Missile Defense Agency (MDA) Exhibit R-2 RDT&E Budget Item Justification	Date February 2007

APPROPRIATION/BUDGET ACTIVITY RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE 0603889C Ballistic Missile Defense Products

COST ($ in Thousands)	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
Total PE Cost	387,402	0	0	0	0	0	0	0
0701 Command and Control, Battle Management and Communications (C2BMC) Block 2004	63,035	0	0	0	0	0	0	0
0801 Command and Control, Battle Management and Communications (C2BMC) Block 2006	147,289	0	0	0	0	0	0	0
0901 Command and Control, Battle Management and Communications (C2BMC) Block 2008	4,617	0	0	0	0	0	0	0
0802 Hercules Block 2006	20,690	0	0	0	0	0	0	0
0902 Hercules Block 2008	29,297	0	0	0	0	0	0	0
0002 Hercules Block 2010	4,620	0	0	0	0	0	0	0
0803 Joint Warfighter Support Block 2006	32,058	0	0	0	0	0	0	0
0204 Joint National Integration Center (JNIC)	71,770	0	0	0	0	0	0	0
0602 Program-Wide Support	14,026	0	0	0	0	0	0	0

Note: For FY07-FY13 the Command and Control, Battle Management, and Communications (C2BMC) element is described in the BMD C2BMC Program Element (PE #0603896C).

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 boosters to include 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 U.S. cities, population, and territory, as well as our deployed forces and other critical assets from this growing threat requires an integrated, layered defense. BMD Products program element is the key integrating component that binds constituent BMD elements together into such a defense.

BMD Products program element efforts enable coordinated, real-time decision-making by Warfighters and leaders across the globe up to and including the Secretary of Defense and the President of the United States. This program element consists of five complementary mission essential projects with efforts spanning Blocks 2004, 2006, 2008, and 2010. These programs are Command and Control, Battle Management, and

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Communications (C2BMC), Project Hercules, Joint Warfighter Support Program, Concurrent Test & Operations Distributed Multi-Echelon Training System (CTO-DMETS), and the Joint National Integration Center.

COMMAND AND CONTROL, BATTLE MANAGEMENT, AND COMMUNICATIONS (C2BMC)
The ballistic missile defense Command and Control, Battle Management, and Communications (C2BMC) Program is the centerpiece of an integrated, layered missile defense. The C2BMC Program puts the ``System`` in the Ballistic Missile Defense System (BMDS). It is the force multiplier--the elements reach their full potential and the BMDS becomes greater than the sum of its parts, with the capability to deliver an integrated, layered defense against any ballistic missile, at any range, from any direction. Without a central C2BMC system there is no BMDS or layered defense.

BMD C2BMC Program efforts enable coordinated, real-time, decision-making by warfighters and leaders across the globe, up to and including the Secretary of Defense and the President of the United States. Specifically, the mission of C2BMC is to provide a Combatant Command decision aid to integrate and globally synchronize missile defense systems and operations to provide optimized layered missile defense against all ranges of threat, in all phases of flight. The result is an extended network of defensive sensors, shooters, battle managers, and intelligence assets. The global C2BMC system spans the existing U.S. Combatant Command structure allowing the warfighter to orchestrate and optimize U.S. ballistic missile defense response on a worldwide level. Without the C2BMC Program, the Ballistic Missile Defense System would require many more sensors and interceptors to achieve equivalent protection from ballistic missile threats to our homeland, friends, and allies.

The C2BMC Program uses spiral development (i.e., incremental development, test, and fielding) to produce the hardware, software, network connectivity, and fielded support required to provide a system-wide, integrated ballistic missile defense capability. As C2BMC products mature they are engineered and integrated into fielded spirals. The average timeframe to develop and field a spiral is 18-24 months (depending on requirements and funding stability), with a new spiral fielded every year. Therefore multiple spirals are in staggered stages of development at any time.

Capabilities are integrated and evolve through four C2BMC product lines: BMD Planner, Combatant Command Command and Control (COCOM C2), Global Integrated Fire Control (GIFC), and BMD Network. (Note: In Block 04, the four C2BMC product lines are BMD Planner, Situation Awareness, Battle Management, and BMD Network.) At the completion of Block 04, the C2BMC Program has integrated 5 of the 9 BMDS elements; is in 21 locations with 12 customers; has deployed over 450 pieces of equipment and 2 SATCOM links, has stood up over 70 crew positions; has trained over 1000 users, and supports over 48,000 miles of DISA communication lines. These numbers will continue to grow with each Block. Delivered spirals enable progressively increased abilities to plan ballistic missile defense, see the battle unfold on common situational

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awareness displays, control sensors worldwide, and optimally pair them with BMD weapons systems (such as Ground Based Missile Defense, Theater High Altitude Air Defense, Patriot, and Aegis BMD) across a global-grid communications network to defeat an adversary's attack.

The C2BMC Program delivers spiral hardware, software capabilities, network connectivity, training, and logistics support to Combatant Commands and national command authorities. Hardware capabilities consist of Enterprise Work Stations (warfighter display monitors and access to BMD planner, situation awareness, and battle manager capabilities), servers, processors, communications racks and equipment, situational awareness web browsers, stand-alone laptop planners, and video distribution equipment. Logistics support includes C2BMC initial operational training, 24/7 on-site sustainment and operational support to the Combatant Commands, hardware and software maintenance and sustainment of deployed AN/TPY-2 radar communications, and C2BMC interface capabilities.

PROJECT HERCULES

Project Hercules is a national effort to develop robust, physics-based detection, tracking, and discrimination algorithms to counter known/expected and unknown/unexpected missiles with planned or unplanned countermeasures in all phases of their flight. These algorithms improve sensor and weapon element discrimination, improve integration of sensor data within C2BMC, and expand integrated battle management capability.

Project Hercules develops advanced discrimination and tracking concepts into prototype software (algorithms) that improves the capability of the BMDS C2BMC, sensor, and weapon elements. Hercules then transitions algorithms to BMDS elements for integration and provides technical assistance during the algorithm integration. These algorithms support existing BMDS Engagement Sequence Groups and enable new Engagement Sequence Groups.

Hercules projects include boost-phase engagement algorithms, discrimination algorithms for forward based sensors, discrimination algorithms and architectures for midcourse sensors, countermeasure mitigation algorithms, terminal discrimination algorithms, and an integrating Decision Architecture concept that provides advanced decision theory for BMDS C2BMC data fusion and global integrated fire control.

JOINT WARFIGHTER SUPPORT PROGRAM

As a part of the total Ballistic Missile Defense System (BMDS), the Joint Warfighter Support Program (JWSP) is critical to enable Warfighters to work with MDA to define, test, deploy and employ new missile defense Block capabilities; maintain proficiency with current Block capabilities; and provide feedback to the MDA BMDS development process. The JWSP consists of a core set of consistent processes, tailored to the new BMDS capabilities to be deployed in each Block. The JWSP is divided into two-year Blocks to match the evolutionary capability Blocks of the BMDS. The

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JWSP builds COCOM proficiency in fielded missile defense capabilities, and provides critical operational level feedback directly to MDA development efforts.

The JWSP consists of seven primary processes, tailored in scope to the current BMDS Block capabilities as they transition, or near transition to the user:
- BMDS Exercise and Wargames
- Concepts & Plans required to address evolving, emerging and projected Ballistic Missile technology (both defensive and threat oriented).
- BMDS Transition and Logistics planning and development.
- Direct support to the Geographic Combatant Commanders (GCCs).
- BMDS Sustainment & Operations coordination and control through the Missile Defense Operations Center (MOC)
- BMDS Training development for the warfighters
- BMDS System Manager

Ballistic Missile Defense System Manager. Block 2006 will see numerous BMDS capabilities and or asset quantity increases during the FY06-2007 time-frame. These capabilities will be added to each JWSP activity to ensure the Joint Warfighter is properly trained to employ and integrate these capabilities to address the evolving Ballistic Missile threat environments.

Among the planned increase scope of the BMDS Block capabilities that will be addressed by the JWSP are:
- Increased numbers of Ground-Base Interceptors at Fort Greely.
- Upgraded Early Warning Radar at Thule, Greenland.
- Additional Forward Based X-Band Radar.
- Additional SM-3 sea-based interceptors and upgraded Aegis cruisers and destroyers.
- Theater High Altitude Area Defense (THAAD) interceptors
- Expanded Link-16 data engagement data sharing between THAAD, PATRIOT, and AEGIS BMDS Elements.
- Implications from the expanded Engagement Sequence Group scope, as new elements and capability is added.
- Expanded upgrades to the BMDS C2BMC planning capabilities.

The JWSP ensures the warfighter and the developer are working together to establish coordinated warfighter and developer system definition, warfighter input to BMDS development and product improvement, required logistics support, and new capability/sustainment training support. It

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therefore enables the effective introduction of new BMDS capabilities and sustainment, and improved operations of BMDS capabilities previously fielded

JOINT NATIONAL INTEGRATION CENTER (JNIC)
The JNIC is MDA's field operating activity in Colorado Springs, CO. It is both a facility and an organization that supports the execution of Agency missions related to the development and test of the BMDS, and that system's operation by designated COCOMs. The JNIC consists of a highly secure research and development complex and a mission support facility located within a military installation (Schriever AFB) that is adjacent to USNORTHCOM and NORAD.

As a facility supporting MDA efforts, the JNIC hosts and supports the Ground-based Midcourse Defense (GMD)'s Mission Control Center Facility (MCCF) that is utilized for both flight and distributed ground tests; the C2BMC's Integration and Test Centers (BITCs) and Experimentation Laboratories (X-Labs); the Space Tracking and Surveillance System (STSS)'s Missile Defense Space Experimentation Center (MDSEC); the Targets & Countermeasure's JNIC Target Operations Center (JTOC); and the Enterprise Network Operations and Support Center for the Agency's Chief Information Officer (CIO). For the COCOMs, the JNIC provides infrastructure support for USNORTHCOM's C2BMC Support Center (NCSC); USSTRATCOM's Joint Functional Component Command-Integrated Missile Defense (JFCC-IMD); and the Missile Defense Element manned by the 100th Missile Defense Brigade.

As an organization, the JNIC directly supports the execution of the Joint Warfighter Support Program, the Combined Test Force, and MDA's BMDS modeling and simulation effort to develop applications vital to BMDS wargaming and system testing. The JNIC provides mission critical system technical capabilities and subject matter expertise in a dedicated and adaptable environment that enables developers, testers, and operators to evolve, assess and quickly deliver the capabilities required for Engagement Sequence Group (ESG) execution and homeland defense.

The JNIC also provides assured worldwide secure communications connectivity, network health and status monitoring, mission critical restoral capability, and technical expertise for all MDA directed activities and events performed on-site. Additionally, the JNIC functions (within MDA's capabilities-based acquisition strategy) as the only system-level integration and interoperability facility for BMDS fire control; and it provides the physical interface between the developers and the COCOMs.

CONCURRENT TEST AND OPERATIONS-DISTRIBUTED MULTI-ECHELON TRAINING SYSTEM (CTO-DMETS)
The CTO-DMETS consists of live, virtual and constructive training environments for proficiency training, operator certification, wargames and exercises, and Tactics, Techniques and Procedures (TTPs) development, review, testing and revision. The CTO-DMETS will create a wargame-like

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environment for units to gain training task coverage and achieve other learning objectives by presenting standardized, technically accurate threat scenarios and other problems, faults, and situations that elicit the performance of individual and collective tasks. As MDA continues to develop the BMDS to defend the United States, deployed forces, friends and allies, the spiral development of CTO-DMETS will keep pace in meeting the continuing need to effectively train the crews, elements, staffs and commanders who execute the evolving BMDS mission.

A.2 System Element Budget Justification and Contribution to the Ballistic Missile Defense System (BMDS)
C2BMC
The C2BMC program contributes to the Ballistic Missile Defense System (BMDS) by delivering:
- BMD Defense designs planning and analysis capability among all Combatant Commands and their service components so that warfighters have the capability to explore the effectiveness of potential BMD courses of action.
- Clear, accurate, and consistent display of the ballistic missile defense battlespace (situational awareness) to warfighters at the tactical, operational, and strategic levels of command, permitting key decision-makers the ability to render command and control decisions of global importance, in real-time.
- A network tying together sensors (both BMDS radars and space sensors) and weapons systems via the Combatant Command Command and Control (COCOM C2) and Global Integrated Fire Control (GIFC) to enable system-wide detection, tracking, and decision tools for optimal engagement of ballistic missile threats across all flight regimes.

C2BMC enables integrated system performance of all BMDS elements by providing missile detection, tracking, discrimination, and network distribution of threat information. It provides the warfighter the ability to rapidly identify and concurrently track multiple ballistic missile threats; dynamically adjust BMD system resources to engage multiple ballistic missile threats in the kill zone through all phases of flight; and globally direct engagement against multiple ballistic missile threats in any area of responsibility, at any time.

The C2BMC program further enables an integrated, layered Ballistic Missile Defense by synergistically planning and operating existing and new theater and strategic ballistic missile defense weapon systems across the world for the highest probability of defeating threats of any type and range. These systems include Patriot, Theater High Altitude Area Defense (THAAD), Ground-based Midcourse Defense (GMD), Aegis BMD; and sensors such as the AN/TPY-2 radar, Sea-Based X-Band Radar (SBX), and Space-Based Infrared System (SBIRS).

PROJECT HERCULES
Project Hercules contributes to the BMDS by conceiving and maturing technical concepts into prototype software (algorithms) and then transitioning these algorithms to all relevant BMDS elements, thus enabling improved BMDS system element performance. Project Hercules further provides

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technical assistance during the integration of the algorithms into the element component to insure that knowledge gained during the development process also assists the integration process. Hercules focuses on algorithms that improve missile detection, tracking and discrimination and algorithms that support global integrated fire control (GIFC).

Additionally, Project Hercules generates advanced ballistic missile threat signatures [Threat Data Packages (TDPs)] for use in its algorithm development to enable better advanced threat representation across the BMDS.

Project Hercules also contributes to the BMDS by developing non-intrusive real-time test capability on BMDS sensors to collect data and demonstrate the performance of Hercules algorithms during actual BMDS flight tests. This capability is called the BMDS Fusion Toolbox (BFT) which is used to support the MDA Battle management Command and Control program test efforts.

Project Hercules also contributes with the development of the forward based discrimination algorithms being integrated by the MDA Sensors program into the BMDS Deployable X-Band Radar (FBX-T)

JOINT WARFIGHTER SUPPORT PROGRAM
The Joint Warfighter Support Program contributes to the BMDS by providing the means to integrate the Combatant Commands (COCOMs), the Services, and the Joint Chief of Staff inputs into the plans and processes necessary to define, develop, test, field, operate, and sustain operational BMDS Block capabilities. Further, it enhances warfighter efficiency and the overall effectiveness of the BMDS by building COCOM proficiency in fielded missile defense capabilities, by preparing the COCOMs for near-term Block delivery enhancements and by providing the means for operational level feedback to MDA developers. Additionally, the JWSP provides the only means for the COCOMS to rehearse for and validate all aspects of their BMD missions with both fielded and emerging capabilities.

JOINT NATIONAL INTEGRATION CENTER
The JNIC contributes to the BMDS by directly supporting the concept of Concurrent Test and Operations for the BMDS. The JNIC accomplishes this by providing both MDA-level technical/horizontal integration and BMDS-level operational integration.

The JNIC provides MDA-level technical/horizontal integration by: developing and operating the models and simulations used to support missile defense planning seminars, wargames, exercises, tests, and analyses; planning and executing the only end-to-end operator-in-the-loop/element-in-the-loop missile defense wargames in support of the Joint Warfighter Support Program; supporting BMDS Engagement Sequence Group (ESG) testing

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and analysis by operating the Test Execution Control (TEC) for distributed BMDS ground tests as part of the Combined Test Force (CTF)-JNIC; and, providing network operations and information assurance for all on-site integration activities.

The JNIC provides BMDS-level operational integration by: integrating and sustaining the enabling infrastructure, services, and processes that support the operation of designated elements of the BMDS and resident COCOM operations and/or support centers; operating the MDA Technical Support Center (MTSC), which provides technical support for the BMDS Watch Officers (BWOs), BMDS Safety Officers (BSOs), and Information Assurance Officers in their efforts to monitor and assess the health and status of the networks and elements that impact BMDS test and operations; operating the Joint Early Warning Laboratory (JEWL) for anomaly resolution; and supporting the Intelligence Support Center (ISC) for critical situational awareness intelligence on worldwide ballistic missile developments that could affect the development and/or operation of the BMDS.

CTO-DMETS
CTO-DMETS contributes to the BMDS by tying geographically dispersed forces together without the need to co-locate those forces at a central training facility, thus providing both cost savings for the exercise conduct and the added advantage of training how and where the operators would conduct a real-world event.

A.3 Major System Element Goals
C2BMC
Block 2004 (Initial Defense Against Rogue Threat)
- Basic Deliberative/Crisis Action Planning
- Common situational awareness capability/displays at the Combatant Commands (COCOMS) and National Military Command Center (NMCC)
- Initial Sensor Battle Management of the AN/TPY-2 radar
- Redundant communication/data paths and connections to Ground Based Missile Defense (GMD), Aegis BMD, AN/TPY-2 radar
- Engagement Sequence Groups (ESG) involving Ground Based Interceptor (GBI), Standard Missile 3 (SM-3), SPY-1 Sensor, and AN/TPY-2.
- Sustain Command and Control, Battle Management, and Communications (C2BMC) operations

Block 2006 (Integrated Defense Against Rogue Threat)
- Improved system reliability and availability to support test and operations
- Initial fielding of Global Integrated Fire Control (GIFC) capability at the Kenney Air Operations Center in Hawaii
- Enhanced situational awareness and command and control at Combatant Commands (COCOM) Headquarters
- Enhanced crisis action/deliberative planning capability

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- Direct feed of SBIRS early warning data
- Sustain C2BMC operations

Block 2008 (Coordinated Defense Against Medium Size Raids and Asymmetric Threat)
- Fully integrated Planner and situation awareness displays with integrated intelligence information and defended asset priority schemes
- Initial type interfaces between weapons and sensors compatible with DoD network-centric service-oriented architecture
- GIFC coordination and optimization of increased ``Launch-on and Engage-on`` networked capability
- Sustain C2BMC operations

PROJECT HERCULES
- Develop and support integration of algorithms that expand the capability of or enable currently identified Engagement Sequence Groups (ESGs).
- Develop and support integration of algorithms that enable BMDS elements to meet capability identified in the BMDS Test Bed System Specification or in the element specific specifications. Examples of algorithms for element enhancement include C2BMC Global Integrated Fire Control, Space Tracking and Surveillance System (STSS) tracking algorithms and AEGIS discrimination concepts.
- Develop new concepts that enable the definition of new ESGs. Examples of new capability include feature hand-over and clutter mitigation.
- Assess algorithm needs and begin development of concepts that support emerging technology, such as Multiple Kill Vehicle (MKV) and Discrimination Augmentation Devices (DADs).

JOINT WARFIGHTER SUPPORT PROGRAM
- Develop and maintain system level BMDS Training and Education activities not currently performed by the Services
- Produce Concepts and Plans that examine evolving and predicted BMDS capabilities to ensure the BMDS keeps pace with the evolving technical and strategic environment
- Conduct Exercises and Wargames for current and emerging BMDS capabilities that allow user training and feedback to the developer
- Create, develop and coordinate BMDS-wide Integrated Logistics Support policies and procedures for each new BMDS Block
- Provide direct support to the Geographic Combatant Commanders (GCCs) to ensure warfighter participation in applicable exercises, wargaming and training activities
- Provide Ballistic Missile Defense System Manager functions, to ensure proper integration of BMDS capabilities within the Services and Warfighting components. These activities include:
  o Prepare BMDS transfer/transition plans

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- o Prepare and update BMDS Activation Plans and Emergency Activation Plan annexes
- o Prepare and update Integrated Service Support Agreements
- o Perform BMDS Operations & Support monitoring and reporting through the MDA Operations Center (MOC) and BMDS Watch Officers.

JOINT NATIONAL INTEGRATION CENTER (JNIC)

- Provide the capabilities and services necessary to support the horizontal integration of on-site activities
- Ensure around the clock support and restoral of designated on-site operational activities
- Improve integration/interface with designated COCOM missile defense activities; host/support the headquarters and operations center for USSTRATCOM's Joint Functional Component Command - Integrated Missile Defense (JFCC-IMD)
- Achieve cost effectiveness and efficiencies through the leveraging of existing JNIC infrastructure, services, processes, and expertise to support assigned missions
- Maintain the reliability, availability, and maintainability of mission critical systems

CTO-DMETS

- Provide a training venue separate from the operational system that imitates the operational environment with high fidelity
- Enable the warfighter to train where he fights
- Provide a scaleable system such that training can be conducted encompassing the entire BMDS (National Military Command Center (NMCC) to the Theater), or down to a single COCOM
- Support the development and evaluation of Tactics, Techniques, and Procedures (TTPs) at the BMDS level.

A.4 Major Events Schedule and Description

Major Event	Project	Timeframe	Description
Flight Test			
Hercules			
Conduct Real-time flight events	0902	1Q FY 2006	
Conduct Real-time flight events	0902	2Q FY 2006	
Conduct Real-time flight events	0902	3Q FY 2006	
Conduct Real-time flight events	0902	4Q FY 2006	
Contract Activity			
C2BMC Element			
GIFC Increment 1	0801	1Q FY 2006 - 4Q FY 2006	
Spiral 6.4 Content Agreement	0801	4Q FY 2006	• Definition of spiral content

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Major Event	Project	Timeframe	Description
Site Activation			
Deliver and Install AN/TPY-2 Shelter to Japan	0701	3Q FY 2006	• Install and check out
Install Web Browsers, EWS, and Planners	0801	1Q FY 2006 - 4Q FY 2006	• Installation per warfighter requirements
Ft. Greely PSN	0801	4Q FY 2006	• Hardware installation
BLOCK 2006			
JNIC BMDS Exercise Planning	0803	1Q FY 2006 - 2Q FY 2006	
BMDS Overlay 06 - Keen Edge 06	0803	2Q FY 2006	
Complete CTO-DMETS Network Design	0803	2Q FY 2006	
Distributed Exercise 06-1	0803	2Q FY 2006	
CTO-DMETS Interface w/Aegis FBX/Theater Elements	0803	2Q FY 2006 - 4Q FY 2006	
Stand-up CTO-DMETS Red Cell Capability	0803	2Q FY 2006 - 4Q FY 2006	
BMDS Overlay 06 - Amalgam Phantom 06	0803	3Q FY 2006	
BMDS Overlay 06 - Joint Project Optic Windmill IX	0803	3Q FY 2006	
Distributed Exercise 06-2	0803	3Q FY 2006	
Preliminary CTO-DMETS Network Stand-up	0803	4Q FY 2006	
Critical Design Review			
Hercules			
Conduct CaT and ATT reviews	0505	1Q FY 2007	• Conduct at least four (4) ATT and CaT algorithm technical reviews
Conduct CaT and ATT reviews	0505	2Q FY 2007	• Conduct at least four (4) ATT and CaT algorithm technical reviews
Conduct CaT and ATT reviews	0505	3Q FY 2007	• Conduct at least four (4) ATT and CaT algorithm technical reviews
Conduct CaT and ATT reviews	0505	4Q FY 2007	• Conduct at least four (4) ATT and CaT algorithm technical reviews
Conduct CaT and ATT reviews	0802	1Q FY 2006	
Conduct CaT and ATT reviews	0802	2Q FY 2006	
Conduct CaT and ATT reviews	0802	3Q FY 2006	
Conduct CaT and ATT reviews	0802	4Q FY 2006	
Other			
C2BMC Element			
Spiral 4.5 Cycle 5 Testing	0701	3Q FY 2006 - 4Q FY 2006	• Field installation and check out
Hercules			
Integration of algorithms to GMD	0505	1Q FY 2007 - 4Q FY 2007	• Support integration of Hercules algorithms that support the Target Designation Concept Description that will improve the GMD system capability in the presence of countermeasures. • These algorithms include discrimination, target handover and kill vehicle enhancement algorithms.

