Missile Defense Agency (MDA) Exhibit R-2 RDT&E Budget Item Justification	Date: May 2009
APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE: **0603890C Ballistic Missile Defense Enabling Programs**

COST ($ in Thousands)	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015
Total PE Cost	416,937	402,778	369,145					
YX24 Systems Engineering & Integration	118,051	122,047	108,109					
YX28 Intelligence & Security	21,747	20,007	18,953					
YX29 Producibility and Manufacturing Technology	29,474	40,379	33,881					
YX30 BMD Information Management Systems	111,420	92,784	110,313					
YX31 Modeling & Simulation	91,080	89,976	51,282					
YX32 Safety, Quality and Mission Assurance	25,914	25,066	33,038					
ZX40 Program-Wide Support	19,251	12,519	13,569					

A. Mission Description and Budget Item Justification

The BMD System core functions are the foundational functions that provide the Missile Defense Agency with the critical processes to synthesize the varying Service Elements, capabilities and processes into a single integrated and operational Ballistic Missile Defense System. The core functions, embedded within a single program, enable the Missile Defense Agency to bring common program management and System Engineering functions up to the MDA level saving manpower, cost and ensuring commonality in key management areas. As an example, BMDS level System Engineering and Integration ensures that the BMD System level performance trades, can occur across the legacy Service systems and new BMDS and Service Components ensuring capability improvements through BMDS level integration of the Unifying Missile Defense Functions (UMDF). The core functions enable the BMD system to operate in an integrated, secure, and technologically collaborative capacity, in both equipment and proficiency. Specifically, these functions evaluate the methodology, threat, manufacturing maturity, technical safeguards, and mission assurance effectiveness independently, but also simultaneously assess whether the BMD System is able to maintain its integrity and superiority with advances in technology development, and function as an integrated system. The MDA core functions are:

- System Engineering and Integration
- Modeling and Simulation
- Producibility and Manufacturing
- Quality and Mission Assurance
- Intelligence and Security
- Information Management Systems

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Systems Engineering plays a lead role in engineering the integrated BMDS using Element and Component programs to enable the Warfighters' capacity to defend the United States and its friends and allies from ballistic missile attacks. Systems Engineering develops integrated BMDS capability improvements through the carefully engineered use of specific Element and Component functions that can not be developed or provided to the Warfighter without BMDS level control of system requirements. As the threat becomes increasingly sophisticated in its use of countermeasures, the Systems Engineering role includes designing integrated discrimination capabilities to stay ahead of the threat. As missile defense technologies continually advance and the threat changes, Modeling and Simulation evaluates the components' accuracy, efficiency and overall system performance in response to the existing threat and its changes. Manufacturing and Producibility provides crosscutting assessments to ensure the production equipment and processes being used for the BMD System are technologically mature, while applying common approaches and best value engineering principals across the BMDS. Quality, Safety, and Mission Assurance has the distinct role of providing the safety requirements throughout design, manufacturing and test processes as well as during system operation to achieve a safe and reliable BMD System. It is a cradle-to-grave role across the entire BMDS. Intelligence and Security core program provides the threat data necessary for the development of the BMDS. Accurate and timely threat data is necessary to enable technologically advanced system solutions and system changes to be provided to the Warfighter for a more capable BMDS. Security is also provided as a core function to apply the same level of system capability protection across the complete BMDS. Information management is vital to the efficient operation and safeguarding of all information in from development to fielding the BMD System.

A.1 System Element Description

(YX24) SYSTEMS ENGINEERING AND INTEGRATION (SE&I)

The Systems Engineering and Integration (SE&I) mission is to define, manage, and integrate all engineering development for the Ballistic Missile Defense System (BMDS). SE&I activities provide the technical expertise, tools, and facilities to develop an integrated, layered BMDS in a five-phased approach: 1) SE&I Planning/concept development, 2) Design and Specification, 3) Integration and Implementation, 4) Verification and Assessment, and 5) Operational Integration (fielding) for the defense of the United States, friends, allies and deployed forces. SE&I provides top-down, overall architectural direction through collaborative system engineering processes to ensure the BMDS functions as an integrated system. SE&I includes the Countermeasures/Counter-Countermeasures (CM/CCM) program which determines the range of feasible engineering approaches an adversary could use to defeat or degrade the BMDS, and develops conceptual countermeasures to realize those approaches.

(YX31) MODELING AND SIMULATION (M&S)

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The mission of the Modeling and Simulation (M&S) program is to engineer and deliver validated, integrated simulation solutions for the primary uses of Ballistic Missile Defense System (BMDS) Performance Assessment and Ground Test, with additional capability to support BMDS-Element integration, missile defense wargames and exercises (national and international), BMDS training, and BMDS concept analysis. In this role, M&S provides cost-effective and proactive tools to assess the fielded capabilities of the BMDS, analyzes and fosters accelerated integration of Element and component capability into the BMDS, and is a valuable training and planning tool for warfighting Concept of Operations and missile defense planning.

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

(YX29) PRODUCIBILITY AND MANUFACTURING TECHNOLOGY

Producibility and Manufacturing improves the design, integration, and assembly of the components used by the Ballistic Missile Defense Elements through producibility efforts that include, Design For Manufacturing and Assembly (DFMA), supply chain gap analysis, and changes to environmental laws and regulations. The identification of manufacturing risks is done through Engineering and Manufacturing Readiness Level (EMRL) Assessments. EMRLs are a systems engineering tool that employs widespread industry and BMDS Element interaction to analyze the maturity of manufacturing processes as a factor in the BMDS Risk Management Process. Producibility and Manufacturing conducts Industrial Capability Assessments (ICAs) across the BMDS Industrial Base in order to identify production gaps created by material supplier changes, loss of manufacturing base, and movement of US production overseas. From these assessments, a gap analysis is developed which focuses on methods that can be used to support our US original equipment manufacturers (OEMs), their supplier base, and other organizations that produce end items for the BMDS. This project funds a number of key investment areas: 1) Power Systems, 2) Radiation Hardening (Rad Hard), 3) Manufacturing Process Improvements, 4) Electro-Optics/Infrared (EO/IR), 5) Radar and RF, 6) Propulsion, 7) Advanced Materials and Structures, and 8) Anti-Tamper. In

each of these key investment areas, Producibility and Manufacturing conducts projects that provide key component and subsystem capabilities that will be incorporated into the applicable BMDS Element.

(YX32) QUALITY, SAFETY AND MISSION ASSURANCE (QSMA)

The MDA Quality, Safety, and Mission Assurance (QSMA) Directorate is responsible for MDA system-wide quality, safety, and mission assurance. QSMA maintains an agency-wide perspective to ensure both program and system Mission Assurance requirements are met to achieve a capable BMDS. QSMA provides practical and robust safety, quality and mission assurance policy, guidance, expertise and assistance to the BMDS and all Elements. Each MDA program has direct QSMA support to ensure that quality, safety and mission assurance is specifically addressed at all times. In addition, QSMA provides the program elements and their prime contractors, sub-contractors, and suppliers direct onsite support to meet emergent or surge safety requirements, and to meet MDA senior leadership requirements. Support includes experienced technical, non-advocate oversight on the design, development, test, manufacturing, integration and operations of critical facilities and suppliers.

(YX28) INTELLIGENCE AND SECURITY

This project funds three specific areas: 1) The Intelligence Requirements Division which provides a single integrated mission area focus that interfaces with the intelligence community to acquire collection and analysis of data on foreign threat missiles. MDA uses this information to provide support to the Ballistic Missile Defense System (BMDS) architecture design, testing, modeling and wargaming to reduce risk and improve system performance; 2) Counterintelligence (CI) Division, which conducts defensive CI activities to detect, identify, assess, exploit, penetrate, degrade and counter or neutralize Foreign Intelligence and Security Service (FISS) collection efforts, other intelligence activities, espionage, sabotage, sedition, subversion, assassination, and international terrorist activities directed against the MDA, its personnel, information, material, facilities, and activities worldwide; and 3) BMDS Security Assessment and Certification Directorate, which develops a comprehensive picture of Information Assurance/Computer Network Defense (IA/CND) architecture at all levels of BMDS. Together these efforts provide critical information regarding threat ballistic missile system capabilities (Intelligence); protection of personnel and activities from espionage and terrorism through active and passive activities (Counterintelligence); and BMDS system vulnerabilities (BMDS Security Assessment and Certification).

(YX30) BMD INFORMATION MANAGEMENT SYSTEMS

The MDA Director has established a multi-year strategy to realign and consolidate information technology resources that directly support our mission, test, and administrative systems. This strategy is designed to achieve secure systems that provide greater efficiency and effectiveness in

compliance with Federal mandates and DoD policies. The BMD Information Management Systems project includes all aspects of Information Technology.

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

Systems Engineering and Integration Program Budget Justification and Contribution to the Ballistic Missile Defense System (BMDS):

The Systems Engineering process, through its technical expertise, tools and facilities, plays a lead role in developing the warfighters' capability, both in equipment and proficiency. The Systems Engineering process is highly collaborative with weapons, sensors, command and control, battle management and communications as the foundation for ensuring unity of effort in the development of subsystems and architecture designs to deliver system-level capability. The Combatant Commanders are involved through the Warfighter Involvement Process (WIP) throughout all phases of the System Engineering process, providing input to develop components to greater levels of reliability, operational availability, maintainability and life-cycle affordability and identifying areas where design improvements in BMDS components and subsystems may be needed. Systems Engineering products optimize performance at the system level and further ensure that the assessment of the designed BMD System is based on sufficient ground and flight testing.

Modeling and Simulation Program Budget Justification and Contribution to the Ballistic Missile Defense System (BMDS):

Modeling and Simulation's distinct capabilities are spread throughout the BMDS elements and provide the Warfighter with a range of assessment capabilities within BMDS to include the evaluation of individual components and system-of-systems. Accredited system-level models and simulations anchored to real-world events provide an accurate and comprehensive assessment of the BMDS. Future developments will focus on the model and simulation framework, BMDS element models, threat assessments and phenomenology modeling. The success of the missile defense program rest with the certainty that the BMDS we employ has been assured of its effectiveness and efficiency to meet the Warfighter's needs.

Producibility and Manufacturing Technology Program Budget Justification and Contribution to the Ballistic Missile Defense System (BMDS):

Producibility and Manufacturing provides crosscutting BMDS manufacturing risk assessments, industrial capability assessments, and near term (1-3 year) producibility enhancements. Common, integrated programs across the BMDS Elements are provided to ensure mature industrial manufacturing capabilities are available to the Blocks through risk reduction, cost reduction/avoidance, and performance enhancement. Producibility and

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Manufacturing furthers efforts in commonality and spreads best practices for producibility and manufacturing across the BMDS Elements by cooperatively funding and leveraging efforts.

QSMA Budget Justification and Contribution to the Ballistic Missile Defense System (BMDS):

Quality, Safety and Mission Assurance efforts enable the development, testing and fielding of an effective, reliable, and safe missile defense capability. To ensure the BMDS can meet its performance, quality, safety, and mission assurance requirements, quality, safety and mission assurance principles and disciplines are being standardized and applied throughout each individual element and the BMDS. Implementation and maintenance of these principles and disciplines are essential to providing an effective war-fighting capability. Currently, there are over 27 MDA Assurance Representatives (MARs) located throughout the United States at major Government and supplier sites. MARs provide Defense Contract Management Agency (DCMA) and suppliers direct access to MDA. Further, they are the conduit to the MDA Director providing unfettered real-time insight into program operations through weekly reporting.

Intelligence and Security Program Budget Justification and Contribution to the Ballistic Missile Defense System (BMDS):

1) Intelligence: The MDA Intelligence Requirements Division acts as a clearing house for MDA's requirements for the Intelligence Community (IC) collection, analysis and production. The MDA Intelligence Requirements Division acts as agent for quality control and dissemination of IC products for all properly cleared Government and contractor personnel and provides feedback to the IC on subsequent questions, issues and other needs resulting from IC reporting. The intelligence process begins when the IC collects and analyzes data on foreign threat missiles. The increased pace of rogue nation missile development, i.e., Iran and North Korea, requires increasing intelligence collection, analysis, and production of data on foreign threat missiles. Additionally, the nature of the 21st century world-wide missile testing is reducing available signatures and warning of test events. Therefore, enhanced collaboration with the IC is crucial to fielding a missile defense capability. Resulting threats and threat changes are given to the BMDS System Engineer who uses the threats to develop and change the BMDS. Through this activity, threat data are provided to support BMDS architecture design, testing, modeling, and wargaming. This information reduces the risk and improves system performance. It enables MDA Program Managers to achieve a sufficiently accurate understanding of the threat environment to respond to relevant capabilities of immediate importance, make informed decisions and invest limited resources on countering the most significant aspects of potential adversary capabilities. Other aspects of the Intelligence program are designed to gain access to, and leverage, unique, IC developed, owned and operated capabilities for the benefit and advocacy of the Missile Defense Community. Many are highly classified and require both access and expertise to exploit. The Program supports the overarching MDA objectives of BMDS on-Alert, continuing incremental development, and enhanced BMDS capabilities.

2) Counterintelligence (CI): Pursuant to DoD Directive O-5240.2 (CI), MDA's CI Division conducts defensive CI activities to detect, identify, assess, exploit, penetrate, degrade and counter or neutralize Foreign Intelligence & Security Service (FISS) collection efforts, other intelligence activities, espionage, sabotage, sedition, subversion, assassination, and international terrorist activities directed against the MDA, its personnel, information, material, facilities, and activities worldwide.

3) BMDS Security Assessment and Certification Directorate: This directorate is responsible for executing the mission of the BMDS Information Assurance (IA) Functional Manager (FM) and enhancing the cyber infrastructure of the MDA BMDS. In this capacity, the directorate fulfills the role of the DoD policy mandated role of the Information Assurance Manager (IAM) for the overarching BMDS. As such, this directorate is responsible for assisting the BMDS to manage and deploy IA/CND solutions and to fulfill DoD Certification and Accreditation processes (DoD 8510.01), while enhancing the robustness and resilience of the cyber infrastructure. To fulfill this role, the directorate works in concert with IA engineers and IA managers to obtain a comprehensive picture of the overall IA/CND architecture at all levels of the BMDS, then influence the design by 1) identifying opportunities to implement Defense-in-Depth (DiD) within planned development cycles (Blocks); 2) providing oversight, coordination and management of key IA management processes and policy-mandated IA roles and responsibilities; 3) providing contract acquisition support to BMDS Elements ensuring IA is addressed throughout the procurement process, and; 4) interfacing with the IC to define cyber security threats relevant to the BMDS.

BMD Information Management Systems Budget Justification and Contribution to the Ballistic Missile Defense System (BMDS):

The BMD Information Management Systems Project integrates and supports every aspect of the BMD System (BMDS) by providing a secure and reliable Information Management/Information Technology (IM/IT) infrastructure and services necessary to enable the BMDS Elements and operators to collaborate and share information which is essential to accomplishing the complex integrated BMDS mission.

A.3 Major System Element Goals

SE&I Major Program Goals:

Engineer the integrated and layered BMD System

- Define, design, integrate BMD System using Unifying Missile Defense Functions (UMDFs)
- Provide technical direction to Element and Component developers

- Develop the Adversary Threat Capability documentation
- Produce controlling specifications and analysis to drive the BMD System design
- Lead collaborative and cross- Element and -Component engineering
- Provide technical support for the Operational BMD System
- Provide engineering development for an International Global BMD

Verify and Assess through testing the BMD System performance and capabilities

- Develop BMD System performance metrics and critical factors
- Support BMD System testing, develop test objectives
- Provide BMD System capabilities and limitations support

Perform analysis of alternatives

- Provide detailed analysis to support MDA Leadership and US policy decisions
- Provide detailed analysis to support MDA Leadership Programmatic decisions

Create future BMD System Architectural Options

- Develop architecture frameworks and operational concepts
- Establish technical roadmaps focusing on unified missile defense functions
- Establish and enforce engineering standards

Modeling and Simulation Program Major Program Goals:

- Reduce integration lead times, mitigate schedule risk and enable higher tempo of Performance Assessment, Test and Fielding Events through rigorous M&S Requirements Engineering
- Continue Product Line development, sustainment, maintenance and product support for:
  - Core Extended Air Defense Simulation (EADSIM)

- Missile Defense Space warning Tool (models validated space-borne assets of BMDS)
- Threat Modeling Simulation System
- BMD International Simulation

Producibility and Manufacturing Technology Program Major Program Goals:

- Producibility and Manufacturing plans to demonstrate the manufacturability and producibility of sensor subsystems/components in a flight experiment planned for FY10. This flight experiment will involve a maneuverable sensor with a radiation tolerant telescope, and a next generation Inertial Measurement Unit (IMU). The flight experiment will utilize common power and data bus interfaces in order to demonstrate the use of standards to achieve commonality.
- To improve engineering and manufacturing readiness of BMDS sensor systems, Producibility and Manufacturing is investing in the next generation of sensor technologies. For BMDS kill vehicles Producibility and Manufacturing has developed a strategy for incorporating lower cost materials and subsystems/components (cryocoolers, focal plane arrays, telescope materials) to improve missile affordability and performance. For ground-based sensors, Producibility and Manufacturing is investing in technologies to improve the performance and reliability of sensor components while reducing component costs.
- Producibility and Manufacturing is investing in Divert and Attitude Control System components and material development in order to reduce manufacturing lead times and improve system performance. The materials development/characterization program will provide the next generation of high temperature composites/insulators and ablative components for rocket motors and engines. Component and subsystem risk reduction testing will demonstrate improvements in technical and manufacturing readiness of these components for missile defense applications.
- Miniaturization and radiation hardening of Next generation inertial measurement units are needed for missile defense applications. Producibility and Manufacturing is maturing technologies to enable miniature, radiation hardened IMUs for interceptors and satellites.

Quality, Safety and Mission Assurance Major Program Goals:

- Improve Supplier / Contractor reliability through a comprehensive quality, safety and mission assurance (QSMA) program that employs Agency wide requirements for design, test, manufacturing, quality, safety and sustainment; provides on-site support to ensure compliance to imposed requirements, and maintains a comprehensive audit program to police overall Supplier performance.

- Provide Agency leadership a non-advocate, independent organization that promotes industry best practices in Agency and Supplier operations.
- Establish and maintain a BMDS parts, materials, and process program that enables MDA to ensure the reliability of critical, space, airborne, sea, and ground assets while also protecting those assets from nefarious activity such as counterfeit parts, prohibited parts and materials, and sloppy process and procedures.
- Provide the Agency a Safety and Occupational Health Program that meets all Federal and DOD regulations.
- Create collaborative efforts with other Agencies to obtain lessons learned and leverage resources.

Intelligence and Security Program Major Program Goals:

- Ensure the intelligence community understands, accurately and timely fulfills MDA's current and future prioritized intelligence requirements; broker BMDS test support collection requirements with the intelligence community and that MDA's intelligence needs and finished intelligence requirements are understood while ensuring the intelligence community is involved in technical interchange meetings, etc.
- Continue the federated approach to supporting MDA by leveraging available national and DoD CI resources to ensure CI products and services are fully integrated into all RDT&E programs and activities to protect classified information and critical technologies and to support and protect MDA and BMDS personnel, facilities, information and activities from threats posed by FISS, terrorism and criminal activities.
- Define information assurance for Continental United States (CONUS) and non-CONUS based on BMDS assets consistently, comprehensively and definitively. Define IA/CND and cyber security infrastructure intelligence requirements to focus intelligence community collection, analysis and production to target MDA/BMDS vulnerabilities; definitize and incorporate information assurance into the systems engineering process.

BMD Information Management Systems Major Program Goals:

- Provide operational support to critical day-to-day Information Technology requirements for Agency missions.
- Implement a new information technology baseline in Huntsville, AL; Dahlgren and Alexandria, VA; and Ft Belvoir, VA.
- Begin and finalize new facilities build-out of IT services and transition of core services as part of BRAC transition.

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A.4 Major Events Schedule and Description

Major Event	Project	Timeframe	Description
Contract Activity			
Sys Eng & Integration (SE&I) General Milestones			
Subsystem Requirements Review	YX24	1Q FY 2009	
Block 2.0 Partial Capability Delivery Support	YX24	2Q FY 2010	
Block 3.1/3.2 Partial Capability Delivery Support	YX24	2Q FY 2010	
Block 5.0 Partial Capability Delivery Support	YX24	2Q FY 2010	
Element Preliminary Design Reviews	YX24	2Q FY 2010	
Engineering Reviews for baselines covering Block 2.0 thru. Block 5.0	YX24	3Q FY 2010	
Products			
DSA	YX31	4Q FY 2008	
MDST	YX31	4Q FY 2008	
DSA	YX31	1Q FY 2009	
Single Stimulation Framework	YX31	1Q FY 2009	
DSA	YX31	2Q FY 2009	• Version 9.0
ISIM	YX31	2Q FY 2009	• Version 5.0
MDST	YX31	2Q FY 2009	• Version 11.0
TMSS	YX31	2Q FY 2009	
MDSE	YX31	3Q FY 2009	• Version 8.3
Single Stimulation Framework	YX31	3Q FY 2009	
TMSS	YX31	3Q FY 2009	
MDSE	YX31	4Q FY 2009	
DSA	YX31	2Q FY 2010	• Version 10.0
ISIM	YX31	2Q FY 2010	• Version 6.0
MDST	YX31	2Q FY 2010	• Version 12.0
TMSS	YX31	2Q FY 2010	• Version 8.0
DSA	YX31	3Q FY 2010	
TMSS	YX31	3Q FY 2010	
DSA	YX31	4Q FY 2010	
Event Support			
Exercises	YX31	1Q FY 2009	
Ground Test	YX31	1Q FY 2009 - 2Q FY 2009	
Training	YX31	2Q FY 2009	
Wargames	YX31	2Q FY 2009	
Ground Test	YX31	4Q FY 2009	

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Major Event	Project	Timeframe	Description
Performance Assessments	YX31	4Q FY 2009	
Ground Test	YX31	1Q FY 2010 - 2Q FY 2010	
Training	YX31	2Q FY 2010	
Ground Test	YX31	3Q FY 2010	
Ground Test	YX31	4Q FY 2010	
Performance Assessments	YX31	4Q FY 2010	
Milestones			
BMD System Specification (BMD SS)	YX24	2Q FY 2009	
Technical Objectives & Goals / Updates	YX24	3Q FY 2009	
BMD System Specification (BMD SS)	YX24	2Q FY 2010	
Technical Objectives & Goals / Updates	YX24	3Q FY 2010	
EO/IR			
Flight Exp. (FE-2) Planning and Development	YX29	4Q FY 2010	

B. Program Change Summary	FY 2008	FY 2009	FY 2010	FY 2011
Previous President's Budget (FY2009 PB)	413,934	432,262	482,947	
Current President's Budget (FY2010 PB)	416,937	402,778	369,145	
Total Adjustments	3,003	-29,484	-113,802	
Congressional Program Reductions	0	-29,484	0	
Congressional Rescissions	0	0	0	
Total Congressional Increases	0	0	0	
Total Reprogrammings	9,708	0	0	
SBIR/STTR Transfer	-6,705	0	0	
Adjustments to Budget Years	0	0	-113,802	

The FY08 increase of $3,003 million includes SBIR/STTR transfer and MDA reprogrammings.

The FY10 decrease of $113,802 million reflects MDA programmatic changes to support BMDS priorities.

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COST ($ in Thousands)	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015
YX24 Systems Engineering & Integration	118,051	122,047	108,109					
RDT&E Articles Qty	0	0	0					

Note:

A. Mission Description and Budget Item Justification

In support of the Director's Strategic Intent and pending legislation, Systems Engineering and Integration's (SE&I) goal is to continue the development and improvement of the integrated BMDS. The Agency will perform the analysis and engineering trades to support the Quadrennial Defense Review (QDR), and policy decisions on European BMD. Our engineering focus will shift to enhancing regional BMD and system improvements to support earlier BMD engagements. The SE&I provides analysis, decision-making and planning activities for real-world operations in support of the White House, Joint Staff, Military Services, NATO, Combatant Commanders (COCOMs) (EUCOM, PACOM, CENTCOM, STRATCOM (Military Utility Assessment), Operational Test Authority, DOT&E, Allies, and others.

The SE&I is the single team that leads and executes this process and applies its technical expertise, tools, and facilities in a collaborative effort that cuts across many disciplines and specialties to realize this goal and is also used to assist in the Quadrennial Defense Review (QDR) development. This disciplined engineering process consists of setting technical objectives and goals, understanding the threat, exploring alternative system design concepts, performing design trades to inform the selection and implement the best design, verifying that the specified design is properly built, integrated and fielded, and then assessing how well the system meets the goals. This is accomplished in a collaborative engineering environment in close partnership with key stakeholders such as the Element developers, Combatant Commands, and international partners. To provide context for the design process we: define the adversary capabilities and operating environments that could be used to defeat or degrade the BMDS; identify where performance gaps exist in Ballistic Missile Defense System (BMDS) capabilities; and determine what improvements are required to close those gaps. It is critically important that we provide top-down, overall architectural direction for system development and assess compliance with those requirements to ensure the BMDS functions as a seamless fully integrated system. To accomplish this, BMDS capabilities are matured using by developing system ``builds``. Each system build progresses through a series of rigorous requirements, design, and management review boards with pre-defined entrance and exit criteria. These events take place at both the system and element level. SE&I also stays focused on opportunities to insert and integrate high-payoff advanced technologies over time to: upgrade system components (sensors, weapons, & C2BMC); improve BMDS overall performance; expand our protection coverage; increase military utility; and improve effectiveness against increasingly sophisticated and proliferating threats.

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The systems engineering process which defines required system-wide BMD behavior, supports and evaluates Element and component system designs, and assesses and verifies system capability across the entire MDA Block process, involves five-phases: 1) Systems engineering planning/concept development; 2) design and specification; 3) integration 4) test and verification and assessment; and 5) operational integration (fielding). Fundamental to the SE&I approach is development, coordination, and dissemination of fully vetted products at each stage of the SE&I process. These products document and communicate key information such as: technical goals and objectives, design trades and resulting decisions; design and interface requirements; integration plans and schedules; assessment and test results and fielding plans. BMD Systems Engineering provides significant and thorough guidance through the System Description Document and System Specifications for elements to design, build, integrate and test BMDS components. These products optimize performance at the system level and further ensure that the assessment of the designed BMD System is based on sufficient ground and flight testing. System Engineering monitors element and component compliance with BMD System level requirements through a series of requirements and design reviews both at the system and element levels. The Interface Control Documents (ICDs), the Capability Assessment Plan (CAP), the Modeling and Simulation Master Plan, and the Master Integration Plan provide additional guidance to the BMDS elements and components. System engineering has the key role in BMD System test development through the development and use of the Critical Engagement Capabilities (CEC). The CECs ensure that the focus of the BMDS testing is on the data necessary not only to show proper system operation, but also to provide solid validation, verification and assessment data for digital simulations of the BMDS. These models along with ground and flight tests will support the DOT&E fielding decisions.

System Engineering collaborates with the Operations Directorate on the system content and activities described in the BMDS Master Plan (BMP). In conjunction with the Test Directorate, System Engineering supplies test objectives, critical engagement conditions, and empirical measurement events, and collaborates on the Integrated Master Test Plan (IMTP). A brief description of some of the remaining, but as essential, System Engineering products follows:

- Adversary Capabilities Document (ACD) - provides an engineering threat reference that details overall feasible threat space and representative Systems including countermeasures
- Concept Descriptions (CDs) - describe a proposed concept to enhance the BMDS in sufficient detail for evaluation
- Achievable Capabilities List (ACL) - a determination based on technology maturity, affordability, and emerging threat assessments of what capabilities desired by the warfighter are achievable
- Capability Planning Specification (CPS) - documents the preliminary requirements for new programs and specific upgrades for the system
- Adversary Data Package (ADP) - provides common and consistent threat data including countermeasures to drive BMDS weapon system designs, ground and flight tests, digital simulations, and pre-mission analysis.
- Analysis Guidance Document (AGD) - sets common analysis scenarios for system/element/component assessments and evaluations

- Element/Component Characterization for Analysis (ECCA) - a database of system-level performance parameters that ensure correct and consistent medium fidelity analysis inputs across the Agency
- System Engineering Assessment Report (SEAR) - annual end-of-year report on progress toward achieving capability objectives

MDA has a set of Unifying Missile Defense Functions (UMDFs), which increase the effectiveness of the BMD System (including probability of engagement success, increase in defended area and raid size capacity, additional redundancy of architecture, unity of command) through the integration of MDA developed capabilities. These UMDF efforts are Sensor Registration (reporting of sensor errors / biases), Correlation (ensuring the information from multiple sensors seeing a threat relates to the same object), System Track (creating a single engageable track of a threat from multiple reports provided by different land, sea, and space based multiple sensors), Discrimination (identifying object details to determine the target from debris or decoys), Battle Management (combining the best sensors and shooters to ensure the highest probability of a kill), Hit / Kill Assessment (determining if the target selected was destroyed after missile impact), and Communications (providing the worldwide connection of sensors and shooters to command authorities). UMDFs are implemented across the BMDS elements to create and utilize system level data and decisions that allow Combatant Commanders the ability to automatically and manually optimize sensor coverage and interceptor inventory to defend against all ranges of ballistic threats.

We ensure that as capability is added to the BMDS, the SE&I process for developing new capabilities is a top-driven, integrated and collaborative approach that stays fully focused on overall BMDS mission objectives and desired system performance. As these new capabilities are defined and requirements are allocated to the sensor, weapon and Command and Control Battle Management Communications elements, a cadre of BMDS engineers works concurrently with the elements to produce the most effective solutions.

The best way to dissuade the proliferation of ballistic missiles and deter their employment is through compelling testing and demonstration of integrated ballistic missile defense capabilities--weapons, sensors, and command and control, battle management and communications (C2BMC). Integrated BMD capabilities draw on space-, land-, and sea-based assets operated by multiple Services to provide the most accurate track of the enemy missile as well as a more diverse and effective set of weapon options for the Combatant Commander to defeat the attack-all connected by a unifying C2BMC system. For example, integrating autonomous missile defense elements tremendously expands the area protected and increases the protection levels without incurring additional force structure costs.

Integrating BMD capabilities can result in an effort funded in one Program Element being critical to success of efforts in other Program Elements. We refer to these connections as ``interdependencies``. Throughout the budget justification material, we have attempted to highlight System Engineering's interdependencies with the MDA directorates and the BMDS elements and components in order to explain fully the relationship between different parts of the proposed program.

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date: May 2009
APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE: 0603890C Ballistic Missile Defense Enabling Programs

B. Accomplishments/Planned Program

	FY 2008	FY 2009	FY 2010	FY 2011
Future Concepts and Planning	24,583	24,707	5,585	
RDT&E Articles (Quantity)	0	0	0	

BMDS Future Concepts and Planning performs the first phase of the systems engineering process, planning/concept development. The planning process includes synthesis of emerging technology and concept input; assessment of these concepts against Agency metrics and goals and adversary capabilities using gap analysis; and production of formal Concept Descriptions (CDs). Affordable concepts demonstrating the most potential for improving BMDS effectiveness are integrated into BMDS program planning and documented in the Ballistic Missile Defense System Description Document for future capabilities. Capability Planning Specifications (CPSs) are produced for documenting precursor requirements for new programs and specific upgrades which improve overall BMDS ability to defeat adversary capabilities.

BMDS Future Concepts and Planning assesses and directs the enterprise-wide lethality program which ensures lethality, post-engagement assessment (miss/hit/kill assessment), collateral effects (such as debris) and consequences (identified for use by other agencies to determine management/mitigation strategies) are accounted for throughout the SE&I process. Lethality requirements are detailed in the Design and Specification documents, verified through system level test and verification objectives, and assessed as part of the BMDS performance assessment process.

FY08 Accomplishments:

- Developed BMDS European Capability planning data and worked with Element and Component program offices and Fielding Deputate to establish European Capability program of record.
- Developed nine Capability Planning Specification documents to support future BMDS Element/Component development/upgrade activities.
- Executed the approved Corporate Lethality Plan.
- Delivered the Technical Objectives and Goals (TOG) Version 2.0, which provided top level goals and metrics used to judge system capability and progress.
- Worked with the Technology Development community to ensure technology investments are prioritized and aligned to address BMDS-level capability needs.
- Updated the MDA System Engineering Plan.
- Worked with Aegis BMD to develop Missile Systems Requirements Document for System Capability Demonstration SM-3, Block IIA.

- Developed Quality of Service (QoS) concept and initial QoS work for Aegis 4.0.1 and Wildcat.

FY09 Planned Program:

- Update European Capability plans.
- Develop/update top level capability descriptions and Capability Planning Specifications for future BMDS capabilities.
- Execute the approved Corporate Lethality Plan.
- Work with the technology development community to ensure technology investments are prioritized and aligned to address BMDS-level capability needs.
- Conduct the 2009 Summer Study that looks at specific performance gaps and possible solutions for mitigation.
- Continue QoS work for other sensors

FY10 Planned Program:

- Develop AEGIS 5.1 SM-3 Blk IIA, Land Based SM-3, AEGIS 5.2 with Far Term Sea-Based Terminal (FTSBT)
- Execute the approved Corporate Lethality Plan
- Update Technical Objectives and Goals (TOG) measurement standards
- Continue QoS work for other sensors

	FY 2008	FY 2009	FY 2010	FY 2011
Countermeasures/Counter-Countermeasures (CM/CCM)	19,000	15,056	2,000	
RDT&E Articles (Quantity)	0	0	0	

The Countermeasures/Counter-countermeasures (CM/CCM) program conducts tailored system engineering to support BMDS capability improvement and works collaboratively with the Threat Systems Engineering Team to synchronize and integrate adversary capability development efforts. These efforts ensure the representation of adversary capabilities is consistent with the MDA Adversary Capability Document. The Adversary Engineering efforts determine the range of feasible engineering approaches an adversary could use to defeat or degrade the BMDS, identifies gaps and risk in BMDS performance, and develops conceptual countermeasures to exploit these potential shortfalls. Adversary engineering is performed by two teams, each operating with a different perspective of adversary capabilities. The Red Team, restricted to using only information on the BMDS available from open sources, provides an outside perspective, analogous to an actual adversary. The Black Team develops countermeasures based on complete access to all technical and design data on the BMDS.

