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<b>Missile Defense Agency (MDA) Exhibit R-2 RDT&amp;E Budget Item Justification</b>						Date <b>February 2007</b>		
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<b>APPROPRIATION/BUDGET ACTIVITY</b>				<b>R-1 NOMENCLATURE</b>				
<b>RDT&amp;E, DW/04 Advanced Component Development and Prototypes (ACD&amp;P)</b>				<b>0603890C Ballistic Missile Defense System Core</b>				

COST (\$ in Thousands)	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
Total PE Cost	409,993	429,420	482,016	511,147	558,746	579,571	579,316	588,481
0101 Systems Engineering & Integration	99,536	100,963	107,422	109,272	124,707	137,531	142,490	145,175
0105 Countermeasures/Counter-Countermeasures (CM/CCM)	23,002	23,038	26,232	27,317	22,759	23,073	23,073	23,073
0102 Intelligence and Security	21,647	21,445	24,190	26,159	37,471	45,446	46,772	47,530
0103 Producibility & Manufacturing Technology	31,248	36,243	37,615	41,080	43,091	43,840	45,193	45,926
0104 BMD Information Management Systems	108,923	110,419	126,451	130,952	142,139	144,294	138,583	140,830
0106 Modeling & Simulation	89,550	92,680	100,698	104,350	108,649	109,570	112,953	114,784
0107 Safety, Quality and Mission Assurance	20,207	23,218	29,720	39,070	39,173	39,432	40,649	41,308
0602 Program-Wide Support	15,880	21,414	29,688	32,947	40,757	36,385	29,603	29,855

*Note: In FY06 through FY11, there is an increase in Project 0104 BMD Information Management Systems partially due to the IT budgets from the Computing Infrastructure, Computing and Network Management Services, and Information Distribution Services projects being consolidated from Program Element 0901598C into this Program Element and Project.*

**A. Mission Description and Budget Item Justification**

**A.1 System Element Description**

**(0101) 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) Test Bed Planning/concept development, 2) Design and Specification, 3) Integration and Implementation, 4) Verification and Assessment, and 5) Operational Integration (fielding) to defend the United States, its friends and allies, including support as necessary for BMDS operational missions. This strategy provides core technical efforts to define, design, and assess the BMDS capabilities, and to enhance these capabilities over time to defeat emerging adversary capabilities through Block upgrades. A cross-cutting System-level engineering effort is integrated with BMDS Elements and components throughout the full system development cycle with increased emphasis on collaborative system engineering activities with BMDS element systems. This strategy also improves efficiency in program execution; defines architectures and critical interfaces; identifies information exchange requirements; reviews technical and performance risks and develops mitigation strategies; oversees program development maturity; and manages configuration baselines within Block development cycles to ensure continuous availability of a performance baseline system which will defeat adversary capabilities.

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<p>(0105) COUNTERMEASURES/COUNTER-COUNTERMEASURES (CM/CCM) The CM/CCM Program assesses technical risks, identifies mitigation approaches and integrates engineering changes to the baseline BMDS to improve its performance against adversary capabilities, focusing primarily on defeating countermeasures. The CM/CCM Program brings together capabilities from across MDA, to include System, Element, and Component technical experts; to conduct integrated engineering assessments of BMDS performance against countermeasures and the technical risks posed by these countermeasures.</p> <p>The CM/CCM Program is a critical SE&amp;I activity that 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. Working in conjunction with Threat Systems Engineering, the program ensures consistency of these adversary capabilities. These efforts bring together capabilities from across MDA to conduct integrated engineering assessments of BMDS performance against countermeasures and the technical risks posed by these countermeasures. High-risk areas are identified, and counter-countermeasure options are proposed to mitigate these risks. An independent assessment team of senior experts, funded by the CM/CCM Program, reviews the adversary capabilities, BMDS performance analyses, risks, and counter-countermeasure proposals, and provides their assessment to the MDA Director.</p> <p>(0102) INTELLIGENCE AND SECURITY This project funds three specific efforts focused on maximizing actionable threat information and ensuring the safety of the BMDS, MDA and its personnel: 1) intelligence, 2) counterintelligence, and 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).</p> <p>(0103) PRODUCIBILITY AND MANUFACTURING TECHNOLOGY (MP) MP conducts manufacturing risk assessments through Engineering and Manufacturing Readiness Level (EMRL) Assessments which is the Producibility and Manufacturing Technology 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. Industrial Capability Assessments (ICAs) are accomplished across the BMDS Industrial Base where trades are performed to assess and analyze the original equipment manufacturers (OEMs), supplier base, and others 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.</p>		

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<p>(0104) BMD INFORMATION MANAGEMENT SYSTEMS</p> <p>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 MDA Information Management / Information Technology (IM/IT) assets are administered, acquired, managed and operated in compliance with, and meet the goals of, existing statutes and DoD regulations, in particular the President's Management Agenda, the Clinger-Cohen Act, the E-Government Act of 2002, the Government Paperwork Elimination Act, and the Office of Management and Budget (OMB) requirements to align IT investments with the Federal Enterprise Architecture. The BMD Information Management Systems project includes the following Task areas:</p> <ul style="list-style-type: none"><li>• Enterprise Architecture and Engineering</li><li>• Enterprise Communications Infrastructure</li><li>• Enterprise Information Assurance (IA)</li><li>• Enterprise Applications</li><li>• Information Management Services</li><li>• Enterprise Video Conferencing Services</li><li>• Enterprise Plans and Policies</li><li>• Computing and Network Management Services (National Capital Region (NCR))</li><li>• Computing Infrastructure (United States Nation Capital Region (USNCR))</li><li>• Computing Infrastructure (United States South (USSOUTH))</li><li>• Service IM/IT for Executing Agents</li></ul> <p>(0106) MODELING AND SIMULATION (M&amp;S)</p> <p>The mission of MDA's Modeling and Simulation (M&amp;S) program is to establish a tool set for planning, engineering, testing and operating an integrated ballistic missile defense system. Specific modeling and simulation products map to the six agency venues: 1) ground tests, 2) flight tests, 3) war games, 4) analysis, 5) training, and 6) element testing. For each of these venues and their stakeholders, M&amp;S defines, designs, develops, deploys and maintains system simulations, including their constituent subsystem, threat and environment models, and provides user and analytical support services. In addition, M&amp;S is responsible for requirements' development, configuration control, verification, validation and accreditation, facility and infrastructure planning, information assurance and risk management.</p>		

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<p>(0107) QUALITY, SAFETY AND MISSION ASSURANCE (QSMA):  The MDA Quality, Safety, and Mission Assurance (QSMA) group 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 mission assurance is specifically addressed. 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 senior management consultation on the viability of contractual requirements, oversight and insight into design, development, test, manufacturing, and operations as well as safety support for all operational facilities and supplier sites.</p> <p><b><u>A.2 System Element Budget Justification and Contribution to the Ballistic Missile Defense System (BMDS)</u></b></p> <p>(0101) SYSTEMS ENGINEERING AND INTEGRATION (SE&amp;I)  A collaborative relationship with the weapons, sensors, command and control, battle management and communications developers is the foundation for ensuring unity of effort in the development of subsystems and architecture designs to deliver system-level capability. During this development process resources are needed not only for near-term Block requirements, but also for long-range Block developments. SE&amp;I develops a set of time-phased technical goals and objectives to guide the design and development of evolutionary capabilities for the BMDS. The overarching development of individual components and elements to provide a capability for multiple engagements along the entire flight path of threat ballistic missiles is integrated into each Test Bed. Significant and thorough guidance to BMDS elements and components is provided throughout the full system development cycle phases. During the recent period leading up to and following the launch of a TD-2 ballistic missile, SE&amp;I formed a crisis action team that provided detailed analytical work, namely predicted system performance against potential threats and trajectories, impact of intercept debris, and timeline and engagement success analyses, that was the technical basis for decisions made at national level. To support this team, analysts normally dedicated to providing support to the five phases of SE&amp;I activities were dedicated to support the crisis action team for 45 days.</p> <p>SE&amp;I employs a Test Bed development approach to set the conditions for ongoing evolutionary improvements to the system. The Test Bed enables MDA to execute configuration management, focus development activities, perform trade-offs, and prioritize investments to ensure end-to-end functionality across a discrete segment of BMDS Elements. BMDS capabilities are matured using a block engineering development process within a Test bed framework. The process is repeated for each successive two-year development Block, and the phases for each development Block do overlap. For example, at the current time Block 2008 planning, Block 2006 design, and Block 2004 test, verification, assessment, and fielding are in progress.</p>		

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<p>(0105) COUNTERMEASURES/COUNTER-COUNTERMEASURES (CM/CCM): The CM/CCM Program is the primary MDA activity focused on the assessment and improvement of BMDS system discrimination capabilities. The program's adversary engineering teams are a significant component of MDA's threat engineering resources focused on assessing adversary capabilities to employ countermeasures which degrade BMDS performance. The adversary teams establish the feasible engineering range of adversary countermeasures' capabilities through the development of engineering tools and generation of new phenomenological data to increase MDA's understanding of the performance of countermeasures, and the design of countermeasure concepts to realize these adversary capabilities. Selected countermeasure designs are transitioned to MDA Targets and Countermeasures for insertion in BMDS flight test target payloads.</p> <p>The program conducts assessments of BMDS capabilities against countermeasures and develops concepts to improve the robustness of the system's capability to defeat ballistic missiles employing countermeasures. The CM/CCM Program is MDA's principal source of new concepts which improve the discrimination capabilities of the BMDS and mitigate the effects of countermeasures on system performance. The program integrates these concepts into the MDA system engineering process for development and deployment in future blocks of the BMDS.</p> <p>(0102) INTELLIGENCE AND SECURITY: 1) Intelligence ensures the development, study and exploitation of relevant, actionable threat information, and makes this information available to all MDA organizations. Through this activity, authoritative, current and projected threat data are provided to support BMDS architecture design, testing, modeling, and wargaming activities, and existing/future national technical means are leveraged to enhance the effectiveness of the BMDS. This information reduces risk, improves system performance, and informs the engineering and development process.</p> <p>2) The MDA Counterintelligence Office serves as the MDA focal point for all counterintelligence (CI) matters and external coordination with the Services, the FBI, and other federal criminal investigative organizations. This office ensures that MDA leadership and the entire workforce are apprised of threats posed by Foreign Intelligence and Security Services (FISS) and terrorist groups worldwide.</p> <p>3) BMDS Certification. This activity develops a comprehensive picture of the overall Information Assurance/Computer Network Defense (IA/CND) architecture at all levels of the BMDS.</p> <p>(0103) PRODUCIBILITY AND MANUFACTURING TECHNOLOGY (MP) MP Program Budget Justification and Contribution to the Ballistic Missile Defense System (BMDS): MP 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</p>		

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<p>available to the Blocks through risk reduction, cost reduction/avoidance, and performance enhancement. MP furthers efforts in commonality and spreads best practices for producibility and manufacturing across the BMDS Elements by cooperatively funding and leveraging efforts.</p> <p>(0104) BMD INFORMATION MANAGEMENT SYSTEMS: The BMD Information Management Systems Project integrates and supports every aspect of the BMD System (BMDS) by providing a secure and reliable Information Technology (IT) infrastructure and the Information Management/Information Technology (IM/IT) services necessary to enable the BMDS Elements and operators to collaborate and share information which is essential to accomplishing the complex integrated BMDS mission.</p> <p>(0106) MODELING AND SIMULATION (M&amp;S): The BMDS exploits maturing capabilities to build an integrated, highly capable defense. As new capabilities are brought to the war fighter, the “plug and fight” missile defense system increases its effectiveness through the use of new engagement sequence groups. These engagement sequences take advantage of air, land, sea and space components to maximize the probability of kill, expand the area that can be defended and decrease the area from which the enemy can launch, as well as minimize, the number of weapons needed in the inventory. Likewise, a M&amp;S framework is being developed that reflects the open architecture envisioned for the BMDS.</p> <p>(0107) QUALITY, SAFETY AND MISSION ASSURANCE (QSMA): QSMA efforts enable the development, testing and fielding of an effective, reliable, and safe missile defense capability. To ensure the BMDS can meet its performance, schedule, quality, safety, and mission assurance requirements, MDA quality, safety and mission assurance principles and disciplines are being applied throughout each individual element and the BMDS. Implementation and maintenance of these disciplines are key to providing an effective war-fighting capability. Currently, there are over 24 MDA Assurance Representatives (MAR) located throughout the United States at major supplier sites. MARs provide Defense Contract Management Agency (DCMA) and contractors direct access to MDA. Further, they are the conduit to the MDA Director providing unfettered insight into program operations “real time” through the QSMA weekly report.</p> <p><b><u>A.3 Major System Element Goals</u></b></p> <p>(0101) SYSTEMS ENGINEERING AND INTEGRATION (SE&amp;I)</p> <ul style="list-style-type: none"><li>• Function as the MDA responsible engineering organization to execute a comprehensive SE&amp;I effort for the BMDS.</li><li>• Establish Technical Objectives and Goals for the BMDS and the Elements.</li><li>• Define BMDS level performance parameters, validate BMDS Element designs, and assess and verify integrated BMDS capability.</li><li>• Develop the BMDS system design and overarching BMDS technical architecture.</li></ul>		

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<ul style="list-style-type: none"><li>• Determine the functionality, capabilities and interfaces required to implement Engagement Sequence Groups into BMDS capabilities.</li><li>• Develop BMDS level requirements and flowdown to Elements' Interface Control Specifications and ensure that the BMDS functions as an integrated system.</li><li>• Assess performance gaps in BMDS capabilities and identify improvements required to close those gaps and defeat emerging adversary capabilities.</li><li>• Support as necessary BMDS operational missions.</li></ul> <p>(0105) COUNTERMEASURES/COUNTER-COUNTERMEASURES (CM/CCM):</p> <ul style="list-style-type: none"><li>• Complete the characterization of adversary countermeasures against BMDS Boost Phase capabilities and deliver a countermeasure design for a BMDS FY08 critical measurements flight test.</li><li>• Complete the assessment of BMDS Boost Phase capabilities against ballistic missiles employing countermeasures.</li><li>• Complete the development of six system discrimination improvement concepts and integrate them into the BMDS Block Program.</li></ul> <p>(0102) INTELLIGENCE AND SECURITY:</p> <ul style="list-style-type: none"><li>• Provide threat support in all MDA sponsored and supported wargames and exercises.</li><li>• Provide daily intelligence support to the MDA Director, his Principal Staff Officers, and the Missile Defense Operations Center (MOC).</li><li>• Develop a certification recommendation on behalf of the BMDS components and overall system to support the increases commensurate with the expansion of the BMDS based on the Block 2008 release, including STSS, upgraded C2BMC backbone, SBX radar, ABL, and THAAD.</li><li>• Provide operational, investigative and counterintelligence (CI) functional support to the MDA/BMDS Research and Technology Protection programs and test activities through oversight and approval of CI Support Plans, Defense Threat Assessments and Multi-Discipline CI Threat Analyses.</li></ul> <p>(0103) PRODUCIBILITY AND MANUFACTURING TECHNOLOGY (MP):</p> <ul style="list-style-type: none"><li>• Integrate technology refresh and critical supplier results into corporate MDA risk mitigation strategy.</li><li>• Develop Radiation Hardened (RH) Visible Sensors for missile and satellite surveillance applications.</li><li>• Continue development in producible materials and technologies to enhance thermal management.</li><li>• Continue efforts from FY06 to address materials and subsystem design and development to reduce cycle time, part count, risk and improve performance of axial and divert propulsion systems for the BMDS.</li></ul>		

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<ul style="list-style-type: none"><li>Continue to focus on advanced materials in radiation hardening, structures, mirrors, thermal management and propulsion that could assist modular or scalable efforts on kill vehicles and missile structures that reduce cycle times and enhance BMDS performance.</li></ul> <p>(0104) BMD INFORMATION MANAGEMENT SYSTEMS:</p> <ul style="list-style-type: none"><li>Implement a new information technology baseline in Huntsville, AL; Dahlgren and Alexandria, VA; and Ft Belvoir</li><li>Implement initiatives to comply Federal mandates and DoD polices</li><li>Consolidate information technology systems and communication networks where possible to achieve greater efficiencies</li><li>Protect mission, test, and administrative systems from all threats and ensure integrity of data</li><li>Sustain a high degree of service to our customers</li></ul> <p>(0106) MODELING AND SIMULATION (M&amp;S):</p> <ul style="list-style-type: none"><li>Modify and sustain legacy tools, develop an integrated simulation open architecture and framework, define a Common Environment and Threat Model, and build a foundation of international missile defense initiatives.</li><li>Promote MDA's simulation-based acquisition of the BMDS.</li><li>Develop, proliferate, and maintain common standards across the enterprise including the architecture, framework, models, interfaces and quality assurance.</li></ul> <p>(0107) QUALITY, SAFETY AND MISSION ASSURANCE (QSMA):</p> <ul style="list-style-type: none"><li>Improve BMDS processes such as Risk Management (RM), Configuration Management (CM), safety and hazard tracking, and Reliability, Maintainability, and Availability (RM&amp;A), enabling direct measurement of Agency quality improvements.</li><li>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 through while also protecting those assets from nefarious activity such as counterfeit parts, prohibited parts and materials, and sloppy process and procedures.</li><li>Integrate QSMA into the BMDS by fostering communication between QSMA MARs, DCMA, and contractors in addition to supporting “out of the box” solutions to handle unique supplier problems by encouraging government/industry partnerships.</li><li>Continue to make improvements to the QSMA audit process and independent safety assessments to ensure the BMDS is postured for mission success</li><li>Facilitate continuous improvements in all audit areas with a focus on the five MAP disciplines showing the highest number of findings.</li></ul>		