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B. Program Change Summary	FY 2006	FY 2007	FY 2008	FY 2009
Previous President's Budget (FY 2007 PB)	388,830	506,840	506,352	509,984
Current President's Budget (FY 2008 PB)	387,402	0	0	0
Total Adjustments	-1,428	-506,840	-506,352	-509,984
Congressional Specific Program Adjustments	0	-506,840	0	0
Congressional Undistributed Adjustments	0	0	0	0
Reprogrammings	5,060	0	0	0
SBIR/STTR Transfer	-6,488	0	0	0
Adjustments to Budget Years	0	0	-506,352	-509,984

FY06 decrease of $1.428 million includes SBIR/STTR transfer and MDA reprogrammings.

FY07 decrease of $506.840 million.

FY08 decrease of $506.352 million and FY09 decrease of $599.984 million reflects the congressional direction to move the work in the Products Program Element to a series of new Program Elements that were specified by Congress.

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COST ($ in Thousands)	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
0701 Command and Control, Battle Management and Communications (C2BMC) Block 2004	63,035	0	0	0	0	0	0	0
RDT&E Articles Qty	2	0	0	0	0	0	0	0

Note: FY06 RDT&E Articles: Spiral 4.5; AN/TPY-2 C2BMC Shelter/Equipment (Communications Node)

A. Mission Description and Budget Item Justification

In support of and in collaboration with the Missile Defense Agency's Ballistic Missile Defense System (BMDS) architectures and system specifications, the Command and Control, Battle Management, and Communications (C2BMC) program is the lynchpin of integrated missile defense providing the warfighter the capability of planning the Ballistic Missile Defense (BMD) fight while concurrently tracking potential ballistic missile threats; directing weapons to engage via a distributed network; and, pairing appropriate sensors with the appropriate weapon system to defeat ballistic missile threats of any range, in any phase of flight, in all theaters, and with coalition partners. The C2BMC Program delivers continually increasing capabilities via hardware, software, network connectivity, and operations and sustainment support in two-year Blocks.

The Block 2004 C2BMC Program delivered the rudimentary foundation for integrated, layered defense for initial defense against a rogue threat or accidental ballistic missile launch. Block goals were to deliver:
- Basic deliberative/crisis action planning capability ·
- Common situational awareness capability/displays at the Combatant Commands (COCOMS) and National Military Command Center (NMCC)
- Initial sensor management of the AN/TPY-2 Radar in Japan to support Ground Based Missile Defense (GMD)
- Redundant communication/data paths and connections to GMD and Aegis BMD ·
- Engagement Sequence Groups (ESG) involving Ground Based Interceptor (GBI), Standard Missile 3 (SM-3), Cobra Dane Upgraded Early Warning Radar, SPY-1 Sensor, and AN/TPY-2
- Sustainment of C2BMC operations

C2BMC ELEMENT
The Command and Control, Battle Management, and Communications (C2BMC) Program includes program management and the hardware/software engineering necessary to accomplish Block 2004 objectives by balancing development in four product lines: BMD Planner, Situation Awareness, Battle Management, and BMD Network. This approach ensures that mature capabilities are integrated and incrementally delivered to the warfighter. Multiple incremental deliveries, or spirals, are planned in Block 2004. Each spiral represents an improvement in capability and functionality over the previous spiral. The delivery of these spirals includes the software, hardware, network connectivity, training, and operations and sustainment support

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APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603889C Ballistic Missile Defense Products**

needed to operate an integrated Ballistic Missile Defense System (BMDS). The capability delivered in the spirals enables ballistic missile defense systems Engagement Sequence Groups (ESGs) by providing the proper interfaces, planning, and coordination to allow the BMDS elements and components to work together effectively. The C2BMC Program also includes development and post analysis support for BMDS-level wargames and tests of fielded spirals.

The BMD Planner and Situation Awareness architecture is based on several design features emphasizing scalability and interoperability. The architecture is designed to utilize an open system approach. This approach also provides a path for technology upgrades. The BMD Planner emphasizes planning for both theater and global missile defense through all planning phases: deliberate, crisis, and execution. It provides the capability to coordinate with all weapon system elements in a collaborative fashion. This type of coherent planning results in ballistic missile defense for the full range and complexity of ballistic missile threats. To ensure the full C2BMC capability is realized by all weapon system elements, the architecture migrates in future Blocks to a network-centric (vice point-to-point) planner to ensure both vertical and horizontal collaboration.

Block 2004 development includes the following BMD Planner and Situational Awareness capabilities:
- Basic force level ballistic missile defense planning capability
- Planning load robustness that protects against incomplete/inaccurate data
- Initial external Extensible Machine Language (XML) interface with the Army Air and Missile Defense Work Station (AMDWS) planner
- Sensor management display (AN/TPY-2 Radar), Integrated Ballistic Missile Picture (IBMP), BMDS Summary Screen (SS), and Executive Displays (displays all BMDS track and status data)

Situation Awareness capability is further enhanced with the introduction of initial Protection Capability (PROCAP) which allows the operator to visually see status and capabilities of BMD assets. Remote situation awareness is also provided to the United Kingdom.

Battle Management comprises the decisions and actions executed in direct response to the activities of enemy forces. In Block 2004, the battle management portion of C2BMC is focused at the Combatant Commands (COCOMs) Headquarters. Block 2004 battle management develops and delivers AN/TPY-2 radar management including Operational State Control, Sensor Tasking (cue), and Resource Management, all which increase the effectiveness of the radar system within the Ballistic Missile Defense System (BMDS). In addition, track data management capability is improved to include forwarding of AN/TPY-2 radar tracks to Ground Based Missile Defense Fire Control (GFC) via fiber and satellite.

The Network Communications portion of C2BMC ensures connectivity between all components of the BMDS on the BMD network. The intent is to develop and deliver products that provide robust connectivity to quickly and unambiguously share information across the global BMD and with

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external users. Effective networking relies on an interconnection of a variety of platforms and capabilities. In Block 2004, network capability is delivered to enable Aegis BMD and GMD Engagement Sequence Groups (ESGs), Joint Range Extension to convert Satellite Communications (SATCOM) formatted messages from Aegis to land line messages to interface with the rest of the BMDS, initial network monitoring and management, Communications Network Equipment (CNE) auto-fail over to prevent system outages, BMDS Global Network Operations Control Center (GNCC) at the Joint Functional Component Commander for Integrated Missile Defense (JFCC IMD) in Colorado Springs, CO for remote monitoring of the network, and support of dual redundant suites. Additionally, engineering planning is provided for communications to support products installed and tested by the GMD and Sensor elements.

As the C2BMC products mature they are integrated into fielded spirals. The C2BMC Program uses spiral development (i.e., incremental development, test, and fielding) to produce the software required to provide a system-wide integrated BMD capability. The key test event for development is completion of Cycle 2, Simulation-Based Verification, when software completes internal C2MBC development and begins integration testing with other BMDS elements. Block 2004 matured products were integrated in Spirals 4.1 through 4.5 and delivered to the field for concurrent developmental testing and operational use in conjunction with the Responsible Test Organization (RTO) and Responsible Engineering Organization (REO) schedules and guidance. Completion of Cycle 5 testing, Site Activation Testing, signals delivery of fully functioning operational software. Spirals 4.1 and 4.2 provided infrastructure (including the development environment and initial message and track processing) and deliberate and dynamic planning (including planning tools and additional message processing and collaborative tools). Spiral 4.3 focused on developing the Initial Defensive Operations (IDO) capability, and was updated with Spiral 4.4 which incorporated high priority user fixes. Block 2004 was completed with the development and delivery of Spiral 4.5, which provides AN/TPY-2 radar management and aligns with the GMD Block 4B configuration.

SITE ACTIVATION
The C2BMC program delivered both spiral software and operational hardware/capabilities to the Combatant Commands at Northern Command (NORTHCOM), Strategic Command (STRATCOM) and Pacific Command (PACOM), and within the National Capital Region (NCR) to provide BMDS operations. Hardware capabilities consist of Enterprise Work Stations (warfighter display monitors and access to C2BMC planner, situation awareness and battle manager capabilities), servers, processors, and communications racks and equipment (up to eight racks of equipment per C2BMC suite in Block 2004), situational awareness web browsers, stand-alone laptop planners, and video distribution equipment. Additionally, Block 2004 site activation included the procurement and deployment of a C2BMC AN/TPY-2 shelter (with nine racks of equipment) in Japan, as well as extended situational awareness screens over leased communication lines to the United Kingdom. These international deployments enable BMDS global reach.

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OPERATIONS AND SUPPORT

C2BMC Program Operations and Support consists of 24/7 On-Site Support, C2BMC Control Center activities, and hardware/software maintenance. On-site support provides:

- Assistance to the System Administrator assigned by the site (e.g., Combatant Commands), with the general operational support of the C2BMC system
- Integration of the C2BMC support processes into the site's support regimen
- Daily network operations and security support for the C2BMC system as part of a transition plan
- Prime contractor `over-the-shoulder` support to users when requested, or alternatively, via the C2BMC Control Center

The C2BMC Control Center is located in Colorado Springs, CO and provides:

- Technical support to on-site personnel and to the C2BMC end-user
- Review of hardware/software problems and coordination of Commercial Off-the-Shelf (COTS) developer/vendor service calls
- Trouble ticket work-off
- Tracking and implementing documented escalation procedures
- Collecting of metrics
- Maintenance of the C2BMC Control Center web site

Maintenance of the C2BMC system includes both software and hardware maintenance and sustaining engineering. Sustaining engineering consists of network and development engineering in support of system anomalies. Operations and Support also includes the procurement of communications lines from the Defense Information Service Agency (DISA), as well as fielding and maintaining, Communications Nodal Equipment (CNE), to include the Joint Range Extension (JRE) equipment, which enables a global network grid. Operations and Support includes on-site maintenance of communications equipment and C2BMC AN/TPY-2 radar interface equipment at the first AN/TPY-2 radar site in Japan.

B. Accomplishments/Planned Program

	FY 2006	FY 2007	FY 2008	FY 2009
C2BMC Element	24,612	0	0	0
RDT&E Articles (Quantity)	1	0	0	0

The C2BMC Element accomplishes Block 2004 objectives by balancing the development of four principle product lines: Situational Awareness, BMD Planner, Battle Management, and BMD Networks, so that mature capabilities can be integrated and incrementally delivered to the warfighter via Spirals. Block 2004 includes infrastructure development, testing activity, and development support of fielded hardware and software.

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APPROPRIATION/BUDGET ACTIVITY	R-1 NOMENCLATURE
RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	**0603889C Ballistic Missile Defense Products**

FY06 Accomplishments:

FY06 RDT&E Article: Spiral 4.5

Delivered Spiral 4.5 (RDT&E article) providing:

- Situational Awareness
  - o AN/TPY-2 Sensor Management Display
  - o AN/TPY-2 added to Integrated Ballistic Missile Picture (IBMP), Summary Screen (SS), and Executive Screens
  - o Protection Capability (PROCAP) Display
  - o Situational Awareness to United Kingdom
- Ballistic Missile Defense (BMD) Planner
  - o Improved User Interface
  - o Performance Enhancements
- Battle Management
  - o AN/TPY-2 sensor management
  - o Track Forwarding AN/TPY-2 data to Ground-based Midcourse Defense (GMD) Fire Control/Ground Based Interceptor (GFC/GBI)
  - o Tri-nodal data synchronization between COCOM suites
- Network
  - o Communications Nodal Equipment (CNE) Auto Failover
  - o Move of the BMDS Global Network Ops Control Center (GNCC) to Joint Functional Component Command - Integrated Missile Defense (JFCC-IMD) at the Joint National Integration Center (JNIC)
  - o Remote connectivity of situational awareness to the United Kingdom
  - o Provide connectivity to transmit AN/TPY-2 radar data to C2BMC and GMD (GFC/GBI)
- Supported BMDS-level tests and post analyses involving Spiral 4.5
- Performed monthly Information Assurance scans and corrected deficiencies

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APPROPRIATION/BUDGET ACTIVITY RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE 0603889C Ballistic Missile Defense Products

	FY 2006	FY 2007	FY 2008	FY 2009
C2BMC Site Activation	8,505	0	0	0
RDT&E Articles (Quantity)	1	0	0	0

Site Activation efforts address fielding of the C2BMC capabilities (both full and remote suite configurations), Communications Gateways, and Web Browser based C2BMC nodes. This activity consists of two primary tasks. The first task includes planning for and installing C2BMC Components and completing required site surveys, and preparing Site Activation Plans and Site Installation Documents. The second task is to provide activation support, including equipment procurement, staging and inventory control.

FY06 Accomplishments:
FY06 RDT&E Article: AN/TPY-2 C2BMC Shelter/Equipment (Communications Node)
- Delivered and Installed AN/TPY-2 C2BMC Shelter/Equipment (Communications Node) in Japan
- Fielded PACOM Test Gateway Air Defense System
- Fielded Air Force Command and Control Intelligence Surveillance Reconnaissance Center (AFC2ISRC) Planner Software 4.5
- Completed missile operations center move to command suite war room

	FY 2006	FY 2007	FY 2008	FY 2009
Operations and Support	29,918	0	0	0
RDT&E Articles (Quantity)	0	0	0	0

Operations and Support procedures are in place for all fielded Block 2004 hardware and software. Maintenance agreements were established, spares were procured and delivered to each site. At each location an agreement in the form of a site installation plan was drafted and approved to outline roles and responsibilities of all stakeholders. A follow-on engineering site implementation document was developed to lay out the details for activating the site.

FY06 Accomplishments:
- Established on-site support for AN/TPY-2 C2BMC shelter/capability and communications in Japan
- Continued on-site operations and sustainment support of Fielded Sites at NORTHCOM, STRATCOM, PACOM, JNIC, and National Capital Region
- Maintained C2BMC Control Center at JNIC
- Provided C2BMC Operator Training

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APPROPRIATION/BUDGET ACTIVITY	R-1 NOMENCLATURE
RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	**0603889C Ballistic Missile Defense Products**

- Updated Integrated Logistics Support Plan
- Provided communications circuits for fielded C2BMC locations
- Provided sustaining engineering support for fielded hardware and software
- Identified and addressed latency issues
- Collected failure data, reliability and maintainability data

C. Other Program Funding Summary

	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	Total Cost
PE 0603175C Ballistic Missile Defense Technology	147,270	193,307	118,569	109,540	116,014	121,008	127,917	131,291	1,064,916
PE 0603881C Ballistic Missile Defense Terminal Defense Segment	1,120,879	1,092,076	962,585	1,004,282	924,101	851,213	678,694	501,147	7,134,977
PE 0603882C Ballistic Missile Defense Midcourse Defense Segment	2,391,246	3,043,058	2,520,064	2,359,665	2,179,602	1,699,963	1,153,082	1,183,003	16,529,683
PE 0603883C Ballistic Missile Defense Boost Defense Segment	455,572	628,958	548,759	432,432	448,375	678,913	829,683	1,026,239	5,048,931
PE 0603884C Ballistic Missile Defense Sensors	284,297	514,129	778,163	984,963	939,417	791,701	723,843	603,585	5,620,098
PE 0603886C Ballistic Missile Defense System Interceptors	200,446	356,004	227,499	393,317	522,388	730,236	836,029	570,206	3,836,125
PE 0603888C Ballistic Missile Defense Test and Targets	610,619	601,782	586,150	628,364	662,984	681,511	696,037	705,210	5,172,657
PE 0603890C Ballistic Missile Defense System Core	409,993	429,420	482,016	511,147	558,746	579,571	579,316	588,481	4,138,690
PE 0603891C Special Programs - MDA	271,021	353,031	323,250	305,409	369,073	526,966	789,017	792,271	3,730,038
PE 0603892C Ballistic Missile Defense Aegis	893,040	1,122,669	1,059,103	1,129,425	1,221,650	1,067,587	1,054,753	1,089,078	8,637,305
PE 0603893C Space Tracking & Surveillance System	220,048	322,220	331,525	347,811	412,623	501,197	778,067	981,424	3,894,915
PE 0603894C Multiple Kill Vehicle	48,370	144,362	271,151	352,741	461,179	618,263	673,477	842,905	3,412,448
PE 0603895C BMD System Space Program	0	0	27,666	35,093	46,849	56,183	133,617	157,117	456,525
PE 0603896C BMD C2BMC	0	246,852	258,913	294,627	300,847	282,615	267,275	269,420	1,920,549
PE 0603897C BMD Hercules	0	49,674	53,658	54,264	54,405	55,142	53,355	54,198	374,696
PE 0603898C BMD Joint Warfighter Support	0	54,935	48,787	50,428	54,086	56,603	58,890	60,206	383,935
PE 0603904C BMD Joint National Integration Center (JNIC)	0	110,629	104,012	106,985	111,542	111,947	113,592	115,287	773,994
PE 0603905C BMD Concurrent Test and Operations	0	23,159	0	0	0	0	0	0	23,159
PE 0603906C Regarding Trench	0	0	2,000	3,000	5,000	5,000	9,000	9,000	33,000
PE 0605502C Small Business Innovative Research - MDA	133,105	0	0	0	0	0	0	0	133,105

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| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | | Date **February 2007** |

| APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE **0603889C Ballistic Missile Defense Products** |

	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	Total Cost
PE 0901585C Pentagon Reservation	14,874	15,527	6,058	6,376	4,490	4,725	4,801	4,877	61,728
PE 0901598C Management Headquarters - MDA	98,609	87,059	85,906	86,453	70,355	69,855	69,855	69,855	637,947

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, spiral development, evolutionary acquisition, and knowledge-based funding through the use of two-year capability blocks. Lockheed Martin Mission Systems is the C2BMC prime contractor via an Other Transactions Agreement. Major team members to Lockheed are North up-Grumman, Boeing, Raytheon, and General Dynamics. They are charged with the development, 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 on-site operations and maintenance support, along with the Defense Information Systems Agency (DISA) for fielded C2BMC capabilities in Nebraska, Colorado, Hawaii, Virginia, and Japan. C2BMC Program Office government, Federally Funded Research Development Center/University Affiliated Research Centers (FFRDC/UARC), and Scientific Engineering and Technical Assistance (SETA) personnel are also fully integrated as part of the Prime contractor's team to function in an Integrated Product Team environment.

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		Date
Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis		**February 2007**

APPROPRIATION/BUDGET ACTIVITY	R-1 NOMENCLATURE
RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	**0603889C Ballistic Missile Defense Products**

I. Product Development   Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2007 Cost	FY 2007 Award/ Oblg Date	FY 2008 Cost	FY 2008 Award/ Oblg Date	FY 2009 Cost	FY 2009 Award/ Oblg Date	Total Cost
C2BMC Element										
C2BMC HW/SW Development, I&T	SS/CPAF	Lockheed Martin/ Col. Springs, Co	34,415	0	N/A	0	N/A	0	N/A	34,415
C2BMC HW/SW Development, I&T	SS/CPAF	Lockheed Martin/ Huntsville, AL	9,253	0	N/A	0	N/A	0	N/A	9,253
C2BMC Product Engineering & Development	SS/CPAF	Lockheed Martin/ Arlington, VA	56,807	0	N/A	0	N/A	0	N/A	56,807
EW/CEW; GCCS; JDP; JRE; ISC2; SBIRS-DSP; PATRIOT-JTAGS		Services, DISA, Agencies/ Various	50,609	0	N/A	0	N/A	0	N/A	50,609
Federally Funded Research Development Center	SS/CPAF	MITRE, IDA, ORNL, MIT/LL/ Washington, DC	13,419	0	N/A	0	N/A	0	N/A	13,419
Scientific Engineering and Technical Assistance	SS/CPFF	Sparta/CSC/ MDA HQ, Arlington, VA	12,369	0	N/A	0	N/A	0	N/A	12,369
Scientific Engineering and Technical Assistance	SS/CPFF	Booz Allen Hamilton/MDA HQ, Arlington, VA	737	0	N/A	0	N/A	0	N/A	737
C2BMC Site Activation										
Suites and Comms Gateways	SS/CPAF	Lockheed Martin/ Various COCOMS	31,549	0	N/A	0	N/A	0	N/A	31,549
Operations and Support										
Unit Personnel, Cont System Improv, Sustaining Suppt	SS/CPAF	Lockheed Martin	40,810	0	N/A	0	N/A	0	N/A	40,810
Indirect Support	MIPR	Various COCOMS	13,610	0	N/A	0	N/A	0	N/A	13,610
Unit Operations - Circuit Costs	MIPR	DISA	4,800	0	N/A	0	N/A	0	N/A	4,800
Subtotal Product Development			268,378	0		0		0		268,378

Remarks

Project: 0701 Command and Control, Battle Management and Communications (C2BMC) Block 2004

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Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	**February 2007**

APPROPRIATION/BUDGET ACTIVITY	R-1 NOMENCLATURE
RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	**0603889C Ballistic Missile Defense Products**

II. Support Costs   Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2007 Cost	FY 2007 Award/ Oblg Date	FY 2008 Cost	FY 2008 Award/ Oblg Date	FY 2009 Cost	FY 2009 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 2007 Cost	FY 2007 Award/ Oblg Date	FY 2008 Cost	FY 2008 Award/ Oblg Date	FY 2009 Cost	FY 2009 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 2007 Cost	FY 2007 Award/ Oblg Date	FY 2008 Cost	FY 2008 Award/ Oblg Date	FY 2009 Cost	FY 2009 Award/ Oblg Date	Total Cost
Subtotal Management Services										

Remarks

Project Total Cost			268,378	0		0		0		268,378

Remarks

Project: 0701 Command and Control, Battle Management and Communications (C2BMC) Block 2004   MDA Exhibit R-3 (PE 0603889C)

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	Date
Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile	**February 2007**

APPROPRIATION/BUDGET ACTIVITY	R-1 NOMENCLATURE
RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	**0603889C Ballistic Missile Defense Products**

Fiscal Year	2006				2007				2008				2009				2010				2011				2012				2013			
	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
C2BMC Element																																
Spiral 4.5 Cycle 5 Testing			△—△																													
Site Activation																																
Deliver and Install AN/TPY-2 Shelter to Japan			△																													
Operation & Sustainment																																
Block 04 O&S	△▬▬▬△																															

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

Project: 0701 Command and Control, Battle Management and Communications (C2BMC) Block 2004   MDA Exhibit R-4 (PE 0603889C)

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	Date
Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail	**February 2007**

APPROPRIATION/BUDGET ACTIVITY	R-1 NOMENCLATURE
RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	**0603889C Ballistic Missile Defense Products**

Schedule Profile	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
C2BMC Element								
Spiral 4.5 Cycle 5 Testing	3Q-4Q							
Site Activation								
Deliver and Install AN/TPY-2 Shelter to Japan	3Q							
Operation & Sustainment								
Block 04 O&S	1Q-4Q							

Project: 0701 Command and Control, Battle Management and Communications (C2BMC) Block 2004

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Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2007**

APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603889C Ballistic Missile Defense Products**

COST ($ in Thousands)	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
0801 Command and Control, Battle Management and Communications (C2BMC) Block 2006	147,289	0	0	0	0	0	0	0
RDT&E Articles Qty	1	0	0	0	0	0	0	0

Note: FY06 RDT&E Article: PSN hardware

A. Mission Description and Budget Item Justification

In support of and in collaboration with 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, in all theaters. The C2BMC products will provide the warfighter the capability to optimize ballistic missile defense from a global level by combining the best sensor information with the most efficient weapon from complimentary weapons systems, which individually, provide only limited area protection.