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date: May 2009
APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE: 0603890C Ballistic Missile Defense Enabling Programs

The Blue Team, comprised of BMDS System, element, and component technical experts, performs integrated performance and risk assessments of the BMDS against the projected adversary capabilities and conceptual countermeasures, identifies and characterizes counter-countermeasure options to mitigate BMDS risks posed by these adversary capabilities and countermeasures, and performs the system-level engineering required to identify the BMDS baseline changes to implement and integrate the options into the operational system baseline. An independent team of senior experts, the White Team, reviews the adversary capabilities and conceptual countermeasures posed by the Black and Red Teams. Risk assessments and mitigation approaches presented by the Blue Team; presents their independent assessments of performance risks associated with countermeasures to the MDA Director; and recommends priorities for MDA investments in counter-countermeasures that have a strong potential to mitigate these risks. This effort has been highly successful in previous years, allowing funds to be diverted to concentrate on implementation of BMDS Capability improvements.

FY08 Accomplishments:

- Delivered engineering descriptions for conceptual midcourse countermeasure suites to support risk assessments of the BMDS Discrimination Strategy.
- Provided independent assessments and recommendations to the MDA Director on the BMDS Discrimination Strategy being pursued to achieve robust performance against adversary countermeasures.
- Analyzed design trades and initial engineering to support development of the specifications and standards for the BMDS Discrimination Architecture evolutionary capability spirals which enable implementation of the BMDS Discrimination Strategy.
- Completed study of alternative advanced discrimination techniques for potential demonstration of capabilities.

FY09 Planned Program:

- Complete the discrimination and lethality enhancement study of changes to the BMDS Technical Baseline and engineering trades to enhance existing BMDS integrated system discrimination capabilities.
- Continue characterization of adversary countermeasures capabilities and phenomenology related to design, employment, and performance of countermeasures to Multiple Kill Vehicles and forward-based radars.
- Complete study on the lethality of multiple kill vehicles and potential advanced discrimination techniques to improve BMDS lethality.

FY10 Planned Program:

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date: May 2009
APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE: **0603890C Ballistic Missile Defense Enabling Programs**

- Initiate assessment of BMDS capabilities in regional engagement scenarios against short to intermediate range adversary ballistic missiles.
- Conduct assessments of BMDS performance against projected adversary capabilities and conceptual countermeasures to the BMDS Discrimination Architecture posed by the Black Team to identify and evaluate performance risks and gaps.
- Provide independent assessments and recommendations to the MDA Director on the BMDS Discrimination Architecture being pursued to achieve robust performance against adversary countermeasures and regional engagements.

	FY 2008	FY 2009	FY 2010	FY 2011
BMDS Design and Specifications	11,882	12,376	24,242	
RDT&E Articles (Quantity)	0	0	0	

BMD System Design and Specification conducts the second phase of the SE&I process, using the data developed during the Planning process, and collaborative engineering with Elements and components to develop the BMD System Specification and interface requirements documented in the integrated Ballistic Missile Defense System Specification and Interface Control Documents (ICDs). Using standard, commercially available system engineering tools, Design and Specification develops, defines and specifies in collaboration with the BMDS elements and components the detailed BMDS design, including functional decomposition and allocation; timing, error, and performance requirements; specialty engineering design constraints and considerations; information and data exchange requirements; and BMDS core standards identification and adherence. Both trade studies and performance analysis must be conducted and managed by SE&I at the BMDS level to ensure the proper BMDS design architecture and specifications across the various Element and Components. The BMDS design architecture, BMD System Specifications, and system level ICDs provide a common, executable set of requirements and design parameters to direct Element design and component specification development that drive the detailed design and integration across the participating Elements. The Design and Specification activities are then culminated in the System/Subsystem Requirements Review to ensure technical execution and understanding to realize the integrated BMDS reflected in the BMDS design. The Design and Specification efforts support the detailed engineering needed to realize the Unifying Missile Defense Functions (UMDFs) to increase the effectiveness of the BMD System through the integration of MDA developed capabilities.

FY08 Accomplishments:

- Continued technical evaluation of emerging adversary capabilities to be included in future Adversary Data Packages.
  - Delivered ADP for BMDS Build C, with discrimination addendum
  - Delivered ADP for BMDS Build D, with European Capability addendum

- Developed System Specifications, associated interface requirements, and core standards:

- Developed the Ballistic Missile Defense System Description Document update which documents the concepts demonstrating the most potential for improving BMDS effectiveness and integrates them into BMDS program planning.
- Developed the Integrated Build D BMD System Specification and approved it at the Director's level.
- Served as Technical Baseline champion to support MDA Corporate Board Decision process.

- Conducted Engineering Reviews to include System Capability Reviews, System Requirements Reviews, In-process Technical Reviews, etc., for baselines covering Block 1.0 through Block 5.0 under the new block structure:
  - Conducted System Design Review following Element Preliminary Design Reviews to review the maturity of the technical baseline and plans for integration, test and verification prior to execution.

- Conducted engineering analyses and performed trade studies for system design and implementation products to include System Specification, Interface Control, Target Capabilities Specification, Information Exchange Requirements and Design Parameters Experiments.

FY09 Planned Program:

- Refocus integrated Build C and D on regional conflicts.
- Conduct the Subsystem Requirements Review for integrated Build D.
- Conduct BMDS European Capability Subsystem Requirements Review, Preliminary Design Review, and Critical Design Review.
- Continue technical evaluation of emerging adversary characteristics to be included within future Adversary Data.
- Develop System Specifications, associated interface requirements, and core standards:
  - Draft and adjust the Ballistic Missile Defense System Description Document update which documents the concepts demonstrating the most potential for improving BMDS effectiveness and integrates them into BMDS program planning.

- Conduct engineering analyses and perform trade studies for system design and implementation products to include System Specification, Interface Control, Target Capabilities Specification, Information Exchange Requirements and Design Parameters Experiments.
- Develop Specification Change Notices to Integrated Build D (e.g., SM-3 Missile Block IIA, Multi-Kill Vehicle, and Far Term Sea-Based Terminal).
- Serve as Technical Baseline Champion to support MDA Corporate Board Decision process

FY10 Planned Program:

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date: May 2009
APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE: **0603890C Ballistic Missile Defense Enabling Programs**

- Conduct Engineering Reviews for baselines covering Block 2.0 through Block 5.0 under the new block structure:
  - Conduct System Design Review following Element Preliminary Design Reviews to review the maturity of the technical baseline and plans for integration, test and verification prior to execution.

- Continue technical evaluation of emerging adversary characteristics to be included within future Adversary Data.
- Develop System Specifications, associated interface requirements, and core standards:
  - Draft and adjust the Ballistic Missile Defense System Description Document update which documents the concepts demonstrating the most potential for improving BMDS effectiveness and integrates them into BMDS program planning for Block-specific requirements.

- Conduct engineering analyses and perform trade studies for system design and implementation products to include System Specification, Interface Control, Target Capabilities Specification, Information Exchange Requirements and Design Parameters Experiments.
- Serve as Technical Baseline Champion to support MDA Corporate Board Decision process.

	FY 2008	FY 2009	FY 2010	FY 2011
Integration and Assessment	23,460	25,424	25,551	
RDT&E Articles (Quantity)	0	0	0	

Integration and Assessment performs the integration and implementation, test verification and assessment, and operational integration (fielding) phases of the systems engineering process. Integration and Assessment comprises various engineering activities within a single structure:

Integration and test describes those system engineering activities and events required to structure and test new block functionality as an integrated, seamless, end-to-end BMD capability composed of Elements and components working together to effect a ballistic missile defense engagement. As part of integration and test, SE&I builds a time-phased Master Integration Plan that defines integration phases for incremental Block capabilities and allocates the functionality captured in the BMD system specification to those integration phases. SE&I also defines the System test requirements for BMD Elements and Components and incorporates them into the Test organization's Integrated Master Test Plan and the system engineering Capabilities Assessment Plan. Integration and test includes participation in Element level design reviews and system design reviews to ensure BMDS specifications are being properly implemented. In addition during integration and test SE&I conducts routine program execution and technical reviews with MDA leadership. Engineering studies and analysis support the allocation of test requirements to test events, design of test architectures, and generation of appropriate scenarios to test the allocated functionality.

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date: May 2009
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Test and verification ensures the ``as built`` system is compliant with the system specification and assesses performance of the delivered capability. During the test planning and execution phase, SE&I provides the needed system engineering support to the Test organization by ensuring tests are appropriately planned, test objectives are developed, critical engagement conditions, and empirical measurement events are identified, test scenarios are certified, and ground test models are accredited for use. SE&I performs test configuration management, assesses test risks, and tracks and resolves anomalies occurring in ground testing to reduces flight test risks. SE&I engineers and analysts collect and analyze data required for system verification, assessment and model validation. Emerging BMDS block capabilities are critically assessed against the established Technical Objectives and Goals. Together with Military Utility Assessments (MUA) and operational test and evaluation assessments (OTA), the warfighter obtains technical knowledge of the system's capabilities that facilitates development and deployment decisions by the Department of Defense. The assessment of the BMDS is highly dependent on analysis and grounded in the use of accredited system models. Ground and flight tests data anchor system models which in turn are used to determine the effectiveness of the system under realistic scenarios.

System verification is accomplished through a methodical allocation and trace of all system-level requirements to the specifications of MDA elements and components, and the roll up of element and component verification back to the system level. Additionally, SE&I identifies system issues during test and verification activities and assigned, tracks and reports progress toward resolution until closed by the System Engineering Integration Council. SE&I reports the status of Verification, Test Performance Assessment and open System Issues periodically during the year to support readiness reviews for delivery of incremental block capability to the War Fighter, and provides an a assessment report each January to summarize the verification and assessment activities of the previous year.

Operational Integration includes the link between the warfighting community and the Systems Engineering team and provides sustaining engineering and analytical services for support, configuration management, operations and sustainment of BMDS capabilities before, during and after transition of fielded capability. During 2007, SE&I stood up a permanent on-site presence in the Warfighter Support Center to enhance our ability to provide JFCC-IMD quick responses to BMDS operational capability questions. This capability has been extensively used throughout 2008. Additionally, the transition of an available defensive capability to the warfighter is facilitated by advocating user-requested changes and modifications to the designed system through the Prioritized Capabilities List, Modification Request Lists and the Warfighter Involvement Process. The SE&I group supporting Operational Integration processes and tracks operational configuration baseline changes through the Program Change Board.

FY08 Accomplishments:

- Supported Integration Task Forces charged with facilitating the design, integration, testing, and fielding of cross-cutting integrating capabilities (e.g., CTTO, Discrimination Capability, Engage on System Track, etc.)

- Updated the Master Integration Plan (MIP) to incorporate changes in planned delivery of Block program content and the MIP Planning Allocation Matrix (PAM) tool to support integration, test, assessment, and verification activities
- Published an end-of-year System Engineering Assessment Report (SEAR) of BMDS performance demonstrated in BMDS-level testing and analyses
- Performed test configuration management, assessed test risks, and tracked and resolved anomalies occurring in ground testing thereby reducing flight test risks.
- Maintained Verification Ledger for monthly tracking of subsystem verification status
- Defined test objectives and provided scenario support for 18 system level test events, to include identification of critical engagement conditions and empirical measurements events.

FY09 Planned Program:

- Support integration task forces charged with facilitating the design, integration, test and fielding of cross-cutting integrating capabilities (e.g., CTTO, Discrimination Capability Engineering, and Engage on System Track.)
- Update the Master Integration Plan (MIP) to incorporate any changes in planned delivery of Block program content, and the MIP Planning Allocation Matrix (PAM) tool to support integration, test, assessment, and verification activities.
- Publish an end-of-year System Engineering Assessment Report (SEAR) of BMDS performance demonstrated in BMDS-level testing and analyses.
- Perform test configuration management, assessed test risks, and tracked and resolved anomalies occurring in ground testing thereby reducing flight test risks.
- Finalize the development of the System Specifications and associated interface requirements for Block 4.0 capabilities
- Define test objectives and provided scenario support for all system level test events, to include identification of critical engagement conditions and empirical measurements events.

FY10 Planned Program:

- Support integration task forces charged with facilitating the design, integration, test and fielding of cross-cutting integrating capabilities (e.g., CTTO, Discrimination Capability Engineering, and Engage on System Track.)

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date: May 2009
APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE: 0603890C Ballistic Missile Defense Enabling Programs

- Update the Master Integration Plan (MIP) to incorporate any changes in planned delivery of Block program content, and the MIP Planning Allocation Matrix (PAM) tool to support integration, test, assessment, and verification activities.
- Perform test configuration management, assess test risks, and track and resolve anomalies occurring in ground testing thereby reducing flight test risks.
- Finalize the development of the System Specifications and associated interface requirements for Block 4.0 capabilities
- Define test objectives and provide scenario support for all system level test events, to include identification of critical engagement conditions and empirical measurements events

	FY 2008	FY 2009	FY 2010	FY 2011
Systems Assessment and Analysis	14,756	14,710	21,698	
RDT&E Articles (Quantity)	0	0	0	

Systems Assessment and Analysis supports all phases of the systems engineering process. It is the only analytic team looking across system block/element/product programs to support the BMDS architecture and systems engineering process with force-on-force effectiveness analyses, identification of system level gaps and shortfalls to defeat adversary capabilities, formulation of system alternatives and their relative contributions, engineering trade studies, war-fighter/war-game analysis support and rapid responses to senior department (MDA Director/Deputy Director, Defense Secretary, State Department, National Security Council) questions and scenarios. Further, BMD System Assessment and Analysis provides engineering and analysis for new capability definitions, BMD System Specifications, and Test Planning and Certification, develop threat scenarios and accomplish trade studies for Element and system-level reviews, such as Technical Interchange Meetings (TIMs), System Requirement Review (SRR) and Sub System Readiness Review (SSRR). The Systems Assessment and Analysis team is responsible for maintaining and updating the BMDS Effectiveness Metric Standard (EMS), which defines requirements and recommendations for methodologies and practices used in the computation and presentation of performance effectiveness metrics. It also updates and maintains the Element/Component Characterization for Analysis (E/CCA), a database of system-level performance parameters that ensure correct and consistent analysis inputs. The Systems Assessment and Analysis team also provides the MDA Director with the technical basis and rationale for developing and balancing the integrated, layered BMDS.

FY08 Accomplishments:

- Conducted 474 system level performance analyses to support the BMDS architecture and system engineering process, respond to Warfighter requests, and address questions from the Executive Branch, Legislative Branch, and delegations from other nations.
- Developed 1,427 separate documents or briefings (including 102 Department of Defense, 24 Congressional, 41 other country, 3 Executive Branch).

- Updated the Element/Component Characterization Analysis (E/CCA).
- Continued to maintain and update the Effective Metric Standard (EMS) necessary for systematic presentation of alternatives to the Combatant Commanders
- Provided analysis in support of BMDS System Requirements Review

FY09 Planned Program:

- Continue to conduct system level performance analysis to support the BMDS architecture and system engineering process.
- Update the Element/Component Characterization Analysis (E/CCA).
- Continue to maintain and update the Effective Metric Standard (EMS) necessary for systematic presentation of alternatives to the Combatant Commanders

FY10 Planned Program:

- Continue to conduct system level performance analysis to support the BMDS architecture and system engineering process.
- Update the Element/Component Characterization Analysis (E/CCA).
- Continue to maintain and update the Effective Metric Standard (EMS) necessary for systematic presentation of alternatives to the Combatant Commanders

	FY 2008	FY 2009	FY 2010	FY 2011
Program Management	14,529	17,455	12,280	
RDT&E Articles (Quantity)	0	0	0	

Program Management provides overall program operations support to the Missile Defense Agency Systems Engineering and Integration (SE&I) program to include planning, programming, budgeting and execution system (PPBES) support, contract management, Congressional and Inspector General responses and correspondence, information and document management, policy and procedures, security, and government human relations functions. In addition, manages 2086 MDA Baselines (Development, Operational) and provide configuration control support for BMDS Headquarters level.

FY08 Accomplishments:

- Developed BMDS solutions to special projects (U.S. satellite shootdown)
- Responded to Congressional, Inspector General, and Department of Defense action
- Implemented consistent task management across all programs and contracts including performance indicators and regular reporting
- Provided project/program management and control for all SE&I
- Maintained Master Schedule for System Engineering products and coordinated with the overall MDA Integrated Program Policy
- Performed contracting officer's representative functions for all project support functions including contract cost oversight
- Maintained information library of all official engineering documents and briefings
- Directed development of engineering core competencies within the workforce

FY09 Planned Program:

- Develop BMDS solutions to special projects (N. Korean Space Launch)
- Respond to Congressional, Inspector General, and Department of Defense actions.
- Implement consistent task management across all programs and contracts including performance indicators and regular reporting.
- Provide project/program management and control for all SE&I.
- Maintain Master Schedule for System Engineering products and coordinate with the overall MDA Integrated Program Policy.
- Perform contracting officer's representative functions for all project support functions including contract cost oversight.
- Maintain information library of all official engineering documents and briefings.
- Manage personnel and MDA site and information security.
- Direct development of engineering core competencies within the workforce

FY10 Planned Program:

- Develop BMDS solutions to special projects
- Respond to Congressional, Inspector General, and Department of Defense actions.
- Implement consistent task management across all programs and contracts including performance indicators and regular reporting.
- Provide project/program management and control for all SE&I.
- Maintain Master Schedule for System Engineering products and coordinate with the overall MDA Integrated Program Policy.
- Perform contracting officer's representative functions for all project support functions including contract cost oversight.
- Maintain information library of all official engineering documents and briefings.
- Maintain information library of all official engineering documents and briefings

- Direct development of engineering core competencies within the workforce

	FY 2008	FY 2009	FY 2010	FY 2011
International	671	651	700	
RDT&E Articles (Quantity)	0	0	0	

International System Engineering supports the MDA Deputy for Engineering by identifying potential technical opportunities to strengthen/improve the globalization of the US BMDS through collaborative international partnerships. International Systems Engineering also provides technical content and analyses to support international discussions led by the MDA Deputy for International Affairs, integrated and interoperable with NATO. Technical analyses enable both the US and foreign partners to understand existing system capabilities, architectural performance, operational concepts, identification of potential opportunities for collaboration; and to also discuss, develop, and execute program plans supporting more effective defenses to defeat adversary capabilities.

FY08 Accomplishments:

- Provided system element data and the review of analysis results in support of NATO Missile Defense Studies
- Developed Israeli BMD Architecture
- Collaboratively developed David's Sling Weapon System Specifications
- As a result of detailed technical discussions with the United Kingdom, put them on a path for an at-sea trial of their Type 45 Destroyer and Sampson radar.
- Supported US-Japan systems integration projects through leadership of the Technical Sub-Group, participation in the SM-3 Block IIA Cooperative Development program (SCD), and execution of Joint System Analyses.
- Supported the development of the Republic of Korea-US joint analysis project.

FY09 Planned Program:

- Conduct discussions with new partners in the Middle East to support policy development and acquisition decisions given their growing interest in ballistic missile defense.
- Continue to support ongoing UK Sea Base, Japan, NATO Missile Defense Study, and future tasking stemming from the 2009 NATO Summit.
- Investigate areas where MDA and the United Kingdom can mutually benefit from participation in the Sensor Integration Research Analysis Network (SIRAN) program.

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date: May 2009
APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE: 0603890C Ballistic Missile Defense Enabling Programs

- Continue discussions with European partners on international flight test cooperation, architecture studies and analyses, and lethality/consequence of intercept issues.
- Support Germany's National Study that is examining the performance of the U.S. European Site architecture.
- Continue to support US-Japan systems integration projects through leadership of the Technical Sub-Group, participation in the SCD and execution of Joint System Analyses.

FY10 Planned Program:

- Conduct discussions with Middle East nations interested in population, critical asset and force protection from adversary ballistic missiles.
- Continue discussions with France, United Kingdom, Netherlands and other European nations on cooperation in future international flight tests, architectural studies and analyses, and lethality/consequence of intercept issues.
- Examine opportunities to improve BMDS capabilities through International collaboration.
- Continue to support US-Japan systems integration projects through leadership of the Technical Sub-Group, participation in the SCD and execution of Joint System Analyses.

	FY 2008	FY 2009	FY 2010	FY 2011
Threat	9,170	11,668	16,053	
RDT&E Articles (Quantity)	0	0	0	

Threat Systems Engineering supports the planning, design and specification, integration and implementation, and test verification and assessment phases of the systems engineering process. The Threat team uses intelligence community data to define adversary missile capabilities and directly supports the development of the BMD System Description Document and System Specification. Common threat engineering produces common and consistent adversary trajectory and signature data to enable Ballistic Missile Defense (BMD) System and sub-system concept and requirements, design, verification, and assessment. Common Threat data is contained in the Adversary Capability Document (ACD) and Adversary Data Packages (ADP) and drives BMDS ground tests, flight tests, digital simulations, and pre-mission analysis activities. Common Threat is also used to develop the BMD System Description Document and BMD System Specification, Support European and Russian cooperative activities, North Korean and Iranian pre- and post-flight launch analysis, and the enhanced Israeli Interceptor program. Threat systems engineering also develops scenarios for system and element utilization for compliance and assessment evaluations as part of the ADP development efforts.

FY08 Accomplishments:

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date: May 2009
APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE: 0603890C Ballistic Missile Defense Enabling Programs

- Developed an agency-wide Common Threat baseline in support of BMDS Block 1.0 through Block 5.0 designs, verification, and assessment.
  - Updated adversary missile capabilities and characterizations consistent with projected threat environment for the BMDS.
  - Produced the threat data required to support the BMDS Blocks 1.0 and 2.0 Ground Test 09 (GT-09), BMDS Performance Assessment 09 (PA-09), and FY-08 war games and exercises.
  - Produced scenario data to support BMD System Element and Component design and assessment.
  - Provided threat data for Israeli BMD Architecture development.
  - Developed threat data for special projects
  - Validated that BMDS test targets are threat representative

FY09 Planned Program:

- Develop an agency-wide Common Threat baseline in support of future BMDS design, verification, and assessment.
  - Complete the Build D ADP and draft the Build E ADP to update adversary missile capabilities and characterizations consistent with projected threat environment for the BMDS.
  - Produce all the threat data required to support the BMDS Ground Test 10 (GT-10), BMDS Performance Assessment 10 (PA-10), FY-09 war games and exercises, and the implementation of Improved BMDS discrimination.
  - Produce scenario data to support Element and Component design and assessment.
  - Develop threat data for special projects
  - Validates that BMDS test targets are threat representative

FY10 Planned Program:

- Develop an agency-wide Common Threat baseline in support of future BMDS design, verification, and assessment.
  - Continue to update adversary missile capabilities and characterizations consistent with projected threat environment for the BMDS.
  - Produce all the threat data required to support the BMDS Ground Test 11 (GT-11), BMDS Performance Assessment 11 (PA-11), FY-10 war games and exercises, and the implementation of Improved BMDS discrimination.
  - Produce scenario data to support Element and Component design and assessment.
  - Develop threat data for special projects
  - Validate that BMDS test targets are threat representative

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date: May 2009
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C. Other Program Funding Summary

	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	Total Cost
PE 0603175C Ballistic Missile Defense Technology	106,437	119,308	109,760						-
PE 0603881C Ballistic Missile Defense Terminal Defense Segment	1,034,478	956,686	719,465						-
PE 0603882C Ballistic Missile Defense Midcourse Defense Segment	2,198,664	1,507,481	982,922						-
PE 0603883C Ballistic Missile Defense Boost Defense Segment	503,475	400,751	186,697						-
PE 0603884C Ballistic Missile Defense Sensors	574,231	777,693	636,856						-
PE 0603886C Ballistic Missile Defense System Interceptors	330,874	385,493	0						-
PE 0603888C Ballistic Missile Defense Test and Targets	619,137	919,956	966,752						-
PE 0603891C Special Programs – MDA	193,157	175,712	301,566						-
PE 0603892C Ballistic Missile Defense Aegis	1,126,337	1,113,655	1,690,758						-
PE 0603893C Space Tracking & Surveillance System	226,499	208,923	180,000						-
PE 0603894C Multiple Kill Vehicle	223,084	283,481	0						-
PE 0603895C BMD System Space Program	16,237	24,686	12,549						-
PE 0603896C BMD C2BMC	439,997	288,287	340,014						-
PE 0603897C BMD Hercules	51,387	55,764	48,186						-
PE 0603898C BMD Joint Warfighter Support	45,400	69,743	60,921						-
PE 0603904C Missile Defense Integration & Operations Center (MDIOC)	77,102	106,040	86,949						-
PE 0603906C Regarding Trench	1,945	2,968	6,164						-
PE 0603907C Sea Based X-Band Radar (SBX)	155,244	146,895	174,576						-
PE 0603908C BMD Europ Intercep Site	0	362,007	0						-
PE 0603909C BMD Europ Midcourse Radar	0	76,537	0						-
PE 0603911C BMD European Capability	0	0	50,504						-
PE 0603912C BMD European Comm Support	0	27,008	0						-
PE 0603913C Israeli Cooperative	0	0	119,634						-
PE 0605502C Small Business Innovative Research BMDO	137,409	0	0						-
PE 0901585C Pentagon Reservation	5,971	19,667	19,709						-
PE 0901598C Management Headquarters – MDA	83,907	81,174	57,403						-

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

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date: May 2009
APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE: 0603890C Ballistic Missile Defense Enabling Programs

D. Acquisition Strategy

The execution of program activities is a collaborative effort involving subject matter experts composed of Government, Federally Funded Research and Development Centers (FFRDC), University Affiliated Research Centers (UARC), System Engineering and Technical Assistance (SETA), and Industry. This combination of resources forms an integrated team to accomplish the necessary engineering for the BMD System. In addition, extensive involvement by the major defense contractors responsible for the development of the BMDS, Elements, and major components is required. Countermeasure/Counter-Countermeasure initiatives will be executed by various labs and industry contractors through the MDA Advanced Systems directorate and BMDS Element Program Offices.

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date: May 2009
APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE: 0603890C Ballistic Missile Defense Enabling Programs

I. Product Development Cost ($ in Thousands)

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

Remarks

II. Support Costs Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2009 Cost	FY 2009 Award/ Oblg Date	FY 2010 Cost	FY 2010 Award/ Oblg Date	FY 2011 Cost	FY 2011 Award/ Oblg Date	Total Cost
Future Concepts and Planning										
Industry	CPAF	Boeing/ VA	14,866	14,825	1/3Q	3,351	1/3Q			33,042
CSS	CPFF	CSC/ VA	4,184	3,953	1/3Q	894	1/3Q			9,031
CSS	CPFF	Sparta/ VA	4,533	3,953	1/3Q	894	1/3Q			9,380
FFRDC/UARC	MIPR	MIT/LL/ MA	0	988	1/3Q	223	1/3Q			1,211
FFRDC/UARC	FFRDC	JHU APL/ VA	0	988	1/3Q	223	1/3Q			1,211
FFRDC/UARC	MIPR	IDA/ VA	1,000	0	N/A	0	N/A			1,000
Countermeasures/Counter-Countermeasures (CM/CCM)										
Industry	CPAF	Boeing/ VA	6,460	5,119	1/3Q	680	N/A			12,259
CSS	CPFF	CSC/ VA	4,940	3,915	1/3Q	520	N/A			9,375
CSS	CPFF	Sparta/ VA	4,940	3,915	1/3Q	520	N/A			9,375

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date: May 2009
APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE: 0603890C Ballistic Missile Defense Enabling Programs

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2009 Cost	FY 2009 Award/ Oblg Date	FY 2010 Cost	FY 2010 Award/ Oblg Date	FY 2011 Cost	FY 2011 Award/ Oblg Date	Total Cost
FFRDC/UARC	MIPR	IDA/ VA	760	602	1/3Q	80	N/A			1,442
FFRDC/UARC	MIPR	SNL/ CA	380	301	1/3Q	40	N/A			721
UK Mod	MIPR	DSTL/ UK	1,520	1,204	1/3Q	160	N/A			2,884
BMDS Design and Specifications										
Industry	CPAF	Boeing/ VA	9,559	7,959	1/3Q	15,590	1/3Q			33,108
CSS	CPFF	CSC/ VA	45	1,367	1/3Q	2,678	1/3Q			4,090
CSS	CPFF	Sparta/ VA	0	1,397	1/3Q	2,737	1/3Q			4,134
FFRDC/UARC	FFRDC	Aerospace/ CA	350	0	N/A	0	4Q			350
FFRDC/UARC	FFRDC	JHU-APL/ VA	744	240	1/3Q	470	1/3Q			1,454
FFRDC/UARC	FFRDC	MIT-LL/ MA	0	413	1/3Q	809	1/3Q			1,222
FFRDC/UARC	FFRDC	MITRE/ NJ	184	0	N/A	0	N/A			184
Other DoD	MIPR	NSWC/ IN	1,000	1,000	1/3Q	1,959	1/3Q			3,959
Integration and Assessment										
Industry	CPAF	Boeing/ VA	8,848	9,662	1/3Q	9,709	1/3Q			28,219
CSS	CPFF	CSC/ VA	5,871	6,356	1/3Q	6,388	1/3Q			18,615

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date: May 2009
APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE: 0603890C Ballistic Missile Defense Enabling Programs

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2009 Cost	FY 2009 Award/ Oblg Date	FY 2010 Cost	FY 2010 Award/ Oblg Date	FY 2011 Cost	FY 2011 Award/ Oblg Date	Total Cost
CSS	CPFF	Sparta/ VA	6,421	6,864	1/3Q	6,899	1/3Q			20,184
FFRDC/UARC	FFRDC	Aerospace/ CA	1,000	1,017	1/3Q	1,022	1/3Q			3,039
FFRDC/UARC	FFRDC	JHU-APL/ VA	620	763	1/3Q	767	1/3Q			2,150
FFRDC/UARC	FFRDC	MIT-LL/ MA	325	254	1/3Q	256	1/3Q			835
FFRDC/UARC	FFRDC	SNL/ CA	375	508	1/3Q	511	1/3Q			1,394
Systems Assessment and Analysis										
Industry	CPAF	Boeing/ VA	7,083	7,060	1/3Q	10,415	1/3Q			24,558
CSS	CPFF	CSC/ VA	3,837	3,825	1/3Q	5,641	1/3Q			13,303
CSS	CPFF	Sparta/ VA	3,837	3,825	1/3Q	5,641	1/3Q			13,303
International										
CSS	CPFF	Sparta/ VA	51	52	1Q	56	N/A			159
FFRDC/UARC	FFRDC	JHU-APL/ VA	620	599	1/3Q	644	N/A			1,863
Threat										
Industry	CPAF	Boeing/ VA	4,006	5,098	1/3Q	7,013	1/3Q			16,117
CSS	CPFF	CSC/ VA	897	1,141	1/3Q	1,570	1/3Q			3,608
CSS	CPFF	Sparta/ VA	508	646	1/3Q	889	1/3Q			2,043

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date: May 2009
APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE: 0603890C Ballistic Missile Defense Enabling Programs

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2009 Cost	FY 2009 Award/ Oblg Date	FY 2010 Cost	FY 2010 Award/ Oblg Date	FY 2011 Cost	FY 2011 Award/ Oblg Date	Total Cost
FFRDC/UARC	FFRDC	JHU-APL/ VA	620	789	1/3Q	1,085	1/3Q			2,494
FFRDC/UARC	FFRDC	MIT-LL/ MA	325	414	1/3Q	569	1/3Q			1,308
FFRDC/UARC	FFRDC	SNL/ CA	375	477	1/3Q	656	1/3Q			1,508
CSS	CPFF	Schafer/ VA	2,439	3,103	1/3Q	4,270	1/3Q			9,812
Subtotal Support Costs			103,523	104,592		95,829				303,944

Remarks

III. Test and Evaluation Cost ($ in Thousands)

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

Remarks

IV. Management Services Cost ($ in Thousands)

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

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date: May 2009
APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE: 0603890C Ballistic Missile Defense Enabling Programs

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2009 Cost	FY 2009 Award/ Oblg Date	FY 2010 Cost	FY 2010 Award/ Oblg Date	FY 2011 Cost	FY 2011 Award/ Oblg Date	Total Cost
CSS	CPFF	CSC/ VA	2,325	2,793	1/3Q	1,965	1/3Q			7,083
CSS	CPFF	Sparta/ VA	7,846	9,426	1/3Q	6,632	1/3Q			23,904
CSS	CPFF	Paradigm/ VA	435	522	1/3Q	368	1/3Q			1,325
FFRDC/UARC	FFRDC	Aerospace/ VA	2,325	2,793	1/3Q	1,965	1/3Q			7,083
FFRDC/UARC	FFRDC	JHU-APL/ VA	436	524	1/3Q	368	1/3Q			1,328
FFRDC/UARC	FFRDC	MITRE/ VA	726	873	1/3Q	614	1/3Q			2,213
FFRDC/UARC	FFRDC	USU-SDL/ VA	436	524	1/3Q	368	1/3Q			1,328
Subtotal Management Services			14,529	17,455		12,280				44,264

Remarks

Project Total Cost			118,052	122,047		108,109				348,208

Remarks

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

Date: **May 2009**

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

R-1 NOMENCLATURE: **0603890C Ballistic Missile Defense Enabling Programs**

Fiscal Year	2008				2009				2010				2011				2012				2013				2014				2015			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Milestones																																
Technical Objectives & Goals / Updates				▲			△				△																					
Master Integration Plan (MIP)		▲				△				△																						
System Engineering Assessment Report (SEAR)	▲				△				△																							
BMDS Description Document (BMDS DD)		▲			△				△																							
BMD System Specification (BMD SS)			▲			△				△																						
Sys Eng & Integration (SE&I) General Milestones																																
Capability Assessment Plan (CAP) / update			▲			△				△																						
Interface Control Documents (ICD)			▲				△				△																					
Adversary Data Package (ADP)		▲			△				△																							
Block 2.0 Partial Capability Delivery Support										△																						
Block 3.1/3.2 Partial Capability Delivery Support										△																						
Block 5.0 Partial Capability Delivery Support										△																						
Element Preliminary Design Reviews										△																						

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-4 Schedule Profile	Date: May 2009
APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE: **0603890C Ballistic Missile Defense Enabling Programs**

Fiscal Year	2008				2009				2010				2011				2012				2013				2014				2015			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Sys Eng & Integration (SE&I) General Milestones																																
Element/Component Characterization for Analysis (E/CCA)		▲		▲		△		△		△		△																				
Engineering Reviews for baselines covering Block 2.0 thru. Block 5.0											△																					
MDA Effectiveness Metrics Standard (EMS)					△				△																							
Subsystem Requirements Review					△																											
Countermeasures/Counter-Countermeasures (CM/CCM)																																
Deliver Special Studies Report				▲				△																								
Provide Independent Assessments to MDA				▲				△				△																				
Deliver Engineering Change Plans for CCM Improvements				▲				△				△																				

Legend

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

Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail	Date: May 2009
APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE: 0603890C Ballistic Missile Defense Enabling Programs

Schedule Profile	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015
Milestones								
Technical Objectives & Goals / Updates	4Q	3Q	3Q					
Master Integration Plan (MIP)	2Q	2Q	2Q					
System Engineering Assessment Report (SEAR)	1Q	1Q	1Q					
BMDS Description Document (BMDS DD)	2Q	1Q	1Q					
BMD System Specification (BMD SS)	3Q	2Q	2Q					
Sys Eng & Integration (SE&I) General Milestones								
Capability Assessment Plan (CAP) / update	3Q	2Q	2Q					
Interface Control Documents (ICD)	3Q	3Q	3Q					
Adversary Data Package (ADP)	2Q	1Q	1Q					
Block 2.0 Partial Capability Delivery Support			2Q					
Block 3.1/3.2 Partial Capability Delivery Support			2Q					
Block 5.0 Partial Capability Delivery Support			2Q					
Element Preliminary Design Reviews			2Q					
Element/Component Characterization for Analysis (E/CCA)	2Q,4Q	2Q,4Q	2Q,4Q					
Engineering Reviews for baselines covering Block 2.0 thru. Block 5.0			3Q					
MDA Effectiveness Metrics Standard (EMS)		1Q	1Q					
Subsystem Requirements Review		1Q						
Countermeasures/Counter-Countermeasures (CM/CCM)								
Deliver Special Studies Report	4Q	4Q						
Provide Independent Assessments to MDA	4Q	4Q	4Q					
Deliver Engineering Change Plans for CCM Improvements	4Q	4Q	4Q					

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date: May 2009
APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE: 0603890C Ballistic Missile Defense Enabling Programs

COST ($ in Thousands)	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015
YX28 Intelligence & Security	21,747	20,007	18,953					
RDT&E Articles Qty	0	0	0					

Note: The content in YX28 is a continuation of the efforts reported in 0102 and was explained in that project(s) in PB08.