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<ul style="list-style-type: none"> <li>• Implement a software acquisition program that improves the processes in the requirements definition, development, test and integration of complex software programs.</li> <li>• Enhance QSMA internal operations to provide effective support and solutions to improve quality, safety, and mission assurance functions</li> <li>• Expand the Safety Occupational Health program to include all MDA programs and operations</li> <li>• Proactively address safety requirements and assessments for all system/element upgrades to eliminate or mitigate safety hazards as early in the design process as possible, and to continuously monitor the BMDS for new safety hazards.</li> <li>• Improve insight into supplier processes through additional MAR coverage and the sharing of lessons learned.</li> <li>• Seek out industry best practices that enhance the BMDS by fostering relationships with other agencies having Quality, Safety and Mission Assurance (QSMA) expertise.</li> </ul>		
<b><u>A.4 Major Events Schedule and Description</u></b>		
<b>Major Event</b>	<b>Project</b>	<b>Timeframe</b>
<b>Ground Test</b>		
<b>Modeling and Simulation</b>		
GTX-01a	0106	2Q FY 2006
<b>Delivery</b>		
<b>Modeling and Simulation</b>		
BMDS SIM v2.0 Release	0106	1Q FY 2007
<b>Other</b>		
<b>Milestones</b>		
Technical Objectives & Goals / Updates	0101	1Q FY 2006
Technical Objectives & Goals / Updates	0101	3Q FY 2007
Technical Objectives & Goals / Updates	0101	3Q FY 2009
Technical Objectives & Goals / Updates	0101	3Q FY 2011
<b>BLOCK 2008</b>		
Test Bed System Specifications (TBSS)	0101	3Q FY 2007
<b>Block 2010</b>		
Test Bed Description Document (TBDD)	0101	4Q FY 2007
Test Bed System Specifications (TBSS)	0101	2Q FY 2008

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<b>B. Program Change Summary</b>	<b>FY 2006</b>	<b>FY 2007</b>	<b>FY 2008</b>	<b>FY 2009</b>
Previous President's Budget (FY 2007 PB)	407,492	473,077	501,395	523,672
Current President's Budget (FY 2008 PB)	409,993	429,420	482,016	511,147
Total Adjustments	2,501	-43,657	-19,379	-12,525
Congressional Specific Program Adjustments	0	-41,840	0	0
Congressional Undistributed Adjustments	0	-1,817	0	0
Reprogrammings	9,957	0	0	0
SBIR/STTR Transfer	-7,451	0	0	0
Adjustments to Budget Years	0	0	-19,379	-12,525

FY06 increase of \$2.501 million includes SBIR/STTR transfer and MDA reprogrammings.

FY07 decrease of \$43.657 million includes a congressional specific program decrease of \$45.0 million, congressional earmarks of \$3.160 million, and a portion of the MDA congressional undistributed reduction.

FY08 decrease of \$19.379 million and FY09 decrease of \$12.525 million are the results of MDA reprogrammings.

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COST (\$ in Thousands)	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
0101 Systems Engineering & Integration	99,536	100,963	107,422	109,272	124,707	137,531	142,490	145,175
RDT&E Articles Qty	0	0	0	0	0	0	0	0

**A. Mission Description and Budget Item Justification**

Systems Engineering and Integration (SE&I) employs integrated working groups to achieve broad engineering collaboration across the Missile Defense Agency (MDA). Significant and thorough guidance to Ballistic Missile Defense System (BMDS) Elements and components is provided throughout the full system development cycle phases, i.e., planning/concept development, system design and specification, integration and implementation, verification and assessment and operational integration (fielding). BMDS capabilities are matured using a block engineering development process within a Test Bed framework. During this development process resources are needed not only for near-term Block requirements, but also for long-range Block developments. The Test Bed represents two-year blocks for maturation, integration, and test of Elements contributing to a time-phased improvement of BMDS capability. The SE&I process is repeated through each successive two-year Block development cycle and the process phases for each development block do overlap. For example, at the current time Block 2008 design, Block 2006 design, and Block 2004 test, verification, assessment, and fielding (operational integration) are in progress. The Test Bed is a management framework enabling MDA to execute configuration management, focus development activities, perform trade-offs, and prioritize investments to ensure end-to-end functionality across a discrete segment of BMDS Elements. While top level system engineering activities are focused on integrating the various Elements to provide an end-to-end seamless BMDS capability, additional systems engineering activities are focused on integrating advanced technologies to improve performance of available defensive capabilities. These efforts include new interceptor technology, improved discrimination and tracking algorithms, counter-countermeasures, enhanced battle management and decision support systems, and improved kill vehicles (KVs). These technology efforts will generate enhanced Engagement Sequence Groups (ESGs) and also lead to new ESGs. The MDA identifies BMDS capabilities, architectures, and element contributions to counter the threat and organizes them by ESGs. These ESGs are developed by SE&I and describe a combination of sensors, weapons, and Command and Control, Battle Management, and Communications capabilities that must work together to detect, track, and intercept an enemy missile. Using ESGs as a tool enhances functional and engineering analysis, creates manageable combinations or Block configurations, simplifies allocations of BMDS capabilities, provides a structure to assess BMDS performance, and assists the warfighters in developing concepts of operations. In addition SE&I provides support as necessary for BMDS operational missions. During the recent period leading up to and following the launch of a TD-2 ballistic missile, SE&I formed a crisis action team that provided detailed analytical work, namely predicted system performance against potential threats and trajectories, impact of intercept debris, and timeline and engagement success analyses, that was the technical basis for decisions made at national level.

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It is an enormous challenge to coordinate developments across several interrelated programs employing several prime contractors combined with the requirement for the BMDS to operate as a unified system stretched across nine time zones. The MDA SE&I Team ensures continuous availability of a proven performance baseline system for defense of the United States, friends, allies and deployed forces to defeat adversary capabilities: defines architectures, subsystem behaviors/functions, and critical interfaces, identifies information exchange requirements, performs technical trade studies, reviews technical and performance risks and develops mitigation strategies, oversees program development maturity across segments and manages multiple configuration baselines within block development cycles. System Engineering is tasked to assess feasibility of BMDS evolutionary development concepts and make performance trade-offs and investment recommendations through the collaborative system engineering process. The system engineering process, which defines required system-wide behavior, validates Element system designs, and assesses and verifies system capability, and involves five-phases: 1) Test Bed planning/concept development; 2) design and specification; 3) integration and implementation 4) verification and assessment, and 5) operational integration (fielding). It enables functional allocation of required capabilities across Elements in a time-phased approach focused on delivery and improvement of the BMDS system capability to defeat adversary capabilities. The process is temporally organized within two-year development Test Beds which enable the SE&I function to define a baseline system architecture and set time-phased technical goals and objectives to guide the design, development, and delivery of evolutionary enhanced BMDS capabilities. Additionally, this engineering process includes Advanced Systems; Force Structure Integration and Deployment; Producibility and Manufacturing Technology; Targets and Countermeasures; and other functional areas. Collaborative Engineering ensures that components (weapons, Sensors, C2BMC), and the Elements are part of an integrated system design.

The Test Bed Planning function begins with an assessment of the threats to be countered by the BMDS. Test Bed Planning takes the input from the threat engineering team that defines the adversary capability, the Adversary Data Package (ADP), for future specific blocks, determines technology needs to defeat those capabilities, develops concept descriptions (CDs) for those maturing solutions to describe proposed concepts that would enhance the BMDS, and defines Engagement Sequence Groups (ESGs) to implement them. Test Bed Planning also finalizes recommended ESG assignments to future blocks for development.

The Test Bed Planning process continues by assessing additional inputs, such as maturing technology possibilities, and candidate concepts that enhance the capability of the BMDS. Inputs include the previous Test Bed system specifications, Element configurations, performance gap analysis, technical objectives and goals, technology assessments, Countermeasures/Counter-Countermeasures (CM/CCM) program inputs, international participation and director's guidance. The planning team writes and annually updates the Technical Objectives and Goals, which provides the overall development goals and metrics used to judge system capability and progress. These concept descriptions and their ESGs are the foundation for the improvements to the BMDS and form the building blocks for the Element programs. The new concepts are analyzed and reviewed through two mechanisms: the annual Summer Study that looks at specific performance gaps and possible solutions for mitigation, and the Preliminary Capability

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<p>Review (PCR) that looks at additional concepts not covered in the Summer Study. Those concepts chosen for development then go into the Test Bed Description Document. Test Bed Planning produces the Test Bed Description Document (TBDD), for future blocks. Each future Block's TBDD is issued to the Elements by MDA and documents the concepts demonstrating the most potential for improving BMDS effectiveness against adversary capabilities and integrates them into BMDS program planning. Without the identification of these concepts and the associated ESG improvements, the Elements would not have the functional and interface identification necessary to make ESGs operational. Approved ESGs are incorporated in BMDS design and description documentation to ensure Element programs include required hardware and software, interfaces and information exchange requirements to support attainment of ESG capability within desired timeframe. This process is executed collaboratively with the BMDS Element system engineers, and other stakeholders to include the warfighter. The result is the disciplined flow-down of requirements to BMDS system specifications in defeating adversary capabilities.</p> <p>BMDS design allocates the functions and interfaces required to execute all ESGs to individual Elements and components in the BMDS specifications and interface control documents. In turn, the Elements perform detailed design of their portions of the system. Approved system architectures, subsystem behaviors/functions and operational concepts are documented in the BMDS Test Bed System Specifications. These documents provide a common set of requirements and design parameters to facilitate development of subordinate Element designs and component specifications, and the specifications drive Element designs ensuring integration across Elements within the Test Bed. The system engineering performed during the Design and Specifications phase develops functional requirements, subsystem behavior identification and specification, information exchange requirements, interfaces, key interoperability requirements and design trade studies to ensure successful attainment to defeat adversary capabilities. Individual Element designs and specifications are coordinated and approved through the SE&amp;I process.</p> <p>Integration describes those system engineering activities and events required to structure and implement an integrated and “seamless” end-to-end BMDS capability composed of Elements working alone and in conjunction with other Elements to effect a ballistic missile defense engagement. The Integration phase begins with the building of a time-phased Master Integration Plan. The Master Integration Plan defines integration phases within the Block, which become the building blocks to achieve final capability, and allocates the ESG functionality captured in the system specification and interface documents to those phases. Integrated functionality is then tested, verified and assessed in accordance with the Responsible Test Organization's Integrated Master Test Plan and the system engineering Capabilities Assessment Plan, assuring that representative adversary capabilities are approximated in testing. During the “Build Phase”, the System Engineering led integration team participates in Element level design reviews including document review and conducts system level design reviews to ensure system specifications are being properly implemented. In addition to design reviews, system engineering conducts routine program execution and technical reviews with MDA leadership to ensure subordinate system engineering activities remain within the BMDS engineered parameters to describe functionality within the planned timeframe. Engineering studies and analysis are conducted to explore alternative approaches to attaining an ESG, assessing feasibility and affordability. During</p>		

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<p>the test planning and execution phase, the integration team works closely with the Responsible Test Organization, MDA's Test program leader, to ensure test data required for system verification, assessment and model validation is collected.</p> <p>System Verification and Assessment verifies the “as built” system is compliant with the system specification and assesses performance of the delivered capability. Emerging BMDS 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. BMDS performance is described in terms of ESGs to provide a common lexicon to measure the performance of various combinations of the sub-systems, and to simplify the complexities and interactions of the system.</p> <p>System verification is accomplished through a methodical allocation and tracing of all system-level requirements to the specifications of MDA elements and components. Additionally, system issues are identified during BMDS test and verification activities and are either assigned to be worked to resolution within the current block, or are acknowledged as limitations and allocated for resolution in future blocks. The plans and status of these three items, 1) BMDS Verification, 2) BMDS Performance Assessment and 3) BMDS Issues, are reported periodically during the year. A formal report is published each January to summarize the verification and assessment activities of the previous year accomplishments. Verification at the component level is then rolled up to a system-level assessment. The results of system level tests and assessments are captured in Interim Capability Assessment Reports. DoD then uses this information to determine whether the ESG capability is ready for transition to operations, to production, or to the next stage of development.</p> <p>The Operational Integration and Support team is the link between the warfighting community and the Systems Engineering team and provides sustaining engineering services for support, configuration management, operations and sustainment of BMDS capabilities before, during and after transition of fielded capability. The Operational Integration and Support function facilitates the transition of an available defensive capability to the warfighter by advocating user-requested changes and modifications to the designed system. This ensures successful transition of an operational BMDS capability by processing and tracking operational configuration baseline changes through the Program Change Board. Development and management of the Operational Configuration Baseline, Concept of Operations (CONOPs), assessment reports, the Incremental Capability Review, and liaison with user organizations at various command levels are key operational integration activities. By ensuring that Systems Engineering responds to requested changes (through the Prioritized Capabilities List and the Warfighter Involvement Process), the OI&amp;S team provides operational support to the warfighter. The Operational Integration and Support team also obtains feedback from the warfighter through simulations, demonstrations, and training exercises to refine system interfaces, modes of operation, and human-machine interfaces, enhancing system reliability,</p>		

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maintainability, suitability and effectiveness. As-built system-level hardware and software products are managed within the Operational Configuration Baseline.

**B. Accomplishments/Planned Program**

	FY 2006	FY 2007	FY 2008	FY 2009
Test Bed Planning	12,263	11,716	12,109	12,219
RDT&E Articles (Quantity)	0	0	0	0

The Test Bed planning phase is a continuous process of assessing and choosing BMDS technical alternatives that can be included in the BMDS Test Bed. The planning process includes the synthesis of emerging technology and concept input, assessment of these concepts against agency metrics and goals using gap analysis and adversary capabilities, and production of formal Concept Descriptions (CDs). Concepts demonstrating the most potential for improving BMDS effectiveness are integrated into BMDS program planning and documented in the Test Bed Description Document for future blocks (e.g., Block 2010, Block 2012, Block 2014, etc.). Without the identification of these concepts and the associated ESG improvements, the Elements would not have the interface requirements necessary to make these ESGs operational. The planning function enables the MDA to review system integration maturity across the individual Element programs, assess Element maturity, and to provide tailored program direction consistent with the readiness of a specific Element for BMDS integration. Test Bed Planning also conducts threat system engineering and lethality assessment to characterize current and emerging threat system performance (adversary capabilities) to ensure BMDS efforts keep pace with threat developments and produces Capability Planning Specifications for documenting pre-cursor requirements for new programs and specific upgrades which impact overall BMDS performance to defeat adversary capabilities. As new improvements get introduced into the BMDS, the Capability Planning Specifications is the key document for allowing the responsible Element to start development planning and acquisition strategies to produce the necessary new capabilities on a schedule required by the system. The Capability Planning Specification defines the threat envisioned for the time period of the development, and the requirements necessary to allow the Element or component function to tie into the overall system in an integrated manner. The Capability Planning Specification is produced in conjunction with the stakeholders involved in delivering the capability.

**FY06 Accomplishments:**

- Delivered the update to the Technical Objectives and Goals, which provides the overall development goals and metrics used to judge system capability and progress.
- Presented results in the Preliminary Capability Review (PCR) for concepts to be included in Block 2010/2012.
- Drafted the Test Bed Description Document for Block 2008/2010, the basis for engineering guidance through Decision Memoranda issued to the Elements by MDA which documents the concepts demonstrating the most potential for improving BMDS effectiveness and integrates them into BMDS program planning.