Today, the center of gravity for integrated BMDS is with C2BMC at the Combatant Command (COCOM) Headquarters, where BMD mission planning, situation awareness, and decisions aids are focused. All 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 from Block 2004 through Block 2006 to Block 2008, 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 and deployed. Development of this Area of Operational Responsibility (AOR)-centric enterprise architecture will allow C2BMC workload to be focused on the ``battle in front of the warfighter``, through the deployment of Global Integrated Fire Control (GIFC) functions within the Area Air Defense Commander's staff while also providing global situation awareness and senior leader decision aides at the COCOM Headquarters. Together, these separate capabilities enable integrated support of prioritized theater, regional, and homeland defense missions. To accomplish this shift in the center of gravity and meet the C2BMC mission objective of any sensor, any weapon, any threat, in any phase of flight, the C2BMC program of work in Block 2006 includes concentrated effort on developing complementary C2BMC system capabilities (i.e., global BMD planning and situation awareness at the Combatant Commands Headquarters and Global Integrated Fire Control (GIFC), based on dependable, trusted software at the Air Operations Center for initial deployment by the end of the Block.

In Block 2006, the C2BMC program will deliver to the warfighters the foundation for an integrated, layered defense against a rogue threat or

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accidental ballistic missile launch. Block goals are to deliver:

- Improved C2BMC system reliability and availability
- Initial GIFC capability at the Air Operations Center
- Enhanced BMD Planner - better user displays, flexible defense designs, faster analysis
- Enhanced situational awareness and command and control at the COCOM headquarters - consolidated essential elements of information, more informative visual representations
- High availability, redundant communications
- Combined test and operations capability via a Parallel Staging Network (PSN)
- Engagement Sequence Groups (ESG) that involve the Ground Based Missile Defense Interceptor, Aegis BMD, Standard Missile 3 (SM-3) and Army/Navy/Surfaced Phased Array system (AN/SPY-2) Radar, Terminal High Altitude Area Defense (THAAD) Interceptors, Army/Navy/Transportable Phased array radar (AN/SPY-2), and Space Based Infrared Sensor (SBIRS)

C2BMC ELEMENT

The C2BMC Program accomplishes integrated BMDS and Block 2006 objectives by designing, developing and delivering enhanced and new capabilities via incremental spirals. Each spiral, 6.0, 6.2, and 6.4, represents an improvement in capability and functionality over its predecessor spiral. The delivery of these spirals includes the software, hardware, and network connectivity needed to operate an integrated Ballistic Missile Defense System (BMDS). C2BMC Program work is integrated across four product lines: BMD Planner, Combatant Command Command and Control (COCOM C2), Global Integrated Fire Control (GIFC), and BMD Network. The C2BMC Program also includes development support and post analysis for BMDS-level wargames and tests with fielded spirals.

The Command, Control, Battle Management, and Communications (C2BMC) Planner, a part of the BMDS test bed system, allows the warfighter to optimize the organization and configuration of the missile defense force (sensor, interceptors, and systems) to counter ballistic missile threats. Because of the global nature of ballistic missile threat, the BMDS requires the use of a C2BMC planner to coordinate between the dispersed commanders with the primary focus of coordinating strategic ballistic missile defense and organizing and coordinating theater missile defense. Rapidly changing geo-political issues will require rapid analysis, planning, and adjustment to missile system platforms and courses of actions among U.S. forces and allied partners, which in turn enables protection of the Homeland while enabling maximum coverage of the troops in the field. The C2BMC Planner uses defense designs that pair specific BMDS systems and sensors (THAAD, GMD, Aegis BMD, AN/TPY-2) to defend specified prioritized defended assets (cities, military installations, command infrastructure) against a given threat or set of threats. The flexibility of the planner allows the user to function in the three modes of activity: Deliberate Planning (18-24 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). The C2BMC Planner

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provides the theater and strategic commanders the ability to build, analyze and coordinate a global, integrated and layered defense at both the operational and strategic levels across all levels of command including across Combatant Commands. This type of coherent planning results in ballistic missile defense for the planned range and complexity of ballistic missile threats.

Specific BMD Planner capabilities in Block 06 are: (1) The C2BMC planner and analysis engines are rearchitected to run more efficiently and more quickly (as much as 4 times) than in Block 04. This increased efficiency results in the warfighters ability to rapidly assess the BMD protection capability (PROCAP) provided by estimating the performance and capability of the BMD systems against the assigned threats-- a unique and necessary capability required for strategic defense. (2) Operator displays and inputs are simplified and streamlined into a single graphical user interface, per Block 2004 user feedback. (3) The Block 2006 Planner incorporates the ability to create planning sequels and branches and adds merge and unmerge functions. This capability improves the warfighters ability to create and adapt integrated defense designs at the strategic and tactical levels by allowing the warfighter to take plans from different COCOMs and merge them and modify them in order to determine what type of coverage is available across commands. It will help to insure the efficient use of resources across commands. (4) The C2BMC Planner utilizes an open system architecture, which provides an evolutionary path for potential technology upgrades.

For the Block 06 C2BMC planner analysis capability, the analysis tool will be improved to include updated Element representations capabilities and Concept of Operations (CONOPS). This will continue through each of the spiral builds and Blocks. Current Block 06 Ballistic Missile Defense System (BMDS) capability assessments include the Ground Based Midcourse Defense System (GMD) with the Sea-Based X-band Radar (SBX), the Theater High Altitude Area Defense System (THAAD), one AN/TPY-2 radar, an interface to the AEGIS Ballistic Missile Defense System (AEGIS BMD), and an interface to the Army's Air and Missile Defense Work Station to enable interface with the PATRIOT systems.

The Combatant Command Command and Control (COCOM C2) product line consists of: situation awareness displays; decision aids that allow senior defense officials the ability to quickly see and evaluate the global missile defense threat and take appropriate defense responses; AN/TPY-2 radar sensor management; and, ability to forward radar tracks to other BMDS elements. Situation awareness emphasizes common, Single Integrated Ballistic Missile Picture (IBMP) and Summary Screens (SS) from the President down to the operational level of command. It combines the information from the BMD Planner with real-world intelligence information to provide the ``big picture`` view of worldwide threats, as well as the ability to focus on specific regions and individual launch events. It provides decision-makers, at all levels of command, BMDS readiness status and its ability to defend specific areas. Displayed data and assessment tools also provide the essential elements of information to enable senior-level decisions regarding defensive measures. COCOM C2 improvements in Block 2006 include executive summary screen enhancements such as Global Integrated Fire Control (GIFC) situation awareness interaction with COCOM Headquarters, additional battlespace information, consolidated display of Essential Elements of Information (EEIs), and improved ability to organize and manage on-screen information with filters and moveable screen

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windows. Additionally, AN/TPY-2 radar management functionality in Block 2004 is re-hosted in Block 2006 software with enhancements for precision cueing and focused search plan selection, as well as improvements in user controls/displays. The ability to forward threat tracks from the AN/TPY-2 radar in Japan to U.S. Forces Japan and to Aegis BMD for cueing is also added in Block 2006. Finally, Block 2006 includes upgrades to interface with the Ground Based Missile Fire Control software version 6A and a direct data connection to Space Based Infrared System (SBIRS) information.

The Global Integrated Fire Control (GIFC) product line provides the first true BMDS battle management capability through C2BMC. It contains algorithms, decision aids, user interfaces, and sensor controls to allow the Integrated Missile Defense Operations Cell inside the Kenney Air Operations Center (AOC) (Hawaii) to optimize available sensor energy and interceptor inventory. GIFC capabilities are based on cutting-edge, dependable software development tools and techniques with significant testing performed up-front to prevent delivered software deficiencies. At the end of Block 2006, GIFC will have the primary task of managing the AN/TPY-2 radar in Japan (with COCOM C2 providing a backup capability) and include Patriot and Aegis BMD interceptors in its weapons assignment calculations. It will communicate intent to these elements using existing Link 16 message sets in the initial release, with eventual transition to BMDS Extensible Markup Language (XML) formatted messages throughout the BMDS network. As we develop the GIFC product line, we are moving towards a Service Oriented Architecture (SOA) for the BMDS. This will allow independent development of the individual elements and well-managed interfaces for integration into the BMD Network. By applying advanced development techniques, the C2BMC Program will produce a highly dependable network that has predictable behavior, is scalable for future growth, and will provide advanced information assurance to protect the BMDS. It will provide these interfaces between BMDS elements, beginning with GIFC in Spiral 6.4. Data Services will provide the right data to applications that need it throughout the BMDS network, and will minimize the number of interfaces required between individual elements.

The Network Communications portion of C2BMC ensures that communications and networking are not the limiting factor in fielding or operation of the BMDS. The intent is to develop products that provide robust, high availability, survivable connectivity to quickly and unambiguously share information across the global BMDS consisting of multiple sensors, weapon systems, and command and control nodes, as well as external users. Effective networking management and operations will rely on the ability to manage, coordinate, and integrate a wide variety of equipment platforms; interfaces with other DoD communications systems and existing/evolving information standards and capabilities. Defense Information Systems Agency (DISA) services are also highly leveraged in providing world-wide communications. In Block 2006, the Network portion of C2BMC will provide initial Network Centric Enterprise Services (NCES) capabilities, starting with centralized detailed network performance monitoring and cryptographic device management, which will evolve to full Quality of Service (QoS) network monitoring to ensure messages and communications are properly routed to avoid bottlenecks. Network development also includes development and fielding of a Parallel Staging Network (PSN) which allows new software spirals to be developed, tested, and operationally checked-out on fielded communications and C2BMC equipment prior to

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switching over to operational use. The PSN assures the operator higher availability of the operational system while continuing development on the parallel system. Once the warfighter accepts the developmental system, with new spiral software, as being operationally ready, it is switched over to operational use and existing operational hardware is turned over to development for the next generation of software. This capability enables concurrent operations and test and seamless transition of new C2BMC capabilities to the warfighter. Also, during Block 2006, Aegis Extremely High Frequency (EHF) connectivity will be established with U.S. Forces Japan (USFJ) and U.S. Forces Korea (USFK). Continued program planning and engineering support for network products provided to the GMD and Sensor elements for development, integration, and test.

As the C2BMC products mature they are engineered and integrated into fielded spirals. The C2BMC program uses spiral development (incremental development, test, and fielding) to deliver the hardware and software required to provide a system-wide integrated BMD capability. The key test event for development is completion of Cycle 2, Simulation-Based Verification, when software completes internal Command and Control, Battle Management, and Communications (C2MBC) development and begins integration testing with other Ballistic Missile Defense System (BMDS) elements. Block 2006 matured products are integrated in Spirals 6.0, 6.2 and 6.4, and then delivered to the field for concurrent development testing and operational use in conjunction with Responsible Test Organization (RTO), Responsible Engineering Organization (REO), and Aegis BMD and Ground-based Midcourse Defense (GMD) schedules and guidance. Completion of Cycle 5 testing, Site Activation Testing, signals delivery of fully functioning operational software. Spiral 6.0 is a minor capability improvement to Spiral 4.5 that enables a host nation interface for the AN/TPY-2 radar and interfaces for new element software improvements. Spiral 6.2 is the first major capability delivery of Block 2006 with the primary focus on improved reliability and availability, particularly with the BMD Planner. Spiral 6.4 delivers complete Block 2006 capability with a focus on the initial fielding of a Global Integrated Fire Control (GIFC) at the Kenney Air Operations Center (AOC).

SITE ACTIVATION
In addition to Block 2006 spiral software, fielding capability also includes installation and activation of C2BMC capabilities at U.S. Forces Korea (USFK), U.S. Forces Japan (USFJ), Cheyenne Mountain Operations Center (CMOC) equipment moves, and Kenney (Hawaii) AOC. Additionally, Pacific Command (PACOM) will receive a second C2BMC equipment suite. C2BMC fielding at these locations results in improved capability of the BMDS to meet global threats. All Combatant Commands (COCOMs) as well as Ft. Greely, AK will be installed with the parallel staging node hardware and capability. Block 2006 expands on current capability with numerous C2BMC planner and web browser installs as identified by the warfighter throughout the Block. Site Activation will include participation in planning for future Global BMDS operations and site installations.

INTEGRATION AND TEST ENVIRONMENT
The C2BMC Program developed and maintains an Element Test Environment at the Joint National Integration Center on Shriever AFB, CO for software integration, testing and verification, system exercises, and operational support. The JNIC hosts four C2BMC Spiral integration and testing

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laboratories (BITC), and the C2BMC-Experimental Laboratory (C2BMC-X). Capabilities and functions located at the JNIC supporting the development of the BMDS C2BMC include: integration and test of C2BMC software Spirals; C2BMC experimentation supported by broad area announcements for independently developed software which may have application in the BMDS and C2BMC operations and maintenance, licenses and upgrades for the BITC and C2BMC-X laboratories. The use of these facilities is essential to testing the integration of C2BMC products with other BMDS elements and involving the warfighter in flushing out operational techniques and issues.

OPERATIONS AND SUPPORT
C2BMC program Operations and Support consists of 24/7 on-site support, C2BMC Control Center activities, and hardware/software maintenance.

On-site support provides:
- Assistance to the System Administrator assigned by the site (e.g. Combatant Commands), with the general operational support of the C2BMC system
- Integration of the C2BMC support processes into the site's support regimen
- Daily network operations and security support for the C2BMC system as part of a transition plan
- Prime contractor ``over-the-shoulder`` support to users when requested, or alternatively, when they contact the C2BMC Control Center.

The C2BMC Control Center is located in Colorado Springs, CO and provides:
- Technical support to on-site personnel and to the C2BMC end-user
- Review of hardware/software problems and coordination of Commercial Off-the-Shelf (COTS) developer/vendor service calls
- Collect and prioritize failure data as identified by site support staff; implement corrective actions, and recommend changes to be implemented in future spirals
- Tracking and implementing documented escalation procedures
- Collection of reliability, availability and maintainability data for development of readiness metrics
- Maintenance of the C2BMC Control Center web site

Maintenance of the C2BMC system includes both software and hardware maintenance and sustaining engineering. Sustaining engineering consists of network and development engineering in support of system anomalies. Operations and Support also includes the procurement of communications lines from the Defense Information Service Agency (DISA), as well as fielding and maintaining, Communications Nodal Equipment (CNE), to include the Joint Range Extension (JRE) equipment, which enables a global network grid. Operations and Support includes on-site maintenance of communications equipment and C2BMC AN/TPY-2 radar interface equipment at the first AN/TPY-2 radar site in Japan.

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B. Accomplishments/Planned Program

	FY 2006	FY 2007	FY 2008	FY 2009
C2BMC Element	111,643	0	0	0
RDT&E Articles (Quantity)	0	0	0	0

The C2BMC Element accomplishes block objectives by integrating work across four product lines: Ballistic Missile Defense (BMD) Planner, Combatant Command Command and Control (COCOM C2), Global Integrated Fire Control (GIFC), and BMD Networks, so that mature capabilities can be integrated and incrementally delivered to the warfighter.

FY06 Accomplishments:
- Completed GIFC/Advanced Battle Management Increment 1
- Approved Spiral 6.4 Content Agreement
- Began Spiral 6.4 design and engineering development
- Began Spiral 6.2 Software Development
- Designed and procured equipment to provide Parallel Staging Network (PSN) capability for Spiral 6.2
- Upgraded Peer Event Forwarding in Neural Star to improve network monitoring
- Automatic CNE failover

	FY 2006	FY 2007	FY 2008	FY 2009
Site Activation	20,009	0	0	0
RDT&E Articles (Quantity)	1	0	0	0

Block 2006 Site Activation efforts will continue to address the fielding and upgrade of all C2BMC associated hardware and software (Suites, Enterprise Workstations (EWS), Web Browsers, and Communications Equipment) which enable the warfighter to plan, see, and manage the ballistic missile defense battle.

FY06 Accomplishments:
FY06 RDT&E Article: PSN hardware
- Fielded Kenney, HI Air Operations Center (AOC) EWSs (4 EWSs and 1 Dual CNI)
- Provided EUCOM Web Browsers
- Moved Existing SECDEF Web Browser
- Provided BMDS watch officer Web Browser (NORTHCOM)

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- Provided UK Web Browsers
- Provided 263rd Army Air Missile Defense Command (AAMDC) Web Browser
- Fielded to Ft. Greely, AK Parallel Staging Node (RDT&E Article)

	FY 2006	FY 2007	FY 2008	FY 2009
Integration and Test Environment	15,637	0	0	0
RDT&E Articles (Quantity)	0	0	0	0

Block 2006 will see the Joint National Integration Center (JNIC) continue providing the capabilities and functions which support development of the BMDS C2BMC Element; Integration and test of C2BMC software Spiral deliveries; C2BMC experimentation supported by Broad Area Announcements for independently developed software which may have applications in the BMDS; Support conduct of BMDS level wargames and ground tests and flight tests; C2BMC Operations & Maintenance, Licenses; and, Upgrades for the BITC and C2BMC-X laboratories.

FY06 Accomplishments:
- Completed BITC-4 build-out to increase BMDS level and systems integration test capacity
- Supported Block 04 BMDS-level tests, wargames, and exercises
  - Combined Test Force (CTF) Test Events (previously known as MDIE): GT 04-1a, GT 04-1b, GTI-01, GTX-1b
  - COCOM Exercises: Amalgam Phantom (AP-06), Nimble Titan 2006, Vigilant Shield (VS-06)
  - Distributed Ground Test (DGT): GT 04-2a
  - GMD Flight Test: FTG-2
  - Aegis Flight Test: FTM 04-3
  - Patriot Flight Test: PAC 2 GEM ATM-46
  - AN/TPY-2 Test: GT-191
- C2BMC-X Events and Experimentation for Block 06 including:
  - Early C2BMC System Integration: STSS, KEI, ESL, ABL, THAAD, MDSEC, CMS
  - Command & Control / Allies: C2BMC Situation Awareness to GCCS Interface, NECC Prototype, Consequence Mitigation
  - Battle Management (GIFC): GIFC Integration / Assessment, Sensor Registration, Discrimination Architecture, Distributed Track Processing, Sensor Netting, Kill Assessment
  - Communications / Networking: Guard Technology, C2BMC Data Services Trade Study
  - Technology Investigation: Small Business Innovative Research (SBIR), Human Machine Interface, DMETS, Analysis Automation
  - Experimentation Flight Events: FTX-02, FTG-2, FTM-10, THAAD, CMCM-2

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- Supported the MDA International Program efforts with briefings, technical interchanges, and exercise participation
  - NATO ALTBMD Program Office
  - Japanese Self Defense Forces - Missile Defense Command and Control Program Office
  - Denmark Immersion Day
  - Joint Project Optic Windmill (JPOW-IX) exercise
- Upgrade Test Environment to support C2BMC Spiral 6.0 & 6.2 testing
- Continue support of C2BMC Concept of Operations and the C2BMC Warfighter Involvement Program (WIP)
- Upgrade Communication Network Equipment (CNE) for C2BMC Integration and Test Center (BITC) Lab Spiral 6.2

C. Other Program Funding Summary

	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	Total Cost
PE 0603175C Ballistic Missile Defense Technology	147,270	193,307	118,569	109,540	116,014	121,008	127,917	131,291	1,064,916
PE 0603881C Ballistic Missile Defense Terminal Defense Segment	1,120,879	1,092,076	962,585	1,004,282	924,101	851,213	678,694	501,147	7,134,977
PE 0603882C Ballistic Missile Defense Midcourse Defense Segment	2,391,246	3,043,058	2,520,064	2,359,665	2,179,602	1,699,963	1,153,082	1,183,003	16,529,683
PE 0603883C Ballistic Missile Defense Boost Defense Segment	455,572	628,958	548,759	432,432	448,375	678,913	829,683	1,026,239	5,048,931
PE 0603884C Ballistic Missile Defense Sensors	284,297	514,129	778,163	984,963	939,417	791,701	723,843	603,585	5,620,098
PE 0603886C Ballistic Missile Defense System Interceptors	200,446	356,004	227,499	393,317	522,388	730,236	836,029	570,206	3,836,125
PE 0603888C Ballistic Missile Defense Test and Targets	610,619	601,782	586,150	628,364	662,984	681,511	696,037	705,210	5,172,657
PE 0603890C Ballistic Missile Defense System Core	409,993	429,420	482,016	511,147	558,746	579,571	579,316	588,481	4,138,690
PE 0603891C Special Programs - MDA	271,021	353,031	323,250	305,409	369,073	526,966	789,017	792,271	3,730,038
PE 0603892C Ballistic Missile Defense Aegis	893,040	1,122,669	1,059,103	1,129,425	1,221,650	1,067,587	1,054,753	1,089,078	8,637,305
PE 0603893C Space Tracking & Surveillance System	220,048	322,220	331,525	347,811	412,623	501,197	778,067	981,424	3,894,915
PE 0603894C Multiple Kill Vehicle	48,370	144,362	271,151	352,741	461,179	618,263	673,477	842,905	3,412,448
PE 0603895C BMD System Space Program	0	0	27,666	35,093	46,849	56,183	133,617	157,117	456,525
PE 0603896C BMD C2BMC	0	246,852	258,913	294,627	300,847	282,615	267,275	269,420	1,920,549
PE 0603897C BMD Hercules	0	49,674	53,658	54,264	54,405	55,142	53,355	54,198	374,696
PE 0603898C BMD Joint Warfighter Support	0	54,935	48,787	50,428	54,086	56,603	58,890	60,206	383,935
PE 0603904C BMD Joint National Integration Center (JNIC)	0	110,629	104,012	106,985	111,542	111,947	113,592	115,287	773,994

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	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	Total Cost
PE 0603905C BMD Concurrent Test and Operations	0	23,159	0	0	0	0	0	0	23,159
PE 0603906C Regarding Trench	0	0	2,000	3,000	5,000	5,000	9,000	9,000	33,000
PE 0605502C Small Business Innovative Research - MDA	133,105	0	0	0	0	0	0	0	133,105
PE 0901585C Pentagon Reservation	14,874	15,527	6,058	6,376	4,490	4,725	4,801	4,877	61,728
PE 0901598C Management Headquarters - MDA	98,609	87,059	85,906	86,453	70,355	69,855	69,855	69,855	637,947

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, spiral development, evolutionary acquisition, and knowledge-based funding through the use of two-year capability blocks. Lockheed Martin Mission Systems is the C2BMC prime contractor via an Other Transactions Agreement. Major team members to Lockheed are North up-Grumman, Boeing, Raytheon, and General Dynamics. They are charged with the development, 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 on-site operations and maintenance support, along with the Defense Information Systems Agency (DISA) for fielded C2BMC capabilities in Nebraska, Colorado, Hawaii, Virginia, and Japan. C2BMC Program Office government, Federally Funded Research Development Center/University Affiliated Research Centers (FFRDC/UARC), and Scientific Engineering and Technical Assistance (SETA) personnel are also fully integrated as part of the Prime contractor's team to function in an Integrated Product Team environment.