A. Mission Description and Budget Item Justification

The Security and Intelligence Project captures three specific areas:

1) Intelligence

2) Counterintelligence

3) BMDS information assurance systems certification

Together these efforts provide critical information regarding threat ballistic missile system capabilities (via intelligence), protection of personnel, activities, and technology from espionage and terrorism through active and passive activities (via counterintelligence); and BMDS system vulnerabilities (via BMDS certification). Specifically, the activities include:

1. The Intelligence Requirements Division provides a single integrated mission area focus that interfaces with the Intelligence Community (IC). The increased pace of rogue nation missile development, i.e., Iran and North Korea, requires increasing intelligence collection, analysis, and production of data on foreign threat missiles. Additionally, the nature of the 21st century world-wide missile testing is reducing available signatures and warning of test events. Therefore, enhanced collaboration with the IC is crucial to fielding a missile defense capability. Resulting threats and threat changes are given to the Ballistic Missile Defense System (BMDS) System Engineer who uses the threats to develop and change the BMDS. Through this activity threat data are provided to support BMDS architecture design, testing, modeling, and wargaming. This information reduces risk and improves system performance. It enables MDA program managers to achieve a sufficiently accurate understanding of the threat environment to respond to relevant capabilities of immediate importance, make informed decisions and invest limited resources on countering the most significant aspects of potential adversary capabilities. Other aspects of the Intelligence program are designed to gain access to, and leverage, unique, IC developed, owned and operated capabilities for the benefit of the Missile Defense Community. Many are classified and require both access and

expertise to exploit. The Program supports the overarching MDA objectives of BMDS on-Alert, continuing spiral development, and enhanced BMDS capabilities.

2. Counterintelligence (CI). Pursuant to Executive Order 12333, (US Intelligence Activities), DoD Directive 5240.2 (DoD Counterintelligence), and other DoD CI policy issuances, the MDA Counterintelligence Division (DOSC) is charged with undertaking activities as part of an integrated DoD and national effort, to detect, identify, assess, exploit, degrade and counter or neutralize foreign intelligence collection efforts, other intelligence activities, sabotage, espionage, sedition, subversion and terrorist activities directed against MDA personnel, information, materials, facilities, and activities or against U.S. national security. As a member of the DoD CI community, DOSC's portfolio includes the following missions & functions:

CI investigations and Preliminary Inquiries:

- DOSC conducts CI preliminary investigations to determine the initial facts and circumstances surrounding suspected clandestine relationships between MDA personnel and Foreign Intelligence Security Services (FISS) agents or individuals associated with terrorist organizations. When allegations are substantiated, DOSC refers these matters to the appropriate Title 10, U.S.C. jurisdiction (Army, Navy or United States Air Force CI Organization, DCIS or Federal Bureau of Investigation (FBI), as appropriate).
- DoD CI Collection and Reporting: DOSC systematically collects CI information from US and foreign counterpart intelligence, CI, security and law enforcement (LE) entities through routine liaison activities associated with multi-national BMD conferences overseas, RDT&E activities and BMDS deployments worldwide. DOSC also conducts briefings and debriefings of MDA personnel who travel outside continental United Stated (OCONUS) for CI relevant information. Information gleaned from these activities is reported to the US intelligence community via Intelligence Information Reports, as appropriate, to answer validated DoD CI collection requirements.
- CI Analysis and Production: DOSC conducts research and prepares timely and relevant analytic products that address the threat from espionage, international terrorism, subversion, sabotage, assassination, other clandestine or covert activities, and any other similar activities that are reasonably believed to have a foreign nexus. This includes threats to MDA personnel and property, RDT&E activities and conferences worldwide, and intelligence collection threats to MDA technology, information systems or infrastructure.
- CI Functional Services: DOSC serves as the focal point within MDA for specialized CI technical services support to include Technical Surveillance Countermeasures (TSCM) surveys/inspections, CI-Scope polygraph exams and computer forensic examinations in support of CI and LE investigations resulting from insider abuse or foreign computer intrusions. DOSC provides specialized support to MDA special access programs to protect the most critical BMDS technologies and capabilities from FISS collection and exploitation throughout the entire acquisition lifecycle. DOSC develops and executes other defensive programs such as the insider threat program with the objective of detecting computer abuse or other nefarious activities detrimental to MDA interests.

- CI Awareness, Briefing and Reporting Program: DOSC provides initial (MDA Newcomer's briefing) and periodic CI awareness training to the entire MDA Government and DoD Contractor workforce on the threats posed by FISS, international terrorists, computer intruders, unauthorized disclosures and insider activities, and individual reporting responsibilities. In addition to CI awareness, DOSC provides mandatory foreign travel threat briefings to all MDA OCONUS travelers to familiarize them with potential terrorism, criminal, health, political and FISS threats. Follow-up debriefings are done to capture pertinent CI information that is shared with other MDA travelers and the US intelligence community, as appropriate.

3. BMDS Security Assessment and Certification Directorate: This directorate is responsible for assisting the BMDS manage and deploy Information Assurance/Computer Network Defense (IA/CND) solutions to enhance the robustness and resilience of the cyber infrastructure. To fulfill this role, the directorate works in concert with IA engineers and IA managers to obtain a comprehensive picture of the overall Information assurance/Computer Network Defense (IA/CND) architecture at all levels of the BMDS, then influence the design by 1) identifying opportunities to implement Defense-in-Depth (DiD) within planned development cycles (Blocks) 2) providing oversight, coordination and management of key IA management processes, 3) by providing contract acquisition support to BMDS Elements ensuring IA is addressed throughout the procurement process and 4) by interfacing with the Intelligence Community (IC) to define cyber security threats relevant to the BMDS. To fulfill stated mission requirements, the directorate must interface with relevant IA domain experts to assess documentation and IA/CND design, gain insight into past/present security related issues, and exploit threat/vulnerability assessments to identify trends, understand threats and manage risks to fulfill certification related requirements.

B. Accomplishments/Planned Program

	FY 2008	FY 2009	FY 2010	FY 2011
Counterintelligence	5,065	4,131	4,167	
RDT&E Articles (Quantity)	0	0	0	

FY08 Counterintelligence Accomplishments:

- The CI Division provided Satellite Reconnaissance Advance Notice analysis and Maritime threat awareness products to MDA leadership and Test Directors in support of all missile defense launches/flight tests to identify potential foreign collection threats targeting MDA Research, Development, Technology and Evaluation activities; actions resulted in the protection of CPI and BMDS technologies.
- The CI Division conducted planning and preparation for construction of the European Interceptor Site in Poland and European Midcourse Radar site in the Czech Republic; briefed the J-2 (Intelligence), European Command, US Embassy staffs and hosted European stakeholder conferences to discuss and plan for on-site CI support.

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date: May 2009
APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE: 0603890C Ballistic Missile Defense Enabling Programs

- The CI Division assumed Contracting Officer Responsibility over an expiring FY08 contract from the former Department of Defense Counterintelligence Field Activity (CIFA) that saved MDA $1.2M in labor costs (for 12-person Flight Test Security Element) and $2.5M in Government Furnished Equipment (GFE).
- The CI Division requested and was granted USD (I) authority to establish an organic Technical Surveillance Countermeasures Program using existing personnel and GFE previously acquired from CIFA.
- In collaboration with sister Divisions (Intelligence Requirements and Information Assurance), the CI Division stood-up a Cyber Intelligence Fusion Cell (CIFC) to identify, characterize, and where possible, exploit and neutralize sophisticated foreign cyber threats to MDA administrative and fire control networks.
- The CI Division procured and beta tested an updated secure data communications system to provide a robust reach-back capability to the National and DoD intelligence communities to facilitate threat analysis and reporting during missile defense launches/flight tests, conferences and overseas deployments.
- The CI Division reinvigorated its CI Awareness Training Program to better educate the MDA workforce on the foreign intelligence & terrorism threats to MDA; organized and hosted NCR CI Awareness Week- trained 1,250 people, a record turn-out.

In FY09 and the Outyears the Counterintelligence Division will continue down a transformational path to expand its capabilities to better support and protect MDA and BMDS personnel, facilities, information and activities from threats posed by FISS, terrorism and criminal activities. The CI Division will continue its federated approach to supporting MDA by leveraging available national and DoD CI resources to ensure CI products and services are fully integrated into all RDT&E programs and activities to protect CPI and critical technologies. Specific plans include:

FY09 Counterintelligence Planned Program:

- The CI Division will continue to foster collaborative partnerships and activities with the National and DoD CI communities targeting FISS collection activities directed against MDA personnel, facilities and activities to prevent the loss or compromise of CPI or critical BMDS technologies.
- We will reinvigorate the CI Division Collection, Analysis and Production Programs to better leverage available technology in support of MDA leadership and Program Managers.
- The CI Division will prepare or update CI Support Plans for all supported MDA Programs.
- The CI Division will continue preparatory planning with European stakeholders and the Combatant Commands for providing on-site CI support to the EIS and EMR construction projects tentatively slated to begin in FY10.
- The CI Division will establish a TSCM Center at Redstone Arsenal, AL and achieve full operational capability by mid 2009; our request supports Military Intelligence Program to sustain TSCM program.

- Using external Foreign CI Program funding, the CI Division will expand the CIFC manpower and focus to include Cyber CI which will seek to identify and neutralize potential insider threats.
- The CI Division will procure and field upgraded secure data communications systems for its Huntsville Regional Office in support of flight tests, conferences and overseas deployments.
- The CI Division will update Defense Threat Assessments and Multi-disciplined CI Threat Assessments on MDA technologies and programs, as appropriate
- The CI Division will partner with the Security and Program Protection Division to reinvigorate the MDA Research and Technology Program to better identify and protect CPI and RDT&E activities.

FY10 Counterintelligence Planned Program:

- The CI Division will continue to foster collaborative partnerships and activities with the National and DoD CI communities targeting FISS collection activities directed against MDA personnel, facilities and activities to prevent the loss or compromise of CPI or critical BMDS technologies.
- The CI Division will leverage available DoD CI resources to deploy CI Officers to Poland and the Czech Republic to provide on-site support to the EIS and EMR construction projects.
- Under a FY10 and outyear Foreign CI Program funding initiative, the CI Division will establish a Flight Test Support Team dedicated to conducting defensive CI operations and technical support (TSCM and Cyber) to MDA RDT&E activities, flight tests and operational BMDS deployments worldwide.
- The CI Division will procure and field updated secure data communications systems for the Colorado Springs Regional CI Office in support of flight tests, conferences and overseas deployments.
- The CI Division will solicit external Military Intelligence Program funding support to execute its TSCM program.
- Execute BRAC relocations according to MDA master plan with relocations to Redstone Arsenal, AL and Colorado Springs, CO.

	FY 2008	FY 2009	FY 2010	FY 2011
Intelligence	12,899	13,096	12,485	
RDT&E Articles (Quantity)	0	0	0	

The Intelligence Requirements Office:

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date: May 2009
APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE: 0603890C Ballistic Missile Defense Enabling Programs

- Provides a single integrated mission area focus that interfaces with the Intelligence Community (IC) to acquire collection and analysis of data on foreign threat missiles. The increased pace of rogue nation missile development, i.e., Iran and North Korea, requires increasing intelligence collection, analysis, and production of data on foreign threat missiles. Additionally, the nature of the 21st century world-wide missile testing is reducing available signatures and warning of test events. Therefore, enhanced collaboration with the IC is crucial to fielding a missile defense capability.
- Provides IC data on foreign threat missiles to the Ballistic Missile Defense System (BMDS) System Engineer who uses the threats to develop and change the BMDS in support of BMDS architecture design, testing, modeling, and wargaming to reduce risk and improve system performance.
- Enables MDA program managers to achieve a sufficiently accurate understanding of the threat environment to respond to relevant capabilities of immediate importance, make informed decisions and invest limited resources on countering the most significant aspects of potential adversary capabilities.
- Gains access to and leverages unique, IC developed, owned and operated capabilities for the benefit of the Missile Defense Community; many capabilities are classified and require both access and expertise to exploit. Supports the overarching MDA objectives of BMDS on-Alert, continuing spiral development, and enhanced BMDS capabilities.

FY08 Intelligence Accomplishments:

- Collection Requirements: MDA's Intelligence Requirements Office managed the MDA's intelligence collection requirements and engaged the IC to ensure MDA requirements are documented, validated, collected, and understood. Tasks included planning, maintaining and updating Measurement and Signatures Intelligence (MASINT), Geospatial Intelligence (GEOINT), and Signals Intelligence (SIGINT) requirements on advances in foreign ballistic missile technology and for all MDA events.
- Intelligence Community (IC) Liaison: Maintained an ongoing, persistent, focused dialog with all members of the IC to ensure MDA intelligence requirements are viewed in the proper context, received the proper level of priority, and are explicitly understood by the Intelligence Community.
- MDA Requirements: Ensured that the IC responds to intelligence requirements of all levels of builders of missile defense with the most up to-date and accurate intelligence. The Intelligence Requirements Office pursued updated, finished intelligence by maintaining a detailed understanding of the BMDS developers and senior leadership's specific requirements for :
  - IC-produced current intelligence products, disseminated daily to the Senior Staff through the Daily Intelligence Read books, Executive Daily Intelligence Summary (EDIS), and updates to the Command Elements.
  - Direct and constant intelligence requirements support to the geographically separated MDA Program Elements such as Aegis BMD, the Ground Based Mid-course Defense System, Terminal High Altitude Area Defense (THAAD) Office, Targets and Countermeasures, Air-borne Laser, Command and Control Battle Management and Communications System (C2BMC), Sensors Directorate as well as the System

Engineering Directorate and the Lead System Architect. Each Program Element has an Intelligence Requirements Office staff member assigned to ensure their requirements are represented and understood by the IC.
- IC information of interest to the MDA Warfighter Support Center located in Colorado Springs via on-site staff providing situational awareness by employing high-intensity 24 hour real time coordination with the IC through IC links and databases.

- Threat Ballistic Missile Knowledge Base: Provided an encyclopedic, all sources, and all encompassing knowledge base of the foreign ballistic missile threat. This included development, enhancement, and population of the classified Missile Threat Portal with IC produced finished intelligence documents. These portals have the most up-to-date current intelligence to provide immediate situational awareness, technical intelligence data to be used by the BMDS Program Elements and System Engineers, and direct linkages to the IC to support the MDA Warfighter Support Center.
- Intelligence Simulation Requirements: Provided MDA analysts with a single interface to ballistic missile modeling tools. The Universal Missile Protocol Instantiation Requester Environment (UMPIRE) is a graphical user interface that integrates four missile modeling tools sponsored by the intelligence agencies, and a fifth sponsored by MDA. This tool provided a powerful, interactive 3-D visualization and analysis capability.

FY09 Intelligence Planned Program:

- The Intelligence Requirements Office will continue to be the single intelligence requirements integration office within MDA and its designated intermediary with the IC and will continue to maintain a consistent dialog with the IC to make sure they have a focused, prioritized, and a complete understanding of the vast requirements for foreign intelligence necessary to build a comprehensive BMDS. The increased pace of rogue nation missile development, i.e., Iran and North Korea, requires intelligence collection, analysis, and production of data on foreign threat missiles. Additionally, the nature of the 21st century world-wide missile testing is reducing available signatures and warning of test events. Therefore, enhanced collaboration with the IC is crucial to fielding a missile defense capability.
- Continue to manage the intelligence collection requirements and engage the IC to ensure MDA requirements are documented, validated, collected, and understood. Intelligence tasks will include planning intelligence collections support for missile defense tests and documenting requirements in IC management systems, maintaining and updating MASINT, GEOINT, and SIGINT requirements on advances in foreign ballistic missile technology and for all MDA events.
- Continue to maintain an ongoing, persistent, focused dialog with all members of the IC to ensure MDA intelligence requirements are viewed in proper context, receive the proper priority level, and are explicitly understood by the IC.
- Continue to provide to all levels of builders of missile defense intelligence requirements with the most up to-date and accurate intelligence which requires a detailed understanding of the BMDS developer's and senior leadership's particular requirements.

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date: May 2009
APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE: 0603890C Ballistic Missile Defense Enabling Programs

- Continue to provide an encyclopedic, all-source, and all encompassing knowledge base of the foreign ballistic missile threat including development, enhancement, and population of the Secret and TS/SCI Missile Threat Portal with IC produced finish intelligence documents. These portals have the most up to date current intelligence to provide immediate situational awareness, technical intelligence data to be used by the BMDS Program Elements and System Engineers, and direct linkages to the IC to support the MDA Warfighter Support Center.
- Continue expansion and use of UMPIRE which is a universal tool to allow BMDS planners and warfighters to access disparate Intelligence Community databases using a single interface.

FY10 Intelligence Planned Program:

- The Intelligence Requirements Office will continue to be the single intelligence requirements integration office within MDA and its designated intermediary with the IC and will continue to maintain a consistent dialog with the IC to make sure they have a focused, prioritized, and a complete understanding of the vast requirements for foreign intelligence necessary to build a comprehensive BMDS. The increased pace of rogue nation missile development, i.e., Iran and North Korea, requires increasing intelligence collection, analysis, and production of data on foreign threat missiles. Additionally, the nature of the 21st century world-wide missile testing is reducing available signatures and warning of test events. Therefore, enhanced collaboration with the IC is crucial to fielding a missile defense capability.
- Continue to manage the intelligence collection requirements and engage the IC to ensure MDA requirements are documented, validated, collected, and understood. Intelligence tasks will include planning intelligence collections support for missile defense tests and documenting requirements in IC management systems, maintaining and updating MASINT, GEOINT, and SIGINT requirements on advances in foreign ballistic missile technology and for all MDA events.
- Continue to maintain an ongoing, persistent, focused dialog with all members of the IC to ensure MDA intelligence requirements are viewed in proper context, receive the proper priority level, and are explicitly understood by the IC.
- Continue to provide to all levels of builders of missile defense intelligence requirements with the most up to-date and accurate intelligence which requires a detailed understanding of the BMDS developer's and senior leadership's particular requirements.
- Continue to provide an encyclopedic, all-source, and all encompassing knowledge base of the foreign ballistic missile threat including development, enhancement, and population of the classified Missile Threat Portal with IC produced finished intelligence documents. These portals have the most up to date current intelligence to provide immediate situational awareness, technical intelligence data to be used by the BMDS Program Elements and System Engineers, and direct linkages to the IC to support the MDA Warfighter Support Center.
- Maintain the use of UMPIRE which is a universal tool to allow BMDS planners and warfighters to access disparate Intelligence Community databases using a single interface.

	FY 2008	FY 2009	FY 2010	FY 2011

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date: May 2009
APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE: 0603890C Ballistic Missile Defense Enabling Programs

BMDS Security Assessment and Certification	3,783	2,780	2,301	
RDT&E Articles (Quantity)	0	0	0	

BMDS Security Assessment and Certification Directorate: Execute the mission of the BMDS Information Assurance (IA) Functional Manager (FM). Responsible for the following functions:

- Fulfilling the DoD 8500.2 and 8510.01 policy-mandated role as the BMDS Information Assurance Manager (IAM) and the BMDS Information Assurance Officer (IAO) for the overarching BMDS Mission System and Element Components.
- Characterizing the overall BMDS security posture; Manage matriced Information Assurance Manager (IAM) staff.
- Defining the BMDS Information Assurance/ Computer Network Defense architecture of the in conjunction with systems engineering.
- Defining IA requirements consistently, comprehensively and definitively at each stage of the acquisition lifecycle and in support of the European Component Office.
- Interfacing with the Intelligence Community (IC) to define cyber security threats relevant to the BMDS.

Project Accomplishments/Plans: BMDS Information Assurance Directorate:

FY08 BMDS Security Assessment and Certification Accomplishments:

- Performed BMDS IA assessments to address cross-element gaps.
- Supported the MDA/D and Chief Information Officer (CIO) in implementing the DoD Information Assurance Certification and Accreditation Process (DIACAP) and BMDS IA Operations.
- Provided BMDS-level Accreditation Package inputs and assisted in the development of the BMDS Plan of Actions and Milestones (POA&M).
- Developed BMDS-wide guidance and Standard Operating Procedures (SOPs) governing IAM Functions.
- Managed vulnerability status reporting and closure and ensured Element IA Inspections, Test, and Reviews were coordinated.
- Supported development of Information Assurance/Computer Network Defense (IA/CND) Plans, Procedures, and Agreements.
- Provided IA/CND Support to Acquisition Support throughout the systems development process.
- Understanding and decomposing cyber threat received by the Intelligence Community to enhance the IA architecture.

FY09 BMDS Security Assessment and Certification Planned Program:

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date: May 2009
APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE: 0603890C Ballistic Missile Defense Enabling Programs

- Fulfill DoD 8500.2 and 8510.01 policy-mandated roles of the Information Assurance Manager (IAM) and Information Assurance Officer (IAO) for the overarching BMDS.
- Define IA requirements for Continental United States (CONUS) and non-CONUS based BMDS assets consistently, comprehensively and definitively.
- Assess the IA/CND security architecture to address gaps, to enhance interoperability, and realize efficiencies across all mission systems. Define the ``As Built`` and ``To Be`` IA architectures to support technical assessments and IA/CND design solutions and implementation recommendations.
- Provide IA advice and assistance to program managers and elements to support ongoing and planned implementation related activities for the fielded BMDS and for planned European and international implementations.
- Define IA/CND and cyber security infrastructure intelligence requirements to focus IC collection, analysis and production to target MDA/BMDS vulnerabilities.
- Assist in the sustainment of an acceptable IA/CND security posture for the Director, MDA, through various initiatives at each stage of the program's lifecycle.

FY10 BMDS Security Assessment and Certification Planned Program:

- Continue to fulfill DoD 8500.2 and 8510.01 policy-mandated roles of the Information Assurance Manager (IAM) and Information Assurance Officer (IAO) for the overarching BMDS.
- Continue to define IA requirements for Continental United States (CONUS) and non-CONUS based BMDS assets consistently, comprehensively and definitively.
- Continue to enhance the Information Assurance posture of the BMDS by delivering expert, responsive, relevant IA/CND products and services supporting the PMs to meet BMDS and Element IA/CND needs and requirements.
- Continue to assist in the sustainment of an acceptable IA/CND security posture for the Director, MDA, through various initiatives at each stage of the program's lifecycle.

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date: May 2009
APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE: 0603890C Ballistic Missile Defense Enabling Programs

C. Other Program Funding Summary

	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	Total Cost
PE 0603175C Ballistic Missile Defense Technology	106,437	119,308	109,760						-
PE 0603881C Ballistic Missile Defense Terminal Defense Segment	1,034,478	956,686	719,465						-
PE 0603882C Ballistic Missile Defense Midcourse Defense Segment	2,198,664	1,507,481	982,922						-
PE 0603883C Ballistic Missile Defense Boost Defense Segment	503,475	400,751	186,697						-
PE 0603884C Ballistic Missile Defense Sensors	574,231	777,693	636,856						-
PE 0603886C Ballistic Missile Defense System Interceptors	330,874	385,493	0						-
PE 0603888C Ballistic Missile Defense Test and Targets	619,137	919,956	966,752						-
PE 0603891C Special Programs - MDA	193,157	175,712	301,566						-
PE 0603892C Ballistic Missile Defense Aegis	1,126,337	1,113,655	1,690,758						-
PE 0603893C Space Tracking & Surveillance System	226,499	208,923	180,000						-
PE 0603894C Multiple Kill Vehicle	223,084	283,481	0						-
PE 0603895C BMD System Space Program	16,237	24,686	12,549						-
PE 0603896C BMD C2BMC	439,997	288,287	340,014						-
PE 0603897C BMD Hercules	51,387	55,764	48,186						-
PE 0603898C BMD Joint Warfighter Support	45,400	69,743	60,921						-
PE 0603904C Missile Defense Integration & Operations Center (MDIOC)	77,102	106,040	86,949						-
PE 0603906C Regarding Trench	1,945	2,968	6,164						-
PE 0603907C Sea Based X-Band Radar (SBX)	155,244	146,895	174,576						-
PE 0603908C BMD Europ Intercep Site	0	362,007	0						-
PE 0603909C BMD Europ Midcourse Radar	0	76,537	0						-
PE 0603911C BMD European Capability	0	0	50,504						-
PE 0603912C BMD European Comm Support	0	27,008	0						-
PE 0603913C Israeli Cooperative	0	0	119,634						-
PE 0605502C Small Business Innovative Research BMDO	137,409	0	0						-
PE 0901585C Pentagon Reservation	5,971	19,667	19,709						-
PE 0901598C Management Headquarters - MDA	83,907	81,174	57,403						-

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

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date: May 2009
APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE: 0603890C Ballistic Missile Defense Enabling Programs

D. Acquisition Strategy

In support of acquiring an effective BMDS capability, this project directs various executing agents and leverages expertise in the intelligence community, counterintelligence community, and information assurance community, including the military departments, Federally Funded Research and Development Centers (FFRDCs), University Affiliated Research Centers (UARCs), and industry. The executing agents utilize various contracting strategies in a flexible manner to maximize their contribution to the BMDS.

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date: May 2009
APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE: 0603890C Ballistic Missile Defense Enabling Programs

I. Product Development Cost ($ in Thousands)

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

Remarks

II. Support Costs Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2009 Cost	FY 2009 Award/ Oblg Date	FY 2010 Cost	FY 2010 Award/ Oblg Date	FY 2011 Cost	FY 2011 Award/ Oblg Date	Total Cost
Counterintelligence										
Analysis and Support	C/FFP	QinetiQ Inc/ Fairfax, VA	4,545	4,031	1/2Q	4,067	1/2Q			12,643
Analysis and Support	C/CPFF	Telecom Systems/ MD	220	0	N/A	0	N/A			220
Analysis and Support	SS/MIPR	Various/ Various	300	100	2/3Q	100	1/2Q			500
Intelligence										
Intelligence Support Center	SS/CPAF	MDIOC - Northrop Grumman/ Colorado Springs, CO	3,118	2,878	1/2Q	2,500	1/2Q			8,496
Intelligence Applications	SS/MIPR	SMDC / Huntsville, AL	858	1,075	1/2Q	1,600	1/2Q			3,533
Scenario Applications	SS/CPAF	MDIOC - Northrop Grumman/ Colorado Springs, CO	1,127	2,510	1/2Q	2,200	1/2Q			5,837

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date: May 2009
APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE: 0603890C Ballistic Missile Defense Enabling Programs

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2009 Cost	FY 2009 Award/ Oblg Date	FY 2010 Cost	FY 2010 Award/ Oblg Date	FY 2011 Cost	FY 2011 Award/ Oblg Date	Total Cost
BMDS Security Assessment and Certification										
IA/CND Support	SS/FFRDC	Aerospace Corporation/ LA, CA and Columbia, MD	1,755	1,800	1/2Q	1,401	1/2Q			4,956
Cyber threat Review and Assessment Support	SS/FFRDC	Mitre/ Bedford,MA	511	100	1/2Q	0	N/A			611
IA/CND Support	SS/FFP	Booz Allen Hamilton/ McLean, VA	1,337	790	1/2Q	900	1/2Q			3,027
IA/CND Support	SS/FFP	Zeltech / Hampton, VA	180	90	1/2Q	0	N/A			270
Subtotal Support Costs			13,951	13,374		12,768				40,093

Remarks

MDIOC-Missile Defense Integration & Operations Center

III. Test and Evaluation Cost ($ in Thousands)

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

Remarks

IV. Management Services Cost ($ in Thousands)

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date: May 2009
APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE: 0603890C Ballistic Missile Defense Enabling Programs

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2009 Cost	FY 2009 Award/ Oblg Date	FY 2010 Cost	FY 2010 Award/ Oblg Date	FY 2011 Cost	FY 2011 Award/ Oblg Date	Total Cost
Intelligence										
Project Management Support	SS/FFRDC	Aerospace/ Los Angeles, CA	705	355	1/2Q	600	1/2Q			1,660
Project Management	C/FFP	BAH/ McLean, VA	5,356	5,120	1/2Q	4,379	1/2Q			14,855
Project Management	C/FFP	SAIC/ San Diego, CA	573	528	1/2Q	400	1/2Q			1,501
Project Management	C/FFP	ASR/ McLean, VA	707	0	N/A	0	N/A			707
Project Management	SS/Various	Various/ Various	125	300	1/2Q	306	1/2Q			731
Project Management	SS/MIPR	CECOM/ Fort Monmouth, NJ	330	330	1/2Q	500	1/2Q			1,160
Subtotal Management Services			7,796	6,633		6,185				20,614
Remarks										
Project Total Cost			21,747	20,007		18,953				60,707
Remarks										

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

Date: **May 2009**

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

R-1 NOMENCLATURE: **0603890C Ballistic Missile Defense Enabling Programs**

Fiscal Year	2008				2009				2010				2011				2012				2013				2014				2015			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Counterintelligence																																
CI Investigations & Operations Updates																																
Defense Threat Assessments																																
Intelligence Information Reports																																
Multi-Discipline CI Threat Assessment																																
Travel Briefings & Debriefings																																
BMDS Certification																																
Certification and Accreditation																																
Systems Engineering & Validation																																
Intelligence																																
Intelligence Briefings																																
Intelligence Support Center																																
Studies and Scenario Development																																
Update and Maintain Foreign Missile Knowledge Base																																

Legend

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

Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail	Date: May 2009
APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE: 0603890C Ballistic Missile Defense Enabling Programs

Schedule Profile	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015
Counterintelligence								
CI Investigations & Operations Updates	1Q-4Q	1Q-4Q	1Q-4Q					
Defense Threat Assessments	1Q-4Q	1Q-4Q	1Q-4Q					
Intelligence Information Reports	1Q-4Q	1Q-4Q	1Q-4Q					
Multi-Discipline CI Threat Assessment	1Q-4Q	1Q-4Q	1Q-4Q					
Travel Briefings & Debriefings	1Q-4Q	1Q-4Q	1Q-4Q					
BMDS Certification								
Certification and Accreditation	1Q-4Q	1Q-4Q	1Q-4Q					
Systems Engineering & Validation	1Q-4Q	1Q-4Q	1Q-4Q					
Intelligence								
Intelligence Briefings	1Q-4Q	1Q-4Q	1Q-4Q					
Intelligence Support Center	1Q-4Q	1Q-4Q	1Q-4Q					
Studies and Scenario Development	1Q-4Q	1Q-4Q	1Q-4Q					
Update and Maintain Foreign Missile Knowledge Base	1Q-4Q	1Q-4Q	1Q-4Q					
Wargaming Support	1Q-4Q	1Q-4Q	1Q-4Q					

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date: May 2009
APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE: **0603890C Ballistic Missile Defense Enabling Programs**

COST ($ in Thousands)	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015
YX29 Producibility and Manufacturing Technology	29,474	40,379	33,881					
RDT&E Articles Qty	0	0	0					

Note: The content in Project YX29 is a continuation of the efforts reported in Project 0103 and was explained in that project in PB08.

A. Mission Description and Budget Item Justification

Producibility and Manufacturing's responsibility is improving the Ballistic Missile Defense System by applying producibility tools; which include Design for Manufacturing and Assembly, supply chain gap analysis, and Continuous Process Improvement (CPI) which includes Lean Six-Sigma, the Theory of Constraints, and others to assist in the elimination of manufacturing waste, reducing process variability, and insuring first time quality for Ballistic Missile Defense Element Program Offices and their suppliers.

The identification of manufacturing risks is done through Engineering and Manufacturing Readiness Level (EMRL) Assessments. EMRLs are a systems engineering tool that employs widespread industry and BMDS Element interaction to analyze the maturity of manufacturing processes as a factor in the BMDS Risk Management Process. Producibility and Manufacturing conducts Industrial Capability Assessments (ICAs) across the BMDS Industrial Base in order to identify production gaps created by material supplier changes, loss of manufacturing base, and movement of US production overseas. From these assessments, a gap analysis is developed which focuses on methods that can be used to support our US original equipment manufacturers (OEMs), their supplier base, and other organizations that produce end items for the BMDS.

As part of the gap analysis US environmental concerns are addressed. Our efforts to find a replacement for the environmentally toxic metal Beryllium has focused us on an environmentally friendly Silicon Carbide as a Kill Vehicle telescope construction material. An additional benefit of Silicon Carbide is the telescope assembly also improves the nuclear survivability of our Kill Vehicle sensors.