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<ul style="list-style-type: none"><li>• Facilitated stakeholder tabletops and working groups.</li><li>• Updated Block 2008 and Block 2010 Performance Gap Analysis to define the concepts that need to be considered for future block development to defeat adversary capabilities.</li><li>• Oversaw Countermeasure/Counter-Countermeasures Program using outputs to generate new Concept Descriptions.</li><li>• Supported the 2006 Summer Study with ESG analysis and trade studies.</li><li>• Drafted initial Capability Planning Specifications for selected programs documenting pre-cursor requirements and specific upgrades which impact overall BMDS performance.</li><li>• Oversaw the international program and analyzed effects on future capability ensuring that international goals are consistent with the needs of the BMDS and that efforts leverage foreign technology and engineering capability as directed by the MDA Director.</li></ul> <p>FY07 Planned Program:</p> <ul style="list-style-type: none"><li>• Deliver the update to the Technical Objectives and Goals (TOG) which provides the overall development goals and metrics used to judge system capability and progress.</li><li>• Draft Engineering Guidance for Block 2010/2012, requesting Element planning and programming for designated ESGs. Approved ESGs are incorporated in BMDS design and description documentation to ensure Element programs include required hardware, interfaces and information exchange requirements to support attainment of ESG capability within desired timeframe.</li><li>• Complete the Test Bed Description Document for Block 2010/2012 directing the Elements to develop supporting specifications. The TBDD documents the concepts demonstrating the most potential for improving BMDS effectiveness and integrates them into BMDS program planning for Block-specific requirements.</li><li>• Facilitate System Capability Review for Block 2008.</li><li>• Produce Concept Descriptions and ESGs for BMDS Block 2014 Planning.</li><li>• Initiate Block 2014 Performance Gap Analysis to define what concepts need to be considered for future block development to defeat emerging adversary capabilities.</li><li>• Oversee CM/CCM Program and assess technical and performance risks, identify mitigation strategies and integrate engineering changes to the baseline BMDS to improve performance against the full spectrum of adversary capabilities, focusing primarily on defeating countermeasures.</li><li>• Take input from the international program and analyze effects on future capability ensuring that international goals are consistent with the needs of the BMDS and that efforts leverage foreign technology and engineering capability as directed by the MDA Director.</li><li>• Support the 2007 Summer Study that looks at specific performance gaps and possible solutions for mitigation.</li><li>• Continue producing Capability Planning Specifications for additional programs.</li></ul>		

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<p>FY08 Planned Program:</p> <ul style="list-style-type: none"><li>• Deliver the update to the Technical Objectives and Goals (TOG) which provides the overall development goals and metrics used to judge system capability and progress.</li><li>• Produce Concept Descriptions and ESGs for BMDS Test Bed Evolution Planning. Approved ESGs are incorporated in BMDS design and description documentation to ensure Element programs include required hardware, interfaces and information exchange requirements to support attainment of ESG capability within desired timeframe.</li><li>• Draft the Block 2012/2014 Test Bed Description Document. The TBDD documents the concepts demonstrating the most potential for improving BMDS effectiveness and integrates them into BMDS program planning for Block-specific requirements.</li><li>• Facilitate System Capability Review for Block 2010.</li><li>• Complete Block 2014 Performance Gap Analysis and define the concepts to be considered for future block development to defeat emerging adversary capabilities.</li><li>• Continue producing Capability Planning Specifications for additional programs.</li><li>• Support the 2008 Summer Study that looks at specific performance gaps and possible solutions for mitigation.</li><li>• Oversee CM/CCM Program and assess technical and performance risks, identify mitigation strategies and integrate engineering changes to the baseline BMDS to improve performance against the full spectrum of adversary capabilities, focusing primarily on defeating countermeasures.</li><li>• Take input from the international program and analyze effects on future capability ensuring that international goals are consistent with the needs of the BMDS and that efforts leverage foreign technology and engineering capability as directed by the MDA Director.</li></ul> <p>FY09 Planned Program:</p> <ul style="list-style-type: none"><li>• Deliver the update to the Technical Objectives and Goals (TOG) which provides the overall development goals and metrics used to judge system capability and progress.</li><li>• Produce Concept Descriptions and ESGs for BMDS Test Bed Evolution Planning. Approved ESGs are incorporated in BMDS design and description documentation to ensure Element programs include required hardware, interfaces and information exchange requirements to support attainment of ESG capability within desired timeframe.</li><li>• Draft the Block 2014/2016 Test Bed Description Document. The TBDD documents the concepts demonstrating the most potential for improving BMDS effectiveness and integrates them into BMDS program planning for Block-specific requirements.</li><li>• Facilitate System Capability Review for Block 2010.</li><li>• Initiate the Block 2016 Performance Gap Analysis and define the concepts to be considered for future block development to defeat emerging adversary capabilities.</li></ul>		

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- Continue producing Capability Planning Specifications for additional programs.
- Support the 2009 Summer Study that looks at specific performance gaps and possible solutions for mitigation.
- Oversee CM/CCM Program and assess technical and performance risks, identify mitigation strategies and integrate engineering changes to the baseline BMDS to improve performance against the full spectrum of adversary capabilities, focusing primarily on defeating countermeasures.
- Take input from the international program and analyze effects on future capability ensuring that international goals are consistent with the needs of the BMDS and that efforts leverage foreign technology and engineering capability as directed by the MDA Director.

	FY 2006	FY 2007	FY 2008	FY 2009
BMDS Design & Specification	10,508	14,270	15,873	15,875
RDT&E Articles (Quantity)	0	0	0	0

BMDS Design and Specification continues the SE&I process and uses the data developed during the Test Bed Planning process, along with existing Element specifications, to develop system specification and interface requirements documented in the BMDS Test Bed System Specifications (TBSS) and Interface Control Documents (ICDs). The TBSS provides a common set of requirements and design parameters to facilitate Element design and component specification development that drive the integration across the participating Elements within the Test Bed. The system ICDs identify interface exchange requirements including data attributes, timelines, criticality, and frequency. Furthermore, Element designs and specifications drive strategies for verification and assessment of Element performance and capability. The objective is to make enhanced capabilities available for Additional Defensive Capability to defeat adversary capabilities by the end of the Operational Block for which it is planned. The end state is an approved architecture design and resulting ESGs which form the basis for test bed engineering and testing activities.

**FY06 Accomplishments:**

- Initiated the design and associated specification and interface requirements and updated the Adversary Data Package for the Block 2008 capabilities.
- Completed the Design and associated Specification and Interface requirements for Block 2006 capabilities including refined Safety and refined Information Assurance.
- Conducted System Requirements Review for Block 2006 including planning for Element execution of allocated requirements.
- Identified critical Countermeasures/Counter Countermeasures content for Block 2006.
- Established DOORS (Dynamic Object Oriented Requirements System) as the standard MDA engineering tool for requirements management and traceability, developed partitions to enable data sharing between System and Element levels.
- Refined BMD Core Technical Standards to capture the environmental, design, and construction constraints.
- Convened the Interface Control Working Group on a regular basis to collaboratively coordinate, control and manage BMDS interface activities.

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<ul style="list-style-type: none"><li>• Drafted the Block 2008 and Block 2010+ Test Bed Description Document which document the concepts demonstrating the most potential for improving BMDS effectiveness to defeat emerging adversary capabilities and integrates them into BMDS program planning for Block-specific requirements.</li><li>• Completed adherence planning for the Block 2008 core Standards.</li></ul> <p>FY07 Planned Program:</p> <ul style="list-style-type: none"><li>• Finalize the Design and associated Specification and Interface requirements for Block 2008 capabilities.</li><li>• Conduct the System Capability Review and System Requirements Review for Block 2008.</li><li>• Refine BMD Core Technical Standards that capture the environmental, design, and construction constraints.</li><li>• Complete adherence planning for Block 2008 Core Standards.</li><li>• Convene the Interface Control Working Group on a regular basis to collaboratively coordinate, control and manage BMDS interface activities.</li></ul> <p>FY08 Planned Program:</p> <ul style="list-style-type: none"><li>• Adjust the Block 2008 Test Bed Description Document, Test Bed System Specifications, and Interface Control Documents based on “fact of life” changes and emergent needs.</li><li>• Continue the development of the System Specifications and associated interface requirements for the Block 2010 capabilities.</li><li>• Initiate adherence planning for the Block 2010 Core Standards.</li><li>• Convene the Interface Control Working Group on a regular basis to collaboratively coordinate, control and manage BMDS interface activities.</li></ul> <p>FY09 Planned Program:</p> <ul style="list-style-type: none"><li>• Adjust the Block 2008 Test Bed Description Document, Test Bed System Specifications, and Interface Control Documents based on “fact of life” changes and emergent needs.</li><li>• Finalize the development of the System Specifications and associated interface requirements for the Block 2010 capabilities.</li><li>• Complete adherence planning for the Block 2010 Core Standards.</li><li>• Convene the Interface Control Working Group on a regular basis to collaboratively coordinate, control and manage BMDS interface activities.</li></ul>		

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	FY 2006	FY 2007	FY 2008	FY 2009
Test Bed Integration & Implementation	9,606	13,868	15,271	15,273
RDT&E Articles (Quantity)	0	0	0	0
<p>Test Bed Integration and Implementation focuses on the system-level engineering activities during the SE&amp;I process that are needed to successfully combine the individual parts of the Elements, components, and subsystems into one seamless interoperable BMD system. Emphasis is on Element-to-Element interfaces and functionality with cross Element dependencies and readiness to support system-level tests; participation in Element Design Reviews to ensure technical compliance with system specifications and standards; and conducting System Design Reviews to assess maturity and readiness to proceed into system integration and test. Additionally, integration produces tools and products to facilitate the understanding and monitoring of BMDS capabilities by the Combatant Commands.</p> <p><b>FY06 Accomplishments:</b></p> <ul style="list-style-type: none"> <li>• Updated and consolidated the Block 2004 and Block 2006 Master Integration Plan (MIP), which defines how the BMDS will be integrated, to incorporate new program content.</li> <li>• Conducted Block 2006 System Design Review to assess our ability to achieve the BMDS Block 2006 design baseline, to meet the capability goals for Block 2006 integration phases in CY06, CY07, and CY08.</li> <li>• Maintained MIP Planning Allocation Matrix (PAM) tool for Block 2004 and Block 2006.</li> <li>• Provided system test objectives, scenarios, representing adversary capabilities, and required test article configurations for system test events.</li> <li>• Provided Technical and System Integration documentation to USNORTHCOM and USSTRATCOM to support training and end of Block 2004 and Early Block 2006 capability (e.g. provide source data for BMDS users handbook, Operations Capability/Systems Capability (OPSCAP/SYSCAP) tool, and BMDS top-level drawings).</li> <li>• Served as Co-Chairman with Director, Combined Test Force and Deputy Director, Integration on the Test Configuration Working Group to coordinate test events and schedules and determine impact of delays in the integration process.</li> <li>• Tracked system interfaces and related documentation and provided bi-weekly status to the Executive Knowledge Database, the Director's database of information to support decision making at specific knowledge points.</li> </ul> <p><b>FY07 Planned Program:</b></p> <ul style="list-style-type: none"> <li>• Conduct Block 2006 delta System Design Review to assess maturity of plans and readiness to execute the second phase of Block 2006 integration.</li> <li>• Update the Master Integration Plan to reflect changes in program execution plans and to incorporate Block 2008 requirements.</li> </ul>				

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<ul style="list-style-type: none"><li>• Maintain MIP Planning Allocation Matrix (PAM) and Integration Event Matrix (IEM) tools for Block 2006 and develop the PAM/IEM for Block 2008 to support 2007-2013 integration, test, assessment and verification activities.</li><li>• Provide system test objectives, scenarios representing adversary capabilities, and required test article configurations for system test events.</li><li>• Conduct System Engineering Integration Working Group meetings to vet, assign and work Block 2006 implementation issues.</li><li>• Provide Technical and System Integration documentation to USNORTHCOM and USSTRATCOM to support training and Block 2006 integration Source Data for BMDS Users Handbook.</li><li>• Track system interfaces and related documentation and provide status to the Director's Executive Knowledge Database.</li><li>• Serve as Co-Chairman with Director, Combined Test Force (CTF) and Deputy Director, Integration on the Test Configuration Change Board (TCCB) to coordinate test events and schedules and determine impact of delays in the integration process.</li><li>• Integrate System Engineering Test Bed Integration and Implementation activities more closely with the BMDS Integration Directorate.</li></ul> <p>FY08 Planned Program:</p> <ul style="list-style-type: none"><li>• Conduct Block 2008 In-Progress Technical Reviews to ensure system specifications are properly implemented.</li><li>• Update the Master Integration Plan to incorporate any changes in planned delivery of Block 2008 program content.</li><li>• Conduct Block 2008 System Design Review following Element Preliminary Design Reviews.</li><li>• Provide system test objectives, scenarios representing adversary capabilities, and required test article configurations for system test events.</li><li>• Maintain MIP Planning Allocation Matrix (PAM) tool for Block 2006 and Block 2008 to support 2007-2013 integration, test, assessment and verification activities.</li><li>• Provide Technical and System Integration documentation to USPACOM, USNORTHCOM and USSTRATCOM to support training and late Block 2006 and early Block 2008 integration; Source Data for BMDS Users Handbook; BMDS top-level Drawings.</li><li>• Track system interfaces and related documentation and provide monthly status to the Director's Executive Knowledge Database.</li><li>• Serve as Co-Chairman with Director, Combined Test Force (CTF) and Deputy Director, Integration on the Test Configuration Change Board (TCCB) to coordinate test events and schedules and determine impact of delays in the integration process.</li></ul> <p>FY09 Planned Program:</p> <ul style="list-style-type: none"><li>• Conduct Block 2010 In-Progress Technical Reviews to ensure system specifications are properly implemented.</li><li>• Conduct Block 2010 System Design Review following Element Preliminary Design Reviews.</li><li>• Provide system test objectives, scenarios representing adversary capabilities, and required test article configurations for system test events.</li><li>• Track system interfaces and related documentation and provide monthly status to the Director's Executive Knowledge Database.</li></ul>		

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	FY 2006	FY 2007	FY 2008	FY 2009
Verification & Assessment Engineering	5,652	5,854	6,455	7,457
RDT&E Articles (Quantity)	0	0	0	0
<p>The Verification and Assessment phase completes the SE&amp;I cycle, provides feedback for the next phase of development, and gives the warfighter objective technical knowledge of the system's capabilities. Verification of system performance is accomplished primarily by allocating all performance requirements in the design phase to subsystem specifications, then testing and verifying performance to those specifications through analysis, modeling and simulation, demonstration, ground tests and flight tests, and finally rolling up all the subsystem verification results into a comprehensive set of system-level capability verification groups. Maintaining a complete and accurate specification trace therefore becomes critical to providing an accurate assessment of BMDS performance verification. The BMDS overall system performance is assessed against the Statement of Goals and Objectives which were established by the Agency during the initial block planning phase. This assessment is completed in part by using distributed ground tests, but it primarily uses models which are validated and accredited by using the results of the test program.</p> <p><b>FY06 Accomplishments:</b></p> <ul style="list-style-type: none"> <li>• Developed/provided BMD System Test Objectives, including overlays on Element Test Objectives to support the MDA's test planning process.</li> <li>• Developed the Block 2006 Capability Assessment Plan (CAP) for assessing progress toward achieving the BMDS Block Baselines and Goals commitment for the Block 2004 and Block 2006 "fielding baseline" capability.</li> <li>• Developed/provided Interim Capability Assessment Reports to document the capability predicted for the BMDS at the end of Block 2004 and the ongoing assessment of the capability available on 31 December 2005.</li> <li>• Developed the System Impact Assessment Report (SIAR), providing an update of the current BMDS Block 2004 capability and documenting Ballistic Missile Defense Element- and System-level functional assessment, verification status, and system issues related to safety and performance through 30 June 2006</li> <li>• Provided Verification and Assessment status to BMDS Readiness Reviews.</li> <li>• Developed a technical framework for Block 2014 Test Bed System Specification and Adversary Data Package documents to accurately assess future capability needs and potential future adversarial capabilities.</li> </ul> <p><b>FY07 Planned Program:</b></p> <ul style="list-style-type: none"> <li>• Publish the end of CY06 Interim Capability Assessment Report (ICAR) to report assessments of BMDS performance demonstrated in BMDS system-level testing and analyses.</li> <li>• Update Block 2006 Capability Assessment Plan (CAP) to describe the plan of action required to assess BMDS system-level technical performance.</li> </ul>				

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- Draft Block 2008 CAP to describe the plan of action required to assess BMDS system-level technical performance.
- Maintain the Block 2006 Traceability Matrix and draft Block 2008 Traceability Matrix to map system-level requirements to the specifications of MDA elements and components.
- Develop Verification Ledger (Dynamic Object Oriented Requirements System (DOORS)-based) for monthly tracking of sub-system verification status.
- Provide System Impact Assessment Reports for significant test events and test campaigns.
- Collect and aggregate Element and Component Block 2006 Assessment Analysis Plans with Modeling and Simulation requirements.
- Draft Block 2008 Analysis Plan for unique system-level Modeling and Simulation requirements.

**FY08 Planned Program:**

- Publish the end of CY07 ICAR to report assessments of BMDS performance demonstrated in BMDS-level testing and analyses.
- Update Block 2008 CAP to describe the plan of action required to assess BMDS system-level technical performance.
- Maintain the Block 2006 and Block 2008 Traceability Matrices to map system-level requirements to the specifications of MDA elements and components.
- Maintain Block 2006 Verification Ledger (DOORS-based) for monthly tracking of sub-system verification status.
- Provide System Impact Assessment Reports for significant test events and test campaigns.

**FY09 Planned Program:**

- Draft Block 2010 CAP to describe the plan of action required to assess BMDS system-level technical performance.
- Publish the end of CY08 ICAR to report assessments of BMDS performance demonstrated in BMDS-level testing and analyses.
- Provide System Impact Assessment Reports for significant test events and test campaigns.