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I. Product Development   Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2007 Cost	FY 2007 Award/ Oblg Date	FY 2008 Cost	FY 2008 Award/ Oblg Date	FY 2009 Cost	FY 2009 Award/ Oblg Date	Total Cost
C2BMC Element										
C2BMC HW/SW Development/I&T	SS/CPAF	Lockheed Martin/ Colorado Springs, CO	46,777	0	N/A	0	N/A	0	N/A	46,777
C2BMC HW/SW Development/I&T	SS/CPAF	Lockheed Martin/ Huntsville, CO	18,749	0	N/A	0	N/A	0	N/A	18,749
C2BMC Product Engineering & Development	SS/CPAF	Lockheed Martin/ Arlington, VA	67,532	0	N/A	0	N/A	0	N/A	67,532
EW/CEW; GCCS; JDP; JRE; ISC2; ECPs	Various	Services, DISA, Agencies/ Various	28,658	0	N/A	0	N/A	0	N/A	28,658
Federally Funded Research Development Centers	SS/CPAF	MITRE, IDA, ORNL, MIT/LL/ Washington, DC	17,037	0	N/A	0	N/A	0	N/A	17,037
Scientific Engineering Technical Assistance	SS/CPFF	Sparta/CSC/ Arlington, VA	1,166	0	N/A	0	N/A	0	N/A	1,166
Scientific Engineering Technical Assistance	SS/FFP	Sparta/ Arlington, VA	17,264	0	N/A	0	N/A	0	N/A	17,264
Scientific Engineering Technical Assistance	SS/FFP	Booz Allen Hamilton/ MDA HQ, Arlington, VA	480	0	N/A	0	N/A	0	N/A	480
Site Activation										
Suites and Comms Gateways	SS/CPAF	Lockheed Martin/ Various COCOMS	2,816	0	N/A	0	N/A	0	N/A	2,816

Project: 0801 Command and Control, Battle Management and Communications (C2BMC) Block 2006

MDA Exhibit R-3 (PE 0603889C)

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Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date **February 2007**

APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603889C Ballistic Missile Defense Products**

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2007 Cost	FY 2007 Award/ Oblg Date	FY 2008 Cost	FY 2008 Award/ Oblg Date	FY 2009 Cost	FY 2009 Award/ Oblg Date	Total Cost
Integration and Test Environment										
Integration & Test Personnel	C/FFP	IDA,SRS Technologies/ Colorado Springs, CO	1,550	0	N/A	0	N/A	0	N/A	1,550
Integration & Test	C/FFP	Northrop Grumman Mission Sys/ Colorado Springs, CO	13,571	0	N/A	0	N/A	0	N/A	13,571
Subtotal Product Development			215,600	0		0		0		215,600

Remarks

II. Support Costs   Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2007 Cost	FY 2007 Award/ Oblg Date	FY 2008 Cost	FY 2008 Award/ Oblg Date	FY 2009 Cost	FY 2009 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 2007 Cost	FY 2007 Award/ Oblg Date	FY 2008 Cost	FY 2008 Award/ Oblg Date	FY 2009 Cost	FY 2009 Award/ Oblg Date	Total Cost
Subtotal Test and Evaluation										

Remarks

Project: 0801 Command and Control, Battle Management and Communications (C2BMC) Block 2006   MDA Exhibit R-3 (PE 0603889C)

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				Date
Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis				**February 2007**

APPROPRIATION/BUDGET ACTIVITY	R-1 NOMENCLATURE
RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	**0603889C Ballistic Missile Defense Products**

IV. Management Services   Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2007 Cost	FY 2007 Award/ Oblg Date	FY 2008 Cost	FY 2008 Award/ Oblg Date	FY 2009 Cost	FY 2009 Award/ Oblg Date	Total Cost
Subtotal Management Services										

Remarks

Project Total Cost			215,600	0		0		0		215,600

Remarks

Project: 0801 Command and Control, Battle Management and Communications (C2BMC) Block 2006   MDA Exhibit R-3 (PE 0603889C)

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	Date
Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile	**February 2007**

APPROPRIATION/BUDGET ACTIVITY	R-1 NOMENCLATURE
RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	**0603889C Ballistic Missile Defense Products**

Fiscal Year	2006				2007				2008				2009				2010				2011				2012				2013			
	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
C2BMC Element																																
Spiral 6.4 Content Agreement				▲																												
GIFC Increment 1	▲▬▬▬▬▲																															
Site Activation																																
Install Web Browsers, EWS, and Planners	▲▬▬▬▬▲																															
Ft. Greely PSN				▲																												

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

Project: 0801 Command and Control, Battle Management and Communications (C2BMC) Block 2006   MDA Exhibit R-4 (PE 0603889C)

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Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail	Date **February 2007**	

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

R-1 NOMENCLATURE
0603889C Ballistic Missile Defense Products

Schedule Profile	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
C2BMC Element								
Spiral 6.4 Content Agreement	4Q							
GIFC Increment 1	1Q-4Q							
Site Activation								
Install Web Browsers, EWS, and Planners	1Q-4Q							
Ft. Greely PSN	4Q							

Project: 0801 Command and Control, Battle Management and Communications (C2BMC) Block 2006

MDA Exhibit R-4A (PE 0603889C)

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Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date February 2007

APPROPRIATION/BUDGET ACTIVITY RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE 0603889C Ballistic Missile Defense Products

COST ($ in Thousands)	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
0901 Command and Control, Battle Management and Communications (C2BMC) Block 2008	4,617	0	0	0	0	0	0	0
RDT&E Articles Qty	0	0	0	0	0	0	0	0

A. Mission Description and Budget Item Justification

In support of and in collaboration with 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, directing weapons to engage on a distributed network; 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 via hardware, software, and operations and sustainment support.

The C2BMC Block 2008 Program enables a coordinated ballistic missile defense against medium size raids and asymmetric threats (as would occur from non-traditional threat trajectories from the south or ship-based). Specific Block goals are to deliver:
- Improved system reliability and availability through network monitoring, equipment upgrades, and maintainable software
- Fully integrated planner and situation awareness displays with integrated intelligence information and defended asset priority schemes
- Initial type interfaces between weapons and sensors compatible with DoD network-centric service-oriented architecture to enable more rapid integration of new assets into the BMDS
- Global Integrated Fire Control (GIFC) coordination and optimization of increased ``Launch-on and Engage-on`` networked capability
- Communication capability which will extend BMDS mission success by providing information management and quality of service to the individual user
- Expanded C2BMC, hence the Ballistic Missile Defense System global coverage with activation of European Command (EUCOM) and Central Command (CENTCOM) C2BMC capability

C2BMC ELEMENT
The C2BMC Program accomplishes block objectives by demonstrating and operationalizing advancements in the integration of four product lines -- BMD Planner, Combatant Command Command and Control (COCOM C2), GIFC, and BMD Network. Two software spirals (8.2 and 8.4) are delivered in Block 2008. The delivery of these spirals includes the software, hardware, and network connectivity needed to operate an integrated Ballistic Missile Defense System (BMDS), consists of a greater number of radars and tactical weapon systems as compared to Block 2006. The hardware and software in Block 2008 will allow network sharing of target data to enable launch/engage on sensors that are not organic to the

Project: 0901 Command and Control, Battle Management and Communications (C2BMC) Block 2008   MDA Exhibit R-2A (PE 0603889C)
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Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2007**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603889C Ballistic Missile Defense Products**

individual weapon system, but rather belong to the BMDS network as a whole. The capability delivered in these spirals will enable BMDS Block 2008 Engagement Sequence Groups (ESG's) by delivering the key interfaces, planning, and coordination to allow BMDS elements and components to work together more effectively by extending the range and reach of the weapon systems.

The Block 08 BMD Planner increases the flexibility, interoperability, and speed of command with innovative new planning capabilities. The first new capability will transition the BMD Planner to a net-centric architecture. Net-Centric Enterprise Services (NCES) will provide publication/subscription planning services to the Combatant Commands, MDA, BMDS Elements, or other authenticated users, laying the foundations for dynamic planning (near real-time). The integration of the BMD Planner with various existing operational planning systems such as the Joint Operational Planning and Execution System (JOPES) and the Time Phased Force Deployment Data (TPFDD) (which estimates force flow and maneuvers), provides the theater and strategic commanders the flexibility to build, analyze and coordinate global, layered defense designs across all levels of command in both time and space. The second new capability is the ability to develop robust two-way interfaces with real-time Global Integrated Fire Control System (GIFC) via C2BMC data services. This will increase the flexibility and speed of command by providing real-time status of weapons inventories, operational capabilities (OPSCAP) status, and engagement recommendations to update current execution plans. This enables capturing battlespace activities and trends, and automatic feed of that information into follow-on planning sessions. This will also enable initial updates to plans given near real-time situational inputs. The third new capability will add integration of Offensive/Defensive Integration (ODI) planning through the Strategic Command's Integrated Strategic Planning and Analysis Network (ISPAN) and the JFACC's Theater Battle Operations Network Centric Environment (TBONE).

The Block 08 BMD Planner's analysis capability will continue to update existing Element representations and add improved capabilities and limitations for Ground-Based Midcourse Defense (GMD), add AN/TPY-2 radars to the BMDS, and provide an initial assessment of Airborne Laser (ABL).

The Combatant Command Command and Control (COCOM C2) product line consists of situation awareness displays, decision aids that allow senior defense officials the ability to quickly see and evaluate the global missile defense threat and take appropriate defense responses, AN/TPY-2 radar sensor management (as a fail over capability from Global Integrated Fire Control), and ability to forward radar tracks to other BMDS elements (also, as a fail over capability from Global Integrated Fire Control). Block 2008 COCOM C2 situation awareness displays add offensive/defensive integration (ODI) implementing an interface with the Air Force Theater Battle Management Core System (TBMCS) for retrieval and display of Air Tasking Orders, and transmission of launch points and target nominations. Additionally, it incorporates basic consequence mitigation information consisting of transmitting consequence prediction data (system track, impact point, hit assessment) to external agencies. Block 2008 COCOM C2 warfighter decision aids are also improved based upon feedback on fielded C2BMC systems and includes the automatic generation of world-wide

Project: 0901 Command and Control, Battle Management and Communications (C2BMC) Block 2008   MDA Exhibit R-2A (PE 0603889C)

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	Date
Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	**February 2007**

APPROPRIATION/BUDGET ACTIVITY	R-1 NOMENCLATURE
RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	**0603889C Ballistic Missile Defense Products**

protection capability (PROCAP) based on real-time status of threats and BMDS assets. Collaboration with friends and Allies will also be enabled via expanded Network Enterprise Centric Services (NECS). Government/Contractor off-the-shelf (GOTS/COTS) products, system administration improvements, post-analysis tools for tests and trouble shooting, a space object catalog for storage and periodic transmission to Ground-Based Midcourse Defense, and hardware upgrades to increase processing capacity are also planned in Block 2008.

The Global Integrated Fire Control (GIFC) product line provides BMDS battle management capability through C2BMC. It contains algorithms, decision aids, user interfaces, and sensor controls to allow an Integrated Missile Defense Operations Cell to optimize available sensor energy and interceptor inventory. GIFC capabilities are based on cutting-edge, dependable software development tools and techniques with significant testing performed up-front to prevent delivered software deficiencies. In Block 2008, Global Integrated Fire Control (GIFC) will fully mature as the Ballistic Missile Defense System (BMDS) battle manager with expansion to the European and Middle Eastern areas of responsibility. Enhanced sensor management includes the creation of common X-Band type interfaces to more easily incorporate Theater High Altitude Area Defense (THAAD) and Sea-Based X-Band Radar (SBX) into the BMDS; ability to receive track-based measurement data from AN/TPY-2 radar and SBX; a direct SBX connection to C2BMC; and AN/TPY-2 radar hit assessment processing. Additionally, Block 2008 capabilities include interfaces for AN/TPY-2 radar capability 2 and 3 (CR2/CR3) discrimination data and ability to perform feature-aided track correlation. The Block 2008 GIFC will also monitor and coordinate sensor registration of BMDS radars and be able to forward radar tracks from AN/TPY-2 radar to THAAD, from THAAD to Ground-based Midcourse Defense (GMD), and from Upgraded Early Warning Radars (UEWRs)/SBX to other Link 16 platforms (such as THAAD and Aegis BMD), as well as, perform engagement coordination between Aegis BMD, THAAD, Patriot and GMD. Finally, the Block 2008 GIFC will be able to create and transmit an initial BMD system track for use by all elements. As GIFC matures it will move towards a Service Oriented Architecture (SOA) -- key to ensuring a BMDS network-centric architecture. This will allow independent development of the individual elements and well-managed interfaces for integration into the BMD Network. By applying advanced development techniques, the C2BMC Program will produce a highly dependable network with predictable behavior, scalable for future growth, providing advanced information assurance to protect the BMDS. Block 2008 incorporates all available services necessary to plan and operate the BMDS. These services will migrate to the DOD-wide move to Network Enabled Command Capability (NECC).

The BMD Network product features a more redundant, high availability network with diverse paths and increased communications support to the BMDS elements to include added sensors and weapons. 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) will extend BMDS mission success by providing information management and quality of service to the

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	Date
Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	**February 2007**

APPROPRIATION/BUDGET ACTIVITY	R-1 NOMENCLATURE
RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	**0603889C Ballistic Missile Defense Products**

individual user. During Block 2008, connectivity will be established with European Command (EUCOM) and Central Command (CENTCOM). Engineering and program planning support will be provided to the GMD and Sensors elements for development of network products for the 3rd Site.

SITE ACTIVATION

C2BMC capabilities (hardware and software) will be deployed to EUCOM and CENTCOM with existing sites receiving upgrades as needed. Deployment to these combatant commands continues to expand BMDS on a global scale, providing increased protection to the U.S., and its friends and Allies. Block 2008 expands current capability with numerous BMD Planner, web browser, and Enterprise Workstation installations per warfighter requirements. Site Activation also includes participation in planning for future BMDS operations and site installations.

OPERATIONS AND SUPPORT

C2BMC Program Operations and Support consists of 24/7 on-site support, C2BMC Control Center activities, and hardware/software maintenance.

On-site support provides:
- Assistance to the System Administrator assigned by the site (e.g., Combatant Commands), with the general operational support of the C2BMC system
- Integration of the C2BMC support processes into the site's support regimen
- Daily network operations and security support for the C2BMC system as part of a transition plan
- Prime contractor ``over-the-shoulder`` support to users when requested, or alternatively, via the C2BMC Control Center

The C2BMC Control Center is located in Colorado Springs, CO and provides:
- Technical support to on-site personnel and to the C2BMC end-user
- Review of hardware/software problems and coordination of Commercial Off-the-Shelf (COTS) developer/vendor service calls
- Collect and prioritize failure data as identified by site support staff; implement corrective actions, and recommend changes to be implemented in future spirals
- Tracking and implementing documented escalation procedures
- Collection of reliability, availability and maintainability data for development of readiness metrics
- Maintenance of the C2BMC Control Center web site

Maintenance of the C2BMC System includes both software and hardware maintenance and sustaining engineering. Sustaining engineering consists of network and development engineering in support of system anomalies. Operations and Support also includes the procurement of communications

Project: 0901 Command and Control, Battle Management and Communications (C2BMC) Block 2008   MDA Exhibit R-2A (PE 0603889C)

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Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2007**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603889C Ballistic Missile Defense Products**

lines from the Defense Information Service Agency (DISA), as well as fielding and maintaining, Communications Nodal Equipment (CNE), to include the Joint Range Extension (JRE) equipment, which enables a global network grid. Operations and Support includes on-site maintenance of communications equipment and C2BMC AN/TPY-2 radar interface equipment at the first AN/TPY-2 radar site in Japan.

B. Accomplishments/Planned Program

	FY 2006	FY 2007	FY 2008	FY 2009
C2BMC Element	4,617	0	0	0
RDT&E Articles (Quantity)	0	0	0	0

The C2BMC Element accomplishes block objectives by integrating work across four product lines (Ballistic Missile Defense (BMD) Planner, Combatant Command and Control (COCOM C2), Global Integrated Fire Control (GIFC), and BMD Networks) so that mature capabilities can be integrated and incrementally delivered to the warfighter.

FY06 Accomplishments:
- Identification of risk areas
- Definition of potential capabilities

C. Other Program Funding Summary

	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	Total Cost
PE 0603175C Ballistic Missile Defense Technology	147,270	193,307	118,569	109,540	116,014	121,008	127,917	131,291	1,064,916
PE 0603881C Ballistic Missile Defense Terminal Defense Segment	1,120,879	1,092,076	962,585	1,004,282	924,101	851,213	678,694	501,147	7,134,977
PE 0603882C Ballistic Missile Defense Midcourse Defense Segment	2,391,246	3,043,058	2,520,064	2,359,665	2,179,602	1,699,963	1,153,082	1,183,003	16,529,683
PE 0603883C Ballistic Missile Defense Boost Defense Segment	455,572	628,958	548,759	432,432	448,375	678,913	829,683	1,026,239	5,048,931
PE 0603884C Ballistic Missile Defense Sensors	284,297	514,129	778,163	984,963	939,417	791,701	723,843	603,585	5,620,098
PE 0603886C Ballistic Missile Defense System Interceptors	200,446	356,004	227,499	393,317	522,388	730,236	836,029	570,206	3,836,125
PE 0603888C Ballistic Missile Defense Test and Targets	610,619	601,782	586,150	628,364	662,984	681,511	696,037	705,210	5,172,657
PE 0603890C Ballistic Missile Defense System Core	409,993	429,420	482,016	511,147	558,746	579,571	579,316	588,481	4,138,690
PE 0603891C Special Programs - MDA	271,021	353,031	323,250	305,409	369,073	526,966	789,017	792,271	3,730,038
PE 0603892C Ballistic Missile Defense Aegis	893,040	1,122,669	1,059,103	1,129,425	1,221,650	1,067,587	1,054,753	1,089,078	8,637,305

Project: 0901 Command and Control, Battle Management and Communications (C2BMC) Block 2008

MDA Exhibit R-2A (PE 0603889C)

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					Date			
Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification					**February 2007**			
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**					R-1 NOMENCLATURE **0603889C Ballistic Missile Defense Products**			

	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	Total Cost
PE 0603893C Space Tracking & Surveillance System	220,048	322,220	331,525	347,811	412,623	501,197	778,067	981,424	3,894,915
PE 0603894C Multiple Kill Vehicle	48,370	144,362	271,151	352,741	461,179	618,263	673,477	842,905	3,412,448
PE 0603895C BMD System Space Program	0	0	27,666	35,093	46,849	56,183	133,617	157,117	456,525
PE 0603896C BMD C2BMC	0	246,852	258,913	294,627	300,847	282,615	267,275	269,420	1,920,549
PE 0603897C BMD Hercules	0	49,674	53,658	54,264	54,405	55,142	53,355	54,198	374,696
PE 0603898C BMD Joint Warfighter Support	0	54,935	48,787	50,428	54,086	56,603	58,890	60,206	383,935
PE 0603904C BMD Joint National Integration Center (JNIC)	0	110,629	104,012	106,985	111,542	111,947	113,592	115,287	773,994
PE 0603905C BMD Concurrent Test and Operations	0	23,159	0	0	0	0	0	0	23,159
PE 0603906C Regarding Trench	0	0	2,000	3,000	5,000	5,000	9,000	9,000	33,000
PE 0605502C Small Business Innovative Research - MDA	133,105	0	0	0	0	0	0	0	133,105
PE 0901585C Pentagon Reservation	14,874	15,527	6,058	6,376	4,490	4,725	4,801	4,877	61,728
PE 0901598C Management Headquarters - MDA	98,609	87,059	85,906	86,453	70,355	69,855	69,855	69,855	637,947

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, spiral development, evolutionary acquisition, and knowledge-based funding through the use of two-year capability blocks. Lockheed Martin Mission Systems is the C2BMC prime contractor via an Other Transactions Agreement. Major team members to Lockheed are North up-Grumman, Boeing, Raytheon, and General Dynamics. They are charged with the development, 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 on-site operations and maintenance support, along with the Defense Information Systems Agency (DISA) for fielded C2BMC capabilities in Nebraska, Colorado, Hawaii, Virginia, and Japan. C2BMC Program Office government, Federally Funded Research Development Center/University Affiliated Research Centers (FFRDC/UARC), and Scientific Engineering and Technical Assistance (SETA) personnel are also fully integrated as part of the Prime contractor's team to function in an Integrated Product Team environment.

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Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date February 2007

APPROPRIATION/BUDGET ACTIVITY RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE 0603889C Ballistic Missile Defense Products

I. Product Development   Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2007 Cost	FY 2007 Award/ Oblg Date	FY 2008 Cost	FY 2008 Award/ Oblg Date	FY 2009 Cost	FY 2009 Award/ Oblg Date	Total Cost
C2BMC Element										
C2BMC HW/SW Development/I&T	SS/CPAF	Lockheed Martin/ Colorado Springs, CO	3,605	0	N/A	0	N/A	0	N/A	3,605
C2BMC HW/SW Development/I&T	SS/CPAF	Lockheed Martin/ Huntsville, AL	782	0	N/A	0	N/A	0	N/A	782
C2BMC Product Engineering & Development	SS/CPAF	Lockheed Martin/ Arlington, VA	7,311	0	N/A	0	N/A	0	N/A	7,311
EW/CEW; GCCS; JDP; JRE; ISC2; ECPs	Various	Services, DISA, Agencies/ Various	0	0	N/A	0	N/A	0	N/A	
Federally Funded Research Development Centers	SS/CPAF	MITRE, IDA, ORNL, MIT/LL/ Washington, DC	687	0	N/A	0	N/A	0	N/A	687
Scientific Engineering and Technical Assistance	SS/CPFF	Sparta/CSC/ Arlington, VA	0	0	N/A	0	N/A	0	N/A	
Subtotal Product Development			12,385	0		0		0		12,385

Remarks

II. Support Costs   Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2007 Cost	FY 2007 Award/ Oblg Date	FY 2008 Cost	FY 2008 Award/ Oblg Date	FY 2009 Cost	FY 2009 Award/ Oblg Date	Total Cost
Subtotal Support Costs										

Project: 0901 Command and Control, Battle Management and Communications (C2BMC) Block 2008

MDA Exhibit R-3 (PE 0603889C)

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Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date **February 2007**

APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603889C Ballistic Missile Defense Products**

III. Test and Evaluation   Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2007 Cost	FY 2007 Award/ Oblg Date	FY 2008 Cost	FY 2008 Award/ Oblg Date	FY 2009 Cost	FY 2009 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 2007 Cost	FY 2007 Award/ Oblg Date	FY 2008 Cost	FY 2008 Award/ Oblg Date	FY 2009 Cost	FY 2009 Award/ Oblg Date	Total Cost
Subtotal Management Services										

Remarks

Project Total Cost			12,385	0		0		0		12,385

Remarks

Project: 0901 Command and Control, Battle Management and Communications (C2BMC) Block 2008

MDA Exhibit R-3 (PE 0603889C)

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	Date
Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	**February 2007**

APPROPRIATION/BUDGET ACTIVITY	R-1 NOMENCLATURE
RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	**0603889C Ballistic Missile Defense Products**

COST ($ in Thousands)	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
0802 Hercules Block 2006	20,690	0	0	0	0	0	0	0
RDT&E Articles Qty	0	0	0	0	0	0	0	0

Note: Starting in FY07, 0802 Hercules moves to the new BMD Hercules Program Element (PE 0603897C) from this Program Element to consolidate with projects 0902 and 0002 into the new project 0505.