Producibility and Manufacturing is MDA's Technology Transition Lead; ensuring technologies and products under development from the Advanced Technology Deputate, items developed through the Small Business Innovative Research program, and efforts developed through the Services MANTECH programs are mapped into the BMDS architecture at the appropriate insertion points and in concert with the Elements. We assess and report transition readiness using Engineering Manufacturing Readiness Levels and exit criteria metrics (i.e., Critical Knowledge Points).

Near term producibility capabilities are accomplished through efforts in a number of key investment areas: Power Systems, Radiation Hardening/ Survivability (both natural and prompt radiation affects), Manufacturing Process Improvements, Electro-Optics/Infrared (EO/IR), Radar RF /

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date: May 2009
APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE: 0603890C Ballistic Missile Defense Enabling Programs

Electronics, Propulsion, Advanced Materials and Structures, and Anti-Tamper. These capabilities are matured through the Next Generation Component Producibility Program and its associated Flight Experiments. These efforts are programmed for BMDS Element integration within a three to five year timeframe. MDA has designated Producibility and Manufacturing as the command focal point for Continuous Process Improvement (CPI) which includes the utilization of tools such as Lean Six-Sigma, and the Theory of Constraints to assist in the elimination of waste, reducing process variability, and insuring first time quality for internal and external customers.

B. Accomplishments/Planned Program

	FY 2008	FY 2009	FY 2010	FY 2011
Power Systems	3,242	5,242	4,387	
RDT&E Articles (Quantity)	0	0	0	

FY08 Accomplishments:

- Eagle Picher Technologies Aided Production system achieved initial operation capability, with THAAD Kill Vehicle batteries used as test trial samples. Eagle Picher Technologies oxyhalide battery improvement development effort successfully demonstrated modifications to battery assembly process. Powder processing improvements were identified and a development process started by ENSER Battery Company successfully demonstrated a thin film thermal battery, which enables production of smaller, more lightweight missile batteries.

FY09 Planned Program:

- Continue projects that were started in FY08 and include demonstrations that allow for the transition of producible, modular, scalable, and affordable technology to the BMDS;
- Complete the following Eagle Picher Technologies Lean Six Sigma Projects:
  - THAAD Gas Generator Lean Six Sigma Project
  - Actuator Value Stream Mapping and Rapid Improvement Events
  - Line Balancing and Reduce Batch Size on Bellows in Energetics
  - Pyro-2 Future State and Rapid Improvement Events
- Initiate following Lean Six Sigma Eagle Picher Technologies Projects

- BottleCutter Value Stream Mapping and Rapid Improvement Events
- Computer Assisted Production Planning/Paperless Manufacturing Factory-wide initiatives at Joplin Investigate and implement cooperative Lean Six Sigma programs with other battery or critical component manufacturers

FY10 Planned Program:

- Continue Lean Six Sigma Projects, Value Stream Mappings and Rapid Improvement Events in selected Eagle Picher Technologies Product areas, both Energetics and Battery
- Fully implement Computer Assisted Production Planning/Paperless Manufacturing
- Review factory integrated improvements which impact MDA product cycle time, quality, and cost
- Relocate Eagle Picher Technologies Company oxyhalide battery production based on manufacturing improvements developed in the FY09 Lean Six Sigma Projects

	FY 2008	FY 2009	FY 2010	FY 2011
Radiation Hardening	3,377	3,800	6,405	
RDT&E Articles (Quantity)	0	0	0	

FY08 Program Accomplishments:

- Completed preliminary design review for Common Inertial Measurement Unit/Guidance, Navigation and Control, MDA-STD-005, with nuclear survivability capability per MDA-STD-001.
- Conducted High Altitude Exoatmospheric Nuclear Survivability (HAENS) standard testing of survivable electronics devices to include Common Inertial Measurement Unit optical components.

FY 09 Planned Program:

- Complete critical design review for Common Inertial Measurement Unit, MDA-STD-005, with nuclear survivability capability demonstrated in accelerometers and data bus per MDA-STD-001.
- Promulgate Position, Navigation and Guidance, MDA-STD-004, Core Standard in support of MDA-STD-005.

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date: May 2009
APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE: 0603890C Ballistic Missile Defense Enabling Programs

- Conduct High Altitude Exoatmospheric Nuclear Survivability standard testing of survivable electronics devices to include Common Inertial Measurement Unit optical components.

FY 10 Planned Program:

- Conduct electronics and sensor nuclear survivability testable protocol testing for the BMDS. This includes sensor chip assembly testing of Kill Vehicle long wave infrared and visible sensors relative to MDA-STD-001.
- Use the High Altitude Exoatmospheric Nuclear Survivability standard tested parts from FY08 and FY09 for building prototype Inertial Measurement Unit engineering development units that meet MDA-STD-005. This will lead to low rate initial production of a Nuclear Survivable common Inertial Measurement Unit.

	FY 2008	FY 2009	FY 2010	FY 2011
Manufacturing Process Improvements	2,537	2,843	3,837	
RDT&E Articles (Quantity)	0	0	0	

FY08 Program Accomplishments:

- Investigated Supply Chain Management issue leading to guidelines/best practices.
- Integrated technology refresh and critical supplier results into corporate MDA risk mitigation strategy.
- Expanded interactive supply chain mapping capability to other MDA programs.
- Developed improved Imbedded Die tooling for enhanced production throughput.
- Developed/deployed Manufacturing Readiness Levels Desktop Application including interface with Know How and Best Manufacturing Practices Databases.
- Initiated Continuous Process Improvement efforts for internal and external MDA customers.

FY09 Planned Program:

- Conduct Continuous Process Improvement efforts for internal and external MDA customers. This includes the following:
  - Lean Six Sigma Green Belt and Black Belt Training and certification

- Lean Six Sigma Green Belt and Black Belt Project Planning, Mentoring and Implementation
  - Target projects that help MDA meet its strategic, short term and long term objectives

- Web-based Lean Six Sigma Champion Training Development
- Complete Lean Six Sigma-Pathways Training for Suppliers to One Original Equipment Manufacturers (Second Wave) and initiate Lean Six Sigma-Pathways with a new MDA Original Equipment Manufacturer and its Suppliers
- Participate in improving the Continuous Process Improvement program based on lessons learned and Lean Six Sigma technology developments

FY10 Planned Program:

- Conduct Continuous Process Improvement efforts for internal and external MDA customers. This includes the following:
  - Lean Six Sigma Green Belt and Black Belt Training and certification
  - Lean Six Sigma Green Belt and Black Belt Project Planning, Mentoring and Implementation
  - Target projects that help MDA meet its strategic, short term and long term objectives

- Web-based Lean Six Sigma Champion Training Development
- Complete Lean Six Sigma -Pathways Training for Suppliers to One Original Equipment Manufacturers (Second Wave) and initiate Lean Six Sigma -Pathways Training with a new MDA Original Equipment Manufacturer and it's Suppliers
- Participate in improving the Continuous Process Improvement program based on lessons learned and Lean Six Sigma technology developments

	FY 2008	FY 2009	FY 2010	FY 2011
Electro-Optics/Infrared (EO/IR)	8,602	11,444	8,587	
RDT&E Articles (Quantity)	0	0	0	

FY08 Accomplishments:

- Demonstrated Visible Sensor w/Digital Read Out Integrated Circuit - Subprime Integration (Silicon Carbide telescope, Common Sensor Visible Focal Plane Array)
- Demonstrated Survivability of Kill Vehicle Telescope (Silicon Carbide telescope, Silver Reflective Coatings)

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date: May 2009
APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE: 0603890C Ballistic Missile Defense Enabling Programs

- Demonstrated Novel Video Hub & 200 Mbit Ku band Telemetry (200Mbits/sec, Portable Ground Station)
- Demonstrated /Infrared Sensors (Raytheon & British Aerospace) (Silicon Carbide & Aluminum telescope, Common Sensor Electronics DRS Corporation 2-color Focal Plane Array)
- Demonstrated Low Loss Composite Ku band Radome
- Demonstrated High Power Long Life Laser Diodes

FY09 Planned Program:

- Commence development of Flight Experiments to assess technology supplier readiness relative to the survivability and performance of their next generation sensor subsystems/component technologies via the following investments: 1) Flight Experiment (FE-2) Planning & Development, 2) Commence low lot production Two Color Infrared Sensor Environment & Radiation and Testing, 3) Commence low lot Production Testing Optical Telescope and Environment & Radiation testing, 4) Commence low lot production of Integrated Dewar Assembly, Split Cryocooler-cryostat and Electronics Environment & Radiation Testing, and 5) Commence low lot production of Advanced Infrared Detector with Digital Readout and Environment & Radiation Testing

FY10 Planned Program:

- Complete coordinated multiple low (3-5 units) quantity production and radiation testing of both improved performance and radiation tolerant next generation sensor subsystems/component technologies for flight experiments planned for FY10 involving two sensors guided by a controlled divert and attitude control system. The planned sensor technologies are : 1) both one and two color digital (up to 200 frames/sec) Focal Plan Arrays, 2) a common power and data bus architecture/connectors, and a (missile and space) standard power and data bus architecture/connectors and common dual-use split-cryocooler configuration, 3) subwavelength gratings in lieu of coatings to improve the efficiency of both transmissive and reflective optics, and 4) laser cross-link telemetry between two separately launched payloads (sensor with Divert and Attitude Control System).

	FY 2008	FY 2009	FY 2010	FY 2011
Radar RF / Electronics	2,377	2,658	2,950	
RDT&E Articles (Quantity)	0	0	0	

FY08 Accomplishments:

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- Executed the High Power Electronics Reliability Test program for MDA and other Joint DoD applications.
- Conducted reliability testing of High Voltage Gallium Arsenide X-band monolithic microwave integrated circuits.
- Conducted reliability testing of Gallium Nitride X-band discrete devices. A significant accomplishment is that test results indicated that a major program goal of improving the hours of reliability for discrete devices was achieved.
- Executed the 4-inch Diameter Semi-insulating Silicon Carbide Wafer Producibility program. Significant accomplishment is that high quality 4-inch diameter wafers were produced via an improved diameter expansion technique. Substrate quality was also improved.

FY09 Planned Program:

- Continue the High Power Electronics Reliability Test program for MDA and other joint DoD applications
- Conduct reliability testing of next generation High Voltage Gallium Arsenide X-band monolithic microwave integrated circuits
- Achieve improved reliability on next generation High Voltage Gallium Arsenide monolithic microwave integrated circuits
- Conduct reliability testing of Gallium Nitride X-band discrete devices.
- Continue the 4-inch Diameter Semi-insulating Silicon Carbide Wafer Producibility program and introduce second source for 4-inch Semi-insulating Silicon Carbide wafers for utilization by MDA and other DoD radar programs.

FY10 Planned Program:

- Continue the High Power Electronics Reliability Test program for MDA and other joint DoD applications.
- Conduct reliability testing of Gallium Nitride X-band monolithic microwave integrated circuits. This testing will focus on 1st generation (28V) Gallium Arsenide monolithic microwave integrated circuits
- Initiate the X-band Gallium Arsenide monolithic microwave integrated circuits Producibility program to support MDA and other joint DoD applications. This is to focus on 1st generation (28V) Gallium Arsenide monolithic microwave integrated circuits
- Initiate development of a Radar Demonstrator to aid in the transition of producible, modular, scalable, and affordable technology to the BMDS.

	FY 2008	FY 2009	FY 2010	FY 2011
Propulsion	5,492	8,481	2,287	
RDT&E Articles (Quantity)	0	0	0	

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date: May 2009
APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE: 0603890C Ballistic Missile Defense Enabling Programs

FY08 Accomplishments:

- Completed two divert thruster subsystem tests to demonstrate controllability for Solid Divert and Altitude Control System concepts. These tests consisted of four flight-type embedded divert thrusters in a gas generator. The program successfully demonstrated three on pulses with two extinguishment periods
- Executed component level testing and qualification of the low cost Liquid Divert and Altitude Control System components. These tests included divert thrusters, high level attitude control thrusters and propellant tank diaphragm reversal tests. The divert and attitude control thruster tests demonstrated low cost material selections to reduce the overall program cost and lead time
- Completed a demonstration program to characterize small igniters/initiation systems that meet the Mil STD 1901A requirements.

FY09 Planned Program:

- Complete detailed design, fabrication and qualification for components associated with the low cost Liquid Divert and Altitude Control System. The component qualification program include the cold gas thrusters, pressure regulator, pyrovalves, tanks and high level attitude control thruster valves.
- Complete trade studies for controllable Solid Divert and Altitude Control System technologies as with potential application to a future next generation sensor producibility program flight experiment. The program will be a testbed for demonstrating products and components developed under Manufacturing and Producibility funds as innovative technologies/products for the future BMDS.
- Continue to complete material characterization for ultra high temperature materials and components developed under the SBIR and core funded activities. Complete initial characterization of initial lots of Molybdenum 41Rhenium samples. Conduct characterization of samples excised from near-net-shape components, and conduct characterization to generate statistical database. Identify property relationship between near-net-shape samples and typical dogbone tensile samples. Conduct characterization of Novoltex Carbon Silicon Carbide samples.

FY10 Planned Program:

- Execute component and subsystem design, fabrication and testing of controllable Solid Divert and Altitude Control System component technologies. This program will be a testbed for products developed as part of the overall materials development program, low cost high performance actuators and other control schemes as they relate to improved performance for controllable solid DACS systems for the BMDS

	FY 2008	FY 2009	FY 2010	FY 2011

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date: May 2009
APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE: 0603890C Ballistic Missile Defense Enabling Programs

Advanced Materials & Structures	2,537	3,066	2,337	
RDT&E Articles (Quantity)	0	0	0	

FY08 Accomplishments:

- Conducted aero thermal and structural analysis (rain erosion tests) between phthalonitrile and silicon nitride materials
- Conducted aero thermal testing and performance assessment for Kinetic Energy Interceptor antenna window and provided polisyloxane antenna window for the Flight Experiment-1

FY09 Planned Program:

- Will deliver composite lightweight solid rocket motor case
- Will deliver Multiple Kill Vehicle / Lockheed Martin Company payload adapter

FY10 Planned Program:

- Will deliver LM electronic control unit housing
- Will deliver pressure vessel fuel tank

	FY 2008	FY 2009	FY 2010	FY 2011
Anti-Tamper	1,310	2,845	3,091	
RDT&E Articles (Quantity)	0	0	0	

FY08 Accomplishments:

- Initiated a software modification effort to improve key management and authentication of processors.
- Work with the BMDS to identify critical technologies and identify Anti-Tamper solutions.

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date: May 2009
APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE: 0603890C Ballistic Missile Defense Enabling Programs

FY09 Planned Program:

- Continue the software modification effort started in FY08 to include a Producibility feasibility demonstration and proof of concept that will aid in the transition of producible, modular, scalable, and affordable technology to the BMDS.
- Develop protective Anti-Tamper technologies for the BMDS.
- Conduct assessments on Anti-Tamper technologies to evaluate likely effectiveness.
- Initiate transition plans and tailor above Anti-Tamper technologies for utilization on and protection of the BMD System.
- Work with the BMDS to identify critical technologies and identify Anti-Tamper solutions.

FY10 Planned Program:

- Evaluate software modification effort started in FY08 to determine its likely effectiveness against reverse engineering.
- Develop protective Anti-Tamper technologies for the BMDS.
- Develop AT technologies to enable active response capabilities for the BMDS.
- Evaluate performance of multiple integrated AT technologies.
- Conduct assessments on Anti-Tamper technologies to evaluate likely effectiveness.
- Initiate transition plans and tailor above Anti-Tamper technologies for utilization on and protection of the BMD System.
- Work with the BMDS to identify critical technologies and identify Anti-Tamper solutions.

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date: May 2009
APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE: 0603890C Ballistic Missile Defense Enabling Programs

C. Other Program Funding Summary

	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	Total Cost
PE 0603175C Ballistic Missile Defense Technology	106,437	119,308	109,760						-
PE 0603881C Ballistic Missile Defense Terminal Defense Segment	1,034,478	956,686	719,465						-
PE 0603882C Ballistic Missile Defense Midcourse Defense Segment	2,198,664	1,507,481	982,922						-
PE 0603883C Ballistic Missile Defense Boost Defense Segment	503,475	400,751	186,697						-
PE 0603884C Ballistic Missile Defense Sensors	574,231	777,693	636,856						-
PE 0603886C Ballistic Missile Defense System Interceptors	330,874	385,493	0						-
PE 0603888C Ballistic Missile Defense Test and Targets	619,137	919,956	966,752						-
PE 0603891C Special Programs - MDA	193,157	175,712	301,566						-
PE 0603892C Ballistic Missile Defense Aegis	1,126,337	1,113,655	1,690,758						-
PE 0603893C Space Tracking & Surveillance System	226,499	208,923	180,000						-
PE 0603894C Multiple Kill Vehicle	223,084	283,481	0						-
PE 0603895C BMD System Space Program	16,237	24,686	12,549						-
PE 0603896C BMD C2BMC	439,997	288,287	340,014						-
PE 0603897C BMD Hercules	51,387	55,764	48,186						-
PE 0603898C BMD Joint Warfighter Support	45,400	69,743	60,921						-
PE 0603904C Missile Defense Integration & Operations Center (MDIOC)	77,102	106,040	86,949						-
PE 0603906C Regarding Trench	1,945	2,968	6,164						-
PE 0603907C Sea Based X-Band Radar (SBX)	155,244	146,895	174,576						-
PE 0603908C BMD Europ Intercep Site	0	362,007	0						-
PE 0603909C BMD Europ Midcourse Radar	0	76,537	0						-
PE 0603911C BMD European Capability	0	0	50,504						-
PE 0603912C BMD European Comm Support	0	27,008	0						-
PE 0603913C Israeli Cooperative	0	0	119,634						-
PE 0605502C Small Business Innovative Research BMDO	137,409	0	0						-
PE 0901585C Pentagon Reservation	5,971	19,667	19,709						-
PE 0901598C Management Headquarters - MDA	83,907	81,174	57,403						-

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

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

Producibility and Manufacturing adheres to MDA's capability-based acquisition strategy that emphasizes testing, incremental development, and evolutionary acquisition. The Producibility and Manufacturing group is MDA's Technology Transition Lead; ensuring technologies and products under development from the Advanced Technology Deputate, items developed through the Small Business Innovative Research program, and efforts developed through the Services MANTECH programs are mapped into the BMDS architecture at the appropriate insertion points and in concert with the BMDS Elements. The identification of manufacturing risks is done through Engineering and Manufacturing Readiness Level (EMRL) Assessments. EMRLs are a systems engineering tool that employs widespread industry and BMDS Element interaction to analyze the maturity of manufacturing processes as a factor in the BMDS Risk Management Process. Producibility and Manufacturing conducts Industrial Capability Assessments (ICAs) across the BMDS Industrial Base in order to identify production gaps created by material supplier changes, loss of manufacturing base, and movement of US production overseas. From these assessments, a gap analysis is developed which focuses on methods that can be used to support our US original equipment manufacturers (OEMs), their supplier base, and other organizations that produce end items for the BMDS.

As part of the gap analysis, US environmental concerns are addressed. Our efforts to find a replacement for the environmentally toxic metal Beryllium has focused our efforts on pursing environmentally friendly Silicon Carbide as a Kill Vehicle telescope construction material. An additional benefit of Silicon Carbide is that it will be used to improve the nuclear survivability of Kill Vehicle sensors which is part of the telescope assembly.

For efficiency, Producibility and Manufacturing utilizes existing MDA and service contract vehicles when possible to execute the program.

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date: May 2009
APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE: 0603890C Ballistic Missile Defense Enabling Programs

I. Product Development Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2009 Cost	FY 2009 Award/ Oblg Date	FY 2010 Cost	FY 2010 Award/ Oblg Date	FY 2011 Cost	FY 2011 Award/ Oblg Date	Total Cost
Power Systems										
Battery Efforts	MIPR	NSWC/ Crane, IN	2,507	1,715	1/3Q	836	1/3Q			5,058
Li-Ion modeling	FFP	Quallion	0	575	2Q	575	2Q			1,150
Lean initiatives	FFP	Tiburon	0	530	1/3Q	530	1/3Q			1,060
BMDS Program Battery	Various	Various	0	1,459	2/3Q	1,459	2/3Q			2,918
Thermal Battery Process Improvements	FFP	Enser	0	200	2Q	200	2Q			400
Radiation Hardening										
Rad Hard	CPFF	Draper	22	0	4Q	0	N/A			22
Rad Hard	CPFF	Kearfott	2,506	2,923	1/3Q	5,503	1/3Q			10,932
Manufacturing Process Improvements										
BMDS Supply Chain	CPFF	ATI	760	851	1/2Q	1,275	1/2Q			2,886
CPI	CPFF	DRC	552	618	2/3Q	1,275	2Q			2,445
COTS	MIPR	Crane	190	275	2/3Q	330	2Q			795
Electro-Optics/Infrared (EO/IR)										
EO/IR	CPFF	BAE/ Kirtland, NM	300	1,600	2/3Q	300	1/3Q			2,200
EO/IR	CPFF	Fibertek/ Hendon, VA	1,025	1,070	1/3Q	1,000	1/3Q			3,095
EO/IR	CPFF	Miltec	1,700	1,600	1/3Q	1,100	1/3Q			4,400
EO/IR	MIPR	DMEA/ MCLELLAN, CA	1,200	0	N/A	1,000	2Q			2,200
EO/IR	MIPR	NASA/ Wallops Island	2,000	3,050	4Q	2,400	2/3Q			7,450
EO/IR	CPFF	AXSYS	1,642	2,161	4Q	1,800	2/3Q			5,603

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date: May 2009
APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE: 0603890C Ballistic Missile Defense Enabling Programs

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2009 Cost	FY 2009 Award/ Oblg Date	FY 2010 Cost	FY 2010 Award/ Oblg Date	FY 2011 Cost	FY 2011 Award/ Oblg Date	Total Cost
EO/IR	CPFF	EOC/ PA	0	1,000	2/3Q	0	1/3Q			1,000
EO/IR	CPFF	Draper	0	200	1Q	200	1Q			400
Radar RF / Electronics										
Bulk SI GaN for RF	CPFF	AFRL/ Kirtland	400	495	1/3Q	500	N/A			1,395
Reliability Testing	MIPR	NRL/ Washington, DC	200	200	1/3Q	300	N/A			700
Tri-Service Rel. Testing	MIPR	AFRL/ Kirtland	442	600	1/4Q	613	N/A			1,655
Producibility of SI SiC Substrates	MIPR	AFRL/ Kirtland	600	600	1/3Q	750	N/A			1,950
Propulsion										
SMDC	CPFF	Aerojet/ Sacramento, CA	4,000	6,650	2/4Q	600	2/4Q			11,250
Propulsion	MIPR	NSWCCD/MD	593	903	2/3Q	730	1/3Q			2,226
Propulsion	MIPR	China Lake, CA	50	51	2Q	55	2Q			156
Advanced Materials & Structures										
Advanced Materials	CPFF	SMDC/San Diego Composites/ San Diego, CA	1,659	1,898	2/3Q	1,385	1/3Q			4,942
Advanced Materials	MIPR	SORI	200	258	2/3Q	0	N/A			458
Advanced Materials	MIPR	DCMA/IAC	25	35	2Q	35	1/3Q			95
Anti-Tamper										
Anti-Tamper	MIPR	NSWC CRANE/ CRANE, IN	575	191	N/A	304	1/3Q			1,070
Technology Development/Assessment	Various	AFRL/Raytheon	0	1,891	2/3Q	2,000	1/3Q			3,891

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date: May 2009
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Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2009 Cost	FY 2009 Award/ Oblg Date	FY 2010 Cost	FY 2010 Award/ Oblg Date	FY 2011 Cost	FY 2011 Award/ Oblg Date	Total Cost
Subtotal Product Development			23,148	33,599		27,055				83,802

Remarks

II. Support Costs Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2009 Cost	FY 2009 Award/ Oblg Date	FY 2010 Cost	FY 2010 Award/ Oblg Date	FY 2011 Cost	FY 2011 Award/ Oblg Date	Total Cost
Power Systems										
SETA	FFP	DRC, SPARTA/ VA	493	513	1/3Q	525	1/3Q			1,531
Radiation Hardening										
SETA	FFP	DRC, SPARTA/ VA	493	513	N/A	525	1/3Q			1,531
Other DoD		SMDC / Huntsville AL	114	114	2/4Q	115	1/3Q			343
Manufacturing Process Improvements										
JDMTP	CPFF	Tiburon	150	168	2/4Q	170	1/3Q			488
Tin Whisker/PCB Tech	MIPR	ONR/VA	150	168	2/4Q	0	N/A			318
SETA	FFP	DRC, SPARTA/ VA	493	513	1/3Q	525	1/3Q			1,531
Electro-Optics/Infrared (EO/IR)										
SETA	FFP	DRC, SPARTA/ VA	493	513	1/3Q	525	1/3Q			1,531
Radar RF / Electronics										
SETA	FFP	DRC, SPARTA/ VA	493	513	1/3Q	525	1/3Q			1,531
Propulsion										

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date: May 2009
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Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2009 Cost	FY 2009 Award/ Oblg Date	FY 2010 Cost	FY 2010 Award/ Oblg Date	FY 2011 Cost	FY 2011 Award/ Oblg Date	Total Cost
SETA	FFP	DRC, SPARTA/ VA	493	513	1/3Q	525	1/3Q			1,531
Other DoD		SMDC/ Huntsville AL	114	114	2/4Q	115	1/3Q			343
			0	0	N/A	0	N/A			
Advanced Materials & Structures										
SETA	FFP	DRC, SPARTA/ VA	493	513	1/3Q	525	1/3Q			1,531
Other DoD		SMDC/ Huntsville AL	112	112	2/4Q	130	1/3Q			354
Anti-Tamper										
SETA	FFP	DRC, SPARTA / VA	493	513	1/2Q	525	1/3Q			1,531
Subtotal Support Costs			4,584	4,780		4,730				14,094

Remarks

III. Test and Evaluation Cost ($ in Thousands)

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

Remarks

IV. Management Services Cost ($ in Thousands)

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

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date: May 2009
APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE: 0603890C Ballistic Missile Defense Enabling Programs

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2009 Cost	FY 2009 Award/ Oblg Date	FY 2010 Cost	FY 2010 Award/ Oblg Date	FY 2011 Cost	FY 2011 Award/ Oblg Date	Total Cost
Power Systems										
Govt Personnel		MDA/ VA	207	213	1/4Q	225	1/4Q			645
CIV Travel		MDA/ VA	35	37	1/4Q	37	1/4Q			109
Radiation Hardening										
Govt Personnel		MDA/ VA	207	213	1/4Q	225	1/4Q			645
CIV Travel		MDA/ VA	35	37	1/4Q	37	1/4Q			109
Manufacturing Process Improvements										
Govt Personnel		MDA/ VA	207	213	1/4Q	225	1/4Q			645
CIV Travel		MDA/ VA	35	37	1/4Q	37	1/4Q			109
Electro-Optics/Infrared (EO/IR)										
Govt Personnel		MDA/ VA	207	213	1/4Q	225	1/4Q			645
CIV Travel		MDA/ VA	35	37	1/4Q	37	1/4Q			109
Radar RF / Electronics										
Govt Personnel		MDA/ VA	207	213	1/4Q	225	1/4Q			645
CIV Travel		MDA/ VA	35	37	1/4Q	37	1/4Q			109
Propulsion										
Govt Personnel		MDA/ VA	207	213	1/4Q	225	1/4Q			645

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date: May 2009
APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE: 0603890C Ballistic Missile Defense Enabling Programs

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2009 Cost	FY 2009 Award/ Oblg Date	FY 2010 Cost	FY 2010 Award/ Oblg Date	FY 2011 Cost	FY 2011 Award/ Oblg Date	Total Cost
CIV Travel		MDA/ VA	35	37	1/4Q	37	1/4Q			109
Advanced Materials & Structures										
Govt Personnel		MDA/ VA	207	213	1/4Q	225	1/4Q			645
CIV Travel		MDA/ VA	35	37	1/4Q	37	1/4Q			109
Anti-Tamper										
Govt Personnel		MDA/ VA	207	213	1/4Q	225	1/4Q			645
CIV Travel		MDA/ VA	35	37	1/4Q	37	1/4Q			109
Subtotal Management Services			1,936	2,000		2,096				6,032

Remarks

Project Total Cost			29,668	40,379		33,881				103,928

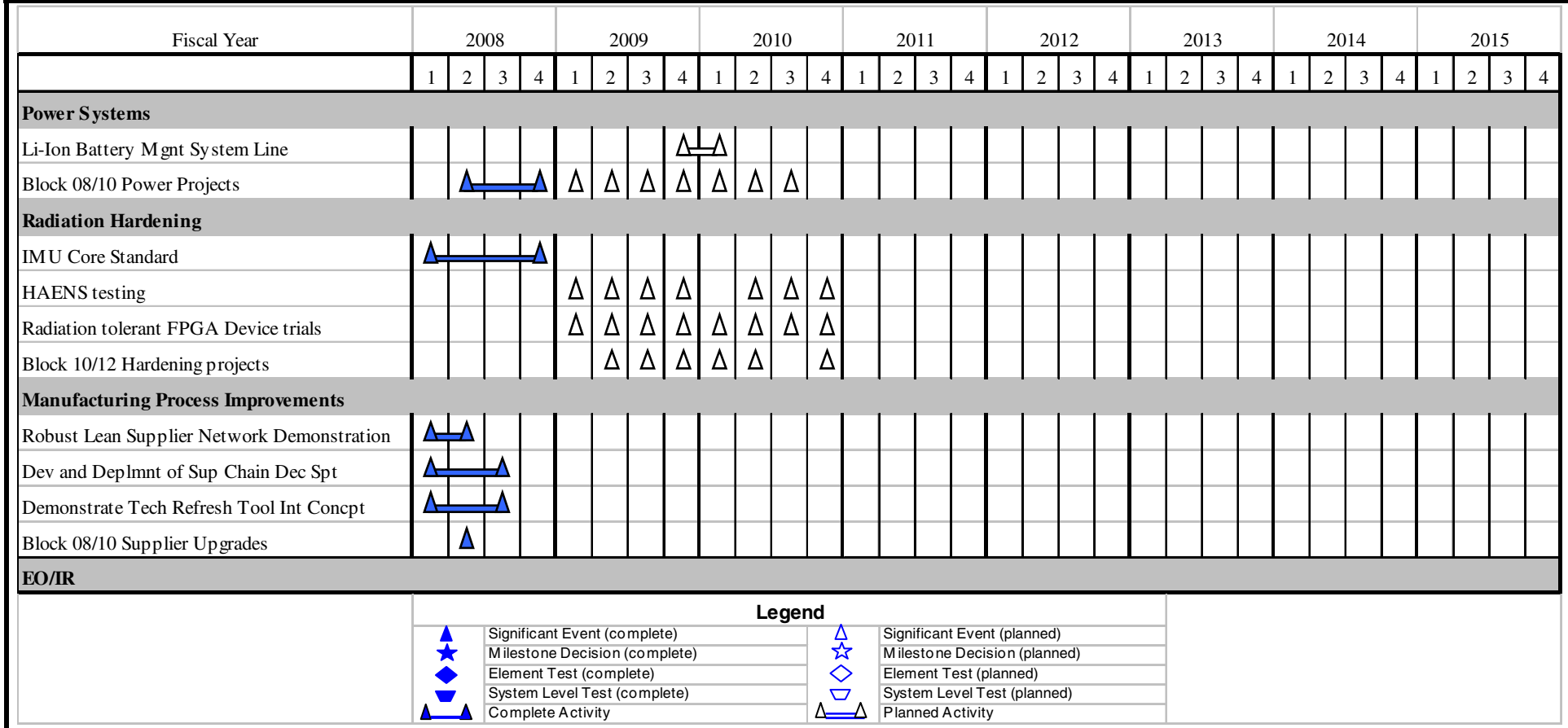
Remarks

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

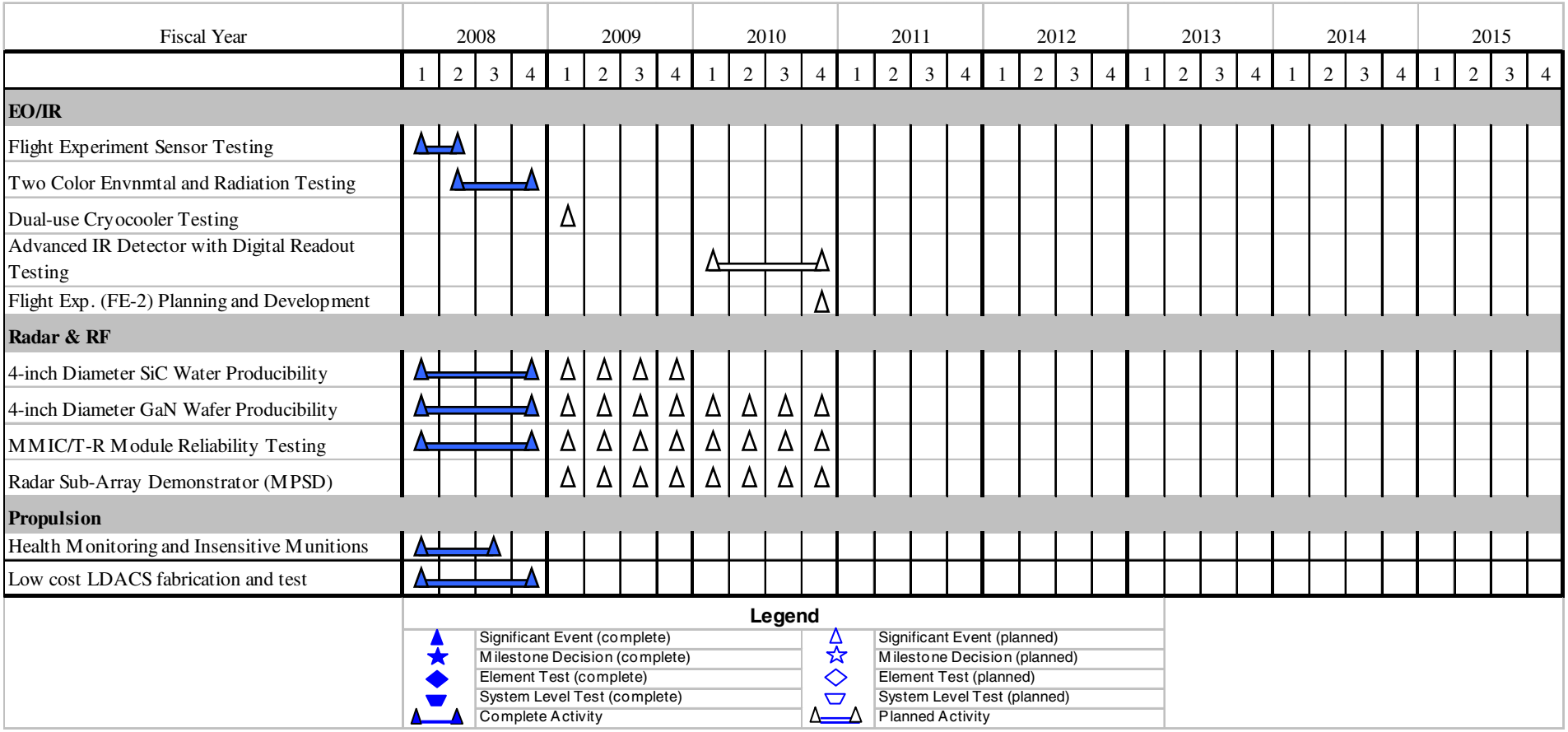
Date: **May 2009**

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

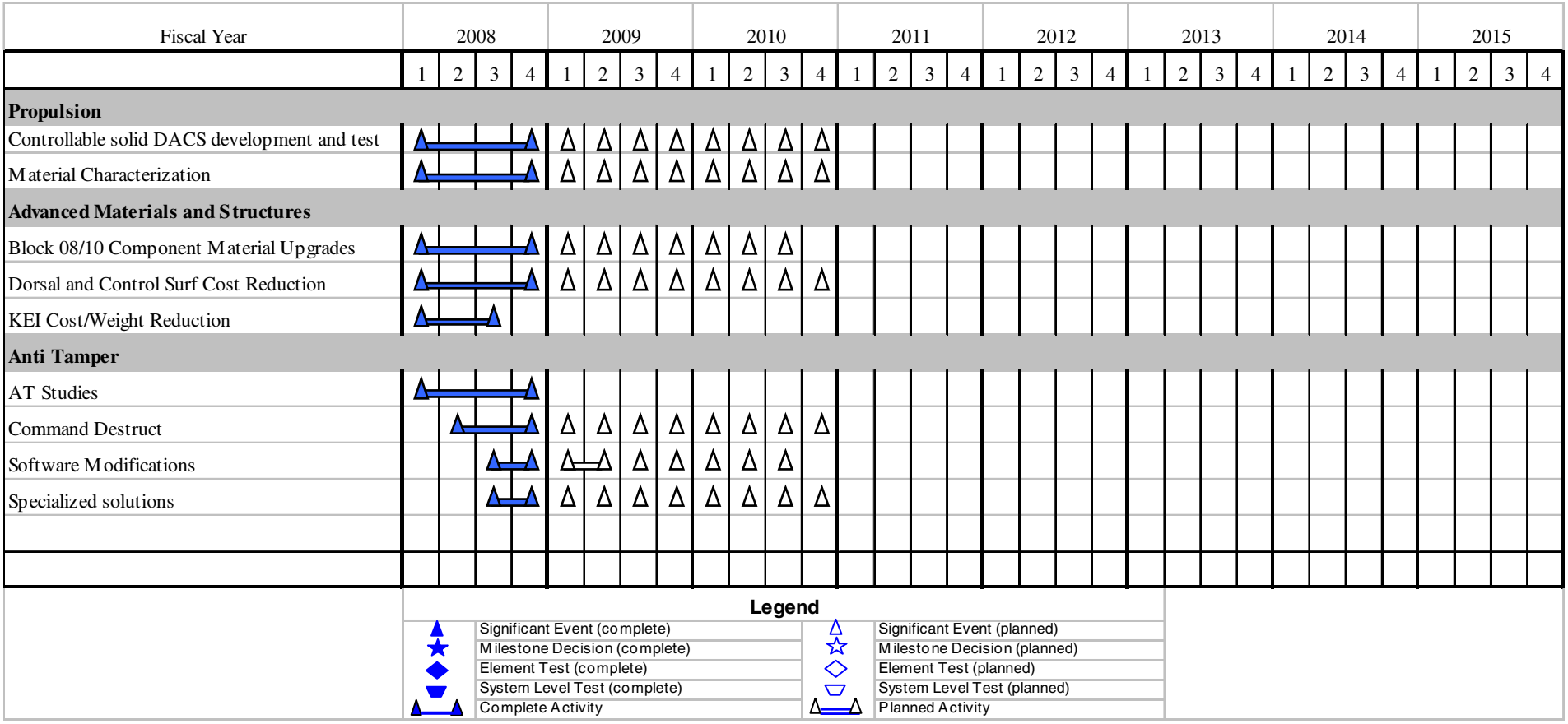
R-1 NOMENCLATURE
0603890C Ballistic Missile Defense Enabling Programs



Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile	Date: May 2009
APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE: 0603890C Ballistic Missile Defense Enabling Programs



Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile	Date: May 2009
APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE: **0603890C Ballistic Missile Defense Enabling Programs**



Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail	Date: May 2009
APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE: 0603890C Ballistic Missile Defense Enabling Programs

Schedule Profile	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015
Power Systems								
Li-Ion Battery Mgnt System Line		4Q	1Q					
Block 08/10 Power Projects	2Q-4Q	1Q,2Q,3Q,4Q	1Q,2Q,3Q					
Radiation Hardening								
IMU Core Standard	1Q-4Q							
HAENS testing		1Q,2Q,3Q,4Q	2Q,3Q,4Q					
Radiation tolerant FPGA Device trials		1Q,2Q,3Q,4Q	1Q,2Q,3Q,4Q					
Block 10/12 Hardening projects		2Q,3Q,4Q	1Q,2Q,4Q					
Manufacturing Process Improvements								
Robust Lean Supplier Network Demonstration	1Q-2Q							
Dev and Deplmnt of Sup Chain Dec Spt	1Q-3Q							
Demonstrate Tech Refresh Tool Int Concpt	1Q-3Q							
Block 08/10 Supplier Upgrades	2Q							
EO/IR								
Flight Experiment Sensor Testing	1Q-2Q							
Two Color Envnmtal and Radiation Testing	2Q-4Q							
Dual-use Cryocooler Testing		1Q						
Optical Mat`ls (Subst./Coatings) Radiation Testing		1Q						
Advanced IR Detector with Digital Readout Testing			1Q-4Q					
Flight Exp. (FE-2) Planning and Development			4Q					
Radar & RF								
4-inch Diameter SiC Water Producibility	1Q-4Q	1Q,2Q,3Q,4Q						
4-inch Diameter GaN Wafer Producibility	1Q-4Q	1Q,2Q,3Q,4Q	1Q,2Q,3Q,4Q					
MMIC/T-R Module Reliability Testing	1Q-4Q	1Q,2Q,3Q,4Q	1Q,2Q,3Q,4Q					
Radar Sub-Array Demonstrator (MPSD)		1Q,2Q,3Q,4Q	1Q,2Q,3Q,4Q					
Propulsion								
Health Monitoring and Insensitive Munitions	1Q-3Q							
Low cost LDACS fabrication and test	1Q-4Q	1Q,2Q,3Q,4Q						
Controllable solid DACS development and test	1Q-4Q	1Q,2Q,3Q,4Q	1Q,2Q,3Q,4Q					
Material Characterization	1Q-4Q	1Q,2Q,3Q,4Q	1Q,2Q,3Q,4Q					
Advanced Materials and Structures								

Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail	Date: May 2009
APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE: **0603890C Ballistic Missile Defense Enabling Programs**

Schedule Profile	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015
Block 08/10 Component Material Upgrades	1Q-4Q	1Q,2Q,3Q,4Q	1Q,2Q,3Q					
Dorsal and Control Surf Cost Reduction	1Q-4Q	1Q,2Q,3Q,4Q	1Q,2Q,3Q,4Q					
KEI Cost/Weight Reduction	1Q-3Q							
Anti Tamper								
AT Studies	1Q-4Q							
Command Destruct	2Q-4Q	1Q,2Q,3Q,4Q	1Q,2Q,3Q,4Q					
Software Modifications	3Q-4Q	1Q-2Q,3Q,4Q	1Q,2Q,3Q					
Specialized solutions	3Q-4Q	1Q,2Q,3Q,4Q	1Q,2Q,3Q,4Q					

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date: May 2009
APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE: **0603890C Ballistic Missile Defense Enabling Programs**

COST ($ in Thousands)	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015
YX30 BMD Information Management Systems	111,420	92,784	110,313					
RDT&E Articles Qty	0	0	0					

Note:
The FY10 budget sustains the existing Information Technology (IT) infrastructure while building the new IT infrastructure at Headquarters Command Center (HQCC)/Ft. Belvoir and Von Braun Center in Huntsville, Alabama during the Base Realignment and Closure (BRAC) transition. Funds will provide telecommunications redundancy; sustain simultaneous IT operations/parallel infrastructure; provide end-user and role-based technical training for improved quality of service; provide Information Assurance (IA) situational awareness, monitoring, and protection; sustain wireless telephony; and support facility decommissioning.

A. Mission Description and Budget Item Justification

Information Management Systems provide MDA secure information technology systems, data centers, operations and monitoring centers, and telecommunications infrastructure, supporting the strategic mission of the Agency and essential capabilities to meet disaster recovery and continuity of operations requirements. The MDA Secure Information Management and Telecommunications Infrastructure sustains access to the Secret Internet Protocol Router Network (SIPRNET), Non-Secure Internet Protocol Router Network (NIPRNET), MDA classified and controlled unclassified secure networks, classified and unclassified Video Teleconferencing services, test and business data stores, Defense Research Engineering Network (DREN), the Joint Worldwide Intelligence Connectivity System (JWICS), and MDA Special Access Wide Area Network (SAPWAN). JWICS and MDA SAPWAN provide critical intelligence data used to feed the Command, Control, Battle Management and Communication project, the Hercules Project, the Countermeasures/Counter-Countermeasures projects, and Modeling and Simulation projects. Provides for the efficient operation and safeguarding of all agency electronic information. Funds Information Management/Information Technology operations for multiple systems in existing as well as new facilities during the MDA BRAC transition to Huntsville, Alabama; Dahlgren, Virginia and Alexandria, Virginia.

This Project funds initiatives supporting the MDA Systems Engineering and Integration mission for the Ballistic Missile Defense System (BMDS) including:

Operational support to provide critical day-to-day Information Technology support to the Agency mission -

- Information Management/Information Technology Enterprise Architecture that is compliant with DoD and Federally mandated standards for the business and mission support activities of the MDA

- Business Transformation Agency efforts to provide DoD approved solutions for information sharing, electronic records management, financial management, and decision support systems to achieve more effective, efficient and secure business and mission support activities throughout MDA
- Knowledge integration and universal access for information sharing capabilities
- Consolidated Information Management/Information Technology infrastructure in support of Information Technology Line of Business Goals/Objectives
- Information Assurance controls and Computer Network Defense of MDA networks Infrastructure for disaster recovery and continuity of operations capabilities
- Information Assurance Certification and Accreditation processes that support the BMDS, test assets, and administrative support networks
- Information Management/Information Technology policies, guidance, planning, oversight, and monitoring to ensure continued compliance with DoD mandated initiatives, statutes, regulations, directives, and policies

The BMD Information Management Systems project includes the following Task areas:

- US South Metropolitan Area Network (US South MAN)
- US National Capital Metropolitan Area Network (US NCR MAN)
- US West Metropolitan Area Network (US West MAN)
- Enterprise Plans, Policies & Analyses
- MDA General Service Wide Area Networks
- MDA Video Teleconferencing
- MDA Knowledge On-Line
- Core Enterprise Applications
- Information Assurance
- Architecture and Implementation Engineering

B. Accomplishments/Planned Program

	FY 2008	FY 2009	FY 2010	FY 2011
US South Metropolitan Area Network (US SOUTH MAN)	12,216	12,218	14,701	
RDT&E Articles (Quantity)	0	0	0	

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date: May 2009
APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE: **0603890C Ballistic Missile Defense Enabling Programs**

This initiative consists of Information Technology support services required to operate and maintain the classified and unclassified local area networks in the Huntsville, Alabama region. This includes operations and maintenance of hardware, software and help desk services in support of BMDS mission, research and test efforts as well as MDA business processes. The US South Information Technology Office coordinates with the MDA Enterprise Network Operations Security Center to implement Information Assurance Vulnerability Assessments issued by the Joint Task Force-Global Network Operations. The increase in funding is for Information Management/Information Technology operations in support of new facilities in Huntsville, Alabama. The funding profile variance is due to Information Technology infrastructure build-out, test and activation efforts and the increase in the user base (2,200 to 5,500) for MDA facilities in Huntsville, Alabama and the decommissioning of leased facilities.

FY08 Accomplishments:

- Implemented Information Assurance control improvements in accordance with established Plan of Action and Milestones
- Monitored networks for user compliance with DoD policies, and reported incidents
- Provided web-based training to MDA users on new applications and upgrades
- Maintained the helpdesk and network services

FY09 Planned Program:

- Implement Information Assurance control improvements in accordance with established Plan of Action and Milestones
- Monitor networks for user compliance with DoD policies, and reported incidents
- Test and implement software application upgrades and provided web-based training to MDA users on new applications and upgrades
- Maintain the network and help desk services
- Provide technical training to Information Technology staff

FY10 Planned Program:

- Maintain MDA enterprise networks to support knowledge integration and research collaboration
- Implement Information Assurance control improvements in accordance with established Plan of Action and Milestones
- Monitor networks for user compliance with DoD policies, and reported incidents
- Maintain Information Technology system configuration control
- Test and implement software application upgrades and provide web-based training to MDA users on new applications and upgrades
- Provide technical training to Information Technology staff

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date: May 2009
APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE: 0603890C Ballistic Missile Defense Enabling Programs

- Maintain the network and help desk services to provide quality customer support to the desktop
- Implement Role-Based-Administration crews to provide a highly skilled workforce in 18 discreet IT areas

	FY 2008	FY 2009	FY 2010	FY 2011
US National Capital Region Metropolitan Area Network (US NCR MAN)	19,708	13,181	13,124	
RDT&E Articles (Quantity)	0	0	0	

This initiative consists of Information Technology support services required to operate and maintain the classified and unclassified local area networks in the National Capital Region and the AEGIS Program Office at Dahlgren, Virginia. Includes operations and maintenance of hardware, software and help desk services in support of BMDS mission, research and test efforts as well as MDA business processes. The National Capital Region Information Technology Office coordinates with the MDA Enterprise Network Operations Security Center to implement Information Assurance Vulnerability. Assessments issued by the Joint Task Force-Global Network Operations. The funding profile variance is due to build-out, test and activation efforts for the MDA HQCC at Alexandria, Virginia, core application transitions to Huntsville, Alabama and preparation for decommissioning of National Capital Region.

FY08 Accomplishments:

- Sustained the BMDS Mission Operation Center · Implemented Information Assurance control improvements in accordance with established Plan of Action and Milestones
- Monitored networks for user compliance with DoD policies, and reported incidents
- Provided web-based training to MDA users on new applications and upgrades
- Maintained the network and help desk services

FY09 Planned Program:

- Sustain the BMDS Mission Operation Center
- Implement Information Assurance control improvements in accordance with established Plan of Action and Milestones
- Monitor networks for user compliance with DoD policies, and report incidents
- Test and implement software application upgrades
- Maintain the network and help desk services
- Provide web-based training to MDA users on new applications and upgrades

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date: May 2009
APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE: 0603890C Ballistic Missile Defense Enabling Programs

FY10 Planned Program:

- Sustain the BMDS Mission Operation Center
- Implement Information Assurance control improvements in accordance with established Plan of Action and Milestones
- Monitor networks for user compliance with DoD policies, and report incidents
- Test and implement software application upgrades
- Maintain the network and help desk services
- Provide web-based training to MDA users on new applications and upgrades
- Maintain the network and help desk services to provide quality customer support to the desktop
- Implement Role-Based-Administration crews to provide a highly skilled workforce in 18 discreet IT areas

	FY 2008	FY 2009	FY 2010	FY 2011
US West Metropolitan Area Network (US WEST MAN)	197	316	388	
RDT&E Articles (Quantity)	0	0	0	

This initiative consists of Information Technology management support to monitor the Airborne Laser Program (ABL) connectivity to the MDA classified and unclassified networks at Kirtland AFB, New Mexico and Edwards AFB, California. The Information Technology Office West coordinates with the MDA Enterprise Network Operations Security Center to implement Information Assurance Vulnerability Assessments issued by the Joint Task Force-Global Network Operations.

FY08 Accomplishments:

- Coordinated the implementation of vulnerability assessments in the Albuquerque area
- Monitored networks for user compliance with DoD policies, and reported incidents
- Maintained Information Technology system configuration control

FY09 Planned Program:

- Coordinate the implementation of vulnerability assessments in the Albuquerque area
- Monitor networks for user compliance with DoD policies, and reported incidents
- Maintain MDA Information Technology system interface configuration control

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date: May 2009
APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE: 0603890C Ballistic Missile Defense Enabling Programs

FY10 Planned Program:

- Coordinate the implementation of vulnerability assessments in the Albuquerque area
- Monitor networks for user compliance with DoD policies, and reported incidents
- Maintain MDA Information Technology system interface configuration control

	FY 2008	FY 2009	FY 2010	FY 2011
Enterprise Plans, Policies & Analyses	4,836	7,380	6,383	
RDT&E Articles (Quantity)	0	0	0	

FY08 Accomplishments:

- Developed, updated, coordinated, and published policies, guidelines and processes to comply with applicable legislation, DoD and MDA guidance
- Updated FYDP budget plans, documentation and reports for future years to comply with guidance
- Executed, tracked and reported the FY08 Information Technology budget
- Conducted assessments, prepared compliance documentation and reported status to Senior Leadership

FY09 Planned Program:

- Develop, update, coordinate, and publish policies, guidelines and processes to comply with applicable legislation, DoD and MDA guidance
- Update FYDP budget plans, documentation and reports for future years to comply with guidance
- Execute, track and report the FY09 Information Technology budget
- Conduct assessments, prepared compliance documentation and reported status to Senior Leadership

FY10 Planned Program:

- Develop, update, coordinate, and publish policies, guidelines and processes to comply with applicable legislation, DoD and MDA guidance
- Update FYDP budget plans, documentation and reports for future years to comply with guidance
- Execute, track and report the FY10 Information Technology budget
- Conduct assessments, prepare compliance documentation and reported status to Senior Leadership

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date: May 2009
APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE: 0603890C Ballistic Missile Defense Enabling Programs

	FY 2008	FY 2009	FY 2010	FY 2011
MDA General Service Wide Area Networks	12,784	10,760	13,657	
RDT&E Articles (Quantity)	0	0	0	

This initiative consists of telecommunications equipment and leased communications for classified and unclassified voice and data circuits, video teleconferencing capabilities, and circuit access to the Joint Worldwide Intelligence Communications System (JWICS). The MDA Special Access Program Wide Area Network supports BMDS planning and contingency operations. Funds sustainment of the MDA wired telephony and provides engineering support for wireless telephony capabilities supporting the MDA highly mobile and distributed workforce. Circuits and associated services are provided by the Defense Information Systems Agency (DISA) as well as the Defense Research and Engineering Network (DREN). These circuits provide access to over 80 government and industry partner locations to enable information sharing of BMD-related data throughout the global MDA Enterprise.

FY08 Accomplishments:

- Upgraded network equipment to comply with DoD Instruction 8500.2 and DoD Global Information Grid architecture plan
- Funded recurring maintenance agreements on MDA Enterprise network equipment and leased communications
- Expanded network and storage capabilities in support of MDA relocation to Huntsville, AL.

FY09 Planned Program:

- Upgrade network equipment to comply with DoD Instruction 8500.2 and DoD Global Information Grid architecture plan
- Maintain support for MDA enterprise telephony
- Fund recurring maintenance agreements on MDA Enterprise network equipment and leased communications

FY10 Planned Program:

- Sustain existing network equipment to comply with DoD Instruction 8500.2 and DoD Global Information Grid architecture plan
- Sustain existing MDA enterprise telephony services
- Fund recurring maintenance agreements on MDA Enterprise network equipment and leased communications

	FY 2008	FY 2009	FY 2010	FY 2011
MDA Video Teleconferencing	7,256	7,705	9,071	

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date: May 2009
APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE: **0603890C Ballistic Missile Defense Enabling Programs**

RDT&E Articles (Quantity)	0	0	0	

The MDA Video Teleconferencing initiative supports management, engineering, systems integration, operation, maintenance and technical support services for the teleconferencing systems and enhancement and improvement of this critical management capability through implementation of a high-bandwidth, Video Over Internet Protocol (VoIP) capability to enhance resolution and reduce per-minute unit cost. Primary MDA video-teleconferencing sites include the National Capital Region, Huntsville Region, the MDA Integration Operations Center, Kirtland Air Force Base in New Mexico, and Los Angeles AFB California.

FY08 Accomplishments:

- Operated and maintained the Video Teleconference Scheduling Operations Center and conference rooms in support of classified and unclassified MDA mission, test and business operations
- Operated and maintained recurring operations and maintenance for Video Teleconference Center equipment in existing MDA facilities at several Nation Capital Region locations, Dahlgren, Virginia, Huntsville, Alabama, and Shriever AFB, Colorado
- Completed the build out of Video Teleconference conference rooms at facilities in Huntsville, Alabama and the Aegis Program Office facility in Dahlgren, Virginia
- Completed the Video Teleconference architecture design in Huntsville, Alabama and the GMD Operations Support Group at Elmendorf AFB, Alaska

FY09 Planned Program:

- Operate and maintain the Video Teleconference Scheduling Operations Center in support of classified and unclassified MDA mission, test and business operations
- Operate and maintain recurring operations and maintenance for Video Teleconference rooms and equipment to include multiple Nation Capital Region locations, Aegis Program Office facility at Dahlgren, Virginia, the Missile Defense Integration Operations Center (MDIOC) at Shriever AFB, Colorado, and the multiple MDA locations in Huntsville, Alabama
- Design and implement a training program for Video Teleconference room facilitators

FY10 Planned Program:

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date: May 2009
APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE: **0603890C Ballistic Missile Defense Enabling Programs**

- Operate and maintain the Video Teleconference Scheduling Operations Center in support of classified and unclassified MDA mission, test and business operations
- Operate and maintain recurring operations and maintenance for Video Teleconference rooms and equipment to include multiple Nation Capital Region locations, Aegis Program Office facility at Dahlgren, Virginia, the Missile Defense Integration Operations Center (MDIOC) at Shriever AFB, Colorado, and the multiple MDA locations in Huntsville, Alabama
- Implement and test Video Teleconference rooms in the new facility in Huntsville, Alabama
- Provide recurring training for Video Teleconference room facilitators

	FY 2008	FY 2009	FY 2010	FY 2011
MDA Knowledge On-Line	14,873	10,927	13,299	
RDT&E Articles (Quantity)	0	0	0	

This initiative includes costs to manage content, operate and maintain the unclassified and classified MDA Portals. The MDA Portals provide a consolidated and integrated data and knowledge store to share information and knowledge throughout the Missile Defense community. This initiative also supports the operations and maintenance of the Visual Information Production Center, a state-of-the-art, high capacity graphic and video production center, which provides services to senior leadership and agency employees.

FY08 Accomplishments:

- Transitioned the MDA Portal core services from the National Capital Region to Huntsville, Alabama
- Continued implementation of MDA Portal (web-based) training programs to include information assurance, business applications, workforce certification, security, and ethics
- Operated and maintained MDA Portal services
- Sustained recurring operation and maintenance of graphic and video production capabilities

FY09 Planned Program:

- Continue implementation of MDA Portal (web-based) training programs to include information assurance, business applications, workforce certification, security, and ethics
- Operate and maintained MDA Portal services (24/7)
- Sustain recurring operation and maintenance of graphic and video production capabilities

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date: May 2009
APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE: 0603890C Ballistic Missile Defense Enabling Programs

FY10 Planned Program:

- Continue implementation of MDA Portal (web-based) training programs to include information assurance, business applications, workforce certification, security, and ethics
- Operate and maintain existing MDA Portal services (8/5)
- Sustain recurring operation and maintenance of graphic and video production capabilities

	FY 2008	FY 2009	FY 2010	FY 2011
Core Enterprise Applications	7,869	6,185	9,349	
RDT&E Articles (Quantity)	0	0	0	

In accordance with the Clinger Cohen Act, DoD Directive 5000.15 and DoD Records Management Program, this initiative provides for the licensing and sustainment of DoD approved enterprise information applications. DoD mandated and mission essential examples include BMD System Asset Management, BMDS Integrated Master Schedule, business technology tools including Electronic Records Management System, E-Tasker, Integrated Acquisition Environment, data management tool, financial management tools, personnel management tools, MDA Identity and Management Infrastructure application, Computer-Aided Facilities Management, and the MDA Corporate University Enterprise (web-based learning management system). The Defense Information Systems Agency sponsored collaboration tool (IBM Collaboration Suite) will be implemented to allow real-time collaboration throughout the MDA enterprise, the BMDS operational sites and the Combatant Command Headquarters. In addition this initiative funds the Program Resource Internet Database Environment (PRIDE) which is a database management tool and the MDA Standard Procurement System (SPS) helpdesk and application support.

FY08 Accomplishments:

- Manage software assessment program and sustained approved software applications
- Implement collaborative environment
- Managed privacy impact surveys and compliance reporting
- Conducted privacy impact surveys and compliance reporting
- Implemented the DoD mandated business management modernization application and sustained MDA financial and contractual support systems

FY09 Planned Program:

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date: May 2009
APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE: 0603890C Ballistic Missile Defense Enabling Programs

- Manage software assessment program and sustain approved software applications
- Sustain the BMDS Integrated Master Schedule and the BMD Asset Management Tool
- Develop concept of operations for MDA use of Microsoft Sharepoint with Video Teleconferencing services to support real-time research, test and operational information exchange
- Conduct privacy impact surveys and compliance reporting
- Continue implementation of DoD mandated business management modernization applications and sustained MDA financial and contractual support systems

FY10 Planned Program:

- Manage software assessment program and sustain approved software applications
- Implement Business Applications
- Implement Agency-wide collaborative environment
- Sustain the BMDS Integrated Master Schedule and the BMD Asset Management Tool
- Conduct privacy impact surveys and compliance reporting
- Continue implementation of DoD mandated business management modernization applications and sustain MDA financial and contractual support systems

	FY 2008	FY 2009	FY 2010	FY 2011
Enterprise Information Assurance	23,402	13,585	22,555	
RDT&E Articles (Quantity)	0	0	0	

Supports MDA compliance with the Federal Information Security Management Act (FISMA) and DOD 8500 series directives.. This vital program of the BMDS and MDA Enterprise consists of Information Assurance, Computer Network Defense, Network Situational Awareness, Certification and Accreditation activities, and Information Assurance Workforce training and certification to comply with DoD Information Assurance policy directives, instructions and guidelines. The Information Assurance program provides guidance and direction for information system security engineering, development, and testing to ensure that command, control, communications, computing and intelligence systems are protected against malicious or accidental attacks. Provides the network security operations centers and emergency response team as well as supporting processes to protect and defend MDA electronic information and information systems. The MDA Enterprise Network Operations Security Center manages network situational awareness and status reporting. The MDA Computer Emergency Response Team (CERT) coordinates with the Joint Task Force-Global Network Operations (JTF-GNO) to identify and implement network vulnerability updates. This ensures the availability, integrity, authentication, confidentiality and non-repudiation of the MDA mission, test and administrative information and systems.

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date: May 2009
APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE: 0603890C Ballistic Missile Defense Enabling Programs

FY08 Accomplishments:

- Provided system security planning, engineering and test support to the spiral development of BMDS Blocks
- Supported the development of the BMDS Block Information Assurance certification packages for BMDS Blocks
- Revised and updated Information Assurance certification packages for test, administrative and business information technology systems reported DoD and OMB
- Completed implementation of network situational awareness tools for the Enterprise Network Operations Security Center
- Conducted certification evaluations of mission, test and administrative systems and assisted in the development of the Plan of Actions and Milestones to correct Information Assurance deficiencies
- Managed the Information Assurance Workforce Improvement Program to certify Information Assurance professionals and reported compliance in accordance with Federal Information Security Management Act (FISMA) and DoDM 8570.1, achieving the DoD certification goal
- Completed annual Information Assurance user training for the MDA workforce
- Provided Information Assurance engineering and planning guidance and vulnerability assessment for all MDA Information Technology acquisition programs

FY09 Planned Program:

- Revise and updated Information Assurance certification packages for test, administrative and business information technology systems reported DoD and OMB
- Complete implementation of network situational awareness tools for the Enterprise Network Operations Security Center
- Operate MDA CERT (24/7) to monitor networks and systems
- Conduct certification evaluations of mission, test and administrative systems and assisted in the development of the Plan of Actions and Milestones to correct Information Assurance deficiencies
- Manage the Information Assurance Workforce Improvement Program to certify Information Assurance professionals and reported compliance in accordance with Federal Information Security Management Act (FISMA) and DoDM 8570.1, achieving the established DoD certification goal
- Complete annual Information Assurance user training for the MDA workforce
- Provide Information Assurance engineering and planning guidance and vulnerability assessment for all MDA Information Technology acquisition programs

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date: May 2009
APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE: 0603890C Ballistic Missile Defense Enabling Programs

FY10 Planned Program:

- Revise and updated Information Assurance certification packages for test, administrative and business information technology systems reported DoD and OMB
- Operate and monitor MDA networks and systems (12/7) and provide emergency on-call support as required
- Complete implementation of network situational awareness tools for the Enterprise Network Operations Security Center
- Conduct certification evaluations of mission, test and administrative systems and assisted in the development of the Plan of Actions and Milestones to correct Information Assurance deficiencies
- Manage the Information Assurance Workforce Improvement Program to certify Information Assurance professionals and reported compliance in accordance with Federal Information Security Management Act (FISMA) and DoDM 8570.1, achieving the DoD certification goal
- Complete annual Information Assurance user training for the MDA workforce
- Provide Information Assurance engineering and planning guidance and vulnerability assessment for all MDA Information Technology acquisition programs

	FY 2008	FY 2009	FY 2010	FY 2011
Architecture and Implementation Engineering	4,279	7,827	7,786	
RDT&E Articles (Quantity)	0	0	0	

Architecture and Implementation Engineering supports the MDA and the Ballistic Missile Defense Systems (BMDS) Core projects through the design, planning and implementation of an MDA Enterprise Architecture that complies with DoD Federal enterprise architecture standards. The MDA Implementation Engineering efforts will improve the management of and access to information throughout the MDA. This is done through the integration of technology with Agency mission and business processes; transition planning for the MDA HQCC to Alexandria, Virginia and to multiple Huntsville, Alabama facilities; and decommission plans for multiple NCR facilities. These efforts will ensure the continuity of the Information Management and Information Technology infrastructure and services necessary for the design, development, modeling, and testing of the BMDS.

FY08 Accomplishments:

- Developed designs and implementation plans for MDA enterprise communications network support to the Agency at Huntsville, Fort Greeley/Fort Richardson, Pacific Missile Range Facility, Vandenburg AFB, Edwards AFB, and Schriever AFB
- Completed revisions to realignment and transition plans in support of the MDA transition efforts to Dahlgren, VA
- Developed designs and implementation plans to expand MDA enterprise networks to support knowledge integration and research collaboration

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date: May 2009
APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE: **0603890C Ballistic Missile Defense Enabling Programs**

- Developed MDA contingency planning standards and templates for Agency IT systems

FY09 Planned Program:

- Architect and develop plans for telecommunication circuits in support of global BMDS test and mission data sharing requirements
- Continue to develop and refine realignment and transition plans to support the MDA relocation to Huntsville, AL and Fort Belvoir
- Execute plans to expand MDA enterprise networks to support knowledge integration and research collaboration
- Revise and test contingency plans for Information Technology systems at Schriever AFB, Colorado and Huntsville, Alabama
- Develop decommission plans NCR facilities

FY10 Planned Program:

- Implement IT technologies that meet the MDA green procurement standards to reduce IT equipment quantities and reduce energy consumption
- Develop plans to sustain existing telecommunication services in support of global BMDS test and mission data sharing requirements
- Maintain the information technology Enterprise infrastructure in Huntsville, Alabama, Colorado Springs, CO and the National Capital Region
- Execute realignment and transition plans to support the MDA relocation to Huntsville, Alabama and Alexandria, Virginia
- Revise and test contingency plans for Information Technology systems at Dahlgren, Virginia, Schriever AFB, Colorado, and Huntsville, Alabama

	FY 2008	FY 2009	FY 2010	FY 2011
Service Information Management/Information Technology for Executing Agents	4,000	2,700	0	
RDT&E Articles (Quantity)	0	0	0	

This initiative provides recurring funds to the U.S. Army Space and Missile Defense Command (SMDC) a MDA Executing Agent in support of BMDS research and mission related efforts in Huntsville, Alabama. Funds provided to SMDC support continuing operations and maintenance of their communications and Information Technology infrastructure in the Von Braun I facility in Huntsville, Alabama. This includes the communications costs, help desk services, and hardware and software sustainment tool used by MDA for planning and budgeting efforts. As a result of the completion of the BRAC transition to Huntsville, the information technology support will be transferred to and provided by the MDA CIO in FY10 and beyond.