	FY 2006	FY 2007	FY 2008	FY 2009
System Assessment and Analysis	17,516	14,143	14,347	14,347
RDT&E Articles (Quantity)	0	0	0	0

Systems Assessment and Analysis provides the Director, Missile Defense Agency, and his staff with the technical basis and rationale for developing and balancing the integrated, layered BMDS. 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, and rapid responses to

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<p>senior department “what if” questions and scenarios. Without this common and consistent engineering decision support team, the Director would be unable to effectively plan, develop, and execute the BMDS and its constituent elements.</p> <p>FY06 Accomplishments:</p> <ul style="list-style-type: none"><li>• Conducted BMDS architecture analyses to support development of Technical Objectives and Goals, Test Bed Description Documents, System Specifications, Interface Control Documents, System Implementation Plan, Capabilities Assessment Plan, and Capabilities Assessment Report.</li><li>• Conducted 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.</li><li>• Conducted Quick reaction analyses, as required that supported real-world events.</li><li>• Maintained the Element/Component Characterization Analysis and the analysis knowledge base.</li><li>• Developed models and simulation requirements for submission to the MDA modeling and simulation process.</li><li>• Provided support as necessary for BMDS operational mission during the recent period leading up to and following the launch of a TD-2 ballistic missile. SE&amp;I formed a crisis action team that provided detailed analytical work, namely predicted system performance against potential threats and trajectories, impact of intercept debris, and timeline and engagement success analyses that was the technical basis for decisions made at the national level. Analysts who normally support the other SE&amp;I activities were dedicated to support the crisis action team for 45 days.</li></ul> <p>FY07 Planned Program:</p> <ul style="list-style-type: none"><li>• Conduct BMDS architecture analyses to support development of Technical Objectives and Goals, Test Bed Description Documents, System Specifications, Interface Control, System Implementation Plan, Capabilities Assessment Plan, and Capabilities Assessment Report.</li><li>• 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.</li><li>• Conduct Quick reaction analyses, as required, to support real-world events.</li><li>• Develop and maintain the Element/Component Characterization Analysis and the analysis knowledge base.</li><li>• Develop models and simulation requirements for submission to the MDA modeling and simulation process.</li><li>• Provide support as necessary for BMDS operational mission.</li></ul> <p>FY08 Planned Program:</p> <ul style="list-style-type: none"><li>• Conduct BMDS architecture analyses to support development of Technical Objectives and Goals, Test Bed Description Documents, System Specifications, Interface Control, System Implementation Plan, Capabilities Assessment Plan, and Capabilities Assessment Report.</li></ul>		

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- 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.
- Conduct Quick reaction analyses, as required, to support real-world events.
- Develop and maintain the Element/Component Characterization Analysis and the analysis knowledge base. Develop models and simulation requirements for submission to the MDA modeling and simulation process.
- Provide support as necessary for the BMDS operational mission.

**FY09 Planned Program:**

- Conduct BMDS architecture analyses to support development of Technical Objectives and Goals, Test Bed Description Documents, System Specifications, Interface Control, System Implementation Plan, Capabilities Assessment Plan, and Capabilities Assessment Report.
- 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.
- Conduct Quick reaction analyses, as required, to support real-world events.
- Develop and maintain the Element/Component Characterization Analysis and the analysis knowledge base. Develop models and simulation requirements for submission to the MDA modeling and simulation process.
- Provide support as necessary for BMDS operational mission.

	FY 2006	FY 2007	FY 2008	FY 2009
Program Management	31,581	26,584	27,101	27,731
RDT&E Articles (Quantity)	0	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 (including Boeing Corporation and Applied Physics Laboratory contracts and award fees), correspondence, information and document management, policy and procedures, security, and government human relations functions.

**FY06 Accomplishments:**

- Maintained information library of all official engineering documents and briefings.
- Managed personnel and MDA site and information security.
- Administered SE&I Industry contract renewal and Award-fee plan determination; processed self-assessments culminating in award fee to Industry.

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<ul style="list-style-type: none"><li>• Upgraded Test Bed Information sharing for both classified and unclassified environments ensuring timely access for all authorized users.</li><li>• Implemented robust collaboration support system to enable desktop planning and technical coordination throughout the enterprise.</li><li>• Provided project/program management and control for all SE&amp;I.</li><li>• Maintained Master Schedule for System Engineering products and coordinated with the overall MDA Integrated Program Policy.</li><li>• Updated the Systems Engineering Plan (SEP) and Configuration Management Plan (CMP) at the onset of the planning step of the next Block development (even year only).</li><li>• Performed contracting officer's representative functions for all project support functions including contract cost oversight.</li></ul> <p>FY07 Planned Program:</p> <ul style="list-style-type: none"><li>• Maintain information library of all official engineering documents and briefings.</li><li>• Manage personnel and MDA site and information security.</li><li>• Implement consistent task management across all programs and contracts including performance indicators and regular reporting.</li><li>• Provide project/program management and control for all SE&amp;I.</li><li>• Maintain Master Schedule for System Engineering products and coordinate with the overall MDA Integrated Program Policy.</li><li>• Perform contracting officer's representative functions for all project support functions including contract cost oversight.</li></ul> <p>FY08 Planned Program:</p> <ul style="list-style-type: none"><li>• Maintain information library of all official engineering documents and briefings.</li><li>• Manage personnel and MDA site and information security.</li><li>• Implement consistent task management across all programs and contracts including performance indicators and regular reporting.</li><li>• Provide project/program management and control for all SE&amp;I.</li><li>• Maintain Master Schedule for System Engineering products and coordinate with the overall MDA Integrated Program Policy.</li><li>• Perform contracting officer's representative functions for all project support functions including contract cost oversight.</li></ul> <p>FY09 Planned Program:</p> <ul style="list-style-type: none"><li>• Maintain information library of all official engineering documents and briefings.</li><li>• Manage personnel and MDA site and information security.</li><li>• Implement consistent task management across all programs and contracts including performance indicators and regular reporting.</li><li>• Provide project/program management and control for all SE&amp;I.</li></ul>		

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<ul style="list-style-type: none"> <li>• Maintain Master Schedule for System Engineering products and coordinate with the overall MDA Integrated Program Policy.</li> <li>• Perform contracting officer's representative functions for all project support functions including contract cost oversight.</li> </ul>				
	FY 2006	FY 2007	FY 2008	FY 2009
Operational Integration & Support	2,053	3,156	4,354	4,355
RDT&E Articles (Quantity)	0	0	0	0
<p>The Operational Integration and Support team is the link between the warfighting community and the Systems Engineering team and provides sustaining engineering services for support, configuration management, operations and sustainment of BMDS capabilities before, during and after transition of fielded capability. Operational Integration and Support collects, analyzes, and disseminates user input and feedback on the BMDS for incorporation into the collaborative System Engineering process by supporting Force Structure Integration and Deployment, and capability development.</p> <p><b>FY06 Accomplishments:</b></p> <ul style="list-style-type: none"> <li>• Supported and staffed Concept of Operations (CONOPS) updates, Execution Orders (EXORDs), and capability description development.</li> <li>• Represented Systems Engineering in the Warfighter Involvement Process (WIP) developed by USSTRATCOM by acting as the System Engineering representative to WIP focus groups.</li> <li>• Supported warfighter surveys to collect and disseminate user input and feedback on the BMDS for incorporation into the collaborative system engineering process.</li> <li>• Supported Force Structure Integration and Deployment by working with the Combatant Commanders (COCOMs) in focus groups or integrated process teams involving BMDS system engineering issues.</li> <li>• Communicated system engineering concepts and results of engineering analyses to users and stakeholders.</li> <li>• Managed the operational system configuration of the BMDS and developed and proposed changes to the operational baseline through the Integration Synchronization Group (ISG) and the Program Change Board (PCB). The ISG and PCB are MDA forums for making changes to the BMDS baseline and its components. The ISG supports the PCB with an integrated and coordinated assessment, the PCB is the single decision making forum.</li> <li>• Participated in the Joint Warfighter Support program and acted as a System Engineering liaison for joint or service exercises, wargames, and seminars.</li> </ul> <p><b>FY07 Planned Program:</b></p> <ul style="list-style-type: none"> <li>• Serve as warfighter advocates into the System Engineering process through interaction with the Warfighter Support Center.</li> </ul>				

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<ul style="list-style-type: none"> <li>• Support Combatant Command CONOPS and EXORD updates.</li> <li>• Represent Systems Engineering in the Warfighter Involvement Process developed by USSTRATCOM, as well as providing input to USSTRATCOM-led WIP Focus Groups.</li> <li>• Support warfighter surveys to collect and disseminate user input and feedback on the BMDS for incorporation into the collaborative system engineering process.</li> <li>• Support Force Structure Integration and Deployment by working with the COCOMs and affected services in focus groups or integrated process teams involving BMDS system engineering issues.</li> <li>• Coordinate an Incremental Capability Review for BMDS components being nominated as deployment options/by higher authority for designation as partially or fully fielded capabilities.</li> <li>• Communicate system engineering concepts and results of engineering analyses to users and stakeholders.</li> <li>• Develop and propose changes to the operational configuration baseline.</li> <li>• Coordinate analysis of operational configuration baseline change requests and present changes to the Integration Synchronization Group and the Program Change Board.</li> <li>• Prepare Decision Memoranda to support changes to the operational baseline.</li> <li>• Support the tracking of Modification Requests that can lead to Near Term capability development and/or modification to the deployed BMDS capabilities.</li> <li>• Support the Deputy for Integration and Fielding including the Warfighter Support Center and Space Missile Defense Center regarding Doctrine, Organization, Training, Material, Leadership and education, Personnel, Facilities (DOTMLPF) Analysis of Emerging Test-bed Capabilities that are being proposed for potential operational use.</li> <li>• Support the Deputy for Integration and Fielding including the Warfighter Support Center on COCOM analytic efforts and studies by providing system engineering expertise.</li> <li>• Collaborate with the WIP Focus Groups in the development of the Functional Needs Analysis Activity Model.</li> <li>• Participate in the Joint Warfighter Support program and act as a SE&amp;I liaison for joint or service exercises, wargames, simulations, demonstrations, and seminars.</li> </ul> <p>FY08 Planned Program:</p> <ul style="list-style-type: none"> <li>• Serve as warfighter advocates into the System Engineering process through interaction with the Warfighter Support Center.</li> <li>• Support Warfighter and Combatant Command CONOPS updates and assist in the preparation of the annual Military Utility Assessment.</li> </ul>		

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<ul style="list-style-type: none"><li>• Represent Systems Engineering in the Warfighter Involvement Process developed by USSTRATCOM, as well as providing input to USSTRATCOM-led WIP Focus Groups.</li><li>• Collaborate with the WIP Focus Groups in the development of the Functional Needs Analysis Activity Model.</li><li>• Support warfighter surveys to collect and disseminate user input and feedback on the BMDS for incorporation into the collaborative system engineering process.</li><li>• Support Force Structure Integration and Deployment by working with the COCOMs and affected services in focus groups or integrated process teams involving BMDS system engineering issues.</li><li>• Coordinate an Incremental Capability Review for BMDS components being nominated as deployment option/s by higher authority for designation as partially or fully fielded capabilities.</li><li>• Communicate system engineering concepts and results of engineering analyses to users and stakeholders.</li><li>• Develop and propose changes to the operational configuration baseline.</li><li>• Coordinate analysis of proposed operational configuration baseline changes and present changes to the Integration Synchronization Group and the Program Change Board.</li><li>• Prepare Decision Memoranda to support changes to the operational baseline.</li><li>• Participate in the Joint Warfighter Support program and act as a SE&amp;I liaison for joint or service exercises, wargames, simulations, demonstrations, and seminars.</li><li>• Interact with the MDA Warfighter Support Center to facilitate resolution of deficiency reporting issues, modification request, and other warfighter or user input to the Missile Defense development process.</li><li>• Support the tracking of Modification Requests (MR) that can lead to Near Term capability development and/or modification to the deployed BMDS capabilities.</li></ul> <p>FY09 Planned Program:</p> <ul style="list-style-type: none"><li>• Serve as warfighter advocates into the System Engineering process through interaction with the Warfighter Support Center.</li><li>• Assist in resolving engineering issues incumbent with the expansion of Ballistic Missile Defense capabilities into the European and Pacific areas.</li><li>• Support Warfighter and Combatant Command CONOPS updates and assist in the preparation of the annual Military Utility Assessment by USSTRATCOM.</li><li>• Represent Systems Engineering in the Warfighter Involvement Process (WIP) developed by USSTRATCOM, as well as continuing to provide input to USSTRATCOM-led WIP Focus Groups.</li><li>• Collaborate with the WIP Focus Groups in the development of the Functional Needs Analysis Activity Model.</li></ul>		

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- Support warfighter surveys to collect and disseminate user input and feedback on the BMDS for incorporation into the collaborative system engineering process.
- Support Force Structure Integration and Deployment by working with the COCOMs and affected services in focus groups or integrated process teams involving BMDS system engineering issues.
- Coordinate an Incremental Capability Review for BMDS components being nominated as deployment options by higher authority for designation as partially or fully fielded capabilities.
- Communicate system engineering concepts and results of engineering analyses to users and stakeholders.
- Develop and propose changes to the operational configuration baseline.
- Prepare Decision Memoranda to support changes to the operational configuration baseline.
- Coordinate analysis of proposed operational configuration baseline changes and present changes to the Integration Synchronization Group and the Program Change Board.
- Participate in the Joint Warfighter Support program and act as a SE&I liaison for joint or service exercises, wargames, simulations, demonstrations, and seminars.
- Interact with the MDA Warfighter Support Center to facilitate resolution of deficiency reporting issues, modification request, and other warfighter or user input to the Missile Defense development process.

	FY 2006	FY 2007	FY 2008	FY 2009
Threat Systems Engineering	10,357	11,372	11,912	12,015
RDT&E Articles (Quantity)	0	0	0	0

Threat Systems Engineering interfaces throughout the SE&I process to define the parameters and assess threats to be countered by the BMDS and provide the initial adversary characteristics input to the Test Bed Planning process. It identifies the technically feasible adversary ballistic missile threat and countermeasure capabilities. It documents these threats by producing adversary characterizations products, including the Adversary Capability Document (ACD), the Block specific Adversary Data Packages and other special purpose documents. Threat Systems Engineering provides detailed threat analysis and characterization of various chemical agents and their simulants, and obtains information on post-impact debris signatures as they impact the BMDS. It plans, executes and provides resources for the Countermeasures/Counter-Countermeasures (CM/CCM) Black Team; plans, executes, and administers the MDA Corporate Lethality program; and maintains oversight and liaison with element lethality programs, including system flight test opportunities to defeat adversary capabilities.

**FY06 Accomplishments:**

- Completed the development of an agency-wide Common Threat baseline in support of the Test Bed 2006 design, verification, and assessment.