A. Mission Description and Budget Item Justification

Hercules develops advanced discrimination and tracking concepts into prototype software (algorithms) that improves the capability of the BMDS C2BMC, sensor, and weapon elements. Hercules then transitions algorithms to BMDS elements for integration and provides technical assistance during the algorithm integration. These algorithms support existing BMDS Engagement Sequence Groups and enable new Engagement Sequence Groups.

In particular, Project 0802, Hercules Block 2006 supports near-term Hercules efforts to mature algorithms in support of Block 2006. This effort includes the development, digital and BMDS Fusion Toolbox testing of algorithms that provide forward based discrimination capability. These algorithms enable the FBX-T Mod Suite 1 Engagement Sequence Group. This effort supports tracking algorithm enhancements that support the Block 2006 C2BMC Situational Awareness display capability. This effort includes the initial prototype development of Decision Architecture components.

Hercules Project 0802 also supports technical algorithm reviews of these algorithms that provide an assessment of algorithm maturity and capability to the program manager. These reviews are called Algorithm-to-Test reviews (ATT) and Characterization and Transition Reviews (CaT).

B. Accomplishments/Planned Program

	FY 2006	FY 2007	FY 2008	FY 2009
Project Hercules	20,690	0	0	0
RDT&E Articles (Quantity)	0	0	0	0

FY06 Accomplishments:
- Flight test demonstration of Discrimination Fusion Engine (DFE) components on Countermeasures Critical Measurements Tests (CMCM-1 & CMCM-2)

Project: 0802 Hercules Block 2006

MDA Exhibit R-2A (PE 0603889C)

0610

	Date
Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	**February 2007**

APPROPRIATION/BUDGET ACTIVITY	R-1 NOMENCLATURE
RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	**0603889C Ballistic Missile Defense Products**

- Provided DFE components to C2BMC (MDA/BC X-Lab) and STSS for familiarization/evaluation
- Provided DFE components to the AEGIS BMD discrimination project
- Delivered an initial Integrated Engagement Planning capability to C2BMC for integration into the Block 06 Global Integrated Fire Control. This capability supports weapon system to target pairing
- Terminated development of advanced computational methods due to funding constraints
- Continued development of multi-sensor DFE
- Continued development of sensor resource management concepts.

C. Other Program Funding Summary

	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	Total Cost
PE 0603175C Ballistic Missile Defense Technology	147,270	193,307	118,569	109,540	116,014	121,008	127,917	131,291	1,064,916
PE 0603881C Ballistic Missile Defense Terminal Defense Segment	1,120,879	1,092,076	962,585	1,004,282	924,101	851,213	678,694	501,147	7,134,977
PE 0603882C Ballistic Missile Defense Midcourse Defense Segment	2,391,246	3,043,058	2,520,064	2,359,665	2,179,602	1,699,963	1,153,082	1,183,003	16,529,683
PE 0603883C Ballistic Missile Defense Boost Defense Segment	455,572	628,958	548,759	432,432	448,375	678,913	829,683	1,026,239	5,048,931
PE 0603884C Ballistic Missile Defense Sensors	284,297	514,129	778,163	984,963	939,417	791,701	723,843	603,585	5,620,098
PE 0603886C Ballistic Missile Defense System Interceptors	200,446	356,004	227,499	393,317	522,388	730,236	836,029	570,206	3,836,125
PE 0603888C Ballistic Missile Defense Test and Targets	610,619	601,782	586,150	628,364	662,984	681,511	696,037	705,210	5,172,657
PE 0603890C Ballistic Missile Defense System Core	409,993	429,420	482,016	511,147	558,746	579,571	579,316	588,481	4,138,690
PE 0603891C Special Programs - MDA	271,021	353,031	323,250	305,409	369,073	526,966	789,017	792,271	3,730,038
PE 0603892C Ballistic Missile Defense Aegis	893,040	1,122,669	1,059,103	1,129,425	1,221,650	1,067,587	1,054,753	1,089,078	8,637,305
PE 0603893C Space Tracking & Surveillance System	220,048	322,220	331,525	347,811	412,623	501,197	778,067	981,424	3,894,915
PE 0603894C Multiple Kill Vehicle	48,370	144,362	271,151	352,741	461,179	618,263	673,477	842,905	3,412,448
PE 0603895C BMD System Space Program	0	0	27,666	35,093	46,849	56,183	133,617	157,117	456,525
PE 0603896C BMD C2BMC	0	246,852	258,913	294,627	300,847	282,615	267,275	269,420	1,920,549
PE 0603897C BMD Hercules	0	49,674	53,658	54,264	54,405	55,142	53,355	54,198	374,696
PE 0603898C BMD Joint Warfighter Support	0	54,935	48,787	50,428	54,086	56,603	58,890	60,206	383,935
PE 0603904C BMD Joint National Integration Center (JNIC)	0	110,629	104,012	106,985	111,542	111,947	113,592	115,287	773,994
PE 0603905C BMD Concurrent Test and Operations	0	23,159	0	0	0	0	0	0	23,159

Project: 0802 Hercules Block 2006

MDA Exhibit R-2A (PE 0603889C)

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		Date
Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification		**February 2007**

APPROPRIATION/BUDGET ACTIVITY	R-1 NOMENCLATURE
RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	**0603889C Ballistic Missile Defense Products**

	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	Total Cost
PE 0603906C Regarding Trench	0	0	2,000	3,000	5,000	5,000	9,000	9,000	33,000
PE 0605502C Small Business Innovative Research - MDA	133,105	0	0	0	0	0	0	0	133,105
PE 0901585C Pentagon Reservation	14,874	15,527	6,058	6,376	4,490	4,725	4,801	4,877	61,728
PE 0901598C Management Headquarters - MDA	98,609	87,059	85,906	86,453	70,355	69,855	69,855	69,855	637,947

D. Acquisition Strategy

Project Hercules follows MDA's capability-based acquisition strategy. This emphasizes assessment, spiral-development testing and evolutionary acquisition through the definition of two-year capability blocks.

Project Hercules activities are performed by subject matter experts composed of Government, Federally Funded Research and Development Centers (FFRDC), University Affiliated Research Centers (UARC), private industry including major defense contractors, Government laboratories, and System Engineering and Technical Assistance (SETA) contractors.

Battle manager, weapon, and sensor capability improvements will be transitioned into the future operational force structure by integrating the Hercules algorithms into BMDS components. BMDS component managers plan, budget, and procure the necessary hardware and software for deployed and sustained operational forces.

Project: 0802 Hercules Block 2006

MDA Exhibit R-2A (PE 0603889C)

0612

	Date
Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	**February 2007**

APPROPRIATION/BUDGET ACTIVITY	R-1 NOMENCLATURE
RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	**0603889C Ballistic Missile Defense Products**

I. Product Development   Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2007 Cost	FY 2007 Award/ Oblg Date	FY 2008 Cost	FY 2008 Award/ Oblg Date	FY 2009 Cost	FY 2009 Award/ Oblg Date	Total Cost
Project Hercules										
Boeing	CPAF	Arlington, VA	4,144	0	N/A	0	N/A	0	N/A	4,144
Lockheed Martin	CPFF	Sunnyvale, CA	4,111	0	N/A	0	N/A	0	N/A	4,111
Raytheon	CPFF	Boston, MA	10,231	0	N/A	0	N/A	0	N/A	10,231
Sparta	CPFF	Arlington, VA	16,128	0	N/A	0	N/A	0	N/A	16,128
Various	MIPR	Various	447	0	N/A	0	N/A	0	N/A	447
Office of Naval Research	MIPR	Arlington, VA	528	0	N/A	0	N/A	0	N/A	528
Massachusetts Institute of Technology/Lincoln Laboratory	FFRDC	Lexington, MA	15,934	0	N/A	0	N/A	0	N/A	15,934
Northrop Grumman	CPFF	Van Nuys, CA	5,047	0	N/A	0	N/A	0	N/A	5,047
Space and Missile Defense Command	MIPR	Various	2,913	0	N/A	0	N/A	0	N/A	2,913
Photon Research Associates	CPFF	Arlington, VA	1,000	0	N/A	0	N/A	0	N/A	1,000
Subtotal Product Development			60,483	0		0		0		60,483

Remarks

II. Support Costs   Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2007 Cost	FY 2007 Award/ Oblg Date	FY 2008 Cost	FY 2008 Award/ Oblg Date	FY 2009 Cost	FY 2009 Award/ Oblg Date	Total Cost
Subtotal Support Costs										

Remarks

Project: 0802 Hercules Block 2006

MDA Exhibit R-3 (PE 0603889C)

0613

					Date
Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis					**February 2007**

APPROPRIATION/BUDGET ACTIVITY	R-1 NOMENCLATURE
RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	**0603889C Ballistic Missile Defense Products**

III. Test and Evaluation   Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2007 Cost	FY 2007 Award/ Oblg Date	FY 2008 Cost	FY 2008 Award/ Oblg Date	FY 2009 Cost	FY 2009 Award/ Oblg Date	Total Cost
Project Hercules										
Space and Missile Defense Command	MIPR	Huntsville, AL	1,297	0	N/A	0	N/A	0	N/A	1,297
Air Force Research Lab - Eglin Air Force Base	MIPR	Eglin AFB, FL	990	0	N/A	0	N/A	0	N/A	990
Massachusetts Institute of Technology/Lincoln Laboratory	CPFF	Lexington, MA	9,019	0	N/A	0	N/A	0	N/A	9,019
Northrop Grumman	CPFF	Van Nuys, CA	5,987	0	N/A	0	N/A	0	N/A	5,987
Decibel Research	CPFF	Huntsville, AL	687	0	N/A	0	N/A	0	N/A	687
Joint National Integration Center	MIPR	Colorado Springs, CO	278	0	N/A	0	N/A	0	N/A	278
Subtotal Test and Evaluation			18,258	0		0		0		18,258

Remarks

IV. Management Services   Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2007 Cost	FY 2007 Award/ Oblg Date	FY 2008 Cost	FY 2008 Award/ Oblg Date	FY 2009 Cost	FY 2009 Award/ Oblg Date	Total Cost
Project Hercules										
Various	MIPR	Various	2,073	0	N/A	0	N/A	0	N/A	2,073
Space and Missile Defense Command	MIPR	Huntsville, AL	2,948	0	N/A	0	N/A	0	N/A	2,948
Subtotal Management Services			5,021	0		0		0		5,021

Remarks

Project Total Cost			83,762	0		0		0		83,762

Remarks

Project: 0802 Hercules Block 2006

MDA Exhibit R-3 (PE 0603889C)

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Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile	Date **February 2007**

APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603889C Ballistic Missile Defense Products**

Fiscal Year	2006				2007				2008				2009				2010				2011				2012				2013			
	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
Hercules																																
Conduct CaT and ATT reviews	▲	▲	▲	▲																												
Evaluate and Improve DA prototype	▲			▲																												
Support SN Integration of FBS Suite 1	▲		▲																													

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

Project: 0802 Hercules Block 2006

MDA Exhibit R-4 (PE 0603889C)

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	Date
Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail	**February 2007**

APPROPRIATION/BUDGET ACTIVITY	R-1 NOMENCLATURE
RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	**0603889C Ballistic Missile Defense Products**

Schedule Profile	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
Hercules								
Conduct CaT and ATT reviews	1Q,2Q,3Q,4Q							
Evaluate and Improve DA prototype	1Q-4Q							
Support SN Integration of FBS Suite 1	1Q-3Q							

Project: 0802 Hercules Block 2006

MDA Exhibit R-4A (PE 0603889C)

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Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2007**

APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603889C Ballistic Missile Defense Products**

COST ($ in Thousands)	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
0902 Hercules Block 2008	29,297	0	0	0	0	0	0	0
RDT&E Articles Qty	0	0	0	0	0	0	0	0

Note: Starting in FY07, 0902 Hercules moves to the new BMD Hercules Program Element (PE 0603897C) from this Program Element to consolidate with projects 0802 and 0002 into the new project 0505.

A. Mission Description and Budget Item Justification

Hercules develops advanced discrimination and tracking concepts into prototype software (algorithms) that improves the capability of the BMDS C2BMC, sensor, and weapon elements. Hercules then transitions algorithms to BMDS elements for integration and provides technical assistance during the algorithm integration. These algorithms support existing BMDS Engagement Sequence Groups and enable new Engagement Sequence Groups.

In particular, Project 0902, Hercules Block 2008 supports near-term Hercules efforts to mature algorithms in support of Block 2008. More complex algorithms such as the Decision Architecture and counter-countermeasure efforts require multi-year development and rigorous testing to increase maturity sufficiently that there is minimal risk when an element integrates the algorithm into the BMDS.

Project 0902 supports the development of additional capability for forward based sensor discrimination, an initial capability to enhance sensor tracking and discrimination in the presence of radar degrading countermeasures, and additional capability for advanced multi-sensor fusion and resource management in the Decision Architecture. This effort also supports development of algorithms supporting Space Tracking and Surveillance System and Kinetic Energy Interceptor programs that will have developmental test capability in 2008-2009.

Project 0902 also supports technical algorithm reviews that provide an assessment of algorithm maturity and capability to the Hercules program manager. These reviews are called Algorithm-to-Test reviews (ATT) and Characterization and Transition Reviews (CaT).

B. Accomplishments/Planned Program

	FY 2006	FY 2007	FY 2008	FY 2009
Project Hercules	29,297	0	0	0
RDT&E Articles (Quantity)	0	0	0	0

	Date
Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	**February 2007**

APPROPRIATION/BUDGET ACTIVITY	R-1 NOMENCLATURE
RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	**0603889C Ballistic Missile Defense Products**

FY06 Accomplishments:

- Flight test demonstration of Discrimination Fusion Engine (DFE) components on Countermeasures Critical Measurements Tests (CMCM-1 & CMCM-2)
- Provided DFE components to C2BMC (MDA/BC X-Lab) and STSS for familiarization/evaluation
- Provided DFE components to the AEGIS BMD discrimination project
- Delivered an initial Integrated Engagement Planning capability to C2BMC for integration into the Block 06 Global Integrated Fire Control. This capability supports weapon system to target pairing
- Terminated development of advanced computational methods due to funding constraints
- Continued development of multi-sensor DFE
- Continued development of sensor resource management concepts.

C. Other Program Funding Summary

	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	Total Cost
PE 0603175C Ballistic Missile Defense Technology	147,270	193,307	118,569	109,540	116,014	121,008	127,917	131,291	1,064,916
PE 0603881C Ballistic Missile Defense Terminal Defense Segment	1,120,879	1,092,076	962,585	1,004,282	924,101	851,213	678,694	501,147	7,134,977
PE 0603882C Ballistic Missile Defense Midcourse Defense Segment	2,391,246	3,043,058	2,520,064	2,359,665	2,179,602	1,699,963	1,153,082	1,183,003	16,529,683
PE 0603883C Ballistic Missile Defense Boost Defense Segment	455,572	628,958	548,759	432,432	448,375	678,913	829,683	1,026,239	5,048,931
PE 0603884C Ballistic Missile Defense Sensors	284,297	514,129	778,163	984,963	939,417	791,701	723,843	603,585	5,620,098
PE 0603886C Ballistic Missile Defense System Interceptors	200,446	356,004	227,499	393,317	522,388	730,236	836,029	570,206	3,836,125
PE 0603888C Ballistic Missile Defense Test and Targets	610,619	601,782	586,150	628,364	662,984	681,511	696,037	705,210	5,172,657
PE 0603890C Ballistic Missile Defense System Core	409,993	429,420	482,016	511,147	558,746	579,571	579,316	588,481	4,138,690
PE 0603891C Special Programs - MDA	271,021	353,031	323,250	305,409	369,073	526,966	789,017	792,271	3,730,038
PE 0603892C Ballistic Missile Defense Aegis	893,040	1,122,669	1,059,103	1,129,425	1,221,650	1,067,587	1,054,753	1,089,078	8,637,305
PE 0603893C Space Tracking & Surveillance System	220,048	322,220	331,525	347,811	412,623	501,197	778,067	981,424	3,894,915
PE 0603894C Multiple Kill Vehicle	48,370	144,362	271,151	352,741	461,179	618,263	673,477	842,905	3,412,448
PE 0603895C BMD System Space Program	0	0	27,666	35,093	46,849	56,183	133,617	157,117	456,525
PE 0603896C BMD C2BMC	0	246,852	258,913	294,627	300,847	282,615	267,275	269,420	1,920,549

Project: 0902 Hercules Block 2008

MDA Exhibit R-2A (PE 0603889C)

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								Date
Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification								**February 2007**

APPROPRIATION/BUDGET ACTIVITY	R-1 NOMENCLATURE
RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	**0603889C Ballistic Missile Defense Products**

	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	Total Cost
PE 0603897C BMD Hercules	0	49,674	53,658	54,264	54,405	55,142	53,355	54,198	374,696
PE 0603898C BMD Joint Warfighter Support	0	54,935	48,787	50,428	54,086	56,603	58,890	60,206	383,935
PE 0603904C BMD Joint National Integration Center (JNIC)	0	110,629	104,012	106,985	111,542	111,947	113,592	115,287	773,994
PE 0603905C BMD Concurrent Test and Operations	0	23,159	0	0	0	0	0	0	23,159
PE 0603906C Regarding Trench	0	0	2,000	3,000	5,000	5,000	9,000	9,000	33,000
PE 0605502C Small Business Innovative Research - MDA	133,105	0	0	0	0	0	0	0	133,105
PE 0901585C Pentagon Reservation	14,874	15,527	6,058	6,376	4,490	4,725	4,801	4,877	61,728
PE 0901598C Management Headquarters - MDA	98,609	87,059	85,906	86,453	70,355	69,855	69,855	69,855	637,947

D. Acquisition Strategy

Project Hercules follows MDA's capability-based acquisition strategy. This emphasizes assessment, spiral-development testing and evolutionary acquisition through the definition of two-year capability blocks.

Project Hercules activities are performed by subject matter experts composed of Government, Federally Funded Research and Development Centers (FFRDC), University Affiliated Research Centers (UARC), private industry including major defense contractors, Government laboratories, and System Engineering and Technical Assistance (SETA) contractors.

Battle manager, weapon, and sensor capability improvements will be transitioned into the future operational force structure by integrating the Hercules algorithms into BMDS components. BMDS component managers plan, budget, and procure the necessary hardware and software for deployed and sustained operational forces.

Project: 0902 Hercules Block 2008

MDA Exhibit R-2A (PE 0603889C)

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Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date **February 2007**

APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603889C Ballistic Missile Defense Products**

I. Product Development   Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2007 Cost	FY 2007 Award/ Oblg Date	FY 2008 Cost	FY 2008 Award/ Oblg Date	FY 2009 Cost	FY 2009 Award/ Oblg Date	Total Cost
Project Hercules										
Lockheed Martin	CPFF	Sunnyvale, CA	9,011	0	N/A	0	N/A	0	N/A	9,011
Raytheon	CPFF	Boston, MA	10,491	0	N/A	0	N/A	0	N/A	10,491
Sparta	CPFF	Arlington, VA	11,690	0	N/A	0	N/A	0	N/A	11,690
Various	MIPR	Various	2,976	0	N/A	0	N/A	0	N/A	2,976
Office of Naval Research	MIPR	Arlington, VA	1,190	0	N/A	0	N/A	0	N/A	1,190
Air Force Research Lab - Eglin Air Force Base	MIPR	Eglin AFB, FL	3,774	0	N/A	0	N/A	0	N/A	3,774
Photon Research Associates	CPFF	Arlington, VA	6,813	0	N/A	0	N/A	0	N/A	6,813
Massachusetts Institute of Technology/Lincoln Laboratory	CPFF	Lexington, MA	17,760	0	N/A	0	N/A	0	N/A	17,760
Northrop Grumman	CPFF	Van Nuys, CA	16,139	0	N/A	0	N/A	0	N/A	16,139
Space and Missile Defense Command	MIPR	Huntsville, AL	7,545	0	N/A	0	N/A	0	N/A	7,545
Subtotal Product Development			87,389	0		0		0		87,389

Remarks

II. Support Costs   Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2007 Cost	FY 2007 Award/ Oblg Date	FY 2008 Cost	FY 2008 Award/ Oblg Date	FY 2009 Cost	FY 2009 Award/ Oblg Date	Total Cost
Project Hercules										
Subtotal Support Costs			0	0		0		0		0

Remarks

Project: 0902 Hercules Block 2008

MDA Exhibit R-3 (PE 0603889C)

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				Date **February 2007**
Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis				

APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603889C Ballistic Missile Defense Products**

III. Test and Evaluation   Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2007 Cost	FY 2007 Award/ Oblg Date	FY 2008 Cost	FY 2008 Award/ Oblg Date	FY 2009 Cost	FY 2009 Award/ Oblg Date	Total Cost
Project Hercules										
Air Force Research Lab - Eglin Air Force Base	MIPR	Eglin AFB, FL	2,398	0	N/A	0	N/A	0	N/A	2,398
Computer Sciences Corporation	CPFF	Fairfax, VA	1,877	0	N/A	0	N/A	0	N/A	1,877
Massachusetts Institute of Technology/Lincoln Laboratory	FFRDC	Lexington, MA	2,153	0	N/A	0	N/A	0	N/A	2,153
Decibel Research	MIPR	Huntsville, AL	1,651	0	N/A	0	N/A	0	N/A	1,651
Various	MIPR	Various	3,000	0	N/A	0	N/A	0	N/A	3,000
Subtotal Test and Evaluation			11,079	0		0		0		11,079

Remarks

IV. Management Services   Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2007 Cost	FY 2007 Award/ Oblg Date	FY 2008 Cost	FY 2008 Award/ Oblg Date	FY 2009 Cost	FY 2009 Award/ Oblg Date	Total Cost
Project Hercules										
Computer Sciences Corporation	FFP	Fairfax, VA	2,334	0	N/A	0	N/A	0	N/A	2,334
Sparta	FFP	Arlington, VA	2,221	0	N/A	0	N/A	0	N/A	2,221
Various	MIPR	Various	929	0	N/A	0	N/A	0	N/A	929
Space and Missile Defense Command	MIPR	Huntsville, AL	2,854	0	N/A	0	N/A	0	N/A	2,854
Subtotal Management Services			8,338	0		0		0		8,338

Remarks

Project Total Cost			106,806	0		0		0		106,806

Remarks

Project: 0902 Hercules Block 2008

MDA Exhibit R-3 (PE 0603889C)

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Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile	Date **February 2007**

APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603889C Ballistic Missile Defense Products**

Fiscal Year	2006				2007				2008				2009				2010				2011				2012				2013			
	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
Hercules																																
Conduct Real-time flight events	▲	▲	▲	▲																												
Deliver Threat Data Packages and Special Data Pack	▲	▲	▲	▲																												
Develop Algorithm for target designation CD	▲━━━━━▲																															
Develop EO/IR detection of closely spaced objects	▲━━━━━▲																															
Develop STSS Tracking and discrimination	▲━━━━━▲																															
Develop and integrate Decision Architecture GIFC	▲━━━━━▲																															
Develop core radar clutter mitigation effort	▲━━━━━▲																															
Develop follow-on FBS Suite (Suite 2)	▲━━━━━▲																															
Develop passive optics FBS algorithms	▲━━━━━▲																															
Interface with System Engineering and Elements	▲━━━━━▲																															
Upgrade BMDS Fusion Toolbox	▲━━━━━▲																															

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

Project: 0902 Hercules Block 2008

MDA Exhibit R-4 (PE 0603889C)

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Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail		Date **February 2007**

APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603889C Ballistic Missile Defense Products**

Schedule Profile	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
Hercules								
Conduct Real-time flight events	1Q,2Q,3Q,4Q							
Deliver Threat Data Packages and Special Data Pack	1Q,2Q,3Q,4Q							
Develop Algorithm for target designation CD	1Q-4Q							
Develop EO/IR detection of closely spaced objects	1Q-4Q							
Develop STSS Tracking and discrimination	1Q-4Q							
Develop and integrate Decision Architecture GIFC	1Q-4Q							
Develop core radar clutter mitigation effort	1Q-4Q							
Develop follow-on FBS Suite (Suite 2)	1Q-4Q							
Develop passive optics FBS algorithms	1Q-4Q							
Interface with System Engineering and Elements	1Q-4Q							
Upgrade BMDS Fusion Toolbox	1Q-4Q							

Project: 0902 Hercules Block 2008

MDA Exhibit R-4A (PE 0603889C)

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Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date
	February 2007

APPROPRIATION/BUDGET ACTIVITY	R-1 NOMENCLATURE
RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	**0603889C Ballistic Missile Defense Products**

COST ($ in Thousands)	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
0002 Hercules Block 2010	4,620	0	0	0	0	0	0	0
RDT&E Articles Qty	0	0	0	0	0	0	0	0

Note: Starting in FY07, 0002 Hercules moves to the new BMD Hercules Program Element (PE 0603897C) from this Program Element to consolidate with projects 0802 and 0902 into the new project 0505.

