II. Support Costs Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2009 Cost	FY 2009 Award/ Oblg Date	FY 2010 Cost	FY 2010 Award/ Oblg Date	FY 2011 Cost	FY 2011 Award/ Oblg Date	Total Cost
Subtotal Support Costs										

Remarks

III. Test and Evaluation Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2009 Cost	FY 2009 Award/ Oblg Date	FY 2010 Cost	FY 2010 Award/ Oblg Date	FY 2011 Cost	FY 2011 Award/ Oblg Date	Total Cost
Subtotal Test and Evaluation										

Remarks

IV. Management Services Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2009 Cost	FY 2009 Award/ Oblg Date	FY 2010 Cost	FY 2010 Award/ Oblg Date	FY 2011 Cost	FY 2011 Award/ Oblg Date	Total Cost
Subtotal Management Services										

Remarks

Project Total Cost			63,904	0		0				63,904

Remarks

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date: May 2009
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603896C BMD C2BMC**

COST ($ in Thousands)	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015
EX01 Ballistic Missile Defense C2BMC Block 5.0	28,713	0	0					
RDT&E Articles Qty	0	0	0					

Note:
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. Block 5.0 includes three RDT&E Articles: Spirals 10.2, 10.4, and 12.2.

A. Mission Description and Budget Item Justification

The C2BMC Block 5.0 Program expands defense of allies and deployed forces by enabling a coordinated defense against short-to intermediate-range threats in two regions/theaters. Specific Block goals are to deliver:

- Capability to easily and quickly incorporate new sensors and weapon systems into the global C2BMC network
- Command and Control decision aids to re-direct coordinated engagements
- BMDS-level discrimination for boost/early ascent and expanded engagement coordination to include intelligence projections
- Continued BMDS global expansion with additional C2BMC deployed locations
- Support development of Unifying Missile Defense (UMDF) capabilities

C2BMC ELEMENT

In Block 5.0, the Ballistic Missile Defense System (BMDS) Planner, Situational Awareness, Global Engagement Manager (GEM), and Ballistic Missile Defense (BMD) Network will all be expanded to include additional BMDS sensors and weapons. This includes planning capability for Kinetic Energy Interceptors and Space Tracking and Surveillance System (STSS). The BMDS Planner improvements include updates for the Global Engagement Manager, bi-directional coalition partner planning, increased Joint Integrated Air and Missile Defense capability, and Offense/Defense integration for planning. Situational Awareness capabilities include the ability to display engagement coordination, consequence mitigation display based on Element Data, and an integrated common operating picture. The BMDS 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. The whole of C2BMC will move to a more distributed processing environment to speed decision making and enable a more geographically diverse (and filterable) system. This includes an enhanced, distributed composite system track with additional discrimination features, and cross-Area of Responsibility (AOR) engagement coordination. Additionally, Global Engagement Manager (GEM) will expand engagement coordination to include intelligence projections.

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date: May 2009
APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE: 0603896C BMD C2BMC

The BMD Network product 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. Capabilities 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 and quality of service to the individual user.

Block 5.0 matured products will be included in Spirals 10.2, 10.4, and 12.2, and delivered to the field for concurrent development testing and operational use.

SITE ACTIVATION

C2BMC capability is expanded with the installation of Spirals 10.2, 10.4 and 12.2. Installation also includes numerous Ballistic Missile Defense System (BMDS) Planner, web browser, and Enterprise Workstations per warfighter requirements. Planning for future BMDS operations and site installations to 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 continues in Block 5.0.

B. Accomplishments/Planned Program

	FY 2008	FY 2009	FY 2010	FY 2011
AN/TPY-2 Communications	28,713	0	0	
RDT&E Articles (Quantity)	0	0	0	

The BMDS Communications System Complex - Transportable (BCSC-T) in support of AN/TPY-2 consolidates all of the communications systems in a transportable configuration: Satellite Communications (SATCOM) (Ultrahigh Frequency (UHF), Extremely High Frequency (EHF), Ka, X & C-bands), Defense Information Service Network (DISN) core, campus communications, Gateway, communications management, and wide area networks. This capability will provide the communications connectivity from the AN/TPY-2 site to the BMDS Network.