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<ul style="list-style-type: none"> <li>Continued the development and evolution of the Adversary Capability Document which defined the projected threat environment for the BMDS and included additional data characterizations of emerging threats and payloads.</li> <li>Commenced efforts associated with the development of the Block 2008 Adversary Data Package to be utilized for the design and assessment of the BMDS performance.</li> <li>Commenced technical evaluation of emerging adversary characteristics to be included within future Block-specific Adversary Data Packages (Block 2010, Block 2012, Block 2014).</li> <li>Defined and developed Adversary Threat Parameter Characterizations and their relationship to BMDS target development.</li> <li>In collaboration with CM/CCM, integrated the results from Phases 1 and 2 of the Adversary Capability Document Parameters Inter-Relationships Study into the ACD, and initiated Phase 3 to study additional parameter relationships.</li> <li>Under the direction of the Systems Engineering Integration Council, ensured the efficient execution of the approved Corporate Lethality Program (CLP).</li> <li>Executed the FY06 BMDS Lethality Plan that included FY07-FY13 projected programs lethality, collateral effects and Test Bed gap analysis of each MDA Element's and associated MDA Director's (2-Letter) programs.</li> <li>Extended the FY06 BMDS Lethality Plan to cover FY07. The FY07 data in the FY06 plan had not changed significantly by the start of FY07, and a complete analysis of current data gaps were not completed. This plan will be reviewed periodically and if necessary a new plan will be published in early CY07. The results of the gap analysis will drive the direction and extent of future efforts.</li> <li>Completed multi-year BMDS lethality, collateral effects and kill assessment tests and experiments including boost phase engagements collateral effects (MUDPACK II), impact flash phenomenology, chemical agent testing in cooperation with the United Kingdom and target response tests in cooperation with Germany.</li> </ul> <p>FY07 Planned Program:</p> <ul style="list-style-type: none"> <li>Continue the development and evolution of the Adversary Capability Document to include additional data files characterizing the performance of Adversary Missile Characterizations and payloads which defines the projected threat environment for the BMDS.</li> <li>Complete the development of the Block 2008 Adversary Data Package utilized for the design and assessment of the BMDS.</li> <li>Continue technical evaluation of emerging Adversary characteristics to be included within future Block-specific ADPs (Block 2010, Block 2012, Block 2014).</li> <li>Define the Adversary Threat Parameter Characterizations and their relationship to BMDS target development.</li> </ul>		

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<ul style="list-style-type: none"><li>• In collaboration with CM/CCM, continue to integrate the Adversary Capability Document Parameter's Inter-Relationship Study into the Adversary Capability Document. Continue the efficient execution of the approved Corporate Lethality Plan under the direction of the Systems Engineering and Integration Council.</li><li>• Define and publish lethality specific payload characterizations to be utilized in conjunction with the Block-specific 2006-2008 Adversary Data Package and Multi-Kill Vehicle threat package.</li><li>• Add an additional kill criteria assessment capability to the numerical Test Bed.</li><li>• Add the ability to calculate post-engagement debris predictions to the numerical Test Bed.</li><li>• Complete lethality and collateral effects gap analysis detailed in the FY06 BMDS Lethality Plan. The results of the gap analysis will drive the direction and extent of future efforts.</li></ul> <p>FY08 Planned Program:</p> <ul style="list-style-type: none"><li>• Continue the development of an agency-wide Common Threat baseline in support of future Block design, verification, and assessment.</li><li>• Continue the development and evolution of future Block Adversary Capability Documents which define the projected threat environment for the BMDS and include additional data characterizations of emerging threats and payloads.</li><li>• Continue efforts associated with the development of future Block Adversary Data Packages to be utilized for the design and assessment of the BMDS performance.</li><li>• Continue technical evaluation of emerging adversary characteristics to be included within future Block-specific Adversary Data Packages (Block 2010, Block 2012, and Block 2014).</li><li>• Continue the efficient execution of the approved Corporate Lethality Plan under the direction of the Systems Engineering and Integration Council.</li><li>• Define and publish lethality specific payload characterizations to be utilized in conjunction with the Block-specific 2010-2012 Adversary Data Package.</li><li>• Utilize Numerical Test Bed to conduct lethality, collateral effects and kill assessment system level assessments.</li></ul> <p>FY09 Planned Program:</p> <ul style="list-style-type: none"><li>• Continue the development of an agency-wide Common Threat baseline in support of future Block design, verification, and assessment.</li><li>• Continue the development and evolution of future Block Adversary Capability Documents which define the projected threat environment for the BMDS and include additional data characterizations of emerging threats and payloads.</li></ul>		

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- Continue efforts associated with the development of future Block Adversary Data Packages to be utilized for the design and assessment of the BMDS performance.
- Continue technical evaluation of emerging adversary characteristics to be included within future Block-specific Adversary Data Packages (Block 2010, Block 2012, and Block 2014).
- Continue the efficient execution of the approved Corporate Lethality Plan under the direction of the Systems Engineering and Integration Council.
- Define and publish lethality specific payload characterizations as required to support additional Adversary Data Package releases.
- Utilize Numerical Test Bed to conduct lethality, collateral effects and kill assessment system level analysis.

**C. Other Program Funding Summary**

	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	Total Cost
PE 0603175C Ballistic Missile Defense Technology	147,270	193,307	118,569	109,540	116,014	121,008	127,917	131,291	1,064,916
PE 0603881C Ballistic Missile Defense Terminal Defense Segment	1,120,879	1,092,076	962,585	1,004,282	924,101	851,213	678,694	501,147	7,134,977
PE 0603882C Ballistic Missile Defense Midcourse Defense Segment	2,391,246	3,043,058	2,520,064	2,359,665	2,179,602	1,699,963	1,153,082	1,183,003	16,529,683
PE 0603883C Ballistic Missile Defense Boost Defense Segment	455,572	628,958	548,759	432,432	448,375	678,913	829,683	1,026,239	5,048,931
PE 0603884C Ballistic Missile Defense Sensors	284,297	514,129	778,163	984,963	939,417	791,701	723,843	603,585	5,620,098
PE 0603886C Ballistic Missile Defense System Interceptors	200,446	356,004	227,499	393,317	522,388	730,236	836,029	570,206	3,836,125
PE 0603888C Ballistic Missile Defense Test and Targets	610,619	601,782	586,150	628,364	662,984	681,511	696,037	705,210	5,172,657
PE 0603889C Ballistic Missile Defense Products	387,402	0	0	0	0	0	0	0	387,402
PE 0603891C Special Programs - MDA	271,021	353,031	323,250	305,409	369,073	526,966	789,017	792,271	3,730,038
PE 0603892C Ballistic Missile Defense Aegis	893,040	1,122,669	1,059,103	1,129,425	1,221,650	1,067,587	1,054,753	1,089,078	8,637,305
PE 0603893C Space Tracking & Surveillance System	220,048	322,220	331,525	347,811	412,623	501,197	778,067	981,424	3,894,915
PE 0603894C Multiple Kill Vehicle	48,370	144,362	271,151	352,741	461,179	618,263	673,477	842,905	3,412,448
PE 0603895C BMD System Space Program	0	0	27,666	35,093	46,849	56,183	133,617	157,117	456,525
PE 0603896C BMD C2BMC	0	246,852	258,913	294,627	300,847	282,615	267,275	269,420	1,920,549
PE 0603897C BMD Hercules	0	49,674	53,658	54,264	54,405	55,142	53,355	54,198	374,696
PE 0603898C BMD Joint Warfighter Support	0	54,935	48,787	50,428	54,086	56,603	58,890	60,206	383,935
PE 0603904C BMD Joint National Integration Center (JNIC)	0	110,629	104,012	106,985	111,542	111,947	113,592	115,287	773,994

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

**D. Acquisition Strategy**

MDA employs a collaborative, system-centric, capability-based BMDS Test Bed Engineering process that spans many functions and organizations across MDA including System Engineering and Integration (SE&I); Test and Evaluation; and the Element programs System Engineers. The SE&I effort is performed by a team of Government, Federally Funded Research and Development Centers (FFRDC), University Affiliated Research Centers (UARC), System Engineering and Technical Assistance (SETA), and industry contractors. This combination of resources forms an integrated team to accomplish the necessary engineering for the BMD System.

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<b>Missile Defense Agency (MDA) Exhibit R-3 RDT&amp;E Project Cost Analysis</b>	Date <b>February 2007</b>
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<b>APPROPRIATION/BUDGET ACTIVITY</b> <b>RDT&amp;E, DW/04 Advanced Component Development and Prototypes (ACD&amp;P)</b>	<b>R-1 NOMENCLATURE</b> <b>0603890C Ballistic Missile Defense System Core</b>
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**I. Product Development Cost ( \$ in Thousands )**

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

**Remarks**

**II. Support Costs Cost ( \$ in Thousands )**

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2007 Cost	FY 2007 Award/ Oblg Date	FY 2008 Cost	FY 2008 Award/ Oblg Date	FY 2009 Cost	FY 2009 Award/ Oblg Date	Total Cost
<b>Test Bed Planning</b>										
Industry	CPAF	Boeing/VA	8,119	2,947	1/3Q	2,981	1/3Q	2,982	1/3Q	17,029
SETA	CPFF	Sparta/VA	12,628	1,787	1/3Q	1,801	1/3Q	1,803	1/3Q	18,019
SETA	CPFF	CSC/VA	9,680	1,657	1/3Q	1,706	1/3Q	1,737	1/3Q	14,780
FFRDC/UARC	MIPR	Aerospace/VA, CA	6,412	1,918	1/3Q	1,908	1/3Q	1,907	1/3Q	12,145
FFRDC/UARC	FFRDC	IDA/VA	0	741	1/3Q	754	1/3Q	805	1/3Q	2,300
FFRDC/UARC	MIPR	MIT/LL/MA	4,341	1,123	1/3Q	1,204	1/3Q	1,205	1/3Q	7,873
FFRDC/UARC	MIPR	LLNL/NM	2,616	875	1/3Q	901	1/3Q	902	1/3Q	5,294
FFRDC/UARC	FFRDC	SDL/UT	841	267	1/3Q	360	1/3Q	361	1/3Q	1,829
FFRDC/UARC	MIPR	Sandia/NM	964	267	1/3Q	360	1/3Q	361	1/3Q	1,952
<b>BMDS Design &amp; Specification</b>										
Industry	CPAF	Boeing/VA	30,089	10,086	1/3Q	11,710	1/3Q	11,710	1/3Q	63,595
SETA	CPFF	Sparta/VA	4,936	2,253	1/3Q	2,177	1/3Q	2,179	1/3Q	11,545
SETA	CPFF	CSC/VA	4,358	1,931	1/3Q	1,986	1/3Q	1,986	1/3Q	10,261
<b>Test Bed Integration &amp; Implementation</b>										
Industry	CPAF	Boeing/VA	25,625	10,368	1/3Q	10,769	1/3Q	10,573	1/3Q	57,335
SETA	CPFF	Sparta/VA	6,414	1,482	1/3Q	1,983	1/3Q	2,003	1/3Q	11,882

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Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis							Date February 2007			
APPROPRIATION/BUDGET ACTIVITY RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)					R-1 NOMENCLATURE 0603890C Ballistic Missile Defense System Core					
Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2007 Cost	FY 2007 Award/ Oblg Date	FY 2008 Cost	FY 2008 Award/ Oblg Date	FY 2009 Cost	FY 2009 Award/ Oblg Date	Total Cost
SETA	CPFF	CSC/VA	5,857	2,018	1/3Q	2,519	1/3Q	2,697	1/3Q	13,091
<b>Verification &amp; Assessment Engineering</b>										
Industry	CPAF	Boeing/VA	13,481	0	N/A	0	N/A	0	N/A	13,481
SETA	CPFF	Sparta/VA	3,905	1,448	1/3Q	1,748	1/3Q	2,171	1/3Q	9,272
SETA	CPFF	CSC/VA	8,360	3,019	1/3Q	3,319	1/3Q	3,779	1/3Q	18,477
FFRDC/UARC	FFRDC	JHU/APL/MD	2,730	1,042	1/3Q	1,042	1/3Q	1,107	1/3Q	5,921
FFRDC/UARC	MIPR	Sandia/NM	452	174	1/3Q	174	1/3Q	202	1/3Q	1,002
<b>System Assessment and Analysis</b>										
Industry	CPAF	Boeing/VA	25,211	4,280	1/3Q	4,280	1/3Q	4,280	1/3Q	38,051
SETA	CPFF	Sparta/VA	25,502	8,073	1/3Q	8,077	1/3Q	8,077	1/3Q	49,729
SETA	CPFF	CSC/VA	8,350	1,790	1/3Q	1,990	1/3Q	1,990	1/3Q	14,120
<b>Operational Integration &amp; Support</b>										
Industry	CPAF	Boeing/VA	1,128	1,018	1/3Q	2,018	1/3Q	2,018	1/3Q	6,182
SETA	CPFF	Sparta/VA	882	967	1/3Q	1,078	1/3Q	1,078	1/3Q	4,005
SETA	CPFF	CSC/VA	1,040	1,171	1/3Q	1,258	1/3Q	1,259	1/3Q	4,728
<b>Threat Systems Engineering</b>										
SETA	CPFF	Sparta/VA	4,442	1,302	1/3Q	1,449	1/3Q	1,455	1/3Q	8,648
SETA	CPFF	CSC/VA	2,624	1,346	1/3Q	1,556	1/3Q	1,561	1/3Q	7,087
SETA	CPFF	Schafer/VA	1,468	1,588	1/3Q	1,696	1/3Q	1,696	1/3Q	6,448
FFRDC/UARC	MIPR	Aerospace/ CA, VA	866	288	1/3Q	288	1/3Q	293	1/3Q	1,735
FFRDC/UARC	MIPR	MIT/LL/MA	1,150	433	1/3Q	458	1/3Q	461	1/3Q	2,502
FFRDC/UARC	FFRDC	JHU/APL/MD	3,221	1,153	1/3Q	1,153	1/3Q	1,161	1/3Q	6,688
FFRDC/UARC	MIPR	Sandia/NM	2,303	794	1/3Q	844	1/3Q	801	1/3Q	4,742
FFRDC/UARC	MIPR	LLNL/CA, VA	944	318	1/3Q	318	1/3Q	326	1/3Q	1,906
Other DoD		SMDC/AL	6,634	1,227	1/3Q	1,227	1/3Q	1,231	1/3Q	10,319

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<b>Missile Defense Agency (MDA) Exhibit R-3 RDT&amp;E Project Cost Analysis</b>	Date <b>February 2007</b>
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<b>APPROPRIATION/BUDGET ACTIVITY</b> <b>RDT&amp;E, DW/04 Advanced Component Development and Prototypes (ACD&amp;P)</b>	<b>R-1 NOMENCLATURE</b> <b>0603890C Ballistic Missile Defense System Core</b>
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Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2007 Cost	FY 2007 Award/ Oblg Date	FY 2008 Cost	FY 2008 Award/ Oblg Date	FY 2009 Cost	FY 2009 Award/ Oblg Date	Total Cost
Other DoD	MIPR	Battelle/OH	3,051	915	1/3Q	915	1/3Q	919	1/3Q	5,800
Other DoD	MIPR	NSWC/VA	2,686	796	1/3Q	796	1/3Q	803	1/3Q	5,081
Other DoD	MIPR	AMSC/VA	611	229	1/3Q	229	1/3Q	237	1/3Q	1,306
<b>Subtotal Support Costs</b>			<b>243,921</b>	<b>73,091</b>		<b>79,032</b>		<b>80,116</b>		<b>476,160</b>

**Remarks**

**III. Test and Evaluation Cost ( \$ in Thousands )**

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

**Remarks**

**IV. Management Services Cost ( \$ in Thousands )**

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2007 Cost	FY 2007 Award/ Oblg Date	FY 2008 Cost	FY 2008 Award/ Oblg Date	FY 2009 Cost	FY 2009 Award/ Oblg Date	Total Cost
<b>Test Bed Planning</b>										
FFRDC/UARC	MIPR	LLNL/CA, VA	503	134	1/3Q	134	1/3Q	156	1/3Q	927
<b>BMDS Design &amp; Specification</b>										
<b>Verification &amp; Assessment Engineering</b>										
FFRDC/UARC	FFRDC	JHU/APL/ MD	439	171	2Q	172	2Q	198	2Q	980
<b>Program Management</b>										
Industry	CPAF	Boeing/VA	94,837	18,106	1/3Q	18,305	1/3Q	18,591	1/3Q	149,839

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Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis								Date February 2007		
APPROPRIATION/BUDGET ACTIVITY RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)					R-1 NOMENCLATURE 0603890C Ballistic Missile Defense System Core					
Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2007 Cost	FY 2007 Award/ Oblg Date	FY 2008 Cost	FY 2008 Award/ Oblg Date	FY 2009 Cost	FY 2009 Award/ Oblg Date	Total Cost
SETA	CPFF	Sparta/VA	9,621	1,650	1/3Q	1,707	1/3Q	1,809	1/3Q	14,787
SETA	CPFF	CSC/VA	7,859	1,478	1/3Q	1,501	1/3Q	1,739	1/3Q	12,577
FFRDC/UARC	MIPR	Aerospace/VA	705	120	1/3Q	158	1/3Q	158	1/3Q	1,141
Govt Personnel		WHS/DC	24,753	4,890	2/4Q	5,090	2/4Q	5,094	2/4Q	39,827
Travel			1,475	250	2/4Q	250	2/4Q	250	2/4Q	2,225
SETA	FFP	Paradigm/VA	277	90	1/3Q	90	1/3Q	90	1/3Q	547
<b>Operational Integration &amp; Support</b>										
<b>Threat Systems Engineering</b>										
SETA	CPFF	Sparta/VA	1,594	426	1/3Q	426	1/3Q	457	1/3Q	2,903
SETA	CPFF	CSC/VA	1,431	412	1/3Q	412	1/3Q	439	1/3Q	2,694
FFRDC/UARC	MIPR	LLNL/CA, VA	134	145	1/3Q	145	1/3Q	175	1/3Q	599
Subtotal Management Services			143,628	27,872		28,390		29,156		229,046
<b>Remarks</b>										
Project Total Cost			387,549	100,963		107,422		109,272		705,206
<b>Remarks</b>										

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<b>Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile</b>	Date <b>February 2007</b>
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<b>APPROPRIATION/BUDGET ACTIVITY</b> <b>RDT&amp;E, DW/04 Advanced Component Development and Prototypes (ACD&amp;P)</b>	<b>R-1 NOMENCLATURE</b> <b>0603890C Ballistic Missile Defense System Core</b>
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Fiscal Year	2006				2007				2008				2009				2010				2011				2012				2013			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
<b>Milestones</b>																																
Technical Objectives & Goals / Updates	▲						△								△													△				
Master Integration Plan (MIP)		▲			▲		△								△													△				
Interim Capability Report (ICAR)		▲				△				△				△				△										△				
Adversary Capability Document / updates						△				△				△				△										△				
<b>BLOCK 2006</b>																																
Capability Assessment Plan (CAP) / update				▲						△																						
Adversary Data Package (ADP)			▲	▲																												
<b>BLOCK 2008</b>																																
Test Bed System Specifications (TBSS)							△																									
Interface Control Document (ICD)							△																									
Capability Assessment Plan (CAP) / update											△																					
Adversary Data Package (ADP)							△																									
<b>Block 2010</b>																																