A. Mission Description and Budget Item Justification

Hercules develops advanced discrimination and tracking concepts into prototype software (algorithms) that improves the capability of the BMDS C2BMC, sensor, and weapon elements. Hercules then transitions algorithms to BMDS elements for integration and provides technical assistance during the algorithm integration. These algorithms support existing BMDS Engagement Sequence Groups and enable new Engagement Sequence Groups.

In particular, Project 0002, Hercules Block 2010 supports near-term Hercules efforts to mature algorithms in support of Block 2010. With algorithm development activity in 2006, Hercules will mature and develop capability for transition to Multiple Kill Vehicle (MKV) and Kinetic Energy Interceptor (KEI) programs in 2007-2009 to enhance the initial deployment capabilities of the MKV and KEI systems. This will support Engagement Sequence Groups that use the MKV and KEI systems. In particular, Hercules will develop target handover and assignment algorithms that leverages current Hercules algorithm development work in these areas.

Additionally, Hercules will develop algorithms in support of boost fire control, and integrate this effort with Hercules efforts that support the Global Integrated Fire Control. This also supports the initial spiral development of the Decision Architecture to include the new capability.

B. Accomplishments/Planned Program

	FY 2006	FY 2007	FY 2008	FY 2009
Project Hercules	4,620	0	0	0
RDT&E Articles (Quantity)	0	0	0	0

FY06 Accomplishments:
- Flight test demonstration of Discrimination Fusion Engine (DFE) components on Countermeasures Critical Measurements Tests (CMCM-1 & CMCM-2)
- Provided DFE components to C2BMC (MDA/BC X-Lab) and STSS for familiarization/evaluation
- Provided DFE components to the AEGIS BMD discrimination project

Project: 0002 Hercules Block 2010   MDA Exhibit R-2A (PE 0603889C)

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		Date
Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification		**February 2007**

APPROPRIATION/BUDGET ACTIVITY	R-1 NOMENCLATURE
RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	**0603889C Ballistic Missile Defense Products**

- Delivered an initial Integrated Engagement Planning capability to C2BMC for integration into the Block 06 Global Integrated Fire Control. This capability supports weapon system to target pairing
- Terminated development of advanced computational methods due to funding constraints
- Continued development of multi-sensor DFE
- Continued development of sensor resource management concepts.

C. Other Program Funding Summary

	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	Total Cost
PE 0603175C Ballistic Missile Defense Technology	147,270	193,307	118,569	109,540	116,014	121,008	127,917	131,291	1,064,916
PE 0603881C Ballistic Missile Defense Terminal Defense Segment	1,120,879	1,092,076	962,585	1,004,282	924,101	851,213	678,694	501,147	7,134,977
PE 0603882C Ballistic Missile Defense Midcourse Defense Segment	2,391,246	3,043,058	2,520,064	2,359,665	2,179,602	1,699,963	1,153,082	1,183,003	16,529,683
PE 0603883C Ballistic Missile Defense Boost Defense Segment	455,572	628,958	548,759	432,432	448,375	678,913	829,683	1,026,239	5,048,931
PE 0603884C Ballistic Missile Defense Sensors	284,297	514,129	778,163	984,963	939,417	791,701	723,843	603,585	5,620,098
PE 0603886C Ballistic Missile Defense System Interceptors	200,446	356,004	227,499	393,317	522,388	730,236	836,029	570,206	3,836,125
PE 0603888C Ballistic Missile Defense Test and Targets	610,619	601,782	586,150	628,364	662,984	681,511	696,037	705,210	5,172,657
PE 0603890C Ballistic Missile Defense System Core	409,993	429,420	482,016	511,147	558,746	579,571	579,316	588,481	4,138,690
PE 0603891C Special Programs - MDA	271,021	353,031	323,250	305,409	369,073	526,966	789,017	792,271	3,730,038
PE 0603892C Ballistic Missile Defense Aegis	893,040	1,122,669	1,059,103	1,129,425	1,221,650	1,067,587	1,054,753	1,089,078	8,637,305
PE 0603893C Space Tracking & Surveillance System	220,048	322,220	331,525	347,811	412,623	501,197	778,067	981,424	3,894,915
PE 0603894C Multiple Kill Vehicle	48,370	144,362	271,151	352,741	461,179	618,263	673,477	842,905	3,412,448
PE 0603895C BMD System Space Program	0	0	27,666	35,093	46,849	56,183	133,617	157,117	456,525
PE 0603896C BMD C2BMC	0	246,852	258,913	294,627	300,847	282,615	267,275	269,420	1,920,549
PE 0603897C BMD Hercules	0	49,674	53,658	54,264	54,405	55,142	53,355	54,198	374,696
PE 0603898C BMD Joint Warfighter Support	0	54,935	48,787	50,428	54,086	56,603	58,890	60,206	383,935
PE 0603904C BMD Joint National Integration Center (JNIC)	0	110,629	104,012	106,985	111,542	111,947	113,592	115,287	773,994
PE 0603905C BMD Concurrent Test and Operations	0	23,159	0	0	0	0	0	0	23,159
PE 0603906C Regarding Trench	0	0	2,000	3,000	5,000	5,000	9,000	9,000	33,000
PE 0605502C Small Business Innovative Research - MDA	133,105	0	0	0	0	0	0	0	133,105

Project: 0002 Hercules Block 2010   MDA Exhibit R-2A (PE 0603889C)

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									Total Cost
	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	
PE 0901585C Pentagon Reservation	14,874	15,527	6,058	6,376	4,490	4,725	4,801	4,877	61,728
PE 0901598C Management Headquarters - MDA	98,609	87,059	85,906	86,453	70,355	69,855	69,855	69,855	637,947

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification

Date **February 2007**

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

R-1 NOMENCLATURE
0603889C Ballistic Missile Defense Products

D. Acquisition Strategy
Project Hercules follows MDA's capability-based acquisition strategy. This emphasizes assessment, spiral-development testing and evolutionary acquisition through the definition of two-year capability blocks.

Project Hercules activities are performed by subject matter experts composed of Government, Federally Funded Research and Development Centers (FFRDC), University Affiliated Research Centers (UARC), private industry including major defense contractors, Government laboratories, and System Engineering and Technical Assistance (SETA) contractors.

Battle manager, weapon, and sensor capability improvements can be transitioned into the future operational force structure by integrating the Hercules algorithms into BMDS components. BMDS component managers plan, budget, and procure the necessary hardware and software for deployed and sustained operational forces.

Project: 0002 Hercules Block 2010

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		Date
Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis		**February 2007**

APPROPRIATION/BUDGET ACTIVITY	R-1 NOMENCLATURE
RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	**0603889C Ballistic Missile Defense Products**

I. Product Development   Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2007 Cost	FY 2007 Award/ Oblg Date	FY 2008 Cost	FY 2008 Award/ Oblg Date	FY 2009 Cost	FY 2009 Award/ Oblg Date	Total Cost
Project Hercules										
Hercules	MIPR	Various	3,500	0	N/A	0	N/A	0	N/A	3,500
Subtotal Product Development			3,500	0		0		0		3,500

Remarks

II. Support Costs   Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2007 Cost	FY 2007 Award/ Oblg Date	FY 2008 Cost	FY 2008 Award/ Oblg Date	FY 2009 Cost	FY 2009 Award/ Oblg Date	Total Cost
Project Hercules										
Hercules	MIPR	Various	1,389	0	N/A	0	N/A	0	N/A	1,389
Subtotal Support Costs			1,389	0		0		0		1,389

Remarks

III. Test and Evaluation   Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2007 Cost	FY 2007 Award/ Oblg Date	FY 2008 Cost	FY 2008 Award/ Oblg Date	FY 2009 Cost	FY 2009 Award/ Oblg Date	Total Cost
Project Hercules										
Hercules	MIPR	Various	915	0	N/A	0	N/A	0	N/A	915
Subtotal Test and Evaluation			915	0		0		0		915

Remarks

Project: 0002 Hercules Block 2010

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					Date			
Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis					**February 2007**			

APPROPRIATION/BUDGET ACTIVITY	R-1 NOMENCLATURE
RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	**0603889C Ballistic Missile Defense Products**

IV. Management Services   Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2007 Cost	FY 2007 Award/ Oblg Date	FY 2008 Cost	FY 2008 Award/ Oblg Date	FY 2009 Cost	FY 2009 Award/ Oblg Date	Total Cost
Project Hercules										
Hercules	MIPR	Arlington, VA	500	0	N/A	0	N/A	0	N/A	500
Subtotal Management Services			500	0		0		0		500

Remarks

Project Total Cost			6,304	0		0		0		6,304

Remarks

Project: 0002 Hercules Block 2010

MDA Exhibit R-3 (PE 0603889C)

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	Date
Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile	**February 2007**

APPROPRIATION/BUDGET ACTIVITY	R-1 NOMENCLATURE
RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	**0603889C Ballistic Missile Defense Products**

Fiscal Year	2006				2007				2008				2009				2010				2011				2012				2013			
	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
Hercules																																
Algorithm support of DADS its effect on decision																																
Develop Decision Architecture Capability																																
Develop TDPs to support algorithm development																																
Develop algorithms for KEI																																
Develop algorithms for MKV																																
Program and development team reviews																																

Legend

	Complete		Planned
▲	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

Project: 0002 Hercules Block 2010

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Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail	Date February 2007

APPROPRIATION/BUDGET ACTIVITY RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE 0603889C Ballistic Missile Defense Products

Schedule Profile	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
Hercules								
Algorithm support of DADS its effect on decision	1Q-4Q							
Develop Decision Architecture Capability	1Q-4Q							
Develop TDPs to support algorithm development	1Q-4Q							
Develop algorithms for KEI	1Q-4Q							
Develop algorithms for MKV	1Q-4Q							
Program and development team reviews	1Q,2Q,3Q,4Q							

Project: 0002 Hercules Block 2010

MDA Exhibit R-4A (PE 0603889C)

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	Date
Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	**February 2007**

APPROPRIATION/BUDGET ACTIVITY	R-1 NOMENCLATURE
RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	**0603889C Ballistic Missile Defense Products**

COST ($ in Thousands)	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
0803 Joint Warfighter Support Block 2006	32,058	0	0	0	0	0	0	0
RDT&E Articles Qty	0	0	0	0	0	0	0	0

Note: Starting in FY07 Projects 0803, 0903 and 0003 was transferred from Ballistic Missile Defense Product PE 0603889C to Ballistic Missile Defense Joint Warfighter Support PE 0603898C.

A. Mission Description and Budget Item Justification

As part of the total Ballistic Missile Defense System (BMDS), the Joint Warfighter Support Program (JWSP) is critical to enable Warfighters to work with MDA to define, test, deploy and employ new missile defense Block capabilities; maintain proficiency with current Block capabilities; and provide feedback to the MDA BMDS development process. The JWSP consists of a core set of consistent processes, tailored to the new BMDS capabilities to be deployed in each Block. The JWSP is divided into two-year Blocks to match the evolutionary capability Blocks of the BMDS. The JWSP builds Combatant Commander (COCOM) proficiency in fielded missile defense capabilities, and provides critical operational level feedback directly to MDA development efforts.

The JWSP consists of seven primary processes, tailored in scope to the current BMDS Block capabilities as they transition, or near transition, to the user.

These seven areas are:

Conducting Exercises and Wargames to enable end-user mission training, qualification, certification and rehearsal of BMDS operations, strengthen user confidence in the current system and shape development of the future BMDS. This activity involves all participating COCOMs in building coherent missile defense plans and tactics, techniques and procedures for the near term BMDS, and then testing cohesive execution of those plans via high fidelity simulations. It also incorporates BMD system engineering and interoperability test activities when possible to leverage MDA material development events by providing `real-world' training to operators. Finally, exercises and wargames create the conditions for continued, in-depth foreign and/or international participation in BMDS operations and development.

Developing Concepts and Plans that explain emerging and future BMDS material capabilities and technologies to the warfighter. This activity addresses potential impacts to current BMDS operations and results in Joint Warfighter development of new BMDS employment constructs /Concepts of Operations (CONOPs). It introduces far term, emerging BMD technologies and capabilities to the Combatant Commanders and enables

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Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2007**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603889C Ballistic Missile Defense Products**

them via low fidelity simulations and tabletop exercises to investigate alternative ways of operating the BMDS. It also serves MDA as a prime vehicle for the Warfighter Involvement Process (WIP) which seeks user feedback and guidance to shape future Block development of the BMDS.

Creating, developing and coordinating BMDS-wide Integrated Logistics Support policies and procedures to ensure that the requisite Doctrine, Organization, Training, Material, Leadership, Personnel, Facilities (DOTMLPF) and funding will be in place to sustain the deployed BMDS Block capabilities. A pre-condition for effective missile defense is having a solidly supported logistics system. This effort develops transition plans and policy to improve logistics planning and predictability for the Military departments and COCOMs. The plans include not only historical precedent, but also provide a forward look to the Services and COCOMs on what capabilities they may be getting, when they may be getting them, and what their support responsibilities may be.

Providing ``Above-Element`` level Training and Education. This activity develops and maintains programs for the Joint Warfighters, Defense officials and the Services to provide stakeholders with critical knowledge on BMD capabilities and system operation. A key part of this activity includes developing BMDS educational courses, establishing training facilities and capabilities within Service/Joint Schools and conducting education and training of select BMDS stakeholders, staffs and organizations on emerging BMDS Block deployment capabilities. As new BMDS capabilities are transitioned to the field, upgrades and improvements will be incorporated to maintain the requisite level of training service.

Supporting the BMD System Manager (BMDSM) function. The Joint Functional Component Command Integrated Missile Defense has been designated by MDA and US Strategic Command as the lead for this function. The MDA funds a portion of this function through the JWSP. The BMDSM monitors and synchronizes all aspects of BMDS development, testing and evaluation, corrective actions, acquisition, materiel release, and fielding, to include direct interaction with the materiel developers, test community, combatant commands and the gaining command. The BMDSM is authorized to integrate Service activities and functions related to the BMDS, and to coordinate directly with the applicable Services, MDA offices, Combatant Commands, and other activities as appropriate. The BMDSM also serves as the Joint User Community's centralized manager and integrator of DOTMLPF considerations and products, and provides a framework for Joint integration and problem resolution as DOD's Lead for Ground-based Missile Defense (GMD).

Delivering BMDS Sustainment & Operations through the MDA Missile Defense Operations Center (MOC) and the BMDS Watch Officers. The MOC serves as the MDA's central node for BMDS operations, situational monitoring and information collection in support of the Combatant Commanders' mission to conduct missile defense. This activity facilitates communications between the MDA and operational activities, maintains situational awareness on the status of the BMDS, and coordinates the activities required to return it to a specified status when necessary. It also

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Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2007**

APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603889C Ballistic Missile Defense Products**

schedules BMDS asset availability for testing, developmental, and operational/training activities. In sum, the MOC is a key hub in assuring that the operational BMDS is provided with timely and effective logistics support on an ongoing basis.

Providing Geographical Combatant Commander (GCC) Support to enable COCOM and Service participation in MDA activities such as wargames, exercises, table tops, flight tests, ground tests, resource planning meetings and other conferences and interchanges where getting user input is critical for an effective outcome. This activity supports the WIP enabling operators, users, and other BMDS stakeholders to travel and participate in missile defense related exercises, tests, activities and other events. User involvement ensures that MDA, the Joint Warfighters and Services will work together to define, field, and operationalize the initial BMDS capability and subsequent new Block capabilities in an efficient and effective manner. Block 2006 will see numerous BMDS capabilities and or asset quantity increases during the FY06-07 time-frame. These capabilities will be added to each JWSP activity to ensure the Joint Warfighter is properly trained to employ and integrate these capabilities to address the evolving Ballistic Missile threat environments.

Among the planned increase scope of the BMDS Block capabilities that will be addressed by the JWSP are:
- Increased numbers of Ground-Base Interceptors at Fort Greely.
- Upgraded Early Warning Radar at Thule, Greenland.
- Additional Forward Based X-Band Radar.
- Additional SM-3 sea-based interceptors and upgraded Aegis cruisers and destroyers.
- Theater High Altitude Area Defense (THAAD) interceptors.
- Expanded Link-16 data engagement data sharing between THAAD, PATRIOT, and AEGIS BMDS Elements.
- Implications from the expanded Engagement Sequence Group scope, as new elements and capability is added.
- Expanded upgrades to the BMDS C2BMC planning capabilities.

B. Accomplishments/Planned Program

	FY 2006	FY 2007	FY 2008	FY 2009
Exercises and Wargames	15,529	0	0	0
RDT&E Articles (Quantity)	0	0	0	0

BMDS overlays are incorporated into Combatant Command Tier 1 Exercises to enable end-user mission rehearsal and sustainment training, qualification, certification of BMDS operations, and strengthen user confidence in the current system and shape development of the future BMDS. BMDS operational effectiveness optimized by involving participating COCOMs in building coherent missile defense plans and Tactics, Techniques and Procedures (TTPs) for the near term BMDS, and then testing cohesive execution of those plans via high fidelity simulations, this effort optimizes

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Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	**February 2007**

APPROPRIATION/BUDGET ACTIVITY	R-1 NOMENCLATURE
RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	**0603889C Ballistic Missile Defense Products**

BMDS operational effectiveness. It also leverages activities MDA system engineering events and interoperability tests by providing real-world training to operators. Finally, exercises and wargames create the conditions for continued, in-depth foreign and/or international participation in BMDS operations and development. Near-term efforts focus on increased integration of regional exercises into a more global BMDS construct. The BMDS exercise and wargame overlays addresses the full spectrum of the Short-Range, Medium-Range, and Long-Range Ballistic Missile threats, from launch to impact, and involve the integrated planning and execution of all participating COCOMs with the goal of improving performance and validating BMDS capabilities.

FY06 Accomplishments:
- BMDS overlay to Keen Edge 06. This provided a BMDS overlay to a 5th Air Force and PACOM exercise, integrated with a Japanese theater exercise to support Northeast Asia (NEA) Warplan Rehearsal
- Exercise Joint Project Optic Windmill IX - A semi-annual combined-joint U.S. European Command (EUCOM) missile defense exercise employing live forces and simulation to investigate interoperability and integration procedures/issues/technologies in addressing the short to medium range ballistic missile threats from South-West Asia (SWA)
- BMDS overlay to the North American Aerospace Defense Command (NORAD) Exercise Amalgam Phantom 06. This overlay enabled development of BMDS Tactics Techniques and Procedures (TTPs), war plans, and Concepts of Operations (CONOPS); and allowed insertion of new/emerging MDA developed BMDS capabilities, including recent C2BMC soft ware builds, to be field tested by the joint Warfighter communities
- BMDS Exercise Terminal Fury 07 planning and most preparatory work was accomplished in FY06, with a planned early FY07 execution date. This exercise overlays U.S. Northern Command's (NORTHCOM's) Vigilant Shield 07 (VS07). Vigilant Shield and Terminal Fury fully integrate Command, Control, Battle Management and Communications (C2BMC) as part of a JTF certification exercise. This exercise also fully integrates C2BMC from the National Capital Region through every COCOM (pending their participation) down to the regional fight as a Situation Awareness and Battle Manager; allows warfighters to interact with the AN/TPY-2 radar; obtains user ``feedback`` from the AN/TPY-2 on operator actions; and uses C2BMC's Battle Manager to control 700+ Theater/Regional ballistic missile shots, a space launch vehicle and a missile with potential Strategic implications.
- Distributed Exercises - Conducted follow-on exercises to BMDS ground and flight tests allowing the operations community to develop new TTPs using the latest test and developmental system configurations.

	Date
Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	**February 2007**

APPROPRIATION/BUDGET ACTIVITY		R-1 NOMENCLATURE	
RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)		**0603889C Ballistic Missile Defense Products**	

	FY 2006	FY 2007	FY 2008	FY 2009
Concepts and Plans	648	0	0	0
RDT&E Articles (Quantity)	0	0	0	0

Concepts and Plans looks at evolving BMDS capabilities and addresses their impact on the Joint Warfighter`s employment of the BMDS. By understanding emerging and future BMDS material capabilities and technologies, Joint Warfighters will be in a position to develop new, more effective employment constructs, CONOPS and tactics. This activity enables them, via low fidelity simulations and tabletop exercises, to efficiently investigate alternative ways of operating the future BMDS. It also serves MDA as a prime vehicle for the Warfighter Involvement Process (WIP) which seeks user feedback and guidance to shape future Block development of the BMDS.

FY06 Accomplishments:
- Provided Missile Defense community interface to the MDA Systems Engineering (SE) process.
- Continued to develop, with U.S. STRATCOM, the WIP.
- Supported development of the U.S. STRATCOM Military Utility Assessment (MUA) of the BMDS and coordinated the MUA with the Operational Test Agencies and the Joint Theater Air and Missile Defense Office, and MDA staff.
- Assisted with development of a highly successful Government of Australia table top exercise.
- Planned and developed a U.S. Forces Japan Missile Defense table top exercise.
- Directly supported the MDA BMDS Integration Synchronization Group and the MDA Program Change Board processes as programmatic changes to the BMDS were considered.
- Supported Exercise Nimble Titan 06.
- Supported the United States-United Kingdom BMDS wargame.