FY08 Accomplishments:

- Procured Defense Red Switch Network (DRSN) and baseband equipment to be installed in the BCSC-T

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date: May 2009
APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE: **0603896C BMD C2BMC**

- Provided engineering support for AN/TPY-2 / BCSC-T integration into the overall Ballistic Missile Defense System (BMDS)

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date: May 2009
APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE: 0603896C BMD C2BMC

C. Other Program Funding Summary

	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	Total Cost
PE 0603175C Ballistic Missile Defense Technology	106,437	119,308	109,760						-
PE 0603881C Ballistic Missile Defense Terminal Defense Segment	1,034,478	956,686	719,465						-
PE 0603882C Ballistic Missile Defense Midcourse Defense Segment	2,198,664	1,507,481	982,922						-
PE 0603883C Ballistic Missile Defense Boost Defense Segment	503,475	400,751	186,697						-
PE 0603884C Ballistic Missile Defense Sensors	574,231	777,693	636,856						-
PE 0603886C Ballistic Missile Defense System Interceptors	330,874	385,493	0						-
PE 0603888C Ballistic Missile Defense Test and Targets	619,137	919,956	966,752						-
PE 0603890C Ballistic Missile Defense Enabling Programs	416,937	402,778	369,145						-
PE 0603891C Special Programs – MDA	193,157	175,712	301,566						-
PE 0603892C Ballistic Missile Defense Aegis	1,126,337	1,113,655	1,690,758						-
PE 0603893C Space Tracking & Surveillance System	226,499	208,923	180,000						-
PE 0603894C Multiple Kill Vehicle	223,084	283,481	0						-
PE 0603895C BMD System Space Program	16,237	24,686	12,549						-
PE 0603897C BMD Hercules	51,387	55,764	48,186						-
PE 0603898C BMD Joint Warfighter Support	45,400	69,743	60,921						-
PE 0603904C Missile Defense Integration & Operations Center (MDIOC)	77,102	106,040	86,949						-
PE 0603906C Regarding Trench	1,945	2,968	3,164						-
PE 0603907C Sea Based X-Band Radar (SBX)	155,244	146,895	174,576						-
PE 0603908C BMD Europ Intercep Site	0	362,007	0						-
PE 0603909C BMD Europ Midcourse Radar	0	76,537	0						-
PE 0603911C BMD European Capability	0	0	50,504						-
PE 0603912C BMD European Comm Support	0	27,008	0						-
PE 0603913C Israeli Cooperative	0	0	119,634						-
PE 0605502C Small Business Innovative Research BMDO	137,409	0	0						-
PE 0901585C Pentagon Reservation	5,971	19,667	19,709						-
PE 0901598C Management Headquarters – MDA	83,907	81,174	57,403						-

Note: The Ballistic Missile Defense System (BMDS) is an integrated, interoperable, global defense system. The programs which comprise the BMDS are interdependent.

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date: May 2009
APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE: 0603896C BMD C2BMC

D. Acquisition Strategy

The Command and Control, Battle Management, and Communications (C2BMC) acquisition strategy for Block 5.0 is evolving as the current prime contractor, Lockheed Martin Mission Systems, Other Transaction Agreement comes to an end in December 2011. Other program acquisition strategy includes use of the Defense Information Systems Agency (DISA) to support C2BMC worldwide long-haul communications. C2BMC Program Office government, Federally Funded Research Development Center/University Affiliated Research Centers (FFRDC/UARC), and Advisory and Assistance Services (A&AS) personnel are also fully integrated as part of the Prime contractor strategy to function in an Integrated Product Team environment.