Legend			
▲	Significant Event (complete)	▲	Significant Event (planned)
★	Milestone Decision (complete)	★	Milestone Decision (planned)
◆	Element Test (complete)	◆	Element Test (planned)
▼	System Level Test (complete)	▼	System Level Test (planned)
▲▼	Complete Activity	▲▼	Planned Activity



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Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail						Date February 2007		
APPROPRIATION/BUDGET ACTIVITY RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)				R-1 NOMENCLATURE 0603890C Ballistic Missile Defense System Core				
Schedule Profile	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
<b>Integration</b>								
Integration Monthly Report	1Q,2Q,3Q,4Q	1Q,2Q,3Q,4Q	1Q,2Q,3Q,4Q	1Q,2Q,3Q,4Q	1Q,2Q,3Q,4Q	1Q,2Q,3Q,4Q		
Block 2008 Integration Design Review		2Q						
<b>Studies &amp; Analyses</b>								
E/CCA	1Q,2Q,3Q,4Q	1Q,2Q,3Q,4Q	1Q,2Q,3Q,4Q	1Q,2Q,3Q,4Q	1Q,2Q,3Q,4Q	1Q,2Q,3Q,4Q		
<b>Milestones</b>								
Technical Objectives & Goals / Updates	1Q	3Q		3Q		3Q		
Master Integration Plan (MIP)	2Q	1Q,3Q		2Q		2Q		
Interim Capability Report (ICAR)	2Q	2Q	2Q	2Q	2Q	2Q		
Adversary Capability Document / updates		2Q	1Q	1Q	1Q	1Q		
<b>Contractual Activities&amp; Events</b>								
OTA Contract Award	1Q							
MDNTS(I) Phase 5 Contract Award			1Q					
<b>BLOCK 2006</b>								
Capability Assessment Plan (CAP) / update	4Q		3Q					
Adversary Data Package (ADP)	3Q,4Q							
<b>BLOCK 2008</b>								
Test Bed System Specifications (TBSS)		3Q						
Interface Control Document (ICD)		3Q						
Capability Assessment Plan (CAP) / update			3Q					
Adversary Data Package (ADP)		3Q						
<b>Block 2010</b>								
Test Bed Description Document (TBDD)		4Q						
Test Bed System Specifications (TBSS)			2Q					
Interface Control Document (ICD)			2Q					
Capability Assessment Plan (CAP) / update					2Q			
Adversary Data Package (ADP)			2Q					
<b>General Milestones</b>								
Adversary Engineering	1Q	1Q	1Q	1Q	1Q	1Q		
Special Adversary Capability Studies	1Q,2Q,3Q,4Q	1Q,2Q,3Q,4Q	1Q,2Q,3Q,4Q	1Q,2Q,3Q,4Q	1Q,2Q,3Q,4Q	1Q,2Q,3Q,4Q		
Perform Intel Threat Analysis	2Q	2Q	2Q	2Q	2Q	2Q		

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Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail						Date February 2007		
APPROPRIATION/BUDGET ACTIVITY RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)				R-1 NOMENCLATURE 0603890C Ballistic Missile Defense System Core				
Schedule Profile	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
Missile Characterizations	3Q	3Q	3Q	3Q	3Q	3Q		
Countermeasure Characterizations	4Q	4Q	4Q	4Q	4Q	4Q		
<b>Lethality</b>								
Perform Studies Chem./Bio - Agents at Altitudes	1Q	1Q	1Q	1Q	1Q	1Q		
Analyze Missile Payload Lethality	2Q	2Q	2Q	2Q	2Q	2Q		
Analyze Post Engagement Lethality Data	2Q	2Q	2Q	2Q	2Q	2Q		
Kill Assessment Phenomenology	3Q	3Q	3Q	3Q	3Q	3Q		
Submunition Properties	3Q	3Q	3Q	3Q	3Q	3Q		
Viscoelastic Fluid Properties	3Q	3Q	3Q	3Q	3Q	3Q		
Chem-Bio Threats - Report	4Q	4Q	4Q	4Q	4Q	4Q		

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<b>Missile Defense Agency (MDA) Exhibit R-2A RDT&amp;E Project Justification</b>	Date <b>February 2007</b>
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<b>APPROPRIATION/BUDGET ACTIVITY</b> <b>RDT&amp;E, DW/04 Advanced Component Development and Prototypes (ACD&amp;P)</b>	<b>R-1 NOMENCLATURE</b> <b>0603890C Ballistic Missile Defense System Core</b>
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COST (\$ in Thousands)	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
0105 Countermeasures/Counter-Countermeasures (CM/CCM)	23,002	23,038	26,232	27,317	22,759	23,073	23,073	23,073
RDT&E Articles Qty	0	0	0	0	0	0	0	0

**A. Mission Description and Budget Item Justification**

The Missile Defense Agency's (MDA) Countermeasures/Counter-Countermeasures (CM/CCM) Program assesses technical and performance risks, identifies mitigation strategies and integrates engineering changes to the baseline Ballistic Missile Defense System (BMDS) to improve its performance against the full spectrum of adversary capabilities, focusing primarily on defeating countermeasures. The CM/CCM Program conducts tailored threat system engineering to support BMDS capability improvement and works collaboratively with the Threat Systems Engineering Team to synchronize and integrate development efforts. These efforts ensure the representation of adversary capabilities is consistent with the MDA Adversary Capability Document (ACD).

The CM/CCM Program brings together capabilities from across MDA; to include System, Element, and Component technical experts; to conduct integrated engineering assessments of BMDS performance against countermeasures and the technical risks posed by these countermeasures. An independent team of senior experts, funded by the CM/CCM Program, reviews the adversary capabilities, BMDS performance analyses, risks, and counter-countermeasure proposals and provides their assessment to the MDA Director.

Acting through the Systems Engineering and Integration (SE&I) team, the CM/CCM Program employs collaborative engineering throughout the entire engineering process from concept through development to operational integration to ensure that its solutions are part of the integrated system design.

**B. Accomplishments/Planned Program**

	FY 2006	FY 2007	FY 2008	FY 2009
Adversary Engineering	10,929	10,939	11,810	12,170
RDT&E Articles (Quantity)	0	0	0	0

The Adversary Engineering effort determines 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. The adversary engineering is performed by two teams, each operating with a different perspective of adversary capabilities. The Red Team, restricted to using only

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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 System Core	
<p>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.</p> <p>FY06 Accomplishments:</p> <ul style="list-style-type: none"><li>• Characterized adversary countermeasures capabilities and phenomenology related to countermeasure design, deployment, and performance.</li><li>• Developed detailed parametric descriptions of specific adversary capability space and countermeasures.</li><li>• Delivered engineering descriptions for four conceptual countermeasure suites in support of BMDS risk assessments.</li><li>• Conducted phenomenology studies on employment techniques for a range of countermeasure suites.</li><li>• Tested applications of new commercial technologies to countermeasure design.</li><li>• Analyzed the use of non-ballistic missile countermeasure techniques to counter BMDS capabilities.</li><li>• Completed development of a low-friction surface to support validation testing for a digital model of countermeasure deployment</li><li>• Completed a Level 1 design for a countermeasure suite slated for an FY06 MDA experimental flight test.</li><li>• In collaboration with Threat Systems Engineering, integrated the results from Phases 1 and 2 of the Adversary Capability Document (ACD) Parameters Inter-Relationships Study into the ACD, and initiated Phase 3 to study four countermeasure relationships involving 15 ACD parameters.</li><li>• Initiated development of a digital tool to provide rapid parametric designs of countermeasure suites to support assessments of BMDS performance</li></ul> <p>FY07 Planned Program:</p> <ul style="list-style-type: none"><li>• Continue characterization of adversary countermeasures capabilities and phenomenology related to countermeasure design, employment, and performance.</li><li>• Update and continue development of detailed parametric descriptions of the adversary capability space and countermeasures.</li><li>• Deliver engineering descriptions for conceptual countermeasure suites to risk assessments of the BMDS discrimination strategy.</li><li>• Integrate, in collaboration with Threat Systems Engineering, results from Phase 3 of the ACD Parameters Inter-Relationships Study into the ACD, and initiate Phase 4 to study five countermeasure relationships involving 18 ACD parameters.</li><li>• Deliver the first version of the digital countermeasure design tool with nine classes of countermeasures and nine adversary missile systems.</li><li>• Complete a project arrangement for five additional years of Red Team operations.</li></ul>		

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Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date <b>February 2007</b>
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APPROPRIATION/BUDGET ACTIVITY <b>RDT&amp;E, DW/04 Advanced Component Development and Prototypes (ACD&amp;P)</b>	R-1 NOMENCLATURE <b>0603890C Ballistic Missile Defense System Core</b>
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**FY08 Planned Program:**

- Continue characterization of adversary countermeasures capabilities and phenomenology related to countermeasure design, employment, and performance.
- Update and continue development of detailed parametric descriptions of the adversary capability space and countermeasures.
- Deliver engineering descriptions for conceptual countermeasure suites to support risk assessments of the BMDS discrimination study
- Integrate, in collaboration with Threat Systems Engineering, results from Phase 4 of the ACD Parameters Inter-Relationships Study into the ACD, and initiate Phase 5 to study countermeasure relationships involving ACD parameters.
- Continue development of the digital countermeasure design tool with classes of countermeasures and adversary missile systems.

**FY09 Planned Program:**

- Continue characterization of adversary countermeasures capabilities and phenomenology related to countermeasure design, employment, and performance.
- Update and continue development of detailed parametric descriptions of the adversary capability space and countermeasures.
- Deliver engineering descriptions for conceptual countermeasure suites to support risk assessments of the BMDS discrimination strategy
- Complete the ACD Parameters Inter-Relationships Study; integrate the results from Phase 5 into the ACD.
- Complete development of the digital countermeasure design tool with coverage of all classes of countermeasures and adversary missile systems.

	FY 2006	FY 2007	FY 2008	FY 2009
Independent Assessment	650	654	975	989
RDT&E Articles (Quantity)	0	0	0	0

Independent Assessment supports a series of annual analyses by a panel of senior experts, the White Team, of adversary capabilities and conceptual countermeasures posed by the Black and Red Teams, and the risk assessments and mitigation approaches presented by the Blue Team. The White Team presents to the MDA Director their independent assessments of performance risks associated with countermeasures and recommended priorities for MDA investments in counter-countermeasures that have a strong potential to mitigate these risks.

**FY06 Accomplishments:**

- Conducted annual reviews of CM/CCM Program Red and Black Team countermeasures and Blue Team risk assessments, and proposed mitigation options.
- Provided independent assessments and recommendations to the MDA Director on the BMDS Discrimination Strategy being pursued to achieve robust performance against adversary countermeasures.

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Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date <b>February 2007</b>
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APPROPRIATION/BUDGET ACTIVITY <b>RDT&amp;E, DW/04 Advanced Component Development and Prototypes (ACD&amp;P)</b>	R-1 NOMENCLATURE <b>0603890C Ballistic Missile Defense System Core</b>
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**FY07 Planned Program:**

- Conduct annual reviews of CM/CCM Program Red and Black Team countermeasures and Blue Team risk assessments, and propose mitigation options.
- Provide independent assessments of CM/CCM Program products and recommendations to the MDA Director.

**FY08 Planned Program:**

- Conduct annual reviews of CM/CCM Program Red and Black Team countermeasures and Blue Team risk assessments, and propose mitigation options.
- Provide independent assessments of CM/CCM Program products and recommendations to the MDA Director.

**FY09 Planned Program:**

- Conduct annual reviews of CM/CCM Program Red and Black Team countermeasures and Blue Team risk assessments, and propose mitigation options.
- Provide independent assessments of CM/CCM Program products and recommendations to the MDA Director.

	FY 2006	FY 2007	FY 2008	FY 2009
BMDS Risk Assessment and Mitigation Engineering	11,423	11,445	13,447	14,158
RDT&E Articles (Quantity)	0	0	0	0

BMDS Risk Assessment and Mitigation Engineering funds the Blue Team, comprised of BMDS system, element, and component technical experts, to perform integrated performance and risk assessments of the BMDS against projected adversary capabilities and conceptual countermeasures, to identify and characterize counter-countermeasure options to mitigate BMDS risks posed by these adversary capabilities and countermeasures, and to perform the system-level engineering required to identify the BMDS baseline changes to implement and integrate the options into the operational system baseline. In order to integrate Blue Team counter-countermeasure concepts into the design of the BMDS, a collaborative engineering process that spans many organizations across MDA to include the BMDS Elements, Systems Engineering and Integration, Test and Evaluation and others is employed. Utilizing integration councils and task oriented working groups, collaborative products, e.g., specifications, interfaces, standards etc. that define the design, assessment, and integration into the BMDS are produced.

**FY06 Accomplishments:**

- Completed a BMDS discrimination strategy to identify the critical system functions required to implement an integrated discrimination capability to enhance BMDS performance against adversary countermeasures.

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<b>Missile Defense Agency (MDA) Exhibit R-2A RDT&amp;E Project Justification</b>		Date <b>February 2007</b>
APPROPRIATION/BUDGET ACTIVITY <b>RDT&amp;E, DW/04 Advanced Component Development and Prototypes (ACD&amp;P)</b>	R-1 NOMENCLATURE <b>0603890C Ballistic Missile Defense System Core</b>	
<ul style="list-style-type: none"> <li>Delivered engineering descriptions for an open architecture BMDS discrimination infrastructure with common, consistent databases to coordinated, collect, exchange, and exploit discrimination data from multiple sensors to generate improved targeting information to BMDS weapons.</li> <li>Delivered an inference interface standard to enable consistent communications and interpretation of discrimination data across the BMDS.</li> <li>Developed an engineering change proposal to implement specific improvements to BMDS midcourse target designation capabilities starting in FY07.</li> <li>Delivered engineering descriptions for three advanced discrimination initiatives which will enter development starting in Block 2008.</li> </ul> <p>FY07 Planned Program:</p> <ul style="list-style-type: none"> <li>Define engineering alternatives, design parameters, and knowledge points for the development of three advanced discrimination initiatives which will enter development in Block 2008.</li> <li>Assess engineering alternatives to implement system discrimination improvements which maximize enforcement of the BMDS Discrimination Strategy</li> <li>Perform initial engineering to support development of the BMDS Discrimination Infrastructure to support development beginning in Block 2008:</li> <li>Identify the recommended functional requirements, allocations and interface definitions to support development of the System and Subsystem level specifications.</li> <li>Characterize internal subsystem behavior, functional requirements, allocations and interface definitions necessary to support development of the BMDS system design and resultant specifications, including proposed changes and/or additions to performance requirements.</li> <li>Provide inputs for the BMDS Test Bed Description Document, Block 2008 Test Bed System Specification, and Interface documents.</li> <li>Develop a Block 2008 Implementation Plan for the BMDS discrimination infrastructure with identified knowledge points, integration schedules, initial test plans and objectives, and inputs for the Master Integration Plan and Integrated Master Test Plan.</li> <li>Define the BMDS Discrimination Infrastructure capabilities evolution in terms of the system functionality and interfaces required in Block 2010 through Block 2014.</li> <li>Conduct assessments of BMDS performance against projected adversary capabilities and conceptual countermeasures to the BMDS Discrimination Strategy posed by the Red and Black Teams to identify and evaluate performance risks and gaps.</li> </ul> <p>FY08 Planned Program:</p> <ul style="list-style-type: none"> <li>Analyze design trades and initial engineering to support development and implementation of the specifications and standards for the BMDS Discrimination Infrastructure Block 2010 evolutionary capability spiral.</li> </ul>		

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<b>Missile Defense Agency (MDA) Exhibit R-2A RDT&amp;E Project Justification</b>	Date <b>February 2007</b>
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<b>APPROPRIATION/BUDGET ACTIVITY</b> <b>RDT&amp;E, DW/04 Advanced Component Development and Prototypes (ACD&amp;P)</b>	<b>R-1 NOMENCLATURE</b> <b>0603890C Ballistic Missile Defense System Core</b>
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- Initiate development of the Block 2010 Implementation Plan for the BMDS discrimination infrastructure and provide inputs to the Block 2010 Test Bed System Specification and Interface Control Documents (ICDs)
- Conduct assessments of BMDS performance against projected adversary capabilities and conceptual countermeasures posed by the Red and Black Teams to identify and evaluate performance risks and gaps.
- Identify and characterize counter-countermeasures to mitigate BMDS risks posed by Black and Red Team conceptual countermeasures.
- Develop Concept Descriptions (CDs) to determine the engineering changes to the baseline BMDS required to integrated advanced discrimination initiatives.

**FY09 Planned Program:**

- Analyze design trades and perform initial engineering to support development and implementation of the specifications and standards for the BMDS Discrimination Infrastructure Block 2012+ evolutionary capability spiral.
- Initiate development of the Block 2012 Implementation Plan for the BMDS discrimination infrastructure and provide inputs to the Block 2012 Test Bed System Specification and Interface documents.
- Conduct assessments of BMDS performance against projected adversary capabilities and conceptual countermeasures posed by the Red and Black Teams to identify and evaluate performance risks and gaps.
- Identify and characterize counter-countermeasures to mitigate BMDS risks posed by Black and Red Team conceptual countermeasures.
- Develop concept descriptions of the engineering changes to the baseline BMDS required to integrate advanced discrimination initiatives.