	FY 2006	FY 2007	FY 2008	FY 2009
BMDS Logistics	1,087	0	0	0
RDT&E Articles (Quantity)	0	0	0	0

A pre-condition for an effective BMDS is having a solidly supported logistics system. The BMDS Logistics activity develops transition plans addressing Doctrine, Organization, Training, Material, Leadership, Personnel, and Facilities (DOTMLPF) and provides funding to improve planning and predictability for Military departments and COCOMs. The plans include not only historical precedent, but also provide a forward look to the Services and COCOMs on what capabilities they may be getting, when they may be getting them, and what their support responsibilities may be. This activity also creates, develops and coordinates BMDS-wide Integrated Logistics Support policies and procedures to ensure that the requisite DOTMLPF and associated funding will be in place to sustain the deployed BMDS Block capabilities.

Project: 0803 Joint Warfighter Support Block 2006   MDA Exhibit R-2A (PE 0603889C)

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	Date
Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	**February 2007**

APPROPRIATION/BUDGET ACTIVITY	R-1 NOMENCLATURE
RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	**0603889C Ballistic Missile Defense Products**

FY06 Accomplishments:
- Planned a BMDS-wide contingency Integrated Logistics Support and Block deployment for emerging Block capabilities.
- Supported BMDS exercises and wargames with the Services and COCOMs through logistics overlays in order to evolve BMDS Block sustainment policies, directives and procedures and to keep pace with new BMDS Block capabilities.
- Updated the BMDS Handbook to document new operational and technical characteristics for combatant commanders, staffs, operators, and other key personnel.

	FY 2006	FY 2007	FY 2008	FY 2009
BMDS Training	2,882	0	0	0
RDT&E Articles (Quantity)	0	0	0	0

BMDS Training focuses on maintaining, developing and providing ``Above-Element` Training for the Joint Warfighters, Defense officials and the Services to provide stakeholders with critical knowledge on BMD capabilities and system operation. The end result is to provide BMDS operators, staffs and defense officials with a better understanding of the BMDS, enabling them to use that knowledge to achieve a more efficient and effective missile defense. Key activities include System-level educational courses, instructional capabilities within Service/Joint Schools and conducting education and training of select BMDS stakeholders, staffs and organizations on emerging BMDS Block deployment capabilities. An additional high priority demand of the Warfighting community is the ability to ``Train As You Fight.`` Part of this effort will produce a Combined Test & Operations (CTO) Distributed, Multi-Echelon, Training System (CTO-DMETS) to satisfy that need. The resulting ``virtual network`` will enable users across the globe at geographically separated BMDS warfighting nodes to routinely engage in missile defense exercises at their actual duty stations. The CTO-DMETS is thus both a training enabler and a cost saver by eliminating the need to transport and sustain BMDS forces at a centralized training venue.

FY06 Accomplishments:
- Operated the BMDS Training Center and provided Above Element training for the Joint Warfighters, Defense Officials and Services
- Provided Training Transition to the Services
- Hosted a BMDS Training Conference
- Completed the design for CTO-DMETS dedicated network bandwidth to parallel the operational network but remain separate (not mixing training and real data)
- Continued to provide Operations and Support to daily warfighter training

Project: 0803 Joint Warfighter Support Block 2006

MDA Exhibit R-2A (PE 0603889C)

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date February 2007
APPROPRIATION/BUDGET ACTIVITY RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE 0603889C Ballistic Missile Defense Products

- Provided AGEIS pier-side connection utilizing the Battle Force Tactical Trainer, the Joint Training & Experimentation Network migrating to the Advance Combat Simulator, theater exercise driving global exercise (e.g., Joint Project Optic initial installation of a U.S. European Command (EUCOM) enclave
- Conducted an annual worldwide Missile Defense Training and Education Conference in order to develop policy and strategies and updates for the BMDS

	FY 2006	FY 2007	FY 2008	FY 2009
Ballistic Missile Defense System Manager	5,000	0	0	0
RDT&E Articles (Quantity)	0	0	0	0

The BMD System Manager monitors and synchronizes all aspects of vertical/element oriented BMDS development, testing and evaluation, corrective actions, acquisition, materiel release, and fielding, to include direct interaction with the materiel developers, test community, combatant commands and the gaining command to ensure effective and efficient Doctrine, Organization, Training, Material, Leadership, Personnel, and Facilities integration with the Joint Warfighter is achieved.

FY06 Accomplishments:
- Updated BMDS user technical requirements documentation based on program changes, engineering change packages and design reviews.
- Maintained a BMDS Operations and Integration Center to support Ground Based Missile Defense (GMD) element spiral development and integration into the BMDS through each Block capability upgrade.
- Monitored current and emerging threats to ground based elements of the BMDS.

	FY 2006	FY 2007	FY 2008	FY 2009
Sustainment & Operations - MOC	4,274	0	0	0
RDT&E Articles (Quantity)	0	0	0	0

The MDA Operations Center (MOC), manned by BMDS Watch Officers (BWOs) in Colorado Springs, serves as the Agency's central node for monitoring and coordinating BMDS operational/developmental activities, and provides the conduit for information flow between MDA and the Combatant Commanders. By facilitating communications between the MDA and operational activities, maintaining situational awareness on the status of the BMDS, and coordinating the activities required to return it to a specified status when necessary, the BWO/MOC team helps assure the BMDS is best configured to support operational and developmental requirements. The BWO/MOC team also coordinates MDA's schedule requirements, ensuring BMDS asset availability for developmental, test, operational, and training activities. The BWO/MOC contributes to assuring that the operational BMDS is provided with timely and effective logistics support on an ongoing basis.

Project: 0803 Joint Warfighter Support Block 2006

MDA Exhibit R-2A (PE 0603889C)

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Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2007**

APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603889C Ballistic Missile Defense Products**

FY06 Accomplishments:
- Provided improved situational awareness and decision support tools.
- Streamlined the BMDS scheduling/asset management process to deconflict operational and developmental BMDS activities by improving tools, process flows, and training for key users
- Increased fidelity and technical detail in configuration specifications needed to support transition activities
- Conducted initial and sustainment training, education, and qualification for MOC watch personnel
- Manned the MOC/BWO on a 7-day per week/24-hours per day/365 days a year basis
- Replaced or upgraded MOC/BWO equipment as required to keep pace with new BMDS Block capabilities

	FY 2006	FY 2007	FY 2008	FY 2009
Geographic Combatant Commander (GCC) Support	2,638	0	0	0
RDT&E Articles (Quantity)	0	0	0	0

Geographical Combatant Commander (GCC) Support enables COCOM and Service participation in MDA activities such as wargames, exercises, table tops, flight tests, ground tests, resource planning meetings and other conferences and interchanges where securing user input is critical for an effective outcome. This activity also supports the Warfighter Involvement Process (WIP) by enabling operators, users, and other BMDS stakeholders to travel and participate in missile defense related exercises, tests, activities and other fora. User involvement ensures that MDA, the Joint Warfighters and Services will work together to define, field, and operationalize current BMDS capabilities and develop subsequent new Block capabilities in an efficient and effective manner.

FY06 Accomplishments:
Enabled all Combatant Commanders (COCOMs) to participate in MDA wargames, exercises, table tops and conferences, providing training, familiarization, and feedback venues back to the developer
MDA provided COCOM support in connection with BMDS exercises conducted in FY06:
- U.S. Northern Command
- U.S. Pacific Command
- U.S. Strategic Command
- U.S. Joint Forces Command

Project: 0803 Joint Warfighter Support Block 2006

MDA Exhibit R-2A (PE 0603889C)

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2007**

APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603889C Ballistic Missile Defense Products**

C. Other Program Funding Summary

	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	Total Cost
PE 0603175C Ballistic Missile Defense Technology	147,270	193,307	118,569	109,540	116,014	121,008	127,917	131,291	1,064,916
PE 0603881C Ballistic Missile Defense Terminal Defense Segment	1,120,879	1,092,076	962,585	1,004,282	924,101	851,213	678,694	501,147	7,134,977
PE 0603882C Ballistic Missile Defense Midcourse Defense Segment	2,391,246	3,043,058	2,520,064	2,359,665	2,179,602	1,699,963	1,153,082	1,183,003	16,529,683
PE 0603883C Ballistic Missile Defense Boost Defense Segment	455,572	628,958	548,759	432,432	448,375	678,913	829,683	1,026,239	5,048,931
PE 0603884C Ballistic Missile Defense Sensors	284,297	514,129	778,163	984,963	939,417	791,701	723,843	603,585	5,620,098
PE 0603886C Ballistic Missile Defense System Interceptors	200,446	356,004	227,499	393,317	522,388	730,236	836,029	570,206	3,836,125
PE 0603888C Ballistic Missile Defense Test and Targets	610,619	601,782	586,150	628,364	662,984	681,511	696,037	705,210	5,172,657
PE 0603890C Ballistic Missile Defense System Core	409,993	429,420	482,016	511,147	558,746	579,571	579,316	588,481	4,138,690
PE 0603891C Special Programs - MDA	271,021	353,031	323,250	305,409	369,073	526,966	789,017	792,271	3,730,038
PE 0603892C Ballistic Missile Defense Aegis	893,040	1,122,669	1,059,103	1,129,425	1,221,650	1,067,587	1,054,753	1,089,078	8,637,305
PE 0603893C Space Tracking & Surveillance System	220,048	322,220	331,525	347,811	412,623	501,197	778,067	981,424	3,894,915
PE 0603894C Multiple Kill Vehicle	48,370	144,362	271,151	352,741	461,179	618,263	673,477	842,905	3,412,448
PE 0603895C BMD System Space Program	0	0	27,666	35,093	46,849	56,183	133,617	157,117	456,525
PE 0603896C BMD C2BMC	0	246,852	258,913	294,627	300,847	282,615	267,275	269,420	1,920,549
PE 0603897C BMD Hercules	0	49,674	53,658	54,264	54,405	55,142	53,355	54,198	374,696
PE 0603898C BMD Joint Warfighter Support	0	54,935	48,787	50,428	54,086	56,603	58,890	60,206	383,935
PE 0603904C BMD Joint National Integration Center (JNIC)	0	110,629	104,012	106,985	111,542	111,947	113,592	115,287	773,994
PE 0603905C BMD Concurrent Test and Operations	0	23,159	0	0	0	0	0	0	23,159
PE 0603906C Regarding Trench	0	0	2,000	3,000	5,000	5,000	9,000	9,000	33,000
PE 0605502C Small Business Innovative Research - MDA	133,105	0	0	0	0	0	0	0	133,105
PE 0901585C Pentagon Reservation	14,874	15,527	6,058	6,376	4,490	4,725	4,801	4,877	61,728
PE 0901598C Management Headquarters - MDA	98,609	87,059	85,906	86,453	70,355	69,855	69,855	69,855	637,947

Project: 0803 Joint Warfighter Support Block 2006   MDA Exhibit R-2A (PE 0603889C)

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	Date
Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	**February 2007**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603889C Ballistic Missile Defense Products**

D. Acquisition Strategy

Joint Warfighter Support will continue to follow the MDA's capability-based acquisition strategy that emphasizes assessment, spiral-development testing and evolutionary acquisition through the definition of two-year capability blocks. The JWSP accomplishes this by development and vetting of Operational Concepts through the Joint Theater Air and Missile Defense Office, the Joint National Integration Center, the COCOMS and the Services utilizing seminars, workshops, table top exercises, wargames and simulation exercises that also support Military Utility Assessment updates.

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Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date **February 2007**

APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603889C Ballistic Missile Defense Products**

I. Product Development   Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2007 Cost	FY 2007 Award/ Oblg Date	FY 2008 Cost	FY 2008 Award/ Oblg Date	FY 2009 Cost	FY 2009 Award/ Oblg Date	Total Cost
Exercises and Wargames										
Distributed Exercise 06-1	CPAF	GM/ Huntsville AL	500	0	N/A	0	N/A	0	N/A	500
Technical Support	CPAF	SPARTA/ Arlington, VA	6,963	0	N/A	0	N/A	0	N/A	6,963
BMDS Overlay - JUNIPER COBRA	CPAF	JNIC/BOEING/PEO AMSD/ Colorado Springs CO, Huntsville AL	500	0	N/A	0	N/A	0	N/A	500
BMDS Overlay - Keen Edge	CPAF	JNIC/ Colorado Springs CO	300	0	N/A	0	N/A	0	N/A	300
BMDS Overlay - Amalgam Phantom	CPAF	JNIC/GM/ASMDPEO/ Colorado Springs CO	1,200	0	N/A	0	N/A	0	N/A	1,200
BMDS Overlay - Joint Project Optic Windmill IX	CPAF	JNIC/GM/ ASMDPEO/ Colorado Springs CO, Arlington VA, Huntsville AL	1,000	0	N/A	0	N/A	0	N/A	1,000
BMDS Overlay - Vigilant Shield	CPAF	JNIC/GM/ ASMDPEO/ Colorado Springs CO, Huntsville AL	1,200	0	N/A	0	N/A	0	N/A	1,200
BMDS Overlay - Planning Terminal Fury	CPAF	JNIC/GM/ ASMDPEO/ Colorado Springs, CO/ArlingtonVA; Huntsville, AL	2,100	0	N/A	0	N/A	0	N/A	2,100

Project: 0803 Joint Warfighter Support Block 2006

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					FY 2007		FY 2008		FY 2009		
	Contract	Performing	Total		Award/		Award/		Award/		
	Method	Activity &	PYs	FY 2007	Oblg	FY 2008	Oblg	FY 2009	Oblg	Total
Cost Categories:	& Type	Location	Cost	Cost	Date	Cost	Date	Cost	Date	Cost
Distributed Exercise 07-1	CPAF	GM/ Huntsville, AL	0	0	N/A	0	N/A	0	N/A	
Distributed Exercise 07-2	CPAF	GM/ Huntsville, AL	500	0	N/A	0	N/A	0	N/A	500
Other Exercises and Data Analyses	CPAF	JNIC/GM/ Colorado Springs, CO, Huntsville AL	966	0	N/A	0	N/A	0	N/A	966
JNIC BMDS Exercise Planning	CPAF	GM/ Huntsville AL	300	0	N/A	0	N/A	0	N/A	300
Concepts and Plans										
Studies & Analysis	MIPR	JNIC/ARMYPEO/ NAVSEA/Colorado Springs CO & Arlington, VA/Huntsville AL	648	0	N/A	0	N/A	0	N/A	648
BMDS Logistics										
BMDS Logistics	CPAF	JNIC/ Denver, CO	1,087	0	N/A	0	N/A	0	N/A	1,087
BMDS Training										
BMDS Training Center	CPAF	JNIC/ Denver, CO	1,523	0	N/A	0	N/A	0	N/A	1,523
Studies & Analyses	CPAF	SPARTA/ Arlington, VA	240	0	N/A	0	N/A	0	N/A	240
Training Transition to Services	CPAF	MDA/ Arlington, VA	643	0	N/A	0	N/A	0	N/A	643
CTO-Distributed Multi-Echelon Training System	C/CPAF	MDNT/B / Arlington, VA	476	0	N/A	0	N/A	0	N/A	476
Ballistic Missile Defense System Manager										
Technical Support	CPAF	TSM	5,000	0	N/A	0	N/A	0	N/A	5,000

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis

Date: **February 2007**

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

R-1 NOMENCLATURE
0603889C Ballistic Missile Defense Products

Project: 0803 Joint Warfighter Support Block 2006

MDA Exhibit R-3 (PE 0603889C)

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					Date **February 2007**

APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**		R-1 NOMENCLATURE **0603889C Ballistic Missile Defense Products**			

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2007 Cost	FY 2007 Award/ Oblg Date	FY 2008 Cost	FY 2008 Award/ Oblg Date	FY 2009 Cost	FY 2009 Award/ Oblg Date	Total Cost
Sustainment & Operations - MOC										
MOC Operations	CPAF	JNIC/ Colorado Springs, CO	1,354	0	N/A	0	N/A	0	N/A	1,354
Technical Support	CPAF	SPARTA/ Rosslyn, VA	2,920	0	N/A	0	N/A	0	N/A	2,920
Geographic Combatant Commander (GCC) Support										
Civilian Staff Support	TM	MDA/ Arlington, VA	2,118	0	N/A	0	N/A	0	N/A	2,118
USSTRATCOM,USECOM,USPACECOM & USNORTHCOM	MIPR	San Diego, CA/Colorado Springs CO/Huntsville AL	520	0	N/A	0	N/A	0	N/A	520
Subtotal Product Development			32,058	0		0		0		32,058

Remarks

Funding for CTO/DMETS transitions to a new Project (0817) in FY07.

Project: 0803 Joint Warfighter Support Block 2006

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Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date
	February 2007

APPROPRIATION/BUDGET ACTIVITY	R-1 NOMENCLATURE
RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	**0603889C Ballistic Missile Defense Products**

II. Support Costs   Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2007 Cost	FY 2007 Award/ Oblg Date	FY 2008 Cost	FY 2008 Award/ Oblg Date	FY 2009 Cost	FY 2009 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 2007 Cost	FY 2007 Award/ Oblg Date	FY 2008 Cost	FY 2008 Award/ Oblg Date	FY 2009 Cost	FY 2009 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 2007 Cost	FY 2007 Award/ Oblg Date	FY 2008 Cost	FY 2008 Award/ Oblg Date	FY 2009 Cost	FY 2009 Award/ Oblg Date	Total Cost
Subtotal Management Services										

Remarks

Project Total Cost			32,058	0		0		0		32,058

Remarks

Project: 0803 Joint Warfighter Support Block 2006

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Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile	Date **February 2007**

APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603889C Ballistic Missile Defense Products**

Fiscal Year	2006				2007				2008				2009				2010				2011				2012				2013			
	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
BLOCK 2006																																
JNIC BMDS Exercise Planning	▲—▲																															
BMDS Overlay 06 - Keen Edge 06		▲																														
CTO-DMETS Interface w/Aegis FBX/Theater Elements		▲———▲																														
Complete CTO-DMETS Network Design		▲																														
Distributed Exercise 06-1		▲																														
Stand-up CTO-DMETS Red Cell Capability		▲———▲																														
BMDS Overlay 06 - Amalgam Phantom 06			▲																													
BMDS Overlay 06 - Joint Project Optic Windmill IX			▲																													
Distributed Exercise 06-2			▲																													
Preliminary CTO-DMETS Network Stand-up				▲																											

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

Project: 0803 Joint Warfighter Support Block 2006

MDA Exhibit R-4 (PE 0603889C)

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Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail				Date **February 2007**			
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**				R-1 NOMENCLATURE **0603889C Ballistic Missile Defense Products**			
Schedule Profile	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
BLOCK 2006								
JNIC BMDS Exercise Planning	1Q-2Q							
BMDS Overlay 06 - Keen Edge 06	2Q							
CTO-DMETS Interface w/Aegis FBX/Theater Elements	2Q-4Q							
Complete CTO-DMETS Network Design	2Q							
Distributed Exercise 06-1	2Q							
PACOM Exercise Set 06	2Q-3Q							
Stand-up CTO-DMETS Red Cell Capability	2Q-4Q							
BMDS Overlay 06 - Amalgam Phantom 06	3Q							
BMDS Overlay 06 - Joint Project Optic Windmill IX	3Q							
Distributed Exercise 06-2	3Q							
Preliminary CTO-DMETS Network Stand-up	4Q							

Project: 0803 Joint Warfighter Support Block 2006

MDA Exhibit R-4A (PE 0603889C)

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Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date February 2007

APPROPRIATION/BUDGET ACTIVITY RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE 0603889C Ballistic Missile Defense Products

COST ($ in Thousands)	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
0204 Joint National Integration Center (JNIC)	71,770	0	0	0	0	0	0	0
RDT&E Articles Qty	0	0	0	0	0	0	0	0

A. Mission Description and Budget Item Justification

The mission of the JNIC is to help develop and support the operation of a robust suite of missile defense wargaming, test and evaluation capabilities, which ensures BMDS elements are acquired and integrated into an interoperable, layered system, while simultaneously supporting warfighter operations of designated BMDS elements. The JNIC accomplishes this mission of providing MDA with Agency-level technical integration and BMDS-level operational integration products and services by:

- Supporting the definition, development, and test & evaluation of integrated missile defense Engagement Sequence Group capabilities;
- Planning and executing the implementation of BMDS-level modeling and simulation;
- Supporting BMDS developers and warfighters by exercising missile defense readiness, and wargaming command and control procedures, operational concepts, and doctrinal requirements; and
- Providing BMDS operational support and technical reachback to designated program elements and Combatant Commands (COCOMs).

The JNIC maintains a secure facility that includes the computers; communications; networks; flight, ground, and simulation test bed environments; wargaming complex; environmental support; and other fixed cost capabilities essential for the execution of MDA programs. It provides the enabling infrastructure to support both acquisition and warfighter communities.

B. Accomplishments/Planned Program

	FY 2006	FY 2007	FY 2008	FY 2009
BMDS Operational Security	585	0	0	0
RDT&E Articles (Quantity)	0	0	0	0

Provides increased reliability, availability and maintainability of the JNIC Electronic Security System as well as improved physical security/anti-terrorism provisions.

FY06 Accomplishments:
- Maintained, operated/monitored, and completed the upgrade of the ESS.
- Installed security screening and an X-ray station leading into the JNIC research and development complex.

Project: 0204 Joint National Integration Center (JNIC)   MDA Exhibit R-2A (PE 0603889C)

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	Date
Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	**February 2007**

APPROPRIATION/BUDGET ACTIVITY	R-1 NOMENCLATURE
RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	**0603889C Ballistic Missile Defense Products**

- Continued to provide around the clock monitoring/security of designated PL 1 resources/SSL-A areas.

	FY 2006	FY 2007	FY 2008	FY 2009
BMD Wargaming, Exercises and Analysis	15,362	0	0	0
RDT&E Articles (Quantity)	0	0	0	0

The JNIC 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 Integration Exercises; 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. Additionally, the JNIC facilitates international cooperation and support of the BMDS through the development and execution of missile defense seminars, workshops, wargames, and other multinational activities. It builds and retains a corporate knowledge base comprised of leading technical experts to respond quickly to customer requirements and perform technical MDA missions.

The JNIC also supports consolidated and integrated modeling and simulation development for the Agency. The BMDS Simulation, formerly known as MDWAR, is the only BMD force-on-force simulation with plug & play tactical message interfaces capable of interactive real-time execution. The Missile Defense and Space Warning Tool is the only trusted tool for injecting simulated missile threats into all Combatant Commands over the Integrated Broadcasting System so that theater and strategic early warning systems can be exercised. The Threat Modeling and Simulation System generates integrated, high-fidelity, force level threat scenarios across all threat objects in flight. Together the development and operation of these Modeling & Simulation tools by the JNIC provides MDA and the missile defense community the ability to simulate the current and evolving BMD environment, threat, and systems for wargames, exercises, training, tests, and performance analyses.

FY06 Accomplishments:
- Supported fleet demonstrations to prove that deployed Aegis ships are capable of integrating into the BMDS command and control structure, can conduct sensor tracking, and possess limited intercept capabilities
- Provided wargame scenarios to enhance understanding of current missile defense capabilities and investigate options for future capabilities
- Supported the Combined Test Force (CTF) conduct of Ground Test/Missile Defense Integrated Exercise(s)
- Provided Wargaming Support to the Joint Warfighter Support Program by:
  o Developing and producing documentation to support all directed wargaming events
  o Conducting wargames to develop, test, and refine Concept of Operations, Tactics, Techniques and Procedures, and Command and Control plans

Project: 0204 Joint National Integration Center (JNIC)   MDA Exhibit R-2A (PE 0603889C)
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Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date February 2007
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603889C Ballistic Missile Defense Products**

- o Providing post-event data collection and analysis support
- o Providing for the operations and maintenance of the Wargaming Enterprise Support Center
- o Managing, as directed, the BMDS Training Center
- Planned, collected data, assessed, examined, and reported on MDA Joint Warfighter Support Program directed missile defense exercises
- Conducted MDA critical analysis efforts in support of Block Capability Verification Assessment Reports, and other MDA System Engineering and Integration directed studies/assessments
- Conducted Verification & Validation of BMD models as directed
- Provided direct support to the MDA Director for International Support in the form of unique capabilities, tools and resources to enhance international missile defense cooperation
- Incorporated advanced employment concepts into JNIC planning tools, exercises, test activities, and wargames across multiple security levels.