Missile Defense Agency (MDA) Exhibit R-3 Project Cost Analysis	Date: May 2009
APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE: 0603896C BMD C2BMC

I. Product Development Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2009 Cost	FY 2009 Award/ Oblg Date	FY 2010 Cost	FY 2010 Award/ Oblg Date	FY 2011 Cost	FY 2011 Award/ Oblg Date	Total Cost
AN/TPY-2 Communications										
AN/TPY-2 Communications	SS/CPAF	Lockheed Martin Team	13,213	0	N/A	0	N/A			13,213
AN/TPY-2 Communications	MIPR	DISA, VA	15,500	0	N/A	0	N/A			15,500
Subtotal Product Development			28,713	0		0				28,713

Remarks

II. Support Costs Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2009 Cost	FY 2009 Award/ Oblg Date	FY 2010 Cost	FY 2010 Award/ Oblg Date	FY 2011 Cost	FY 2011 Award/ Oblg Date	Total Cost
Subtotal Support Costs										

Remarks

III. Test and Evaluation Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2009 Cost	FY 2009 Award/ Oblg Date	FY 2010 Cost	FY 2010 Award/ Oblg Date	FY 2011 Cost	FY 2011 Award/ Oblg Date	Total Cost
Subtotal Test and Evaluation										

Remarks

IV. Management Services Cost ($ in Thousands)

Missile Defense Agency (MDA) Exhibit R-3 Project Cost Analysis	Date: May 2009
APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE: 0603896C BMD C2BMC

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2009 Cost	FY 2009 Award/ Oblg Date	FY 2010 Cost	FY 2010 Award/ Oblg Date	FY 2011 Cost	FY 2011 Award/ Oblg Date	Total Cost
Subtotal Management Services										

Remarks

Project Total Cost			28,713	0		0				28,713

Remarks

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date: May 2009
APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE: **0603896C BMD C2BMC**

COST ($ in Thousands)	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015
XX01 Ballistic Missile Defense C2BMC Sustainment	45,608	42,475	46,455					
RDT&E Articles Qty	0	0	0					

Note:

A. Mission Description and Budget Item Justification

Operations and Support

C2BMC Program Operations and Support consists of 1) sustaining C2BMC Operational Capability Worldwide 24/7/365 with on-site personnel in 17 time zones, supporting 26 locations, and over 100 major sub-systems; 2) on-site maintenance sub-systems for all C2BMC including suites, planners, remote Enterprise Work Stations (EWS), Web Browsers, and communication site(s) associated with the AN/TPY-2 radar(s); 3) the C2BMC Control Center (help desk) 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 24/7/365 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
- Security support for the C2BMC equipment, hardware and software and auxiliary communication capabilities
- 24/7/365 network and equipment operations monitoring
- Support to operators and testers during test, exercises, and wargames

Off-site support provides:

- The 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:

- Developing and maintaining Operator, Maintenance personnel tester training material for C2BMC components/capabilities
  - Training tailored to each deployment and/or test
  - Training curriculum/courses provided for C2BMC Planner, and the C2BMC Executive Course

- New equipment training to end-users and training organizations

B. Accomplishments/Planned Program

	FY 2008	FY 2009	FY 2010	FY 2011
Sustainment	37,158	42,475	46,455	
RDT&E Articles (Quantity)	0	0	0	

Operations and Support procedures are planned for all fielded hardware and software. Maintenance agreements will be established and spare parts will be procured and delivered to each site. At each location an agreement in the form of a site support plan will be drafted and approved to outline the details of support for each site. An overarching system Integrated Logistics Support Plan (ILSP) will be developed to outline the roles and responsibilities for sustaining the C2BMC system.

FY08 Accomplishments:

- Sustained C2BMC 24/7/365 worldwide

- Developed curriculum for and trained 700 operators, maintenance personnel, and testers
- Resolved real-time operational issues through the C2BMC Control Center
- Provided global BMDS communications via leased 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
- Provided support of AN/TPY-2 radar communications

FY09 Planned Program:

- Sustain C2BMC 24/7/365 worldwide
- Develop curriculum for and trained 700 operators, maintenance personnel, and testers
- Resolve real-time operational issues through the C2BMC Control Center
- Provide global BMDS communications via leased DISA circuit lines
- Provide and supported communications circuits for fielded C2BMC locations
- Provide integrated logistics support planning and management and sustaining engineering support for fielded hardware and software
- Provide support of AN/TPY-2 radar communications
- Field new software for collection and reporting of C2BMC system reliability and maintainability metrics

FY10 Planned Program:

- Sustain C2BMC 24/7/365 worldwide
- Develop curriculum for and trained 700 operators, maintenance personnel, and testers
- Resolve real-time operational issues through the C2BMC Control Center
- Provide global BMDS communications via leased DISA circuit lines
- Provide and supported communications circuits for fielded C2BMC locations
- Provide integrated logistics support planning and management and sustaining engineering support for fielded hardware and software
- Provide support of AN/TPY-2 radar communications

	FY 2008	FY 2009	FY 2010	FY 2011
BMDS Radars Communications (Sustainment)	8,450	0	0	
RDT&E Articles (Quantity)	0	0	0	

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date: May 2009
APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE: **0603896C BMD C2BMC**

Provide C2BMC Operations and Support for the AN/TPY-2 during the test, deployment and operations of the radar in Shariki, Japan. Operations and Support personnel will be hired, trained and phased in to support the development and deployment of communications shelters and equipment associated with the AN/TPY-2 radar. Logistics support elements will be delivered and verified. Maintenance agreements will be established and spare parts will be procured and delivered. For FY09-10, the Ballistic Missile Defense System (BMDS) Radars Communications (Sustainment) efforts are included in Program Element 0603884C, Ballistic Missile Defense Sensors, Project XX11, Ballistic Missile Defense Radars Sustainment.

FY08 Accomplishments:

- Provided on-site operations and sustainment during communications shelters test and development
- Verified logistics requirements; and ensured initial spares, support equipment, and training elements were identified and provided
- Provided and supported initial communications capability during radar testing
- Provided and trained initial cadre of operations and support personnel

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date: May 2009
APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE: 0603896C BMD C2BMC

C. Other Program Funding Summary

	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	Total Cost
PE 0603175C Ballistic Missile Defense Technology	106,437	119,308	109,760						-
PE 0603881C Ballistic Missile Defense Terminal Defense Segment	1,034,478	956,686	719,465						-
PE 0603882C Ballistic Missile Defense Midcourse Defense Segment	2,198,664	1,507,481	982,922						-
PE 0603883C Ballistic Missile Defense Boost Defense Segment	503,475	400,751	186,697						-
PE 0603884C Ballistic Missile Defense Sensors	574,231	777,693	636,856						-
PE 0603886C Ballistic Missile Defense System Interceptors	330,874	385,493	0						-
PE 0603888C Ballistic Missile Defense Test and Targets	619,137	919,956	966,752						-
PE 0603890C Ballistic Missile Defense Enabling Programs	416,937	402,778	369,145						-
PE 0603891C Special Programs - MDA	193,157	175,712	301,566						-
PE 0603892C Ballistic Missile Defense Aegis	1,126,337	1,113,655	1,690,758						-
PE 0603893C Space Tracking & Surveillance System	226,499	208,923	180,000						-
PE 0603894C Multiple Kill Vehicle	223,084	283,481	0						-
PE 0603895C BMD System Space Program	16,237	24,686	12,549						-
PE 0603897C BMD Hercules	51,387	55,764	48,186						-
PE 0603898C BMD Joint Warfighter Support	45,400	69,743	60,921						-
PE 0603904C Missile Defense Integration & Operations Center (MDIOC)	77,102	106,040	86,949						-
PE 0603906C Regarding Trench	1,945	2,968	3,164						-
PE 0603907C Sea Based X-Band Radar (SBX)	155,244	146,895	174,576						-
PE 0603908C BMD Europ Intercep Site	0	362,007	0						-
PE 0603909C BMD Europ Midcourse Radar	0	76,537	0						-
PE 0603911C BMD European Capability	0	0	50,504						-
PE 0603912C BMD European Comm Support	0	27,008	0						-
PE 0603913C Israeli Cooperative	0	0	119,634						-
PE 0605502C Small Business Innovative Research BMDO	137,409	0	0						-
PE 0901585C Pentagon Reservation	5,971	19,667	19,709						-
PE 0901598C Management Headquarters - MDA	83,907	81,174	57,403						-

Note: The Ballistic Missile Defense System (BMDS) is an integrated, interoperable, global defense system. The programs which comprise the BMDS are interdependent.