**C. Other Program Funding Summary**

	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	Total Cost
PE 0603175C Ballistic Missile Defense Technology	147,270	193,307	118,569	109,540	116,014	121,008	127,917	131,291	1,064,916
PE 0603881C Ballistic Missile Defense Terminal Defense Segment	1,120,879	1,092,076	962,585	1,004,282	924,101	851,213	678,694	501,147	7,134,977
PE 0603882C Ballistic Missile Defense Midcourse Defense Segment	2,391,246	3,043,058	2,520,064	2,359,665	2,179,602	1,699,963	1,153,082	1,183,003	16,529,683
PE 0603883C Ballistic Missile Defense Boost Defense Segment	455,572	628,958	548,759	432,432	448,375	678,913	829,683	1,026,239	5,048,931
PE 0603884C Ballistic Missile Defense Sensors	284,297	514,129	778,163	984,963	939,417	791,701	723,843	603,585	5,620,098
PE 0603886C Ballistic Missile Defense System Interceptors	200,446	356,004	227,499	393,317	522,388	730,236	836,029	570,206	3,836,125
PE 0603888C Ballistic Missile Defense Test and Targets	610,619	601,782	586,150	628,364	662,984	681,511	696,037	705,210	5,172,657

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<b>Missile Defense Agency (MDA) Exhibit R-2A RDT&amp;E Project Justification</b>							<b>Date</b> <b>February 2007</b>		
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<b>APPROPRIATION/BUDGET ACTIVITY</b> <b>RDT&amp;E, DW/04 Advanced Component Development and Prototypes (ACD&amp;P)</b>					<b>R-1 NOMENCLATURE</b> <b>0603890C Ballistic Missile Defense System Core</b>				
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	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	Total Cost
PE 0603889C Ballistic Missile Defense Products	387,402	0	0	0	0	0	0	0	387,402
PE 0603891C Special Programs - MDA	271,021	353,031	323,250	305,409	369,073	526,966	789,017	792,271	3,730,038
PE 0603892C Ballistic Missile Defense Aegis	893,040	1,122,669	1,059,103	1,129,425	1,221,650	1,067,587	1,054,753	1,089,078	8,637,305
PE 0603893C Space Tracking & Surveillance System	220,048	322,220	331,525	347,811	412,623	501,197	778,067	981,424	3,894,915
PE 0603894C Multiple Kill Vehicle	48,370	144,362	271,151	352,741	461,179	618,263	673,477	842,905	3,412,448
PE 0603895C BMD System Space Program	0	0	27,666	35,093	46,849	56,183	133,617	157,117	456,525
PE 0603896C BMD C2BMC	0	246,852	258,913	294,627	300,847	282,615	267,275	269,420	1,920,549
PE 0603897C BMD Hercules	0	49,674	53,658	54,264	54,405	55,142	53,355	54,198	374,696
PE 0603898C BMD Joint Warfighter Support	0	54,935	48,787	50,428	54,086	56,603	58,890	60,206	383,935
PE 0603904C BMD Joint National Integration Center (JNIC)	0	110,629	104,012	106,985	111,542	111,947	113,592	115,287	773,994
PE 0603905C BMD Concurrent Test and Operations	0	23,159	0	0	0	0	0	0	23,159
PE 0603906C Regarding Trench	0	0	2,000	3,000	5,000	5,000	9,000	9,000	33,000
PE 0605502C Small Business Innovative Research - MDA	133,105	0	0	0	0	0	0	0	133,105
PE 0901585C Pentagon Reservation	14,874	15,527	6,058	6,376	4,490	4,725	4,801	4,877	61,728
PE 0901598C Management Headquarters - MDA	98,609	87,059	85,906	86,453	70,355	69,855	69,855	69,855	637,947

**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) Science Engineering and Technical Assistance (SETA), and Industry. In addition, extensive involvement by the major defense contractors responsible for the development of the BMDS, Elements, and major components is required. CM/CCM initiatives will be executed by various labs and industry contractors through the MDA Advanced Systems directorate and BMDS Element Program Offices.

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<b>Missile Defense Agency (MDA) Exhibit R-3 RDT&amp;E Project Cost Analysis</b>	Date <b>February 2007</b>
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<b>APPROPRIATION/BUDGET ACTIVITY</b> <b>RDT&amp;E, DW/04 Advanced Component Development and Prototypes (ACD&amp;P)</b>	<b>R-1 NOMENCLATURE</b> <b>0603890C Ballistic Missile Defense System Core</b>
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**I. Product Development Cost ( \$ in Thousands )**

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

**Remarks**

**II. Support Costs Cost ( \$ in Thousands )**

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2007 Cost	FY 2007 Award/ Oblg Date	FY 2008 Cost	FY 2008 Award/ Oblg Date	FY 2009 Cost	FY 2009 Award/ Oblg Date	Total Cost
<b>Adversary Engineering</b>										
SETA	CPFF	SPARTA/VA	3,935	1,864	1/3Q	1,864	1/3Q	1,947	1/3Q	9,610
SETA	CPFF	CSC/VA	992	651	1/3Q	701	1/3Q	786	1/3Q	3,130
Other DoD		SMDC/AL	1,185	600	1/3Q	742	1/3Q	792	1/3Q	3,319
Other DoD	MIPR	ARL/NM	2,398	880	1/3Q	1,030	1/3Q	1,060	1/3Q	5,368
Other DoD	MIPR	Battelle/OH	1,228	448	1/3Q	486	1/3Q	557	1/3Q	2,719
FFRDC/UARC	MIPR	MIT/LL/MA	1,475	274	1/3Q	277	1/3Q	288	1/3Q	2,314
FFRDC/UARC	MIPR	IDA/VA	1,310	400	1/3Q	400	1/3Q	430	1/3Q	2,540
Red Team		MDA Elements	9,956	3,100	2Q	3,420	1/3Q	3,420	1/3Q	19,896
Other DoD		MDA Elements	4,525	2,722	1/3Q	2,890	1/3Q	2,890	1/3Q	13,027
<b>BMDs Risk Assessment and Mitigation Engineering</b>										
SETA	CPFF	CSC/MA	1,000	724	1/3Q	770	1/3Q	931	N/A	3,425
Industry	CPAF	Boeing/NM	8,000	1,538	1/3Q	2,061	1/3Q	2,173	N/A	13,772
Industry	CPAF	Raytheon/AL	6,950	1,350	1/3Q	1,954	1/3Q	2,111	N/A	12,365
FFRDC/UARC	MIPR	MIT/LL/MA	4,655	1,089	1/3Q	1,300	1/3Q	1,321	N/A	8,365
Other DoD	MIPR	NSWC/IN	3,000	881	1/3Q	1,000	1/3Q	1,118	N/A	5,999
Collaborative Engineering		MDA Elements	15,356	2,489	1/3Q	2,694	1/3Q	2,718	N/A	23,257

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Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis								Date February 2007		
APPROPRIATION/BUDGET ACTIVITY RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)					R-1 NOMENCLATURE 0603890C Ballistic Missile Defense System Core					
Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2007 Cost	FY 2007 Award/Oblg Date	FY 2008 Cost	FY 2008 Award/Oblg Date	FY 2009 Cost	FY 2009 Award/Oblg Date	Total Cost
Assessment and Concept Development Support		MDA Elements	5,634	3,124	1/3Q	3,279	1/3Q	3,359	N/A	15,396
Subtotal Support Costs			71,599	22,134		24,868		25,901		144,502
<b>Remarks</b>										
<b>III. Test and Evaluation Cost ( \$ in Thousands )</b>										
Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2007 Cost	FY 2007 Award/Oblg Date	FY 2008 Cost	FY 2008 Award/Oblg Date	FY 2009 Cost	FY 2009 Award/Oblg Date	Total Cost
Subtotal Test and Evaluation										
<b>Remarks</b>										
<b>IV. Management Services Cost ( \$ in Thousands )</b>										
Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2007 Cost	FY 2007 Award/Oblg Date	FY 2008 Cost	FY 2008 Award/Oblg Date	FY 2009 Cost	FY 2009 Award/Oblg Date	Total Cost
<b>Independent Assessment</b>										
FFRDC/UARC	MIPR	IDA/VA	2,885	654	1/3Q	975	1/3Q	989	1Q	5,503
<b>BMDS Risk Assessment and Mitigation Engineering</b>										
SETA	CPFF	CSC/VA	750	250	1Q	389	1Q	427	1Q	1,816
Subtotal Management Services			3,635	904		1,364		1,416		7,319
<b>Remarks</b>										
Project Total Cost			75,234	23,038		26,232		27,317		151,821
<b>Remarks</b>										

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<b>Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile</b>	Date <b>February 2007</b>
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<b>APPROPRIATION/BUDGET ACTIVITY</b> <b>RDT&amp;E, DW/04 Advanced Component Development and Prototypes (ACD&amp;P)</b>	<b>R-1 NOMENCLATURE</b> <b>0603890C Ballistic Missile Defense System Core</b>
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Fiscal Year	2006				2007				2008				2009				2010				2011				2012				2013			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
<b>Adversary Engineering</b>																																
Deliver Countermeasure Concepts		▲		▲		△		△		△		△		△		△																
Deliver Special Studies Report	▲					△		△						△																		
Complete 5-Year Project Arrangement						△																										
<b>Independent Assessment</b>																																
Provide Independent Assessments to MDA			▲			△		△		△		△		△		△																
<b>BMDS Risk Assessment and Mitigation Engineering</b>																																
Complete BMDS Discrimination Strategy			▲																													
Deliver Init Eng Design Pkg (Discrim Initiatives)				▲		△				△				△				△				△				△				△		

Legend			
▲	Significant Event (complete)	▲	Significant Event (planned)
★	Milestone Decision (complete)	★	Milestone Decision (planned)
◆	Element Test (complete)	◆	Element Test (planned)
▼	System Level Test (complete)	▼	System Level Test (planned)
▲	Complete Activity	▲	Planned Activity

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Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail						Date February 2007		
APPROPRIATION/BUDGET ACTIVITY RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)				R-1 NOMENCLATURE 0603890C Ballistic Missile Defense System Core				
Schedule Profile	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
<b>Adversary Engineering</b>								
Deliver Countermeasure Concepts	2Q,4Q	2Q,4Q	2Q,4Q	2Q,4Q				
Deliver Special Studies Report	1Q	2Q	1Q	1Q				
Complete 5-Year Project Arrangement		2Q						
<b>Independent Assessment</b>								
Review Black and Red Team Countermeasure Concepts	2Q,4Q	1Q,2Q	1Q,2Q	1Q,2Q				
Review Blue Team CCM Concepts and Plans	2Q,3Q	3Q,4Q	3Q,4Q	3Q,4Q				
Provide Independent Assessments to MDA	3Q	2Q,4Q	2Q,4Q	2Q,4Q				
<b>BMDS Risk Assessment and Mitigation Engineering</b>								
Assess Performance Against Countermeasures	1Q,2Q	2Q,3Q	2Q,3Q	2Q,3Q				
Develop and Analyze CCM Concepts	2Q,3Q,4Q	2Q,3Q,4Q	2Q,3Q,4Q	2Q,3Q,4Q				
Perform Collab Eng to Integrate CCM into BMDS TB	2Q,3Q	2Q,3Q	2Q,3Q	2Q,3Q				
Complete BMDS Discrimination Strategy	3Q							
Deliver Init Eng Design Pkg (Discrim Initiatives)	4Q	2Q	2Q	2Q	2Q	2Q	2Q	2Q

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<b>Missile Defense Agency (MDA) Exhibit R-2A RDT&amp;E Project Justification</b>	Date <b>February 2007</b>
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<b>APPROPRIATION/BUDGET ACTIVITY</b> <b>RDT&amp;E, DW/04 Advanced Component Development and Prototypes (ACD&amp;P)</b>	<b>R-1 NOMENCLATURE</b> <b>0603890C Ballistic Missile Defense System Core</b>
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COST (\$ in Thousands)	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
0102 Intelligence and Security	21,647	21,445	24,190	26,159	37,471	45,446	46,772	47,530
RDT&E Articles Qty	0	0	0	0	0	0	0	0

**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. **Intelligence:** The intelligence process begins when the Intelligence Community collects and analyzes data on foreign threat missiles. 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, 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, Intelligence Community developed, owned and operated capabilities for the benefit 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 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 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, the MDA Counterintelligence Division's portfolio includes the following missions & functions:

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<ul style="list-style-type: none"><li>• Pursuant to DoD Instruction 5240.4 (CI investigations and Preliminary Inquiries), MDA Counterintelligence Division conducts CI preliminary investigations to determine the initial facts and circumstances surrounding suspected clandestine relationships between MDA personnel and FISS agents or individuals associated with terrorist organizations. When allegations are substantiated, MDA Counterintelligence Division refers these matters to the appropriate Title 10, U.S.C. jurisdiction (Army, Navy or USAF CI Organization, DCIS or FBI, as appropriate).</li><li>• Pursuant to DoD Instruction 5240.17 (DoD CI Collection and Reporting), MDA Counterintelligence Division 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&amp;E activities and BMDS deployments worldwide. MDA Counterintelligence Division also conducts briefings and debriefings of MDA personnel who travel 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.</li><li>• Pursuant to DoD Instruction 5240.18, (CI Analysis and Production), MDA Counterintelligence Division 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&amp;E activities and conferences worldwide, and intelligence collection threats to MDA technology, information systems or infrastructure.</li><li>• Pursuant to DoD Instruction 5240.16 (CI Functional Services): MDA Counterintelligence Division serves as the focal point within MDA for specialized CI technical services support to include Technical Surveillance Countermeasures 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. MDA Counterintelligence Division 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. MDA Counterintelligence Division directs and manages the MDA CI research and technology protection effort by leveraging organic and external DoD and National CI resources to provide on-site support to T&amp;E activities conducted at various test ranges, MDA operational locations and during overseas multi-national BMD conferences to protect information, technology, personnel, facilities and activities from FISS, criminal or terrorism threats. MDA Counterintelligence Division 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.</li><li>• Pursuant to DoD Instruction 5240.6 (CI Awareness, Briefing and Reporting Program): MDA Counterintelligence Division 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, MDA Counterintelligence Division provides mandatory foreign travel threat briefings to all MDA OCONUS travelers</li></ul>		

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<b>Missile Defense Agency (MDA) Exhibit R-2A RDT&amp;E Project Justification</b>	Date <b>February 2007</b>
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<b>APPROPRIATION/BUDGET ACTIVITY</b> <b>RDT&amp;E, DW/04 Advanced Component Development and Prototypes (ACD&amp;P)</b>	<b>R-1 NOMENCLATURE</b> <b>0603890C Ballistic Missile Defense System Core</b>
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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 develops a comprehensive picture of the overall Information assurance/Computer Network Defense (IA/CND) architecture at all levels of the BMDS. To accomplish this, the MDA DOSA team 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. This office also provides a recommendation to the Designated Approving Authority relating to system certification for the BMDS and its Elements. Additionally, this directorate's functions entail engagement in various activities to assess the security posture by 1) identifying opportunities to implement Defense-in-Depth (DiD) in Block 2006 and subsequent versions of the BMDS 2) providing oversight, coordination and management of all processes (e.g., definition and scope of ST&E's, vulnerability assessments, and risk mitigation strategies), and 3) by conducting cyber threat/vulnerability assessments in coordination with the Intelligence Community (IC) in order to influence BMDS risk assessments and to recommend enhancements in the technical implementation and design.

**B. Accomplishments/Planned Program**

	FY 2006	FY 2007	FY 2008	FY 2009
Counterintelligence	3,059	3,151	3,245	3,343
RDT&E Articles (Quantity)	0	0	0	0

The MDA Counterintelligence Office serves as the MDA focal point for all counterintelligence (CI) matters and external coordination with the Services, the FBI, and other federal criminal investigative organizations. This office ensures that MDA leadership and the entire workforce are apprised of threats posed by Foreign Intelligence and Security Services (FISS) and terrorist groups worldwide.

**FY06 Accomplishments:**

- Hired personnel with backgrounds in Technical Surveillance Countermeasures to establish an organic capability to conduct surveys and inspections to protect critical MDA sensitive or classified information from FISS electronic interception.
- Developed concept for Automated Foreign Travel CI Threat Briefing Program.
- Developed concept for an MDA CI Insider Threat Program.
- Developed Joint FBI/MDA Counterintelligence Assessment Process to evaluate SBIR proposals.
- Developed and initiated action on PROJECT 56 - an MDA Counterintelligence Division initiative for Joint MDA Counterintelligence Division - FBI engagement with MDA industrial partners to provide enhanced and prioritized CI support leveraging all available CI community resources.