	FY 2006	FY 2007	FY 2008	FY 2009
Infrastructure Development & Support	52,135	0	0	0
RDT&E Articles (Quantity)	0	0	0	0

The JNIC supports the technical development and provides the enabling infrastructure for several critical Agency activities. The JNIC supports the Ground-based Midcourse Missile Defense Mission Control Center Facility, as well as the C2BMC Integration and Test Centers and the C2BMC Experimentation Laboratories. It provides infrastructure support for the Satellite Tracking and Surveillance System's Missile Defense Space Experimentation Center; the Targets and Countermeasures' JNIC Target Operations Center; and the developmental support, as directed, of a common satellite ground station and sensor netting test bed for designated BMDS elements. It also plans, conducts, and supports BMDS Engagement Sequence Group testing and analysis with the Combined Test Force through the operation of the Test Execution Control node for distributed BMDS ground tests.

The JNIC provides the enabling infrastructure that supports operations of the Missile Defense Element, manned by the 100th Missile Defense Brigade, the USNORTHCOM C2BMC Support Center, and USSTRATCOM's Joint Functional Component Command-Integrated Missile Defense. In addition, the JNIC operates the MDA Technical Support Center, which provides situational awareness of the health and status of the end-to-end BMDS; provides network subject matter expertise and technical reachback for the program elements and COCOMs; maintains a technical repository of BMDS Implementation Architectures for real-time Operation & Maintenance and configuration control; provides both state change management and asset management technical support for the BMDS; and provides the technical environment for BMDS Watch Officers, Safety Officers, and Information Assurance Officers to execute their assigned duties. The JNIC also operates the Joint Early Warning Laboratory, which provides USSTRATCOM with quick response analyses of real-world launches, and rapid anomaly identification and resolution.

Project: 0204 Joint National Integration Center (JNIC) MDA Exhibit R-2A (PE 0603889C)

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Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date February 2007

APPROPRIATION/BUDGET ACTIVITY RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE 0603889C Ballistic Missile Defense Products

The JNIC designs, implements, verifies, operates, maintains and manages secure Information Technology infrastructure(s) and service interfaces, communication circuit connectivity, and tiered service levels on site. It provides additional labor and diagnostic tools for around the clock information management, and facilities operation and maintenance technical support. This technical support, provided outside normal duty hours, is crucial to warfighter mission critical system outage restoration, coordination, and reporting.

FY06 Accomplishments:
- Provided ongoing information management services
- Conducted ongoing environment and facilities O&M
- Initiated environment and facility repairs:
  - Installed an electrical backup capability in the Computer Center for servers supporting operational missions
  - Executed Phase II and Phase III of the Direct Digital Control (DDC) repair plan
  - Corrected Facility Installation Standards (FIS) and Safety deficiencies identified in the previous fiscal year
  - Replaced deteriorating stairwell treads throughout the JNIC
  - Procured and installed a Hot Water Heater for Building 730
  - Repaired and expanded West Parking Lot to absorb 300 additional spaces required to support events and added missions
  - Began the Phase I expansion of the Uninterrupted Power System (UPS) Switchgear to support MDA and COCOM organizations operating from the JNIC
  - Expanded the Emergency Voice System into the rest of the Research and Development Complex (Building 720)
- Executed ongoing systems engineering of mission critical systems
- Provided continuing media support in the areas of graphics, photography, and video production
- Executed continuing public affairs and protocol activities in support of MDA and the JNIC
- Provided an enabling infrastructure that supports MDA RDT&E efforts at the JNIC for the:
  - GMD Mission Control Center Facility
  - C2BMC Integration and Test Centers, and the C2BMC Experimentation Laboratories
  - STSS Missile Defense Space Experimentation Center
  - JNIC Target Operations Center
  - Joint Warfighter Support Program
  - Combined Test Force-JNIC
- Provided an enabling infrastructure that supports BMDS operational capability development for the:
  - MDE and 100th Missile Defense Brigade

Project: 0204 Joint National Integration Center (JNIC)

MDA Exhibit R-2A (PE 0603889C)

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	Date
Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	**February 2007**

APPROPRIATION/BUDGET ACTIVITY	R-1 NOMENCLATURE
RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	**0603889C Ballistic Missile Defense Products**

- o USNORTHCOM C2BMC Support Center
- o USSTRATCOM Joint Functional Component Command-Integrated Missile Defense (JFCC-IMD) Headquarters and Operations Center
- o Joint Early Warning Laboratory
- Operated and maintained the MDA Technical Support Center (MTSC); and as directed, expanded the situational awareness and BMDS monitoring capability of the BWOs, BSOs, and Information Awareness Officers manning the MTSC
- Incorporated and supported the MDA Centers of Excellence assigned to the JNIC
- Planned and began, as directed, the consolidation of existing MDA spaces in Colorado Springs into the JNIC.

	FY 2006	FY 2007	FY 2008	FY 2009
Special Programs	315	0	0	0
RDT&E Articles (Quantity)	0	0	0	0

The JNIC runs the Intelligence Support Center/Special Programs Center for the MDA Director, Security/Intelligence Operations, USSTRATCOM, and the 100th Missile Defense Brigade.

FY06 Accomplishments:
- Provided intelligence SA to the BWOs as they monitor BMDS health and status, and state changes.
- Produced credible threat products and engineering trajectories for DoD users.
- Prepared daily intelligence briefings and special intelligence topic briefings as directed by MDA.
- Provided ongoing maintenance and operation support of the ISC for both MDA and COCOM customers.

	FY 2006	FY 2007	FY 2008	FY 2009
JNIC Security	3,373	0	0	0
RDT&E Articles (Quantity)	0	0	0	0

Provides physical and access control to protect BMDS development capabilities, annual training and education for all assigned personnel, and additional labor and diagnostic tools for around the clock security systems engineering and Security Operations Command Post activities.

FY06 Accomplishments:
- Provided program protection, force protection, and an anti-terrorism posture in compliance with MDA and DoD requirements, capable of supporting various events scheduled at the JNIC.
  - o Transitioned all applicable annual security training to a computer based system.

Project: 0204 Joint National Integration Center (JNIC) MDA Exhibit R-2A (PE 0603889C)

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Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2007**

APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603889C Ballistic Missile Defense Products**

- o Provided an integrated security approach for all new mission areas assigned to the JNIC.
- o Transitioned the JNIC Classified Document Control Center from a long-term to short-term storage facility by leveraging the MDA electronic repository for all retained material.
- Provided ongoing industrial and physical security, including foreign disclosure, counterintelligence analysis and threat assessment, and guard/response force management.

C. Other Program Funding Summary

	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	Total Cost
PE 0603175C Ballistic Missile Defense Technology	147,270	193,307	118,569	109,540	116,014	121,008	127,917	131,291	1,064,916
PE 0603881C Ballistic Missile Defense Terminal Defense Segment	1,120,879	1,092,076	962,585	1,004,282	924,101	851,213	678,694	501,147	7,134,977
PE 0603882C Ballistic Missile Defense Midcourse Defense Segment	2,391,246	3,043,058	2,520,064	2,359,665	2,179,602	1,699,963	1,153,082	1,183,003	16,529,683
PE 0603883C Ballistic Missile Defense Boost Defense Segment	455,572	628,958	548,759	432,432	448,375	678,913	829,683	1,026,239	5,048,931
PE 0603884C Ballistic Missile Defense Sensors	284,297	514,129	778,163	984,963	939,417	791,701	723,843	603,585	5,620,098
PE 0603886C Ballistic Missile Defense System Interceptors	200,446	356,004	227,499	393,317	522,388	730,236	836,029	570,206	3,836,125
PE 0603888C Ballistic Missile Defense Test and Targets	610,619	601,782	586,150	628,364	662,984	681,511	696,037	705,210	5,172,657
PE 0603890C Ballistic Missile Defense System Core	409,993	429,420	482,016	511,147	558,746	579,571	579,316	588,481	4,138,690
PE 0603891C Special Programs - MDA	271,021	353,031	323,250	305,409	369,073	526,966	789,017	792,271	3,730,038
PE 0603892C Ballistic Missile Defense Aegis	893,040	1,122,669	1,059,103	1,129,425	1,221,650	1,067,587	1,054,753	1,089,078	8,637,305
PE 0603893C Space Tracking & Surveillance System	220,048	322,220	331,525	347,811	412,623	501,197	778,067	981,424	3,894,915
PE 0603894C Multiple Kill Vehicle	48,370	144,362	271,151	352,741	461,179	618,263	673,477	842,905	3,412,448
PE 0603895C BMD System Space Program	0	0	27,666	35,093	46,849	56,183	133,617	157,117	456,525
PE 0603896C BMD C2BMC	0	246,852	258,913	294,627	300,847	282,615	267,275	269,420	1,920,549
PE 0603897C BMD Hercules	0	49,674	53,658	54,264	54,405	55,142	53,355	54,198	374,696
PE 0603898C BMD Joint Warfighter Support	0	54,935	48,787	50,428	54,086	56,603	58,890	60,206	383,935
PE 0603904C BMD Joint National Integration Center (JNIC)	0	110,629	104,012	106,985	111,542	111,947	113,592	115,287	773,994
PE 0603905C BMD Concurrent Test and Operations	0	23,159	0	0	0	0	0	0	23,159
PE 0603906C Regarding Trench	0	0	2,000	3,000	5,000	5,000	9,000	9,000	33,000
PE 0605502C Small Business Innovative Research - MDA	133,105	0	0	0	0	0	0	0	133,105

Project: 0204 Joint National Integration Center (JNIC)   MDA Exhibit R-2A (PE 0603889C)

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Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification		Date February 2007

APPROPRIATION/BUDGET ACTIVITY RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE 0603889C Ballistic Missile Defense Products

	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	Total Cost
PE 0901585C Pentagon Reservation	14,874	15,527	6,058	6,376	4,490	4,725	4,801	4,877	61,728
PE 0901598C Management Headquarters - MDA	98,609	87,059	85,906	86,453	70,355	69,855	69,855	69,855	637,947

D. Acquisition Strategy

The strategy for JNIC mission execution is to employ an integration contract to simultaneously perform all of the BMDS RDT&E tasks with integrated operation and sustainment. The JNIC is operated by missile defense subject matter experts composed of Government military and civilian personnel, Federally Funded Research and Development Center, JNIC Technical Advisory and Assistance Services, and major defense contractors.

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Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date **February 2007**

APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603889C Ballistic Missile Defense Products**

I. Product Development   Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2007 Cost	FY 2007 Award/ Oblg Date	FY 2008 Cost	FY 2008 Award/ Oblg Date	FY 2009 Cost	FY 2009 Award/ Oblg Date	Total Cost
Subtotal Product Development										

Remarks

II. Support Costs   Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2007 Cost	FY 2007 Award/ Oblg Date	FY 2008 Cost	FY 2008 Award/ Oblg Date	FY 2009 Cost	FY 2009 Award/ Oblg Date	Total Cost
Infrastructure Development & Support										
JNIC	MIPR	JNIC/ 50th Space Wing, Schriever AFB, CO	3,082	0	N/A	0	N/A	0	N/A	3,082
Subtotal Support Costs			3,082	0		0		0		3,082

Remarks

These funds are for utilities and base communications as specified in the Inter-service Support Agreement with the 50th Space Wing.

III. Test and Evaluation   Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2007 Cost	FY 2007 Award/ Oblg Date	FY 2008 Cost	FY 2008 Award/ Oblg Date	FY 2009 Cost	FY 2009 Award/ Oblg Date	Total Cost
BMDS Operational Security										
JNIC	C/CPAF	Northrop Grumman Mission Sys/CO	2,153	0	N/A	0	N/A	0	N/A	2,153

Project: 0204 Joint National Integration Center (JNIC)   MDA Exhibit R-3 (PE 0603889C)

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Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis									Date **February 2007**

APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**				R-1 NOMENCLATURE **0603889C Ballistic Missile Defense Products**					

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2007 Cost	FY 2007 Award/ Oblg Date	FY 2008 Cost	FY 2008 Award/ Oblg Date	FY 2009 Cost	FY 2009 Award/ Oblg Date	Total Cost
JNIC		JNIC/ Colorado Springs, CO	512	0	N/A	0	N/A	0	N/A	512
BMD Wargaming, Exercises and Analysis										
JNIC	C/CPAF	Northrop Grumman Mission Sys/CO	27,538	0	N/A	0	N/A	0	N/A	27,538
JNIC		JNIC/ Colorado Springs, CO	8,445	0	N/A	0	N/A	0	N/A	8,445
JNIC	C/FFP	JNIC/SRS/ Colorado Springs, CO	4,589	0	N/A	0	N/A	0	N/A	4,589
Infrastructure Development & Support										
JNIC	C/CPAF	JNIC/ CO	130,359	0	N/A	0	N/A	0	N/A	130,359
JNIC		JNIC/ Colorado Springs, CO	9,212	0	N/A	0	N/A	0	N/A	9,212
JNIC	C/FFP	JNIC/SRS/ Colorado Springs, CO	9,448	0	N/A	0	N/A	0	N/A	9,448
JNIC	C/FFRDC	JNIC/Mitre Corp/Colorado Springs, CO	4,580	0	N/A	0	N/A	0	N/A	4,580
Special Programs										
JNIC	C/CPAF	Northrop Grumman Mission Sys/CO	916	0	N/A	0	N/A	0	N/A	916

Project: 0204 Joint National Integration Center (JNIC) MDA Exhibit R-3 (PE 0603889C)

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date February 2007

APPROPRIATION/BUDGET ACTIVITY RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE 0603889C Ballistic Missile Defense Products

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2007 Cost	FY 2007 Award/ Oblg Date	FY 2008 Cost	FY 2008 Award/ Oblg Date	FY 2009 Cost	FY 2009 Award/ Oblg Date	Total Cost
JNIC Security										
JNIC	C/CPAF	5457/ CO	8,996	0	N/A	0	N/A	0	N/A	8,996
JNIC		JNIC/ Colorado Springs, CO	1,279	0	N/A	0	N/A	0	N/A	1,279
Subtotal Test and Evaluation			208,027	0		0		0		208,027

Remarks

These funds are executed by the Integration Center Research and Development Contractor and provide FFRDC and Technical Advisory and Assistance Services employees, for JNIC operations and oversight of the Integration Center Research and Development Contractor

IV. Management Services   Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2007 Cost	FY 2007 Award/ Oblg Date	FY 2008 Cost	FY 2008 Award/ Oblg Date	FY 2009 Cost	FY 2009 Award/ Oblg Date	Total Cost
Subtotal Management Services										

Remarks

Project Total Cost			211,109	0		0		0		211,109

Remarks

Project: 0204 Joint National Integration Center (JNIC)

MDA Exhibit R-3 (PE 0603889C)

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Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile	Date **February 2007**

APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603889C Ballistic Missile Defense Products**

Fiscal Year	2006				2007				2008				2009				2010				2011				2012				2013			
	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
JNIC																																
Aegis Ballistic Msl Defense Fleet Msl Tests	▲																															
FTM 04-2 (FM-8)	▲																															
FTM 04-3 (FM-9)		▲																														
FTM 06-1			▲																													
Aegis Critical Measurement Program Tests		▲																														
Arrow System Test	▲━━━━━▲																															
Airborne Laser System Integrated Flight Test Spt		▲━━━━▲																														
Nimble Titan Wargame		▲━━━━▲																														
Integrated Missile Defense (IMD) Wargames		▲━━━━▲																														
GT 06-1 (MDIE 06a)				▲																												
FTG 04-5	▲																															
FTG 04-2		▲																														
FTG 06-1 a/b (Salvo Mission)				▲																												

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

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	Date
Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile	**February 2007**

APPROPRIATION/BUDGET ACTIVITY	R-1 NOMENCLATURE
RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	**0603889C Ballistic Missile Defense Products**

Fiscal Year	2006				2007				2008				2009				2010				2011				2012				2013			
	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
JNIC																																
FT 06-1			▲																													
FT 04-1 (IFT-16a)		▲																														
FT 04-4 (CMCM-2)			▲																													
FT 04-2 (CMCM-1)			▲																													
C2BMC (spirals 4.5, 6.1, and 6.2)	▲━━━▲																															
IMD 05.4 BMDS SE-SIM Exercise/Wargame	▲																															
STSS Surrogate Test Bed	▲━━▲																															
NFIRE Experiment				▲																												

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 **February 2007**				
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**				R-1 NOMENCLATURE **0603889C Ballistic Missile Defense Products**				
Schedule Profile	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
JNIC								
Aegis Ballistic Msl Defense Fleet Msl Tests	1Q							
FTM 04-2 (FM-8)	1Q							
FTM 04-3 (FM-9)	2Q							
FTM 06-1	3Q							
Aegis Critical Measurement Program Tests	2Q							
Arrow System Test	1Q-4Q							
Airborne Laser System Integrated Flight Test Spt	2Q-4Q							
Nimble Titan Wargame	2Q-4Q							
Integrated Missile Defense (IMD) Wargames	2Q-4Q							
GT 06-1 (MDIE 06a)	4Q							
FTG 04-5	1Q							
FTG 04-2	2Q							
FTG 06-1 a/b (Salvo Mission)	4Q							
FT 06-1	3Q							
FT 04-1 (IFT-16a)	2Q							
FT 04-4 (CMCM-2)	3Q							
FT 04-2 (CMCM-1)	3Q							
C2BMC (spirals 4.5, 6.1, and 6.2)	1Q-4Q							
IMD 05.4 BMDS SE-SIM Exercise/Wargame	1Q							
International Events (Taiwan)	1Q							
International Events (Ukraine)	1Q,3Q							
JDEP Defense of Israel Evaluation	1Q							
STSS Surrogate Test Bed	1Q-4Q							
International Events (India)	2Q,4Q							
International Events (Japan)	2Q							
Joint Expeditionary Force Experiment	2Q							
Keen Edge	2Q							
Marine Aviation Weapons and Tactics Squadron	2Q,4Q							
National Missile Defense Conference 06 Wargame	2Q							
IMD 06.1 COCOM Exercise	3Q							

Project: 0204 Joint National Integration Center (JNIC)   MDA Exhibit R-4A (PE 0603889C)

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	Date
Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail	**February 2007**

APPROPRIATION/BUDGET ACTIVITY	R-1 NOMENCLATURE
RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	**0603889C Ballistic Missile Defense Products**

Schedule Profile	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
IMD 06.2 BMDS SE-SIM Exercise/Wargame	3Q							
International Events (Australia)	3Q							
International Events (DTRA)	3Q							
International Events (Russia)	3Q							
International Events (Spain)	3Q,4Q							
NT Workshop	3Q							
International Events (NATO)	4Q							
Joint Project Windmill (JPOW)	4Q							
Multinational Conference Wargame 06	4Q							
NFIRE Experiment	4Q							
Terminal Fury	4Q							

Project: 0204 Joint National Integration Center (JNIC)　　　　　　　　　　　　　　　　　　　　　　　　MDA Exhibit R-4A (PE 0603889C)

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Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification		Date **February 2007**

APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603889C Ballistic Missile Defense Products**

COST ($ in Thousands)	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
0602 Program-Wide Support	14,026	0	0	0	0	0	0	0
RDT&E Articles Qty	0	0	0	0	0	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 such as strategic planning, program integration, business management, cost estimating, contracting, and financial management, to include preparation of financial statements, reimbursement of financial services provided by DFAS, internal review and audit, earned-value management, and program assessment. Includes costs for both government civilians performing these functions, as well as outside services and support contractors that augment government staff in these areas. Many of these costs reside within the Missile Defense Agency Executing Agents in the Services: Army Space and Missile Defense Command, Army PEO Space and Missile Defense, Office of Naval Research, and various Air Force laboratory and acquisition activities, although some functions and costs within this program element are performed by MDA employees assigned within the National Capital Region (NCR). Other costs included herein 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 fluctuation on a limited number of foreign contracts.

B. Accomplishments/Planned Program

	FY 2006	FY 2007	FY 2008	FY 2009
Civilian Salaries and Support	14,026	0	0	0
RDT&E Articles (Quantity)	0	0	0	0

See Section A: Mission Description and Budget Item Justification

Project: 0602 Program-Wide Support

MDA Exhibit R-2A (PE 0603889C)

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Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2007**

APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603889C Ballistic Missile Defense Products**

C. Other Program Funding Summary

	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	Total Cost
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PE 0603884C Ballistic Missile Defense Sensors	284,297	514,129	778,163	984,963	939,417	791,701	723,843	603,585	5,620,098
PE 0603886C Ballistic Missile Defense System Interceptors	200,446	356,004	227,499	393,317	522,388	730,236	836,029	570,206	3,836,125
PE 0603888C Ballistic Missile Defense Test and Targets	610,619	601,782	586,150	628,364	662,984	681,511	696,037	705,210	5,172,657
PE 0603890C Ballistic Missile Defense System Core	409,993	429,420	482,016	511,147	558,746	579,571	579,316	588,481	4,138,690
PE 0603891C Special Programs - MDA	271,021	353,031	323,250	305,409	369,073	526,966	789,017	792,271	3,730,038
PE 0603892C Ballistic Missile Defense Aegis	893,040	1,122,669	1,059,103	1,129,425	1,221,650	1,067,587	1,054,753	1,089,078	8,637,305
PE 0603893C Space Tracking & Surveillance System	220,048	322,220	331,525	347,811	412,623	501,197	778,067	981,424	3,894,915
PE 0603894C Multiple Kill Vehicle	48,370	144,362	271,151	352,741	461,179	618,263	673,477	842,905	3,412,448
PE 0603895C BMD System Space Program	0	0	27,666	35,093	46,849	56,183	133,617	157,117	456,525
PE 0603896C BMD C2BMC	0	246,852	258,913	294,627	300,847	282,615	267,275	269,420	1,920,549
PE 0603897C BMD Hercules	0	49,674	53,658	54,264	54,405	55,142	53,355	54,198	374,696
PE 0603898C BMD Joint Warfighter Support	0	54,935	48,787	50,428	54,086	56,603	58,890	60,206	383,935
PE 0603904C BMD Joint National Integration Center (JNIC)	0	110,629	104,012	106,985	111,542	111,947	113,592	115,287	773,994
PE 0603905C BMD Concurrent Test and Operations	0	23,159	0	0	0	0	0	0	23,159
PE 0603906C Regarding Trench	0	0	2,000	3,000	5,000	5,000	9,000	9,000	33,000
PE 0605502C Small Business Innovative Research - MDA	133,105	0	0	0	0	0	0	0	133,105
PE 0901585C Pentagon Reservation	14,874	15,527	6,058	6,376	4,490	4,725	4,801	4,877	61,728
PE 0901598C Management Headquarters - MDA	98,609	87,059	85,906	86,453	70,355	69,855	69,855	69,855	637,947

Project: 0602 Program-Wide Support

MDA Exhibit R-2A (PE 0603889C)

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