FY08 Accomplishments:

- Operated and maintained Information Technology networks in support of MDA and SMDC efforts in Huntsville, Alabama
- Implemented Information Assurance control improvements in accordance with established Plan of Action and Milestones
- Monitored networks for user compliance with DoD policies, and reported incidents
- Tested and implemented software application upgrades
- Maintained the network and help desk services

FY09 Planned Program:

- Operate and maintain Information Technology networks in support of MDA efforts in Huntsville, Alabama
- Implement Information Assurance control improvements in accordance with established Plan of Action and Milestones
- Monitor networks for user compliance with DoD policies, and reported incidents
- Test and implemented software application upgrades
- Maintain the network and help desk services

FY10 Planned Program:

- As a result of the completion of the BRAC transition to Huntsville, this Information Technology support will be transferred to and provided by the MDA CIO

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date: May 2009
APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE: 0603890C Ballistic Missile Defense Enabling Programs

C. Other Program Funding Summary

	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	Total Cost
PE 0603175C Ballistic Missile Defense Technology	106,437	119,308	109,760						-
PE 0603881C Ballistic Missile Defense Terminal Defense Segment	1,034,478	956,686	719,465						-
PE 0603882C Ballistic Missile Defense Midcourse Defense Segment	2,198,664	1,507,481	982,922						-
PE 0603883C Ballistic Missile Defense Boost Defense Segment	503,475	400,751	186,697						-
PE 0603884C Ballistic Missile Defense Sensors	574,231	777,693	636,856						-
PE 0603886C Ballistic Missile Defense System Interceptors	330,874	385,493	0						-
PE 0603888C Ballistic Missile Defense Test and Targets	619,137	919,956	966,752						-
PE 0603891C Special Programs - MDA	193,157	175,712	301,566						-
PE 0603892C Ballistic Missile Defense Aegis	1,126,337	1,113,655	1,690,758						-
PE 0603893C Space Tracking & Surveillance System	226,499	208,923	180,000						-
PE 0603894C Multiple Kill Vehicle	223,084	283,481	0						-
PE 0603895C BMD System Space Program	16,237	24,686	12,549						-
PE 0603896C BMD C2BMC	439,997	288,287	340,014						-
PE 0603897C BMD Hercules	51,387	55,764	48,186						-
PE 0603898C BMD Joint Warfighter Support	45,400	69,743	60,921						-
PE 0603904C Missile Defense Integration & Operations Center (MDIOC)	77,102	106,040	86,949						-
PE 0603906C Regarding Trench	1,945	2,968	6,164						-
PE 0603907C Sea Based X-Band Radar (SBX)	155,244	146,895	174,576						-
PE 0603908C BMD Europ Intercep Site	0	362,007	0						-
PE 0603909C BMD Europ Midcourse Radar	0	76,537	0						-
PE 0603911C BMD European Capability	0	0	50,504						-
PE 0603912C BMD European Comm Support	0	27,008	0						-
PE 0603913C Israeli Cooperative	0	0	119,634						-
PE 0605502C Small Business Innovative Research BMDO	137,409	0	0						-
PE 0901585C Pentagon Reservation	5,971	19,667	19,709						-
PE 0901598C Management Headquarters - MDA	83,907	81,174	57,403						-

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

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date: May 2009
APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE: 0603890C Ballistic Missile Defense Enabling Programs

D. Acquisition Strategy

MDA employs a federated acquisition strategy for the procurement and sustainment of the MDA Enterprise. This strategy utilizes an Engineering and Architectural Planning support contractor with approved engineering designs and plans are then implemented, sustained, and operated by local contractors in each regional area (Arlington, Virginia; Dahlgren, Virginia; Huntsville, Alabama; Colorado Springs, Colorado; Albuquerque, New Mexico; and Los Angeles, California).

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date: May 2009
APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE: 0603890C Ballistic Missile Defense Enabling Programs

I. Product Development Cost ($ in Thousands)

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

Remarks

II. Support Costs Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2009 Cost	FY 2009 Award/ Oblg Date	FY 2010 Cost	FY 2010 Award/ Oblg Date	FY 2011 Cost	FY 2011 Award/ Oblg Date	Total Cost
US South Metropolitan Area Network (US SOUTH MAN)										
IT Equipment	C/Various	Various	7,653	3,647	1/4Q	3,922	1/4Q			15,222
IT HSV O&M Support	C/CPAF	ASD/ AL	4,241	4,354	1/4Q	8,647	1Q			17,242
SETA Support	C/TM	General Dynamics IT/ AL	172	354	1/3Q	422	1Q			948
IT Integration Support	C/CPAF	Northrop Grumman/ VA	150	173	1/4Q	194	1/4Q			517
Customer Relations	C/CPAF	ASD/ VA	0	666	1/4Q	655	1/2Q			1,321
Portfolio Management	C/CPAF	ASD/ AL	0	3,024	1/4Q	229	1/2Q			3,253
Portfolio Management	C/CPFF	BAH/ AL	0	0	N/A	632	1/2Q			632
US National Capital Region Metropolitan Area Network (US NCR MAN)										

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date: May 2009
APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE: 0603890C Ballistic Missile Defense Enabling Programs

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2009 Cost	FY 2009 Award/ Oblg Date	FY 2010 Cost	FY 2010 Award/ Oblg Date	FY 2011 Cost	FY 2011 Award/ Oblg Date	Total Cost
Computing & Network Services	C/CPAF	Northrop Grumman/ VA	17,734	11,323	1/4Q	12,071	1Q			41,128
IM/IT SETA Support	C/TM	General Dynamics IT/ VA	1,974	1,858	1/4Q	1,053	1Q			4,885
US West Metropolitan Area Network (US WEST MAN)										
SETA Support	C/TM	General Dynamics IT/ NM	197	316	1/3Q	388	1/3Q			901
Enterprise Plans, Policies & Analyses										
SETA Support	C/TM	General Dynamics IT/ VA	1,545	1,938	1/3Q	1,936	1/3Q			5,419
CIO Support/Exec Mgt/PMIB	Various	Various/ AL	503	1,031	1/4Q	1,274	1/4Q			2,808
CIO Support	C/TM	Decisive Analytics/ VA	1,820	1,552	1/4Q	965	1/4Q			4,337
CIO Travel			302	300	1/4Q	318	1/4Q			920
Publications/Subscriptions	Various	Various	556	139	1/4Q	689	1/4Q			1,384
Customer Relations	C/CPAF	SRA/ VA	0	1,760	1/4Q	480	N/A			2,240
CIO Support	C/CPAF	SRA/ VA	0	660	1/4Q	721	N/A			1,381
MDA General Service Wide Area Networks										
Leased Communications	MIPR	DISA/ IL	1,200	1,111	1/3Q	1,590	1/3Q			3,901

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date: May 2009
APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE: 0603890C Ballistic Missile Defense Enabling Programs

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2009 Cost	FY 2009 Award/ Oblg Date	FY 2010 Cost	FY 2010 Award/ Oblg Date	FY 2011 Cost	FY 2011 Award/ Oblg Date	Total Cost
Leased Communications	MIPR	Army Rsch Lab/ MD	3,070	3,000	1/2Q	3,275	1/2Q			9,345
WAN Eng/Sustainment	C/CPAF	Northrop Grumman/ CO	5,200	2,356	2Q	3,517	2Q			11,073
Leased Communications	MIPR	DTSW/ VA	250	0	1/3Q	265	1Q			515
SETA Support	C/CPFF	General Dynamics IT/ VA	858	1,416	1/3Q	1,393	1/3Q			3,667
Comm SAP WAN/JWICS	C/CPAF	Northrop Grumman/ VA	0	64	1/3Q	127	4Q			191
COM SAP WAN	MIPR	FEDSIM/ VA	125	440	1Q	0	N/A			565
Army DOIM	MIPR	Army/ Al/ AL	432	0	1/4Q	583	1/4Q			1,015
Wireless	C/BPA	Various/ AL	1,649	2,373	1/4Q	2,650	1/4Q			6,672
Leased Communications Sonet Ring	MIPR	DTSW/ VA	0	0	4Q	257	N/A			257
MDA Video Teleconferencing										
SETA Support	C/CPFF	General Dynamics IT/ VA	172	708	1/4Q	421	1Q			1,301
VTC Support & Maintenance	C/CPAF	Microtech/ VA	6,145	6,432	1/4Q	8,438	1/4Q			21,015
VTC Support & Maintenance	C/CPAF	ODC	762	388	3Q	212	1Q			1,362
SETA Support	C/CPAF	JTAAS/ CO	177	177	1/4Q	0	N/A			354
MDA Knowledge On-Line										

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date: May 2009
APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE: 0603890C Ballistic Missile Defense Enabling Programs

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2009 Cost	FY 2009 Award/ Oblg Date	FY 2010 Cost	FY 2010 Award/ Oblg Date	FY 2011 Cost	FY 2011 Award/ Oblg Date	Total Cost
MDA Portal	C/CPAF	Phacil/ VA	5,400	5,550	1Q	6,758	1Q			17,708
Video Info Production Ctr	SS/CPFF	CSC/ VA	4,000	3,474	1/4Q	4,240	1/4Q			11,714
Business Innovation	C/CPAF	ASD/ AL	0	0	4Q	262	4Q			262
Classified MKO	C/CPAF	Northrop Grumman/ VA	2,291	1,903	1/4Q	1,078	1/4Q			5,272
Knowledge Management	C/CPAF	FEDSIM/SRA/ VA	3,182	0	1/4Q	961	1/4Q			4,143
Core Enterprise Applications										
PRIDE Maintenance and Support	MIPR	SMDC/CIMS/ AL	981	985	1Q	995	1Q			2,961
SETA Support	C/TM	General Dynamics IT/ VA	1,889	1,806	1/4Q	1,475	1Q			5,170
Application support	C/CPAF	Northrop Grumman/ CO	1,547	814	2Q	0	N/A			2,361
Standard Procurement Sys Support	C/MIPR	SPS JPMO/ VA	222	366	1/2Q	412	1/2Q			1,000
Software License/Maintenance	C/CPAF	SRA/ VA	3,230	414	1/4Q	4,559	1/4Q			8,203
Microsoft Licenses	C/BPA	FEDSIM/ VA	0	1,800	N/A	1,908	3Q			3,708
Enterprise Information Assurance										
Certification & Accreditation Support	C/CPAF	FEDSIM/ VA	381	660	1/2Q	721	1Q			1,762

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date: May 2009
APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE: 0603890C Ballistic Missile Defense Enabling Programs

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2009 Cost	FY 2009 Award/ Oblg Date	FY 2010 Cost	FY 2010 Award/ Oblg Date	FY 2011 Cost	FY 2011 Award/ Oblg Date	Total Cost
Certification & Accreditation Support (DIACAP)	C/TM	General Dynamic IT/ VA	1,545	885	2Q	1,264	2Q			3,694
MDA CERT	C/CPAF	Northrop Grumman/ VA	2,300	2,768	1/2Q	2,721	2Q			7,789
DIACAP Product	C/CPAF	ASD / AL	2,340	756	1/4Q	786	1Q			3,882
Compliance Verification SETA Supt	C/TM	General Dynamics IT/ VA	1,482	79	1/4Q	2,059	1Q			3,620
Enterprise Network Op Security Center/TRD MGt	C/CPAF	Northrop Grumman/ CO	9,462	3,598	2Q	6,590	2Q			19,650
PKI/CAC Support	C/CPAF	FEDSIM/SRA/ VA	193	220	1/2Q	240	1Q			653
NetOps / CERT Analysis	C/CPFF	Booz Allen Hamilton/ CO	1,268	426	1/4Q	240	N/A			1,934
ENOSC SETA Support	C/CPAF	JTAAS/ CO	736	177	1/4Q	437	4Q			1,350
DEERS/RAPIDS	C/MIPR	WHS	194	0	1/4Q	43	1/4Q			237
ENOSC/CERT SETA Supt	C/TM	General Dynamics IT/ VA	0	0	4Q	422	4Q			422
COMSEC Equip/Labor	C/BPA	ASD/ AL	554	252	2Q	315	2Q			1,121
IA Workforce Improvement Training	C/TM	General Dynamics IT/ VA	1,495	1,408	2Q	529	N/A			3,432

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date: May 2009
APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE: 0603890C Ballistic Missile Defense Enabling Programs

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2009 Cost	FY 2009 Award/ Oblg Date	FY 2010 Cost	FY 2010 Award/ Oblg Date	FY 2011 Cost	FY 2011 Award/ Oblg Date	Total Cost
IA KB SETA Supt	C/TM	General Dynamics IT/ VA	630	400	1/4Q	529	1Q			1,559
Arcsight /SW Licenses	C/CPAF	FEDSIM/SRA/ VA	0	177	2Q	1,270	2Q			1,447
DIACAP Certification & Accreditation BMDS Documentation	C/CPAF	Northrop Grumman/ VA	650	519	1Q	583	1Q			1,752
Identify Protection Support	C/CPAF	WHS/ VA	0	0	1/4Q	170	1/4Q			170
IAVA / ANOSC	C/CPAF	ASD/ AL	0	1,260	1Q	1,310	1Q			2,570
MDA CERT Supt	C/CPAF	ASD/ AL	0	0	N/A	1,266	1Q			1,266
ENOSC HW Maintenance	C/CPAF	Northrop Grumman/ CO	0	0	N/A	1,060	2Q			1,060
Architecture and Implementation Engineering										
Enterprise Architecture & Engineering	C/CPAF	FEDSIM/SRA/ VA	3,764	1,340	2Q	1,935	1/4Q			7,039
SETA Support	C/CPFF	General Dynamics IT/ VA	515	1,416	1/4Q	1,792	1/4Q			3,723
Enterprise Architecture & Engineering	C/CPAF	ASD/ HSV	0	760	1/4Q	1,703	1/4Q			2,463
Enterprise Architecture & Engineering	C/CPAF	NG/ VA	0	3,460	N/A	2,138	N/A			5,598
Enterprise Architecture & Engineering	C/CPAF	JTAAS/ CO	0	531	1/4Q	218	N/A			749

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date: May 2009
APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE: 0603890C Ballistic Missile Defense Enabling Programs

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2009 Cost	FY 2009 Award/ Oblg Date	FY 2010 Cost	FY 2010 Award/ Oblg Date	FY 2011 Cost	FY 2011 Award/ Oblg Date	Total Cost
Enterprise Architecture & Engineering	C/CPAF	BAH/ CO	0	320	1/4Q	0	N/A			320
Service Information Management/Information Technology for Executing Agents										
Service IM/IT	C/CPAF	SMDC/SAIC/ AL	4,000	2,700	1/4Q	0	N/A			6,700
Subtotal Support Costs			111,138	92,784		110,313				314,235

Remarks

Remarks:

III. Test and Evaluation Cost ($ in Thousands)

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

Remarks

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date: May 2009
APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE: 0603890C Ballistic Missile Defense Enabling Programs

IV. Management Services Cost ($ in Thousands)

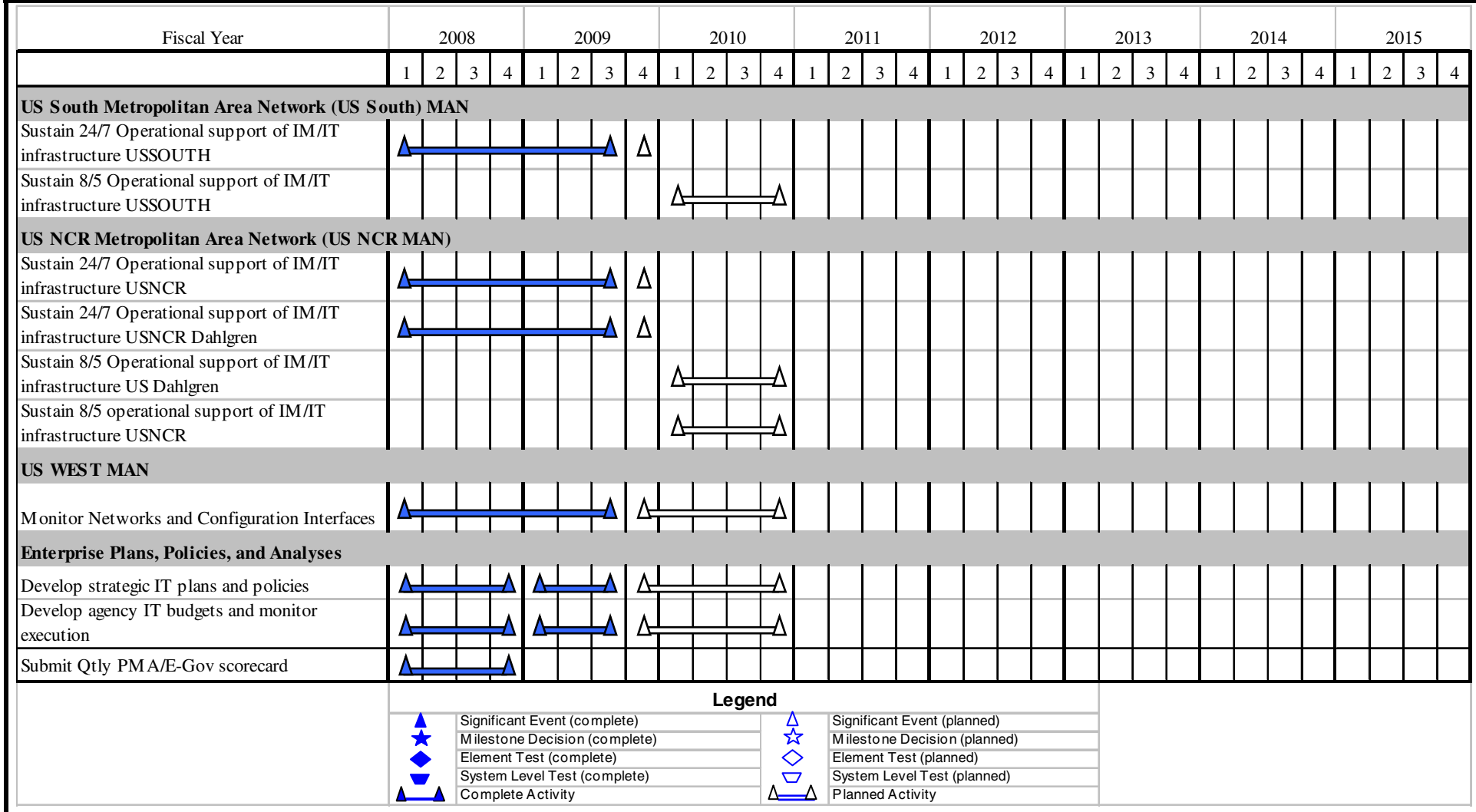
Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2009 Cost	FY 2009 Award/ Oblg Date	FY 2010 Cost	FY 2010 Award/ Oblg Date	FY 2011 Cost	FY 2011 Award/ Oblg Date	Total Cost
Subtotal Management Services										

Remarks

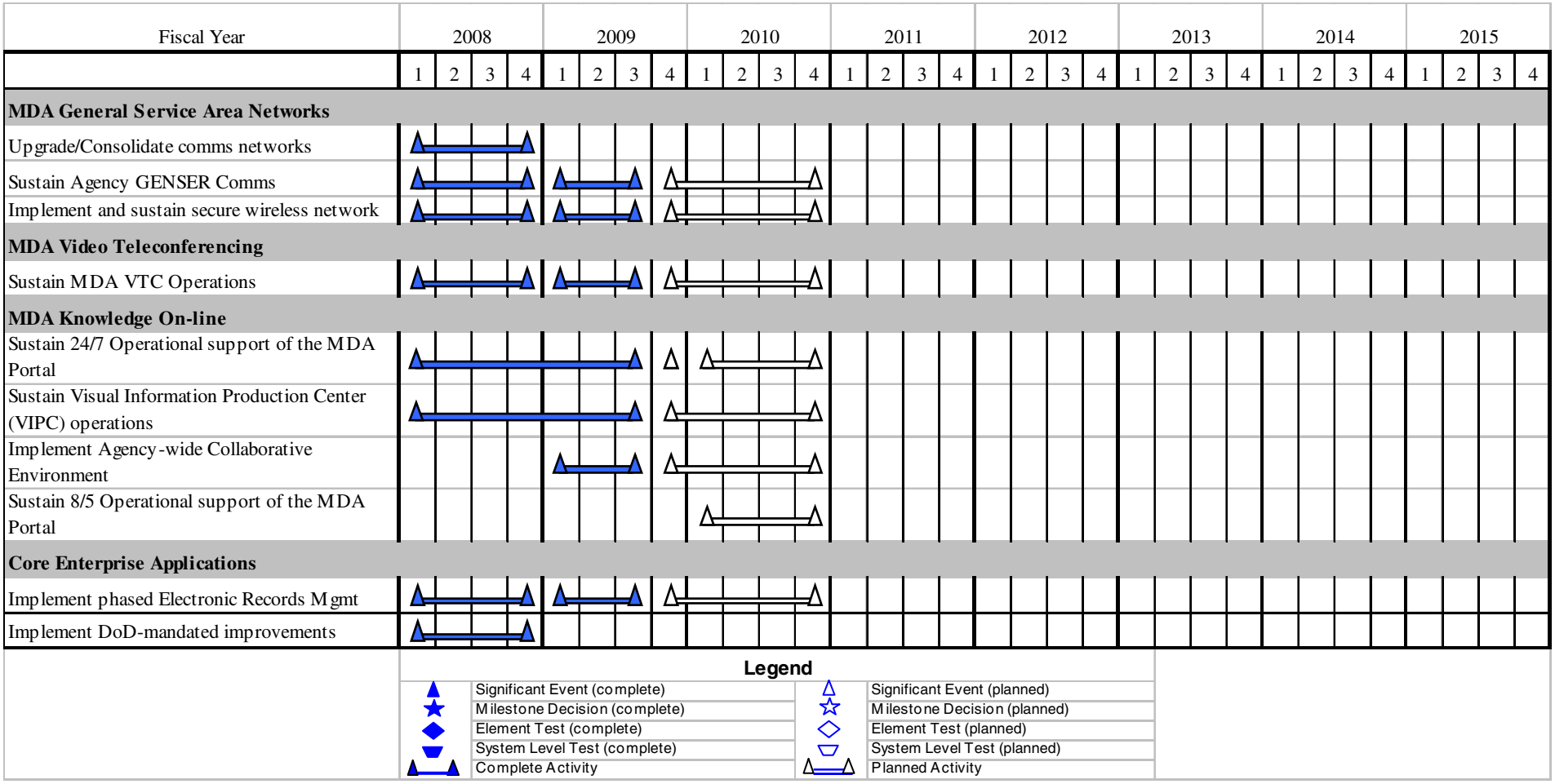
Project Total Cost			111,138	92,784		110,313				314,235

Remarks

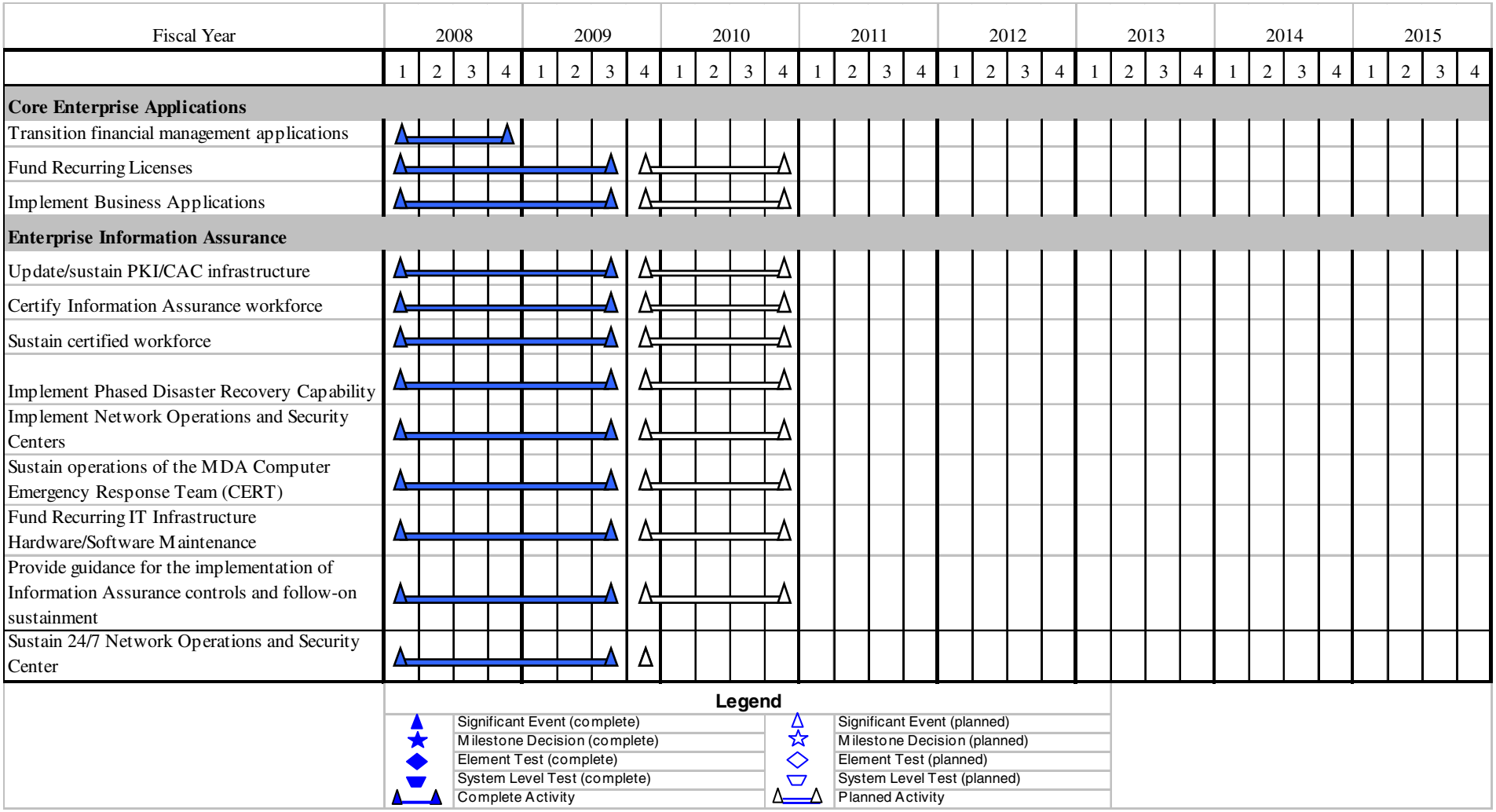
Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile	Date: May 2009
APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE: **0603890C Ballistic Missile Defense Enabling Programs**



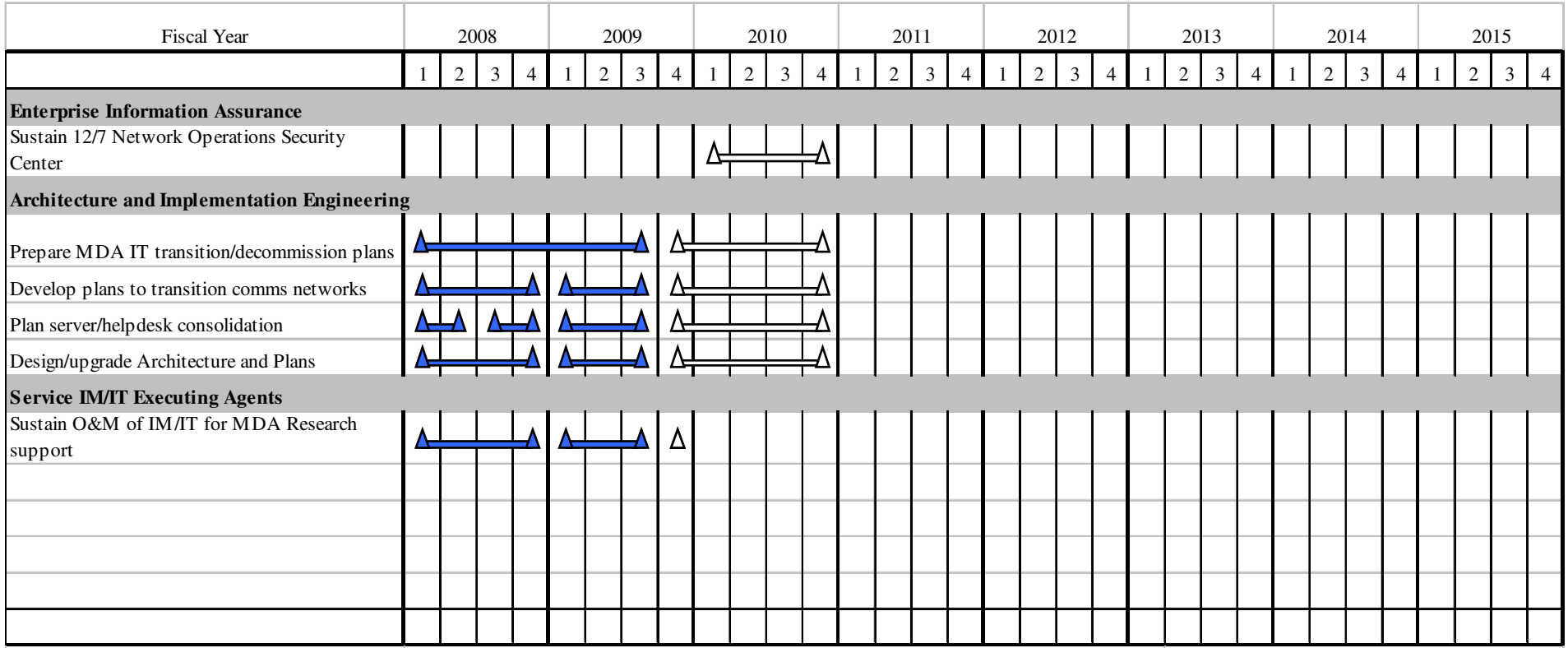
Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile	Date: May 2009
APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE: **0603890C Ballistic Missile Defense Enabling Programs**



Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile	Date: May 2009
APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE: 0603890C Ballistic Missile Defense Enabling Programs



Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile	Date: May 2009
APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE: **0603890C Ballistic Missile Defense Enabling Programs**



Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail	Date **May 2009**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603890C Ballistic Missile Defense Enabling Programs**

Schedule Profile	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015
US South Metropolitan Area Network (US South) MAN								
Sustain 24/7 Operational support of IM/IT infrastructure USSOUTH	1Q-4Q	1Q-4Q						
Sustain 8/5 Operational support of IM/IT infrastructure USSOUTH			1Q-4Q					
US NCR Metropolitan Area Network (US NCR MAN)								
Sustain 24/7 Operational support of IM/IT infrastructure USNCR	1Q-4Q	1Q-4Q						
Sustain 24/7 Operational support of IM/IT infrastructure USNCR Dahlgren	1Q-4Q	1Q-4Q						
Sustain 8/5 Operational support of IM/IT infrastructure US Dahlgren			1Q-4Q					
Sustain 8/5 operational support of IM/IT infrastructure USNCR			1Q-4Q					
US WEST MAN								
Monitor Networks and Configuration Interfaces	1Q-4Q	1Q-4Q	1Q-4Q					
Enterprise Plans, Policies, and Analyses								
Develop strategic IT plans and policies	1Q-4Q	1Q-4Q	1Q-4Q					
Develop agency IT budgets and monitor execution	1Q-4Q	1Q-4Q	1Q-4Q					
Submit Qtly PMA/E-Gov scorecard	1Q-4Q	1Q-4Q	1Q-4Q					
MDA General Service Area Networks								
Upgrade/Consolidate comms networks	1Q-4Q							
Sustain Agency GENSER Comms	1Q-4Q	1Q-4Q	1Q-4Q					
Implement and sustain secure wireless network	1Q-4Q	1Q-4Q	1Q-4Q					
MDA Video Teleconferencing								
Sustain MDA VTC Operations	1Q-4Q	1Q-4Q	1Q-4Q					
MDA Knowledge On-line								
Sustain 24/7 Operational support of the MDA Portal	1Q-4Q	1Q-4Q	1Q-4Q					
Sustain Visual Information Production Center (VIPC) operations	1Q-4Q	1Q-4Q	1Q-4Q					
Implement Agency-wide Collaborative Environment		1Q-4Q	1Q-4Q					

Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail	Date **May 2009**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603890C Ballistic Missile Defense Enabling Programs**

Schedule Profile	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015
Sustain 8/5 Operational support of the MDA Portal			1Q-4Q					
Core Enterprise Applications								
Implement phased Electronic Records Mgmt	1Q-4Q	1Q-4Q	1Q-4Q					
Implement DoD-mandated improvements	1Q-4Q	1Q-4Q	1Q-4Q					
Transition financial management applications	1Q-4Q							
Fund Recurring Licenses	1Q-4Q	1Q-4Q	1Q-4Q					
Implement Business Applications	1Q-4Q	1Q-4Q	1Q-4Q					
Enterprise Information Assurance								
Update/sustain PKI/CAC infrastructure	1Q-4Q	1Q-4Q	1Q-4Q					
Certify Information Assurance workforce	1Q-4Q	1Q-4Q	1Q-4Q					
Sustain certified workforce	1Q-4Q	1Q-4Q	1Q-4Q					
Implement Phased Disaster Recovery Capability	1Q-4Q	1Q-4Q	1Q-4Q					
Implement Network Operations and Security Centers	1Q-4Q	1Q-4Q	1Q-4Q					
Sustain operations of the MDA Computer Emergency Response Team (CERT)	1Q-4Q	1Q-4Q	1Q-4Q					
Fund Recurring IT Infrastructure Hardware/Software Maintenance	1Q-4Q	1Q-4Q	1Q-4Q					
Provide guidance for the implementation of Information Assurance controls and follow-on sustainment	1Q-4Q	1Q-4Q	1Q-4Q					
Sustain 24/7 Network Operations and Security Center	1Q-4Q	1Q-4Q						
Sustain 12/7 Network Operations Security Center			1Q-4Q					
Architecture and Implementation Engineering								
Prepare MDA IT transition/decommission plans	1Q-4Q	1Q-4Q	1Q-4Q					
Develop plans to transition comms networks	1Q-4Q	1Q-4Q	1Q-4Q					
Plan server/helpdesk consolidation	3Q-4Q	1Q-4Q	1Q-4Q					
Design/upgrade Architecture and Plans	1Q-4Q	1Q-4Q	1Q-4Q					
Service IM/IT Executing Agents								
Sustain O&M of IM/IT for MDA Research support	1Q-4Q	1Q-4Q						

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date: May 2009
APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE: 0603890C Ballistic Missile Defense Enabling Programs

COST ($ in Thousands)	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015
YX31 Modeling & Simulation	91,080	89,976	51,282					
RDT&E Articles Qty	0	0	0					

Note: While FY2010 M&S funding decreases in the table above, the total M&S Program funding increases in FY10, because of M&S funding for Hardware-in-the-Loop and Digital Modeling & Simulation was moved to the Elements for execution of Element specific Modeling & Simulation requirements.

A. Mission Description and Budget Item Justification

M&S Mission:

MDA's Modeling and Simulation (M&S) program designs, develops, and delivers validated integrated simulation solutions for BMDS Performance Assessments, Ground Tests, BMDS-Element integration, missile defense Wargames & exercises (national and international), BMDS training, and BMDS concept analysis. In this role, M&S provides cost-effective and proactive tools to assess the fielded capabilities of the BMDS, to analyze and foster accelerated integration of Element and component capability into the BMDS, and to provide a valuable training and planning tool for Warfighting Concept of Operations and missile defense planning. These M&S attributes enable the BMDS acquisition program to provide Warfighting capability in a faster timetable and achieve tighter systems integration. The M&S program accomplishes this by engineering and delivering an M&S tool set for planning, engineering, testing, acquiring, and operating an integrated and evolving BMD System. For each venue, in cooperation with Element Program Offices, M&S defines designs, develops, deploys and maintains system-level simulations, including their constituent subsystem, threat, and environment models, and provides user and analytical support services. In addition, M&S is responsible for requirements development, configuration control, verification, validation and accreditation, facility and infrastructure planning, information assurance and risk management.