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date: May 2009
APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE: 0603896C BMD C2BMC

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, which ends 1QFY12. A follow-on contracting strategy will be developed during the Block 3.0 timeframe. 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 Development Center/University Affiliated Research Centers (FFRDC/UARC), and Advisory and Assistance Services (A&AS) personnel are also fully integrated as part of the Prime contractor's team to function in an Integrated Product Team environment.

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date: May 2009
APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE: 0603896C BMD C2BMC

I. Product Development Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2009 Cost	FY 2009 Award/ Oblg Date	FY 2010 Cost	FY 2010 Award/ Oblg Date	FY 2011 Cost	FY 2011 Award/ Oblg Date	Total Cost
Sustainment										
Unit Personnel, Cont System Improvement, Sustaining Support	SS/CPAF	Lockheed Martin Team Arlington, VA	24,686	28,813	1Q	32,350	N/A			85,849
Indirect Support	MIPR	DISA DECC	3,121	3,042	1Q	3,271	N/A			9,434
Unit Operations - Leased Circuits	MIPR	DISA	6,341	9,955	1Q	10,165	N/A			26,461
DOTMLPF		SETAC	500	500	1Q	500	N/A			1,500
AN/TPY-2 Shariki Support			160	165	1Q	169	N/A			494
Thule Transponder O&M			550	0	N/A	0	N/A			550
SBX Communications			1,800	0	N/A	0	N/A			1,800
BMDS Radars Communications (Sustainment)										
AN/TPY-2 Sustainment	C/CPAF	Lockheed Martin Team	8,450	0	N/A	0	N/A			8,450
Subtotal Product Development			45,608	42,475		46,455				134,538

Remarks

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date: May 2009
APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE: 0603896C BMD C2BMC

II. Support Costs Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2009 Cost	FY 2009 Award/ Oblg Date	FY 2010 Cost	FY 2010 Award/ Oblg Date	FY 2011 Cost	FY 2011 Award/ Oblg Date	Total Cost
Subtotal Support Costs										

Remarks

III. Test and Evaluation Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2009 Cost	FY 2009 Award/ Oblg Date	FY 2010 Cost	FY 2010 Award/ Oblg Date	FY 2011 Cost	FY 2011 Award/ Oblg Date	Total Cost
Subtotal Test and Evaluation										

Remarks

IV. Management Services Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2009 Cost	FY 2009 Award/ Oblg Date	FY 2010 Cost	FY 2010 Award/ Oblg Date	FY 2011 Cost	FY 2011 Award/ Oblg Date	Total Cost
Subtotal Management Services										

Remarks

Project Total Cost			45,608	42,475		46,455				134,538

Remarks

Missile Defense Agency (MDA) Exhibit R-2A Project Justification	Date: May 2009
APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE: 0603896C BMD C2BMC

COST ($ in Thousands)	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015
ZX40 Program-Wide Support	7,124	8,338	11,988					
RDT&E Articles Qty	0	0	0					

A. Mission Description and Budget Item Justification

Program-Wide Support provides funding for common non-headquarters support functions across the entire program. Includes costs for both government civilians performing these functions, as well as outside services and support contractors that augment government staff in these areas. Other costs included provide facility capabilities for MDA Executing Agent locations, such as physical and technical security, legal services, travel and training, office and equipment leases, utilities and communications, supplies and maintenance, and similar operating expenses. Also includes funding for charges on canceled appropriations in accordance with Public Law 101-510, legal settlements, and foreign currency fluctuations on a limited number of foreign contracts.

B. Accomplishments/Planned Program

	FY 2008	FY 2009	FY 2010	FY 2011
Civilian Salaries and Support	7,124	8,338	11,988	
RDT&E Articles (Quantity)	0	0	0	

See Section A: Mission Description and Budget Item Justification

Missile Defense Agency (MDA) Exhibit R-2A Project Justification	Date: May 2009
APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE: 0603896C BMD C2BMC

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PE 0603911C BMD European Capability	0	0	50,504						-
PE 0603912C BMD European Comm Support	0	27,008	0						-
PE 0603913C Israeli Cooperative	0	0	119,634						-
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