Modeling & Simulation:

MDAs M&S Systems provide analysis, decision-making and planning activities for Real-World Operations in support of the White House, Joint Staff, Services, NATO, COCOMs (EUCOM, PACOM, CENTCOM, STRATCOM [Military Utility Assessment]), Operational Test Authority, DOT&E, Allies, and others. MDAs M&S System will be used to assist in the Quadrennial Defense Review (QDR) development. Targeted M&S activities support all phases of BMDS development including Element modifications, flight test missions, ground tests, wargames, exercises, and performance assessment. Models and simulations are tailored to the specific need of a component in its current phase of development, ranging from low-to-medium fidelity analyses supporting concept definitions studies, to high-fidelity models used to support engineering development, or testing

and are integrated into the BMD Digital Simulations Architecture. MDA uses its M&S Systems to integrate Element Baselines and Facilitate Technical Trade-Offs within the BMDS Program. Digital Simulations support Program Assessment events, which provide critical system level performance data relative to all elements, the system engineer, M&S developers, OTA and Warfighter. Further, the M&S Digital tools are accredited for each application and for specific Critical Engagement Conditions (CECs) and Empirical Measurement Events (EMEs) objectives; tools are put through a rigorous verification and validation process, reviewing coding and specifications, and comparing analyses against actual flight test results. Planning support is required to assist in the V&V plan development, test execution, analysis for V&V reports and program office M&S certification. The Digital End-to-End simulation of the BMDS requires a PA Integrated V&V Plan and Report (at both element and system level), and a PA-system level Accreditation Plan and Report.

BMDS Hardware-In-The Loop (HWIL) and Digital Simulation Architecture (DSA):

Each BMDS Element will support the BMDS HWIL and Digital Modeling and Simulation Program by providing and integrating into the BMDS system-level framework to support full-envelope BMDS ground test, flight test, and training events based upon Agency and Warfighter needs. The BMDS M&S System is evolving into a fully integrated End-to-End HWIL/Digital system with an Initial Operational Capability (IOC) available in FY12. The final integrated system will merge the Single Stimulation Framework (SSF) and Digital Simulation Architectures (DSA) into one seamless M&S product that will meet both real-time and non-real time simulation activities. This combined framework will host all simulated activities, events, scenarios, and Element and Threat models. The end-to-end M&S System will be used to conduct BMDS Ground Tests and Performance Assessments, Component Training, Wargames, Flight Tests, Threat Analysis, International events, and COCOM Exercises. This final product will provide truth and control from a common source.

System Pre- and Post-Flight Reconstruction:

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

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date: May 2009
APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE: 0603890C Ballistic Missile Defense Enabling Programs

Interdependencies:

The best way to dissuade, deter, and defeat ballistic missile threats is through integrated ballistic missile defense capabilities, weapons, sensors and Command and Control, Battle Management and Communications (C2BMC). A potential or actual attack may cross regions and may fly higher and faster than stand-alone, autonomous capabilities operated by a single Military Service can defend against. Integrated BMD capabilities draw on space-, land-, and sea-based assets operated by multiple Services to provide both the best sensor information on the enemy missiles location and track as well as a more diverse and effective set of weapon options for the Combatant Commander to defeat the attack, all connected by a unifying C2BMC system. As a result, an effort funded in a Program Element may be critical to success of efforts in other Program Elements we refer to these connections as interdependencies. Throughout the budget justification material, we have attempted to highlight interdependencies in order to explain for fully the relationship between different parts of the proposed program.

Test:

The FY10 M&S Program will be focused on correcting the deficiencies stated in the 2008 DOT&E BMDS Assessment Report to include:
Executing BMDS scenarios that flight test cannot assess because of geographic and safety constraints with models and simulations (M&S)
Predicting system performance with the use of verified and validated M&S
Performing System Post-Flight Reconstruction, [SPFR] to provide empirical data to confirm system performance and to further refine and validate M&S
Continuing to jointly develop accreditation criteria between MDA & OTA
Continuing to address the verification and validation of threat models, radar models, kill vehicle models and lethality models
MDA Element testing is based on an integrated, comprehensive, and phased test program. Element systems, subsystems, and components are tested early in development and are necessary prior to conducting BMD-System level testing. M&S Program Element level testing is funded as part of a developmental program and reflected in this Program Element (PE) submission. This PE also provides M&S Program participation in the consolidated MDA-wide System Test Program and the resources for the, planning, design, execution and management of M&S in BMD System testing in accordance with the BMDS Test Policy, MDA Directive 3202.03 (Jan 09). This applies to all Flight, Integrated Ground, and Distributed Ground Tests and Post-test analysis and reconstructions listed in the Integrated Master Test Plan (IMTP).

Common Threat Engineering:

Common threat engineering produces common and consistent adversary trajectory and signature data to enable Ballistic Missile Defense (BMD) System and sub-system concept and requirements, design, verification, and assessment. Common Threat data is contained in the Adversary

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Capability Document (ACD) and Adversary Data Packages (ADP) and drives BMDS ground tests, flight tests, digital simulations, and pre-mission analysis initiatives. M&S is used to develop the BMD System Description Document and BMD System Specification. MDA M&S is used to support European and Russian cooperative activities, North Korean and Iranian pre and post-flight launch analysis, and the enhanced Israeli Interceptor program.

B. Accomplishments/Planned Program

	FY 2008	FY 2009	FY 2010	FY 2011
Simulation Architecture & Requirements	4,699	7,983	23,035	
RDT&E Articles (Quantity)	0	0	0	

Architecture and Requirements (A&R) products include BMDS Event supporting system architectures and the standards and specifications used for BMDS model, simulation, and representation compliance. A&R provides Performance Assessment (PA) Scenario support for BMDS Test campaigns, implements a common Conceptual Model, and enables consistent/common Data Management and stakeholder collaboration. Architecture and Requirements (A&R) is responsible for coordinating architectures to support MDA events, and for establishing consistent standards and specifications for all MDA models, simulations, and representations. A&R supports BMDS Systems Engineering to create System Description Documents and System Specifications for M&S Programs to design, build, integrate, and test BMDS components. These products optimize performance at the system level and further ensure that the assessment of the designed BMD System is based on sufficient ground and flight testing. Compliance of the Modeling and Simulation (M&S) Programs to BMD System level requirements is monitored by A&R in a series of requirements and design reviews both at the system and element levels.

FY08 Accomplishments:

- Established M&S system-level Working Group with collaborative participation by BMDS Element Program Offices
- Established M&S system-level Event architecture engineering process
- Updated M&S System Engineering Management Plan
- Updated M&S Needs Statement and Product Development and Implementation Plans
- Established a system-level M&S configuration management capability

FY09 Planned Program:

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date: May 2009
APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE: 0603890C Ballistic Missile Defense Enabling Programs

- Modify code to support model, threat, and scenario development, and conduct BMDS events for Keen Edge 09, Assured Response 09A and 09B, Eagle Resolve 09, Terminal Fury 09, Global Thunder 09, Global Lightning 10 planning, Vigilant Shield 10 planning, Juniper Cobra 10 planning, Keen Edge 10 planning, Nimble Titan 10 planning
- Modify code to support model, threat, and scenario development, and conduct BMDS events for National MD Conference Wargame, Congressional Wargame, M-NMD Conference Wargame
- Modify code to support model, threat, and scenario development, and conduct BMDS events for European Capability Operator in the Loop (OITL) 09
- Realign the M&S Engineering and Architecture staff while migrating the existing M&S Working Groups into the new M&S System Engineering Working Groups including the developed of the System Engineering Process
- Develop a system engineering approach for developing and implementing the PA09 M&S system requirements process including the development of the PA09 Requirements and Standards Documentation
- Complete the Lean Six Sigma project on requirements prioritization process. Capability Development Document (CDD) for the Use Cases (Training, Exercise)
- Request, Receive, and Transfer FTX-05, FTG-03, FTT-10A, GTD-03, and E-CCA data to the M&S development and VV&A teams
- Evaluate and award three (3) Phase I Small Business Innovative Research (SBIR) contracts to improve modeling and simulation capabilities and optimization algorithms
- Develop and manage M&S Product Inventory and Configuration Management (CM) with the development of the M&S Inventory and CM Database
- Coordinate M&S reviews of international agreements being negotiated with foreign nations. Planned implementation of specific M&S projects under BASIL agreement
- Prepare and staff software export packages for I-Sim releases, EADSIM releases, and PEGEM releases. Reviewed multiple MDA Staff presentations for M&S Foreign Disclosure
- Process export packages for I-Sim updates and EADSIM export
- Continue planning support to Joint Staff for resuming US-Russia activities
- Refine technical definition of projects to be executed under US-Australia Project Arrangement (PA)

FY10 Planned Program:

- Develop capability documents and system performance specifications for the following Digital and HWIL Products: DE SIM, DSA, I-SIM, MDST, TMSS, TGx, WILMA, EADSIM. OSC, CBSD, SPP, TDK, SIRRM, SPURC, HALT, RPFM/Plus, CLDSIM, MOSART, SAMM, SIG, SSGM, FLITES, OPTISIG, PERCORP, VIPER, SPF, CHARM, SOCRATES, PARCS, SOCRATES-P, MODTRAN, SHARC, SAG, GENESSIS, PLEXUS, PEEL, PEGIM, KIDD, MDSE, SSF, TIU

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date: May 2009
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- Coordinate and facilitate Systems Engineering Activities supporting M&S Strategic Product Evolution and Event Execution, managing the Risk Management System, and the M&S Product Inventory and Configuration Management (CM) systems
- Capability Development Document (CDD) for the Use Cases (Training, Exercise, Wargame, PA, Element Integration, GTI-04 and GTD-04)
- Data Management Requested, Received, and Transferred for test data to support the M&S development and VV&A team
- Processed export packages for I-Sim, Provide advice & support meetings at DI request
- Review development requirements from international agreements & track resulting M&S developments
- Perform foreign release review on M&S related documents, briefings, screen views and data
- Manage export review process for all M&S software

	FY 2008	FY 2009	FY 2010	FY 2011
Verification, Validation & Accreditation	5,280	9,837	3,883	
RDT&E Articles (Quantity)	0	0	0	

Accredited system-level models and simulations (M&S) anchored to real-world events, are required to perform an accurate and comprehensive assessment of the BMDS. VV&A is responsible for implementing and documenting system-level M&S verification, validation, and accreditation which establish credibility and increases confidence in the M&S that provides a cornerstone for the Agency's simulation-based acquisition approach. The individual MDA elements and components are responsible for conducting the VV&A of their own models and providing that evidence to system-level VV&A for each event. This includes benchmarking their M&S to higher fidelity simulations, anchoring to real world events, and planning and conducting post-flight reconstruction. VV&A annually verifies, validates and, accredits multiple MDA events to include Performance Assessment, Ground Tests that support BMDS fielding decisions, and tier one COCOM exercises. VV&A is responsible for the development and promulgation of system-level VV&A policies and standards, benchmarked against leading industry practices. VV&A provides model, simulation, and event credibility across Performance Assessment, Ground Tests, Element Integration, Wargames and Exercises, Training, and all associated infrastructure that supports BMDS fielding decisions. Through the consistent practice of verifying model representations benchmarked to other higher-fidelity models, and anchored to operational tests, VV&A will continue to increase model confidence and acceptability by outside agencies like the Operational Test Agency. Due to varying architectures and configurations required for different events, VV&A provides strong coordination, thorough analysis, development and use of appropriate tools, identification of metrics, and validation of both digital and hardware in the loop modeling and simulation capability. The implementation of the Model-Test-Model process requires that VV&A maintain close collaboration with the test community, and the capability to predict system-level test results and perform post-flight test reconstruction in order to improve model confidence and future performance. Robust VV&A requires flexibility and capability to explore new BMDS concepts, and evaluate new Element representations to identify and correct flaws early in the development process. VV&A is responsible for implementing and documenting system-level

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M&S verification, validation, and accreditation which establish credibility and increases confidence in the M&S that provides a cornerstone for the Agency's simulation-based acquisition approach.

FY08 Accomplishments:

- Completed VV&A of GTX-03a
- Completed VV&A of GTI-03
- Completed VV&A of AR-07B
- Completed VV&A of AR-08A
- Planned VV&A for GTX-03d
- Planned VV&A for GTD-03
- Planned VV&A for PA-09

FY09 Planned Program:

- Complete VV&A for on Keen Edge 09, Assured Response 09A and 09B, Eagle Resolve 09, Terminal Fury 09, Global Thunder 09, Global Lightning 10 planning, Vigilant Shield 10 planning, Juniper Cobra 10 planning, Keen Edge 10 planning, Nimble Titan 10 planning
- Complete VV&A for National MD Conference Wargame, Congressional Wargame, M-NMD Conference Wargame
- Complete VV&A for European Capability Operator in the Loop (OITL) 09
- Implement a system-level M&S VV&A capability
- Continue VV&A for BMDS-level M&S events/venues
- Accredit Models and Simulations for Core Intended Uses
- Develop Accreditation Reports
- Provide Facility/Test support for test events
- Release Accreditation Plans and Final Report
- Prepare Test Event Assessment Reports
- Continue to refine M&S Enterprise Verification, Validation, and Accreditation Process
- Coordinate development and use with partner and coalition organizations
- Develop and implement M&S standards consistent with industry best practices
- Develop and collect metrics on system-level M&S
- Ensure that individual BMDS elements and components are responsible for the verification and validation of their own model

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FY10 Planned Program:

- Complete VV&A for Assured Response 10, Eagle Resolve 10, Terminal Fury 10, Global Thunder 10, Global Lightning 10, Vigilant Shield 10, Juniper Cobra 10, Keen Edge 10, Nimble Titan 10
- Complete VV&A for National MD Conference Wargame, Congressional Wargame, M-NMD Conference Wargame
- Complete VV&A for European Capability Operator in the Loop (OITL) 10
- Develop and implement comprehensive validation program
- Ensure that individual BMDS elements and components are responsible for the proper VV&A of their own models
- Provide integrated Verification, Validation, and Accreditation (VV&A) of MDA Models and Simulations (M&S) at the system-level for specific events to include Performance Assessment, Ground Tests that support BMDS fielding decisions, and tier one COCOM exercises
- Align Elements, Test Community, System Engineering, and OTA to ensure M&S for event meets intended uses and objectives, and has proper VV&A documentation and evidence to include benchmarking/anchoring pedigree
- Derive and support implementation and verification of the CEC and EMEs to BMDS System Performance V&V to include the core phenomenology and lethality models
- Provide integrated Verification, Validation, and Accreditation (VV&A) of MDA Models and Simulations (M&S) at the system-level for specific events to include Performance Assessment, Ground Tests that support BMDS fielding decisions, and tier one COCOM exercises
- Conduct system-level V&V to include threat trajectory and signature V&V throughout the system; end-to-end environmental implementation is consistent and correct; communications and architecture behave properly; and interoperability is adequately addressed [Conduct system-level post flight reconstruction for validation of BMDS performance assessment M&S]
- Conduct system-level post flight reconstruction for validation of BMDS performance assessment M&S
- Develop integrated VV&A Plans and Reports for each event
- V&V throughout the system; end-to-end environmental implementation is consistent and correct; communications and architecture behave properly; and interoperability is adequately addressed
- Conduct annual review of MDA Element VV&A programs

	FY 2008	FY 2009	FY 2010	FY 2011
BMDS Digital Modeling & Simulation	33,028	27,655	7,740	
RDT&E Articles (Quantity)	0	0	0	

Note:

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date: May 2009
APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE: 0603890C Ballistic Missile Defense Enabling Programs

While FY2010 M&S funding decreases in the table above, the total M&S Program funding increases in FY10, because of M&S funding for Hardware-in-the-Loop and Digital Modeling & Simulation was moved to the Elements for execution of Element specific Modeling & Simulation requirements.

BMDS Digital Modeling and Simulation produces and integrates digital M&S assets for use with the Digital Simulation Architecture to form system-level constructive simulations for full-envelope BMDS performance assessment with surrogate capability for BMDS ground tests. Digital M&S creates system-level stimulus for Element integration testing and system-level M&S capabilities which augment BMDS flight tests. Other mission areas include digital M&S capability for system-level concept definition and exploration; real-time, interactive system-level M&S capability to support warfighter-in-the-loop wargaming, training and exercises, and capabilities to support rapid, flexible scenario development and execution control. Digital Modeling and Simulation is responsible for providing and integrating system-level constructive simulation to support full-envelope BMDS performance assessment, ground test M&S capability, system-level stimulus for Element integration testing, system-level M&S capabilities to augment BMDS flight tests and surrogate digital M&S to augment HWIL ground tests control, and capabilities to support archiving and post-mission analysis.

FY08 Accomplishments:

- Specified and implemented the common Digital Simulation Architecture (DSA)
- Upgraded Common Environment and Threat Models
- Codified the Operational Concept Descriptions
- Began a collaborative effort to define and document the BMDS-level conceptual model
- Designed, integrated, delivered, and executed the Performance Assessment 08 (PA08) Composition (constructive simulation) to support full-envelope BMDS performance assessment
- Provided execution and analytic services for excursion cases utilizing the Performance Assessment 07 (PA07) ensemble
- Provided the digital simulation infrastructure (architecture, frameworks) to support system-level M&S constructive analytic simulations, warfighter-in-the-loop ability for wargames and exercises, test driver for element integration (a virtual BMDS for Command and Control development and test), and the Distributed Multi-Echelon Education and Training System
- Integrated Element-provided models to the Digital Simulation Architecture (DSA)
- Provided common threat representations and scenarios to met specific event and customer requirements, across all M&S use cases
- Developed EMF/OMF interface code for centralized control and execution of numerous models that form a BMDS composition
- Product Line development, sustainment, maintenance and product support for:
  - BMDS Discrete Event Simulation (provides the DSA, EMF/OMF, communications modeling, setup/analytic tools)

- Missile Defense Space warning Tool (models validated space-borne assets of BMDS)
- Threat Modeling Simulation System
- BMD International Simulation

- Support software operations/maintenance of the Extended Air Defense Simulation (EADSIM) code base
- Began integration of EADSIM to the DSA

FY09 Planned Program:

- Complete the first release of the Digital Simulation Architecture (DSA) and successfully conducted all five Risk Reduction Tests while simultaneously integrating Element-provided models to form the Performance Assessment 2009 (PA09) end-to-end simulation
- Enhance digital M&S Product Lines, including development, sustainment, maintenance and product support
- Develop DSA Infrastructure (model interfaces, communications, threat playback, environment, and analytical tools)
- Continue incremental upgrades of the Missile Defense Space warning Tool (models validated space-borne assets of BMDS)
- Modify Threat Modeling Simulation System to meet existing and emerging threats
- Continue incremental upgrades of the BMD International Simulation
- Develop digital threat models and scenarios for MDA, OTA and DOT&E simulation customers supporting assessment and test venues, including real world events
- Design, integrate, and deliver the PA09 constructive simulation to support full-envelope BMDS performance assessment
- Integrate DSA-compliant models supplied by the Elements, and federated with non-compliant models to produce limited-capability BMDS-level simulations for warfighter training systems (e.g., Distributed Multi-echelon Education and Training System), exercises (e.g., Assured Response), wargames (e.g., Future Epoch Wargame), and test drivers for Element integration (e.g., for C2BMC software spiral test/analysis)
- Implement an Agency-common process for M&S systems engineering
- Initiate formal documentation of M&S user needs, capability analyses, and BMDS-level simulation specifications covering all M&S use cases (as listed above)
- Initiate the conceptual design of an Agency-common database and configuration management software tool for systems management of M&S products, capabilities, validation/verification, and tracking to requirements and Critical Engagement Conditions (CECs)/Empirical Measurement Events (EMEs)
- Complete a facility improvement to the Performance Assessment laboratory
- Deliver DSA interface software and control specifications to MDA Elements to facilitate model integrations to the DSA framework
- Support software operations/maintenance of the Extended Air Defense Simulation (EADSIM) code base

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APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE: 0603890C Ballistic Missile Defense Enabling Programs

FY10 Planned Program:

- Develop and incrementally upgrade the following Digital and HWIL Products: DE SIM, DSA, I-SIM, MDST, TMSS, TGx, WILMA, EADSIM
- Provide M&S Tools and technical support, and modify code for model, threat, and scenario development, for conducting Assured Response 10, Eagle Resolve 10, Terminal Fury 10, Global Thunder 10, Global Lightning 10, Vigilant Shield 10, Juniper Cobra 10, Keen Edge 10, Nimble Titan 10
- Provide M&S Tools and technical support, and modify code for model, threat, and scenario development, for conducting National MD Conference Wargame, Congressional Wargame, Multinational Missile Defense Conference Wargame
- Provide M&S Tools and technical support, and modify code for model, threat, and scenario development, for conducting European Capability Operator in the Loop (OITL) 10
- FY10 funding for Digital Modeling & Simulation was moved to the Elements for execution of Element specific Modeling & Simulation requirements
- Provide and integrate validated system-level constructive simulation to support full-envelope BMDS performance assessment
- Provide and integrate validated ground test M&S capability to support BMDS performance assessment
- Provide and integrate validated system-level M&S capabilities to augment BMDS flight tests
- Provide and integrate validated M&S capability to support Element Integration
- Provide validated M&S capability for wargaming
- Missile Defense Space warning Tool (models validated space-borne assets of BMDS)
- Deliver updates to DSA and related interface software to MDA Elements to facilitate model integrations to the DSA framework
- Support software operations/maintenance of the Extended Air Defense Simulation (EADSIM) code base
- Threat Modeling Simulation System
- Provide software operations/maintenance of the BMD International Simulation
- Review development requirements from international agreements & track resulting M&S developments
- Perform foreign release review on M&S related documents, briefings, screen views and data
- Complete PA runs for record, while simultaneously updating the simulation and making it available for PA testing and execution
- Continue enhancements to digital M&S Product Lines
- Design, Develop, Field, and Maintain the DSA Infrastructure, including interoperability with the hardware-in-the-loop (HWIL) Single Stimulation Framework (SSF)

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	FY 2008	FY 2009	FY 2010	FY 2011
BMDS HWIL	48,073	44,501	16,624	
RDT&E Articles (Quantity)	0	0	0	

Note: While FY2010 M&S funding decreases in the table above, the total M&S Program funding increases in FY10, because of M&S funding for Hardware-in-the-Loop and Digital Modeling & Simulation was moved to the Elements for execution of Element specific Modeling & Simulation requirements.

The HWIL Program will Plan, develop, integrate and test a common BMDS HWIL stimulation framework with the Elements for the GTX, GTI, GTD ground tests, ALTBMD exercises, Assured Response (AR) exercises, JC-10 exercises, Near-Term Discrimination (NTD) excursions test, and Concurrent Test, Training, and Operations (CTTO) demos. BMDS HWIL Modeling and Simulation is responsible to provide and integrate the BMDS system-level HWIL stimulation framework to support full-envelope BMDS ground test, flight test, and training events based upon Agency and warfighter needs. BMDS HWIL provides development, integration, and test funding to both MDA and non-MDA Elements participating in the BMDS ground test campaigns. BMDS HWIL also provides the core Lethality and Phenomenology models for use in analysis of BMDS and Element mission requirements. BMDS HWIL additionally maintains the Advanced Research Center and Simulation Center High Performance Computing Capabilities to support test and M&S requirements across MDA. BMDS HWIL Modeling and Simulation is responsible to provide and integrate the BMDS system-level HWIL stimulation framework to support full-envelope BMDS ground test, flight test, and training events based upon Agency and warfighter needs.

FY08 Accomplishments:

- Planned, developed, integrated and tested a common BMDS HWIL stimulation framework with the Elements for the GTX-03a, GTX-3c, GTX-3d, GTI-03, GTD-03, Fast Shield, ground tests, ALTBMD exercises, AR08 exercises, JDIE09 exercises and CTTO demos.
- Conduced BMDS HWIL stimulation framework V&V for BMDS GTI-03 and GTD-03 ground tests.
- Derived and designed the BMDS HWIL stimulation framework for use in domestic and international BMDS M&S venues.
- Provided funding (at historical levels) for Element integration and development testing in support of GTX-03a and GTI-03 ground tests.
- Provided development, and IV&V of standardized phenomenology and lethality tools and models to include active and passive signatures codes of threat objects and their kinematics and operational behaviors, relevant natural and perturbed battlespace environments, and a common way of dealing with the consequences of missile defense engagements.
- Upgraded the BMDS stimulation framework to support common debris for BMDS Elements.
- Performed the initial integration of the BMDS stimulation framework with the External Sensor Lab (ESL), Israeli Test Bed (ITB) and AN/TPY-2 tactical radar

- Provided funding for the Advanced Research Center (ARC) in Huntsville, Alabama. The ARC supplies computational resources, infrastructure, and IT subject matter experts who support both system and element-level flight and ground testing
- Provided funding for the Simulation Center in Huntsville, Alabama. The Sim-Center supplies computational resources and infrastructure for support of MDA distributed High Performance Computing Requirements. Plan, develop, integrate and test a common BMDS HWIL stimulation framework with the Elements for the GTX-03a, GTI-03, GTD-03 ground tests

FY09 Planned Program:

- Keen Edge 09, Assured Response 09A and 09B, Eagle Resolve 09, Terminal Fury 09, Global Thunder 09, Global Lightning 10 planning, Vigilant Shield 10 planning, Juniper Cobra 10 planning, Keen Edge 10 planning, Nimble Titan 10 planning
- National MD Conference Wargame, Congressional Wargame, M-NMD Conference Wargame
- European Capability Operator in the Loop (OITL) 09
- Plan, develop, integrate and test a common BMDS HWIL stimulation framework with the Elements for the GTX-09a, GTI-09, GTD-09 ground tests. · Conduct BMDS HWIL stimulation framework V&V for BMDS GTX-09a, GTI-09 and GTD-09 ground tests.
- Derive and design the BMDS HWIL stimulation framework for use in domestic and international BMDS M&S venues.
- Provide funding for Element integration and development testing in support of GTX-09a and GTI-09 ground tests.
- Provide funding for the Advanced Research Center (ARC) in Huntsville, Alabama. The ARC supplies computational resources, infrastructure, and IT subject matter experts who support both system and element-level flight and ground testing.
- Provide funding for the Simulation Center in Huntsville, Alabama. The Sim-Center supplies computational resources and infrastructure for support of MDA distributed High Performance Computing Requirements.
- Provide development, and IV&V of standardized tools and models to include active and passive signatures of threat objects and their kinematics and operational behaviors, relevant natural and perturbed battlespace environments, and a common way of dealing with the consequences of missile defense engagements.
- Upgrade the BMDS stimulation framework to support wideband debris for BMDS sensors.
- Complete integration of the BMDS stimulation framework with the Israeli Test Bed (ITB) and AN/TPY-2 tactical radar.
- Initial integration of the BMDS stimulation framework with the ARROW HWIL facility in Israel and additional MDA/SN sensors.

FY10 Planned Program:

- Lease and Maintain the Advanced Research Center (ARC) and the Simulation Center (SIMctr) in Huntsville Alabama

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date: May 2009
APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE: **0603890C Ballistic Missile Defense Enabling Programs**

- Modify and incrementally upgrade the following HWIL Products: OSC, CBSD, SPP, TDK, SIRRM, SPURC, HALT, RPFM/Plus, CLDSIM, MOSART, SAMM, SIG, SSGM, FLITES, OPTISIG, PERCORP, VIPER, SPF, CHARM, SOCRATES, PARCS, SOCRATES-P, MODTRAN, SHARC, SAG, GENESSIS, PLEXUS, PEEL, PEGIM, KIDD, MDSE, SSF, TIU
- Support for the SPAWAR-Pacific, Tactical Communication Emulation (TCES)
- FY10 funding for HWIL and Digital Modeling & Simulation was moved to the Elements for execution of Element specific Modeling & Simulation requirements
- Derive and support implementation and verification of the CEC and EMEs to BMDS System Performance V&V to include the core phenomenology and lethality models
- Develop, integrate, and test a common BMDS HWIL stimulation framework with the Elements for the GTI-04, GTD-04 ground tests
- Conduct BMDS HWIL stimulation framework V&V for BMDS GTI-04 and GTD-04 ground tests
- Define and plan for enhancements to the SSF required for execution of the GT05 campaign to include identification of interdependencies required for execution
- Provide development, operations, support, and IV&V of standardized phenomenology and lethality tools and models to for the common environmental toolset
- Initiate planning to integrate SSF interface with the CD UEWR and close the air gap
- Initiate planning to integrate SSF interface with the GMD Fielded assets
- Integrate common RDSIS for X-Band radars
- Initial integration of the BMDS stimulation framework with the ARROW HWIL facility in Israel
- Evolve and enhance the SSF to provide increased Warfighter support, specifically Training and Exercises
- Integrate the SSF with additional Allied/Coalition elements to expand Distributed GT and Exercise venues
- Initial Integration of the SSF with the Digital Stimulation Architecture
- Product Line development, sustainment, maintenance and product support for HWIL products
- Plan, develop, integrate and test a common BMDS HWIL stimulation framework with the Elements for the GTX-04, GTI-04, GTD-04 ground tests, ALTBMD exercises, AR exercises, Juniper Cobra exercises, Near-Term Discrimination (NTD) excursions tests, and CTTO demos
- Conduct BMDS HWIL stimulation framework V&V for BMDS GTX-04a, GTI-04, GTD-04 ground tests, ALTBMD, AR, Juniper Cobra exercises, and CTTO demos
- System Engineering Support to upgrade the BMDS stimulation framework to support wideband debris for BMDS sensors
- Initial integration of the BMDS stimulation framework with the additional MDA/SN sensors
- Provide common threat representations and scenarios to met specific event and customer requirements for BMDS HWIL Framework

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date: May 2009
APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE: 0603890C Ballistic Missile Defense Enabling Programs

C. Other Program Funding Summary

	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	Total Cost
PE 0603175C Ballistic Missile Defense Technology	106,437	119,308	109,760						-
PE 0603881C Ballistic Missile Defense Terminal Defense Segment	1,034,478	956,686	719,465						-
PE 0603882C Ballistic Missile Defense Midcourse Defense Segment	2,198,664	1,507,481	982,922						-
PE 0603883C Ballistic Missile Defense Boost Defense Segment	503,475	400,751	186,697						-
PE 0603884C Ballistic Missile Defense Sensors	574,231	777,693	636,856						-
PE 0603886C Ballistic Missile Defense System Interceptors	330,874	385,493	0						-
PE 0603888C Ballistic Missile Defense Test and Targets	619,137	919,956	966,752						-
PE 0603891C Special Programs - MDA	193,157	175,712	301,566						-
PE 0603892C Ballistic Missile Defense Aegis	1,126,337	1,113,655	1,690,758						-
PE 0603893C Space Tracking & Surveillance System	226,499	208,923	180,000						-
PE 0603894C Multiple Kill Vehicle	223,084	283,481	0						-
PE 0603895C BMD System Space Program	16,237	24,686	12,549						-
PE 0603896C BMD C2BMC	439,997	288,287	340,014						-
PE 0603897C BMD Hercules	51,387	55,764	48,186						-
PE 0603898C BMD Joint Warfighter Support	45,400	69,743	60,921						-
PE 0603904C Missile Defense Integration & Operations Center (MDIOC)	77,102	106,040	86,949						-
PE 0603906C Regarding Trench	1,945	2,968	6,164						-
PE 0603907C Sea Based X-Band Radar (SBX)	155,244	146,895	174,576						-
PE 0603908C BMD Europ Intercep Site	0	362,007	0						-
PE 0603909C BMD Europ Midcourse Radar	0	76,537	0						-
PE 0603911C BMD European Capability	0	0	50,504						-
PE 0603912C BMD European Comm Support	0	27,008	0						-
PE 0603913C Israeli Cooperative	0	0	119,634						-
PE 0605502C Small Business Innovative Research BMDO	137,409	0	0						-
PE 0901585C Pentagon Reservation	5,971	19,667	19,709						-
PE 0901598C Management Headquarters - MDA	83,907	81,174	57,403						-

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

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date: May 2009
APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE: 0603890C Ballistic Missile Defense Enabling Programs

D. Acquisition Strategy

The M&S acquisition strategy is to develop, acquire and deliver the integrated architectures/frameworks while the Elements develop and deliver models of their system. The Digital and HWIL product centers integrate the suite of M&S into a composite simulation capability, all based on an open architecture. M&S achieves this end-state via close collaboration between its integrating contractor teams (Digital and HWIL) and those of the Element prime contractors, with additional technical standards and engineering oversight provided by FFRDC and UARCs.

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date: May 2009
APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE: 0603890C Ballistic Missile Defense Enabling Programs

I. Product Development Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2009 Cost	FY 2009 Award/ Oblg Date	FY 2010 Cost	FY 2010 Award/ Oblg Date	FY 2011 Cost	FY 2011 Award/ Oblg Date	Total Cost
Simulation Architecture & Requirements										
Requirements, System Engineering, Architecture Development, Element Integration	C/CPAF	Northrop Grumman/ CO	5,148	4,630	1/2Q	0	N/A			9,778
Key and Critical Factor Development	C/CPAF	Northrop Grumman/ CO	0	0	N/A	1,032	1/3Q			1,032
M&S Analysis and Test Objective Development	C/CPAF	Northrop Grumman/ CO	0	0	N/A	1,916	1/3Q			1,916
M&S Product Baseline & Configuration Management	C/CPAF	Northrop Grumman/ CO	0	0	N/A	1,200	1/3Q			1,200
M&S Standards	C/CPAF	Northrop Grumman/ CO	0	0	N/A	708	1/3Q			708
Standards & Conceptual Model Support	C/CPAF	Northrop Grumman/ CO	0	0	N/A	90	1/3Q			90
Management Data/Requirements	C/CPAF	Northrop Grumman/ CO	0	0	N/A	361	1/3Q			361
M&S Architecture Requirements and Engineering	C/CPAF	Northrop Grumman/ CO	0	0	N/A	464	1/3Q			464
Requirements Lean Six Sigma	C/CPAF	Northrop Grumman/ CO	0	0	N/A	120	1/3Q			120

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date: May 2009
APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE: 0603890C Ballistic Missile Defense Enabling Programs

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2009 Cost	FY 2009 Award/ Oblg Date	FY 2010 Cost	FY 2010 Award/ Oblg Date	FY 2011 Cost	FY 2011 Award/ Oblg Date	Total Cost
M&S Architecture Requirements and Engineering			0	0	N/A	5,306	1/3Q			5,306
Mature M&S Inventory & CM Solution (Database)	C/CPAF	Northrop Grumman/ CO	0	0	N/A	378	1/3Q			378
Comprehensive BMDS M&S Requirements Engineering	C/CPAF	Northrop Grumman/ CO	0	0	N/A	4,388	1/3Q			4,388
Full Initiation: Standards and Conceptual Modeling			0	0	N/A	2,260	1/3Q			2,260
Configuration Management Board			0	0	N/A	920	1/3Q			920
Data Repository			0	0	N/A	1,542	1/3Q			1,542
Mature Requirements Solution (Database)	C/CPAF	Northrop Grumman	0	0	N/A	752	1/3Q			752
Verification, Validation & Accreditation										
SBIRS, JTAGS, Digital Modeling Support	C/CPAF	Northrop Grumman/ CO	0	0	N/A	200	1/2Q			200
Establish Comprehensive Validation Program			0	0	N/A	3,683	N/A			3,683
BMDS Digital Modeling & Simulation										
BMDS DE SIM (Product Development)	C/CPAF	Northrop Grumman/ CO	16,139	14,456	1/2Q	0	N/A			30,595
BMDS Threat Modeling (Product Development, Sustainment, O&M)	C/CPAF	Northrop Grumman/ CO	5,780	7,768	1/2Q	0	N/A			13,548

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date: May 2009
APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE: 0603890C Ballistic Missile Defense Enabling Programs

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2009 Cost	FY 2009 Award/ Oblg Date	FY 2010 Cost	FY 2010 Award/ Oblg Date	FY 2011 Cost	FY 2011 Award/ Oblg Date	Total Cost
Missile Defense Space Warning Tool (MDST)	C/CPAF	Northrop Grumman/ CO	1,630	2,694	1/2Q	0	N/A			4,324
EADSIM (Prod Dev)	C/FFP	SMDC/ AL	1,600	1,380	1/2Q	0	N/A			2,980
BMDS HWIL										
MDSE Core	Various	Various/ AL	14,741	7,208	1/2Q	0	N/A			21,949
Ground Test - MDSE - Element Integration	Various	Various/ AL	9,261	8,337	1/2Q	0	N/A			17,598
Lethality	C/FFP	Various/ AL	2,283	2,777	1/2Q	0	N/A			5,060
Phenomenology	C/FFP	Various/ Various	3,100	3,200	1/2Q	0	N/A			6,300
Engineering Change Proposals (Event Driven)	C/FFP	Northrop Grumman/ CO	631	803	1/2Q	0	N/A			1,434
Single Stimulation Framework	C/FFP	Various/ Various	0	4,000	1/2Q	0	N/A			4,000
Subtotal Product Development			60,313	57,253		25,320				142,886

Remarks

II. Support Costs Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2009 Cost	FY 2009 Award/ Oblg Date	FY 2010 Cost	FY 2010 Award/ Oblg Date	FY 2011 Cost	FY 2011 Award/ Oblg Date	Total Cost
Simulation Architecture & Requirements										

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date: May 2009
APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE: 0603890C Ballistic Missile Defense Enabling Programs

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2009 Cost	FY 2009 Award/ Oblg Date	FY 2010 Cost	FY 2010 Award/ Oblg Date	FY 2011 Cost	FY 2011 Award/ Oblg Date	Total Cost
Intl Events NATO Agreements Support	C/CPAF	MDA/ DC	0	1,022	N/A	0	N/A			1,022
Intl Events Bilateral Agreement Support	C/CPAF	Northrop Grumman/ Co	357	245	1/2Q	0	N/A			602
BMDS HWIL										
Sim Center Infrastructure	C/FFP	Madison Research Corp/ AL	3,300	3,390	1/2Q	3,326	1/2Q			10,016
ARC Infrastructure	C/FFP	COLSA/ AL	10,282	10,820	1/2Q	10,820	1/2Q			31,922
Subtotal Support Costs			13,939	15,477		14,146				43,562

Remarks

III. Test and Evaluation Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2009 Cost	FY 2009 Award/ Oblg Date	FY 2010 Cost	FY 2010 Award/ Oblg Date	FY 2011 Cost	FY 2011 Award/ Oblg Date	Total Cost
Simulation Architecture & Requirements										
International Support to DI			0	0	N/A	578	1/2Q			578
NATO ALTBMD Program Office			0	0	N/A	338	1/2Q			338
International Agreements (BASIL,GE Annex E)			0	0	N/A	257	1/2Q			257
International Agreements (US-GE Annex, US-UK Lethality)			0	0	N/A	425	1/2Q			425
Verification, Validation & Accreditation										

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date: May 2009
APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE: 0603890C Ballistic Missile Defense Enabling Programs

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2009 Cost	FY 2009 Award/ Oblg Date	FY 2010 Cost	FY 2010 Award/ Oblg Date	FY 2011 Cost	FY 2011 Award/ Oblg Date	Total Cost
PA Integrated V&V	C/CPAF	Northrop Grumman/ CO	1,147	2,248	1/2Q	0	N/A			3,395
GT Integrated V&V	C/CPAF	Various/ AL	2,539	2,596	1/2Q	0	N/A			5,135
GT Models & Anchoring	C/CPAF	Various/ AL	220	266	1/2Q	0	N/A			486
Elem Integration VV&A	C/CPAF	Various/ AL	500	521	1/2Q	0	N/A			1,021
Wargames & Exercises VV&A	C/CPAF	Northrop Grumman/ CO	550	638	1/2Q	0	N/A			1,188
BMDS HWIL										
SPAWAR - Pacific, Tactical Comm Emulation (TCES)	C/CPAF	Various/ AL	0	0	N/A	2,478	1/2Q			2,478
Subtotal Test and Evaluation			4,956	6,269		4,076				15,301

Remarks

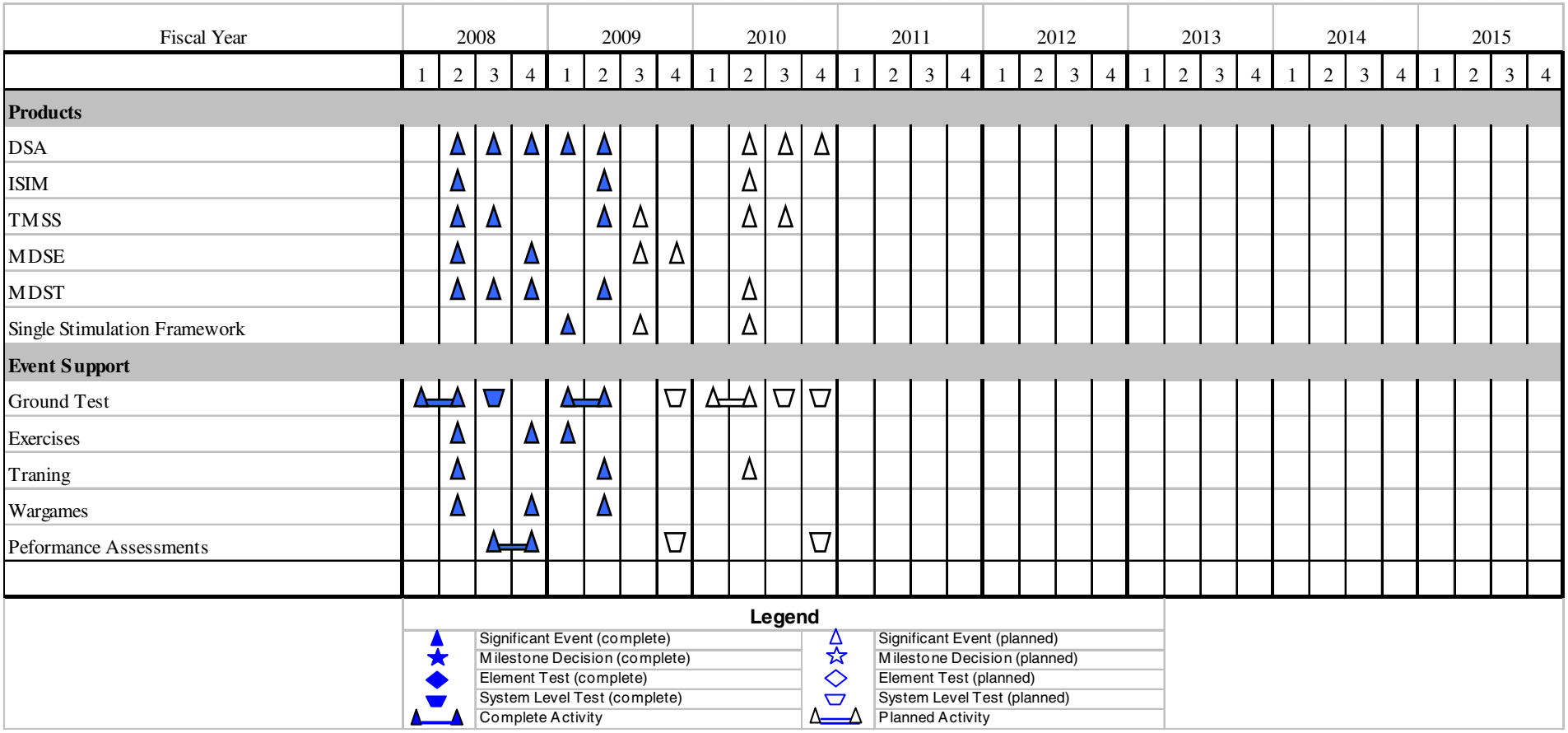
IV. Management Services Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2009 Cost	FY 2009 Award/ Oblg Date	FY 2010 Cost	FY 2010 Award/ Oblg Date	FY 2011 Cost	FY 2011 Award/ Oblg Date	Total Cost
Simulation Architecture & Requirements										
Government Salaries			550	639	N/A	0	N/A			1,189
Government Travel			75	87	N/A	0	N/A			162
Government Travel			9	10	N/A	0	N/A			19
SETA			679	1,350	N/A	0	N/A			2,029

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date: May 2009
APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE: 0603890C Ballistic Missile Defense Enabling Programs

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2009 Cost	FY 2009 Award/ Oblg Date	FY 2010 Cost	FY 2010 Award/ Oblg Date	FY 2011 Cost	FY 2011 Award/ Oblg Date	Total Cost
Verification, Validation & Accreditation										
FFRDC - VV&A/ Architectures	C/FFRDC	Various/ CO/MA/GA	1,961	1,867	1/2Q	0	N/A			3,828
Government Salaries			550	638	N/A	0	N/A			1,188
Government Travel			74	86	N/A	0	N/A			160
Government Training			8	10	N/A	0	N/A			18
SETA			678	967	N/A	0	N/A			1,645
BMDS Digital Modeling & Simulation										
Government Salaries			550	638	N/A	4,688	N/A			5,876
Government Travel			75	87	N/A	505	N/A			667
Government Training			9	10	N/A	95	N/A			114
SETA			679	622	N/A	2,452	N/A			3,753
BMDS HWIL										
SETA	C/FFP	Various/ AL	2,240	796	1/2Q	0	N/A			3,036
Government Salaries		SMDC/ AL	2,755	3,070	N/A	0	N/A			5,825
Government Travel		SMDC/ AL	80	80	N/A	0	N/A			160
Government Training		SMDC/ AL	20	20	N/A	0	N/A			40
Subtotal Management Services			10,992	10,977		7,740				29,709
Remarks										
Project Total Cost			90,200	89,976		51,282				231,458
Remarks										

Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile	Date: May 2009
APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE: **0603890C Ballistic Missile Defense Enabling Programs**



Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail	Date: May 2009
APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE: 0603890C Ballistic Missile Defense Enabling Programs

Schedule Profile	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015
Products								
DSA	2Q,3Q,4Q	1Q,2Q	2Q,3Q,4Q					
ISIM	2Q	2Q	2Q					
TMSS	2Q,3Q	2Q,3Q	2Q,3Q					
MDSE	2Q,4Q	3Q,4Q						
MDST	2Q,3Q,4Q	2Q	2Q					
Single Stimulation Framework		1Q,3Q	2Q					
Event Support								
Ground Test	1Q-2Q,3Q	1Q-2Q,4Q	1Q-2Q,3Q,4Q					
Exercises	2Q,4Q	1Q						
Training	2Q	2Q	2Q					
Wargames	2Q,4Q	2Q						
Performance Assessments	3Q-4Q	4Q	4Q					

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date: May 2009
APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE: 0603890C Ballistic Missile Defense Enabling Programs

COST ($ in Thousands)	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015
YX32 Safety, Quality and Mission Assurance	25,914	25,066	33,038					
RDT&E Articles Qty	0	0	0					

A. Mission Description and Budget Item Justification

The Missile Defense Agency (MDA) Quality, Safety, and Mission Assurance (QSMA) group provides to the Agency the expertise necessary to ensure the success of the Ballistic Missile Defense System (BMDS). The Agency Director has emphasized the significant role of quality and safety in mission success and the importance of protecting people from catastrophic accidents and failures.

Over the past few years, using the Ground based Midcourse Defense (GMD) launch aborts as an example, the QSMA team has made dramatic improvements that impact the BMDS, present and future. A combination of enforcing the MDA assurance provisions on all mission critical suppliers, and establishing an audit program revealed significant shortfalls that prompted the Director to action. The audit findings, direct unbiased weekly reports, and GBI failures formed the rational for establishing the Mission Readiness Task Force (MRTF).

QSMA has made several quality overhauls through rigorous audits. In the past two years, there has been a 15% reduction in audit findings. Audit results are tracked for several months culminating in process improvements, enhancing statistical controls, cultural changes, and best practices.

The QSMA culture espouses near and long term priorities and solutions for MDA. Since QSMA was established in 2002, proactive efforts have turned ideas into BMDS solutions. Currently, two quality and safety initiatives are contractual requirements for all programs. These initiatives, MDA Assurance Provisions, (MAP), Government MDA Assurance Provisions, (GMAP), and the Parts, Materials, and Process Mission Assurance Plan (PMAP) standardize the way MDA does business relative to quality, safety, and mission assurance. Currently, 7 programs have placed the MAP on contract. Also, Raytheon uses the MAP as a corporate standard, not only for MDA but all their defense programs.

QSMA facilitated a unique government and industry partnership which salvaged the Eagle Picher Company, a critical sole source battery supplier for 5 major MDA programs. Timely intervention with disciplined quality and safety guidance was key to restoring Eagle Picher as a stable supplier. Moreover, test failures have decreased, on-time deliveries have increased, and the supplier quality measurement rating increased greatly this year. Eagle Picher's successful turnaround prompted another government industry partnership to address the Pacific Scientific company in a similar situation. It also has embraced stakeholder involvement and is committed to resolving major issues. All indications show that Pacific Scientific is on the path to success.

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date: May 2009
APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE: 0603890C Ballistic Missile Defense Enabling Programs

B. Accomplishments/Planned Program

	FY 2008	FY 2009	FY 2010	FY 2011
Quality, Safety and Mission Assurance	25,914	25,066	33,038	
RDT&E Articles (Quantity)	0	0	0	

FY09 Planned Program

The FY09 planned program builds upon the previous year's development of expertise and closes the loop with BMDS processes such as risk management, non-conformance reporting, and Reliability, Maintainability, and Availability (RMA). Through QSMA administration of these processes QSMA is able to link as-built performance of the systems to systems engineering. This will ensure that the operational system further meets Agency requirements and that any anomalous behavior is documented, tracked, measured, and resolved.

BMDS Independent Mission Assurance & Safety Assessments

- Administer BMDS non-conformance, risk management, and Reliability, Maintainability, and Availability (RMA) process by providing the leadership and administrative resources necessary for ensuring effective operation and metric reporting.
- Conduct system analysis/assessments such as reliability prediction analysis, failure modes and effects criticality analysis, safety hazards analysis etc.
- Continue to perform independent mission assurance assessments on GMD, THAAD and Aegis test flight tests. By acquiring additional resources, increase system cognizance and provide greater depth in assessments.
- Continue independent assessments for significant ground flight tests. By acquiring additional resources, increase system cognizance and provide greater depth in assessments.
- Continue to provide Independent Readiness Review Team support by providing senior specialists.
- Manage the integrated MDA Software Metrics Program to provide information on the health of the BMDS to MDA management.
- Continue operating the BMDS Material and Failure Review Board to resolve significant Supplier non-conformances.
- Conduct independent Safety Assessments/Reviews of MDA programs and Elements to enhance BMDS safety
- Maintain the MDA Safety Review Board, MDA Range Safety Council and BMDS Safety Working Groups to ensure that all BMDS activities are conducted safely.

Quality, Safety and Mission Assurance Audits

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date: May 2009
APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE: 0603890C Ballistic Missile Defense Enabling Programs

- Conduct up to 6 unannounced Agency large scale Mission Assurance audits to continue enhancement of quality in BMDS products.
- Perform 2 safety audits based on safety concerns
- Perform 2 post audit corrective action assessments as necessary to accelerate audit resolution.
- MDA Assurance Provisions (MAP) Implementation
- Update MAP revision to address Lessons Learned, inputs from the Industry Specification Working Group, and to improve metric reporting throughout the Agency.
- Continue working with existing Programs Elements to get the MAP on contract and to track individual Program status.

On-Site Support - Mission Assurance Representatives (MAR) & BMDS Safety Officers

- Expand on-site reporting to include engineers at key locations where design work occurs. Continue to increase on-site performance through further development of cognizant engineer data books aimed at improving the MARs systems engineering awareness.
- Expand BMDS Safety Officer Program by adding engineers to aid the 24/7 team in ensuring that the BMDS is operated safely when in test or operational modes. Engineering support shall provide greater knowledge of fire control loop.
- Provide further refinement in the end-of-week processing by metric processing on Quality Issues Tracking System.
- Manage the MDA BMDS Safety Officer Program to ensure that the BMDS is operated safely when in test or operational modes.
- Maintain and coordinate safety career training program.
- Continue performing weekly mission assurance and safety walk-downs.
- Using Supplier metrics, continue to pursue process improvements.

MDA Parts and Materials Program

- Continue to provide technical support via the Center of Excellence (COE) to address Program Element and Supplier part and material issues arising from the Agency Part, Material, and Processes Board (PMPB); and the Program Element Parts, Materials, and Processes Control Boards (PMPCB). Agency PMPB ensures uniformity; PMPCB is the Program Element decision board that works directly with the Suppliers.
- Work with each Program Element to adjudicate part and material issues, i.e., waivers and deviations, arising from PMAP requirements.
- Using the COE resources and lab capability, create test methods for new emerging technologies.
- Using data from cost assessments and industry road shows, update the MDA PMAP. Incorporate in the revision Industry practices known to increase product reliability.
- Update the Agency preferred parts and materials list database that facilitates new system design and the resolution of part obsolescence issues.

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Government MDA Assurance Provisions (GMAP)

- Continue supporting Public Law 107-314, Section 804 ``Improvement of software acquisition processes`` Bob Stump National Defense Authorization Act for Fiscal Year 2003. GMAP used to ensure each Program Element has a Software Acquisition Improvement Program
- Update the GMAP for further refinements in software acquisition strategies.
- Continue to provide metric assessments to the Director for each Program Element Senior Executive Review.
- Update the MDA Software Verification and Validation Program

Program Support

- Continue providing mission assurance support to Kinetic Energy Interceptor (KEI), Advanced Sensors, Multiple Kill Vehicle (MKV), and Sensors Forward Based X-Band Transportable Radar (AN/TPY-2) program offices.
- Continue safety support to Advanced Sensors, MKV, and AN/TPY-2 program office.
- Continue providing GMD with Navy quality expertise for SBX operations.

Intra-Agency & Industry Activities

- Perform the next yearly major Supplier Initiative. Leveraging the cooperation of several prime Supplier contracts, create a task force to address quality concerns associated with a particular supplier.
- Specification and Standards Working Group for Industry acceptance of core quality standards to be applied in Supplier contracts.
- Provide participation in the Defense Standardization Board to ensure that MDA has an equal voice
- Continue the sharing of lessons learned with NASA, National Reconnaissance Office (NRO) and other DOD organizations.
- Maintain the Range Safety mediation, augmentation and commonality program.

Safety and Occupational Health

- Continue management oversight of MDA safety policies and requirements addressed in DoD safety directives.
- Perform all required Occupational Safety and Health Inspections of MDA facilities
- Maintain MDA's Safety and Quality Concerns Hotline · Conduct required Federal and Department of Defense safety training
- Represent MDA at safety meetings and task forces

- Ensure safety and occupational health involvement in facilities planning
- Prepare reports for MDA, DOD and other Federal safety presentations.
- Support quality, mission assurance, and safety audits and assessments.
- Proactively ensure a safe working environment for all MDA employees and operations through compliance and enforcement of OSHA (Occupational Safety and Health Administration) and DoD directives

FY10 Planned Program

The FY10 planned program maintains on-site quality, safety and mission assurance (QSMA) oversight at key suppliers, creates a consistent set of QSMA acquisition requirements for each new contract, provides safety and quality operations for flight tests, ruthlessly pursues root cause and correction of anomalies, and continues to infuse best industry practices into Program supplier operations. With QS as a direct report to the Agency Director, it provides a non-advocate, independent perspective on Supplier and Agency operations across the Ballistic Missile Defense System.

BMDS Quality, Safety and Mission Assurance Support

- Perform non-conformance reporting, tracking and mitigation for all major flight and ground test (THAAD, GMD and AB) operations.
- Perform configuration management verification and reconciliation for all major flight and ground test assets.
- Perform independent mission assurance assessments on GMD, THAAD and Aegis test flight tests systems, including participation in requirement verification forums.
- Conduct safety risk assessments per Mil-Std-882 of all test and operational systems to ensure catastrophic risks remain improbable.
- Provide non-advocate / independent quality, safety and mission assurance oversight / support to Agency key engineering and configuration management forums.
- Conduct system analysis/assessments such as reliability prediction analysis, failure modes and effects criticality analysis, safety hazards analysis etc., to lower flight and operational system risks
- Create an Agency wide quality metrics program to measure the health of MDA Programs.
- Continue to maintain the supplier-road-map, which identifies key mission critical suppliers for all Programs.
- Continue operating the BMDS Material and Failure Review Board to resolve significant Supplier non-conformances.
- Maintain the MDA Safety Review Board, MDA Range Safety Council and BMDS Safety Working Groups to ensure that all BMDS activities are conducted safely. Quality, Safety and Mission

Assurance Audits

- Conduct 3 no-knock full scale Mission Assurance audits (approx 40 people for 2 weeks), approximately 20 corrective action assessments, and safety audits as necessary at key mission critical suppliers. Mission assurance audits identify Supplier deficiencies in design, test, manufacturing, quality and safety. These audits have generated over a thousand findings, holding the Program Offices and Suppliers accountable to resolve all issues. Accountability has been enhanced as these audits have played a significant role in the award fee process.

Mission Assurance Representatives (MAR)

- Perform government on-site quality and mission assurance support at 23 sites. Personnel ensure that MDA mission critical components / assemblies follow and employ MDA QSMA requirements and other best industry practices for design, test and manufacturing. On-site, ``boots-on-the-ground,`` technical expertise identifies design and manufacturing process flaws early in the production cycle to facilitate a low cost resolution. MARs walk the production floor daily to address operational issues, meet with technical counterparts to address proper root-cause and resolution, and provide Supplier management direct access to MDA government to address Supplier concerns. By functioning as the Agency's on-site ``eyes and ears`` the MARs effectively ensure Program Offices are acutely aware of Supplier issues.
- Perform weekly mission assurance and safety walk-downs with the Defense Contract Management Agency (DCMA). By working closely with DCMA quality counterparts, the MAR-DCMA team forms an effective force to resolve major issue.
- Increase on-site support performance through industry best practice training for solder workmanship, electrostatic sensitive device requirements, foreign object debris, etc.

BMDS Safety Officers (BSOs)

- Perform 24/7 safety monitoring of operational and test systems to ensure safe transition between test and operations. BSOs provide round-the-clock safety situational awareness, coordinating with Warfighter to correctly identify missile track information (friend or foe). BSOs also evaluate operational to test transitions to determine safety risks associated with configuration changes.
- Perform monitoring and tracking of non-conformance behavior of the operational system. Coordinates with Warfighter and QS mission assurance on proper root cause and resolution of all anomalies.

MDA Parts and Materials Program

- Continue to enforce Program compliance to the Missile Defense Agency Part, Material and Processes Assurance Provisions (PMAP). PMAP provides comprehensive requirements that govern the use of Electrical, Electronic and Electromechanical (EEE) parts used in high reliability,

strategic systems. Document ensures similar major assemblies contain parts with identical reliability requirements. It also leads the DOD on explicit requirements to preclude counterfeit parts from entering mission critical systems.
- Eliminate Program contractual gaps between PMAP and Supplier part and material plans.
- Continue to maintain the MDA Advisory Program for Parts and Materials. Program rapidly promulgates part and material issues arising on other Programs, providing detailed recommendations for resolution.
- Continue to provide a Part and Material knowledge center to address Program and Supplier part and material issues arising from development or fielded systems. Organization supports Program surveillance and refurbishment operations to ensure fielded life requirements are met.
- Using the knowledge center and its leverage off of DOD existing labs, create test methods for new emerging EEE part technologies.
- Update the Agency's preferred parts and materials list database to facilitate new system design and to identify part obsolescence issues.

Acquisition Support

- Ensure all new acquisitions are in compliance with the MDA Assurance Provisions (MAP), the MDA Parts, Materials and Processes Assurance Provisions and all applicable DFAR, FAR, and clauses regarding quality, safety and mission assurance. The MAP is a comprehensive document governing best industry practices for design, test, manufacturing, quality, maintainability and safety. It contains approximately 1800 requirements known and well accepted within industry to promote / ensure product reliability.
- Update the Missile Defense Agency Assurance Provisions (MAP) document to incorporate design, test, manufacturing, quality, safety, and mission assurance lessons learned to further improve acquisition requirements.
- Improve MDA's acquisition strategy through participation in the definition and determination of all award fees. Provide in the award fee structure specific QSMA criteria and access worthiness of awards using waivers / deviations and quality metric information from Programs QSMA organization and MARs.

Program Support

- Provide on-site QSMA surge support at suppliers having quality concerns. Surge team provides ``full-contact`` quality to ensure compliance to Supplier build paper and Industry best practices. Surge team provides subject matter / quality expertise to supplement the Suppliers team when insufficient resources exist.
- Perform independent / non-advocate reviews, such as design certification, pedigree, failure review board, preliminary design, critical design and technical interchange reviews to ensure compliance with industry best practices.
- Provide mission assurance support to major failure review boards to ensure comprehensive mitigation strategies for operational assets are employed.

- Continue providing GMD with Navy quality expertise for SBX operations.

Intra-Agency & Industry Activities

- Further leverage DCMA resources to maximize on-site quality support. In working closely with DCMA, QS is able to increase its quality footprint across the supplier base and improve its leverage in addressing major issues. A detailed Memorandum of Agreement, currently in effect, enables MDA to explicitly identify mandatory government inspection points during critical operations.
- Perform one major stakeholder quality initiative. Similar to previous initiatives, MDA-QS leads a joint Industry initiative that uses resources from Prime Contractors to improve quality problems at a common sub-tier Supplier.
- Participate in the Defense Standardization Board to ensure that MDA has an equal voice in DOD requirements.
- Continue participation in quality, safety and mission assurance forums to obtain lessons learned and understand / promote new requirements or methods. Current membership is with American Institute of Aeronautics and Astronautics, NASA's Quality Leadership Forum, Space Supplier Council, Joint Mission Assurance Committee, Space Quality Industry Council and Conference on Quality in the Space Defense Industry, Joint Audit Planning Committee

Safety and Occupational Health

- Protect safety and welfare of MDA workforce by ensuring compliance to DOD Instruction 6055.1 for a Safety and Occupational Health Program; Section 7902, Title 5, and Section 651, Title 29, of United States Code; Executive Order 12196, ``Occupational Safety and Health Programs for Federal Employees;`` and 29 CFR 1960, ``Basic Program Elements for Federal Employees Occupational Safety and Health Programs and Related Matters.``
- Perform all required Occupational Safety and Health Inspections of MDA facilities
- Maintain MDA's Safety and Quality concerns Hotline allowing anomis reporting of any incident effecting the health and safety of MDA employees.

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date: May 2009
APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE: **0603890C Ballistic Missile Defense Enabling Programs**

- Conduct required Federal and Department of Defense safety training · Represent MDA at safety meetings and task forces
- Prepare reports for MDA, DOD and other Federal institutions.
- Support quality, mission assurance, and safety audits and assessments.

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date: May 2009
APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE: 0603890C Ballistic Missile Defense Enabling Programs

C. Other Program Funding Summary

	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	Total Cost
PE 0603175C Ballistic Missile Defense Technology	106,437	119,308	109,760						-
PE 0603881C Ballistic Missile Defense Terminal Defense Segment	1,034,478	956,686	719,465						-
PE 0603882C Ballistic Missile Defense Midcourse Defense Segment	2,198,664	1,507,481	982,922						-
PE 0603883C Ballistic Missile Defense Boost Defense Segment	503,475	400,751	186,697						-
PE 0603884C Ballistic Missile Defense Sensors	574,231	777,693	636,856						-
PE 0603886C Ballistic Missile Defense System Interceptors	330,874	385,493	0						-
PE 0603888C Ballistic Missile Defense Test and Targets	619,137	919,956	966,752						-
PE 0603891C Special Programs - MDA	193,157	175,712	301,566						-
PE 0603892C Ballistic Missile Defense Aegis	1,126,337	1,113,655	1,690,758						-
PE 0603893C Space Tracking & Surveillance System	226,499	208,923	180,000						-
PE 0603894C Multiple Kill Vehicle	223,084	283,481	0						-
PE 0603895C BMD System Space Program	16,237	24,686	12,549						-
PE 0603896C BMD C2BMC	439,997	288,287	340,014						-
PE 0603897C BMD Hercules	51,387	55,764	48,186						-
PE 0603898C BMD Joint Warfighter Support	45,400	69,743	60,921						-
PE 0603904C Missile Defense Integration & Operations Center (MDIOC)	77,102	106,040	86,949						-
PE 0603906C Regarding Trench	1,945	2,968	6,164						-
PE 0603907C Sea Based X-Band Radar (SBX)	155,244	146,895	174,576						-
PE 0603908C BMD Europ Intercep Site	0	362,007	0						-
PE 0603909C BMD Europ Midcourse Radar	0	76,537	0						-
PE 0603911C BMD European Capability	0	0	50,504						-
PE 0603912C BMD European Comm Support	0	27,008	0						-
PE 0603913C Israeli Cooperative	0	0	119,634						-
PE 0605502C Small Business Innovative Research BMDO	137,409	0	0						-
PE 0901585C Pentagon Reservation	5,971	19,667	19,709						-
PE 0901598C Management Headquarters - MDA	83,907	81,174	57,403						-

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

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D. Acquisition Strategy

The execution of an effective Quality, Safety and Mission Assurance program is carried out in collaboration with subject matter expertise found in the Government, Federally Funded Research and Development Centers (FFRDC), University Affiliated Research Centers (UARC), Science, Engineering and Technical Assistance (SETA), and Industry.

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date: May 2009
APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE: 0603890C Ballistic Missile Defense Enabling Programs

I. Product Development Cost ($ in Thousands)

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

Remarks

II. Support Costs Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2009 Cost	FY 2009 Award/ Oblg Date	FY 2010 Cost	FY 2010 Award/ Oblg Date	FY 2011 Cost	FY 2011 Award/ Oblg Date	Total Cost
Quality, Safety and Mission Assurance										
OGA Quality Surge Support & Core	SS/MIPR	NSWC Corona/CA, VA	2,341	3,150	1Q	3,100	1Q			8,591
Mission Assurance/Audits	C/FFP	SRS Tech/VA,MD	3,648	1,500	1Q	10,526	1Q			15,674
OGA Crane PMP	SS/MIPR	NSWC Crane/IN,VA	1,200	2,350	1Q	1,716	1Q			5,266
S/W Acquisition	C/MIPR	Hill/ PA, VA	250	400	1Q	400	1Q			1,050
Pedigree, DCRs Review	C/FFRDC	Aerospace, SEI/PA, CA, VA	450	500	1Q	2,500	1Q			3,450
Parts & Material Expertise	SS/MIPR	AMRDEC/AL	0	800	1Q	1,615	1Q			2,415
Safety & Quality Audits	C/FFP	SRS	8,000	4,086	1Q	0	N/A			12,086
Govt Sept	SS/MIPR	NSWC VA Beach/VA	150	300	1Q	0	N/A			450
Parts Material Pro	SS/MIPR	NSWC Crane, IN, VA	0	2,378	1Q	0	N/A			2,378
Subtotal Support Costs			16,039	15,464		19,857				51,360

Remarks

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date: May 2009
APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE: 0603890C Ballistic Missile Defense Enabling Programs

III. Test and Evaluation Cost ($ in Thousands)

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

Remarks

IV. Management Services Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2009 Cost	FY 2009 Award/ Oblg Date	FY 2010 Cost	FY 2010 Award/ Oblg Date	FY 2011 Cost	FY 2011 Award/ Oblg Date	Total Cost
Quality, Safety and Mission Assurance										
QS Civilian Salaries	TM	MDA/VA,MD,AL,CA,AZ,HI,AK,MA,NJ,FL,AR,UT,MH	9,323	8,397	1Q	11,530	1/2Q			29,250
Travel/PCS	TM	MDA/VA,MD,A.,CA,AZ,HI,AK,MA,NJ,FL,AR,UT,MH	886	1,205	1Q	1,651	1Q			3,742
Subtotal Management Services			10,209	9,602		13,181				32,992

Remarks

Project Total Cost			26,248	25,066		33,038				84,352

Remarks

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date: May 2009
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COST ($ in Thousands)	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015
ZX40 Program-Wide Support	19,251	12,519	13,569					
RDT&E Articles Qty	0	0	0					

A. Mission Description and Budget Item Justification

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

B. Accomplishments/Planned Program

	FY 2008	FY 2009	FY 2010	FY 2011
Civilian Salaries and Support	19,251	12,519	13,569	
RDT&E Articles (Quantity)	0	0	0	

See Section A: Mission Description and Budget Item Justification

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