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Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification		Date February 2007
APPROPRIATION/BUDGET ACTIVITY RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE 0603890C Ballistic Missile Defense System Core	
<ul style="list-style-type: none"><li>• Procured and fielded deployable Swift Link 2300 secure INMARSAT data communications kits to provide on-site classified threat support to MDA leadership and program managers during T&amp;E events at remote test ranges and during OCONUS multinational BMD conferences.</li><li>• Produce updated CI Surveys, Defense Threat Assessments and Multi-disciplined CI Threat Assessments for selected MDA/BMDS Programs.</li><li>• Continued to develop, expand and populate CI databases to identify FISS, criminal and terrorist threats to MDA interests.</li></ul> <p>FY07 Planned Program:</p> <ul style="list-style-type: none"><li>• Partner with other DoD TSCM organizations to develop limited organic capability to conduct surveys and inspections of key MDA facilities where critical program information and technologies are discussed or processed to preclude FISS electronic exploitation.</li><li>• Implement and beta test automated Foreign Travel Threat Briefing Program.</li><li>• Continue to mature PROJECT 56 - the MDA Counterintelligence Division initiative for Joint MDA Counterintelligence Division - FBI engagement with MDA industrial partners to provide them CI coverage and support.</li><li>• Implement MDA CI Insider Threat Program while continuing to research and integrate DoD best practices in regard to software tools, processes, and procedures.</li><li>• Review sampling of MDA SBIR proposals to test MDA/FBI collaborative processes designed to identify potential FISS influences.</li><li>• Produce updated CI Surveys, Defense Threat Assessments and Multi-disciplined CI Threat Assessments for selected MDA/BMDS Programs.</li><li>• Continue to develop, expand and populate CI databases.</li><li>• Develop and publish MDA-specific CI policy that implements DoD CI policy issuances.</li></ul> <p>FY08 Planned Program:</p> <ul style="list-style-type: none"><li>• Continue to build organic TSCM capability by obtaining specialized equipment that might be available across the DoD TSCM community.</li><li>• Continue to implement an automated Foreign Travel CI Threat Briefing Program.</li><li>• Continue to expand personnel resources to provide CI support to MDA centers of gravity, T&amp;E activities and BMDS fielding worldwide.</li><li>• Continue to improve MDA CI Insider Threat Program by integrating DoD best practices, software tools, processes and procedures.</li><li>• Research enhanced secure data communications system capability to facilitate on-site support during T&amp;E activities and OCONUS multi-national BMD conferences.</li><li>• Refine the process to identify critical MDA/BMDS technology and increase the PROJECT 56 effort to provide Joint FBI/MDA CI coverage.</li><li>• Produce updated CI Surveys, Defense Threat Assessments and Multi-disciplined CI Threat Assessments for selected MDA/BMDS Programs.</li><li>• Continue to develop and publish MDA-specific CI policy that implements DoD CI policy issuances</li></ul>		

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<b>Missile Defense Agency (MDA) Exhibit R-2A RDT&amp;E Project Justification</b>	Date <b>February 2007</b>
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<b>APPROPRIATION/BUDGET ACTIVITY</b> <b>RDT&amp;E, DW/04 Advanced Component Development and Prototypes (ACD&amp;P)</b>	<b>R-1 NOMENCLATURE</b> <b>0603890C Ballistic Missile Defense System Core</b>
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**FY09 Planned Program:**

- Field an organic full-up TSCM capability; provide external TSCM support as necessary.
- Deploy a robust automated Foreign Travel Briefing Program across MDA.
- Continue and enhance CI support to Tests and Exercises, on-site and off-site.
- Continue and enhance Insider Threat Program.
- Develop procurement plan for enhanced secure data communications system.
- Refine the process to identify critical MDA technology and increase the PROJECT 56 effort to provide CI coverage and support.
- Produce updated CI Surveys, Defense Threat Assessments and Multi-disciplined CI Threat Assessments for selected MDA/BMDS Programs.
- Continue to develop and publish MDA-specific CI policy that implements DoD CI policy issuances.

	FY 2006	FY 2007	FY 2008	FY 2009
BMDS Certification	2,109	3,281	2,925	3,012
RDT&E Articles (Quantity)	0	0	0	0

The BMDS Certification activity develops a comprehensive picture of the overall Information Assurance/Computer Network Defense (IA/CND) architecture at all levels of the BMDS.

**FY 2006 Accomplishments:**

- Developed a certification recommendation on behalf of the BMDS components and overall system in time to fulfill Block 2004 release dates.
- Implemented risk management processes across the BMDS elements to prioritize and categorize vulnerabilities. This information helped decision makers understand the risks, select strategies to mitigate threats, and enhance the information systems infrastructure, while improving the security, command and control of essential systems.
- Enhanced the confidentiality, integrity and availability of key systems, networks and data through direct participation in information assurance related activities designed to enforce requirements, verified and/or implemented essential processes, controls and procedures required by key systems as part of a defensive strategy.
- Characterized existing Information Assurance (IA) related guidance (e.g., DoD 8500.2, Information Assurance Technology Framework (IATF), NSA, and DISA CND requirements) for use by systems engineers and program developers to facilitate incorporation of practices and procedures developed in accordance with emerging IA Technologies.

**FY 2007 Planned Program:**

- Provide domain expertise as the Program Manager for IA on behalf of the BMDS.

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<b>Missile Defense Agency (MDA) Exhibit R-2A RDT&amp;E Project Justification</b>		Date <b>February 2007</b>
<b>APPROPRIATION/BUDGET ACTIVITY</b> <b>RDT&amp;E, DW/04 Advanced Component Development and Prototypes (ACD&amp;P)</b>		<b>R-1 NOMENCLATURE</b> <b>0603890C Ballistic Missile Defense System Core</b>
<ul style="list-style-type: none"> <li>○ Oversee the activities of the Information Assurance Managers (IAM) and Information Assurance Officers (IAO) to ensure satisfactory compliance of the responsibilities established in DoDI 8500.2 (reference (g)) and related guidance. DoDI 8500.2 implements policy, assigns responsibilities, and prescribes procedures for applying integrated, layered protection of the DoD information systems and networks in accordance with existing policy doctrine.</li> <li>○ Plan for IA Controls implementation, validation and sustainment throughout the system life cycle, to include timely and effective configuration and vulnerability management.</li> <li>○ Ensure that Information System Security Engineering (ISSE) is employed to develop or modify the IA component of the system architecture in compliance with the IA component and to make maximum use of enterprise IA capabilities and services.</li> <li>○ Identify and implement software quality controls and validation methods for assigned DoD information system programs that develop or integrate software.</li> <li>○ Enforce accreditation decisions for hosted or interconnected DoD information systems.</li> <li>○ Develop, track, and resolve the DIACAP Implementation Plan for assigned DoD information systems to address overall IA for the BMDS and coordination with Element POCs for items.</li> <li>○ Characterize mission specific and DoD IA/CND doctrine to realize BMDS lifecycle objectives.</li> <li>○ Decompose IA/CND requirements to enhance assessments and traceability to achieve the desired end state.</li> <li>○ Identify high-return/near-term deployment opportunities and unfunded IA/CND related element-level initiatives.</li> <li>● Leverage Element engineering and IA development teams from the National Team and Prime Contractors to perform IA/CND architecture and design studies.             <ul style="list-style-type: none"> <li>○ Characterize mission specific and DoD IA/CND doctrine to realize BMDS lifecycle objectives.</li> <li>○ Decompose IA/CND requirements to enhance assessments and traceability to the desired end state.</li> <li>○ Identify high-return/near-term deployment opportunities and unfunded IA/CND related element-level initiatives.</li> </ul> </li> <li>● Develop a BMDS Network Operations Security capability.             <ul style="list-style-type: none"> <li>○ Develop the means to monitor the operational state of the BMDS mission network.</li> <li>○ Identify contextually, significant state changes that may impact the mission network.</li> <li>○ Develop the means to identify an attack and develop the means to employ the appropriate contingency strategy.</li> </ul> </li> </ul> <p>FY 2008 Planned Program:</p> <ul style="list-style-type: none"> <li>● Provide domain expertise as the Program Manager for IA on behalf of the BMDS.             <ul style="list-style-type: none"> <li>○ Oversee the activities of the Information Assurance Managers (IAM) and Information Assurance Officers (IAO) to ensure satisfactory compliance of the responsibilities established in DoDI 8500.2 (reference (g)) and related guidance.</li> </ul> </li> </ul>		

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<b>Missile Defense Agency (MDA) Exhibit R-2A RDT&amp;E Project Justification</b>	Date <b>February 2007</b>
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<b>APPROPRIATION/BUDGET ACTIVITY</b> <b>RDT&amp;E, DW/04 Advanced Component Development and Prototypes (ACD&amp;P)</b>	<b>R-1 NOMENCLATURE</b> <b>0603890C Ballistic Missile Defense System Core</b>
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- Plan for IA Controls implementation, validation and sustainment throughout the system life cycle, to include timely and effective configuration and vulnerability management.
- Ensure that Information System Security Engineering (ISSE) is employed to develop or modify the IA component of the system architecture in compliance with the IA component and to make maximum use of enterprise IA capabilities and services.
- Identify and implement software quality controls and validation methods for assigned DoD information system programs that develop or integrate software.
- Enforce accreditation decisions for hosted or interconnected DoD information systems.
- Develop, track, and resolve the DIACAP Implementation Plan for assigned DoD information systems to address overall IA for the BMDS and coordination with Element POCs for items.
- Characterize mission specific and DoD IA/CND doctrine to realize BMDS lifecycle objectives.
- Decompose IA/CND requirements to enhance assessments and traceability to achieve the desired end state.
- Identify high-return/near-term deployment opportunities and unfunded IA/CND related element-level initiatives.
- Leverage Element engineering and IA development teams from the National Team and Prime Contractors to perform IA/CND architecture and design studies.
  - Characterize mission specific and DoD IA/CND doctrine to realize BMDS lifecycle objectives.
  - Decompose IA/CND requirements to enhance assessments and traceability to the desired end state.
  - Identify high-return/near-term deployment opportunities and unfunded IA/CND related element-level initiatives.
- Develop a BMDS Network Operations Security capability.
  - Develop the means to monitor the operational state of the BMDS mission network.
  - Identify contextually, significant state changes that may impact the mission network.
  - Develop the means to identify an attack and develop the means to employ the appropriate contingency strategy.

	FY 2006	FY 2007	FY 2008	FY 2009
Intelligence	16,479	15,013	18,020	19,804
RDT&E Articles (Quantity)	0	0	0	0

Note: The External Sensor Program was formerly known as the National Sensor Integration Rapid Prototyping (NSIRP) program and was funded under this PE through FY06. Starting in FY07 the External Sensor Program will be funded as a Block 2010 activity (Project 0011) within the Sensors Program Element (0603884C).

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<b>Missile Defense Agency (MDA) Exhibit R-2A RDT&amp;E Project Justification</b>		Date <b>February 2007</b>
APPROPRIATION/BUDGET ACTIVITY <b>RDT&amp;E, DW/04 Advanced Component Development and Prototypes (ACD&amp;P)</b>	R-1 NOMENCLATURE <b>0603890C Ballistic Missile Defense System Core</b>	
<p>The Intelligence activity ensures the development, study and exploitation of relevant, actionable threat information, and makes this information available to all MDA organizations. Through this activity, authoritative, current and projected threat data are provided to support MDA leadership, Ballistic Missile Defense System (BMDS) architecture design, testing, modeling, and wargaming activities, and existing/future national technical means are leveraged to enhance the effectiveness of the BMDS.</p> <p>FY06 Accomplishments:</p> <ul style="list-style-type: none"><li>• Further expand the Missiles and Rockets Knowledge Base (MARKB).</li><li>• Further developed UMPIRE (a universal tool to allow BMDS planners and warfighters to access disparate Intelligence Community (IC) databases using a single interface).</li><li>• Developed intelligence-based plume and signature data for C2BMC and the COCOMs.</li><li>• Provided threat support in all MDA sponsored and supported wargames and exercises.</li><li>• Provided daily intelligence support to the MDA Director, his Principal Staff Officers, and the Missile Defense Operations Center (MOC).</li><li>• Upgraded External Sensor Laboratory (ESL) hardware.</li><li>• Established development and demonstration hardware configuration.</li><li>• Established connectivity to C2BMC.</li><li>• Demonstrated cueing of Forward Based Sensor.</li></ul> <p>FY07 Planned Accomplishments:</p> <ul style="list-style-type: none"><li>• Expand the Missiles and Rockets Knowledge Base (MARKB) to include another 50 parameters for each of 75 foreign missiles.</li><li>• Further develop UMPIRE (a universal tool to allow BMDS planners and warfighters to access four Intelligence Community (IC) databases using a single interface).</li><li>• Develop intelligence-based plume and signature data each of 75 foreign missiles for use by C2BMC and the COCOMs.</li><li>• Provide characteristics and performance parameters for each of 75 foreign missiles to be used in threat support in all MDA sponsored and supported wargames and exercises.</li><li>• Provide daily intelligence support to the MDA Director, his Principal Staff Officers, and the Missile Defense Operations Center (MOC).</li></ul> <p>FY08 Planned Program:</p> <ul style="list-style-type: none"><li>• Expand the electronic availability of the Missiles and Rockets Knowledge Base (MARKB) on the classified Missile Threat Portal to include the entire warfighter community as well as the development community.</li></ul>		

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<b>Missile Defense Agency (MDA) Exhibit R-2A RDT&amp;E Project Justification</b>	Date <b>February 2007</b>
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<b>APPROPRIATION/BUDGET ACTIVITY</b> <b>RDT&amp;E, DW/04 Advanced Component Development and Prototypes (ACD&amp;P)</b>	<b>R-1 NOMENCLATURE</b> <b>0603890C Ballistic Missile Defense System Core</b>
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- Further expand UMPIRE (a universal tool to allow BMDS planners and warfighters to access disparate Intelligence Community (IC) databases using a single interface). This will give users a six degree of freedom tool vice a three degree of freedom tool thereby allowing a higher level of fidelity in the development of missile trajectories. Develop intelligence-based plume and signature data for C2BMC and the COCOMs for up to 90 foreign missiles.
- Provide characteristics and performance parameters for up to 90 foreign missiles to be used in threat support in all MDA sponsored and supported wargames and exercises.
- Provide daily intelligence support to the MDA Director, his Principal Staff Officers, and the Missile Defense Operations Center (MOC).
- Expand the partially complete foreign missile knowledge base to include up to 400 parameters for each threat missile.
- Expand intelligence support for MDA's lethality program Expand MDA's role in providing the Intelligence Community with missile related collection requirements.

**FY09 Planned Program:**

- Further expand the Missiles and Rockets Knowledge Base (MARKB).
- Further expand UMPIRE (a universal tool to allow BMDS planners and warfighters to access disparate Intelligence Community (IC) databases using a single interface).
- Develop intelligence-based plume and signature data for C2BMC and the COCOMs.
- Provide threat support in all MDA sponsored and supported wargames and exercises.
- Provide daily intelligence support to the MDA Director, his Principal Staff Officers, and the Missile Defense Operations Center (MOC).
- Expand the partially complete foreign missile knowledge base to include the required number of parameters for each threat missile.
- Expand intelligence support for MDA's lethality program.
- Expand MDA's role in providing the Intelligence Community with missile related collection requirements.

**C. Other Program Funding Summary**

	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	Total Cost
PE 0603175C Ballistic Missile Defense Technology	147,270	193,307	118,569	109,540	116,014	121,008	127,917	131,291	1,064,916
PE 0603881C Ballistic Missile Defense Terminal Defense Segment	1,120,879	1,092,076	962,585	1,004,282	924,101	851,213	678,694	501,147	7,134,977
PE 0603882C Ballistic Missile Defense Midcourse Defense Segment	2,391,246	3,043,058	2,520,064	2,359,665	2,179,602	1,699,963	1,153,082	1,183,003	16,529,683

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<b>Missile Defense Agency (MDA) Exhibit R-2A RDT&amp;E Project Justification</b>	Date <b>February 2007</b>
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<b>APPROPRIATION/BUDGET ACTIVITY</b> <b>RDT&amp;E, DW/04 Advanced Component Development and Prototypes (ACD&amp;P)</b>	<b>R-1 NOMENCLATURE</b> <b>0603890C Ballistic Missile Defense System Core</b>
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	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	Total Cost
PE 0603883C Ballistic Missile Defense Boost Defense Segment	455,572	628,958	548,759	432,432	448,375	678,913	829,683	1,026,239	5,048,931
PE 0603884C Ballistic Missile Defense Sensors	284,297	514,129	778,163	984,963	939,417	791,701	723,843	603,585	5,620,098
PE 0603886C Ballistic Missile Defense System Interceptors	200,446	356,004	227,499	393,317	522,388	730,236	836,029	570,206	3,836,125
PE 0603888C Ballistic Missile Defense Test and Targets	610,619	601,782	586,150	628,364	662,984	681,511	696,037	705,210	5,172,657
PE 0603889C Ballistic Missile Defense Products	387,402	0	0	0	0	0	0	0	387,402
PE 0603891C Special Programs - MDA	271,021	353,031	323,250	305,409	369,073	526,966	789,017	792,271	3,730,038
PE 0603892C Ballistic Missile Defense Aegis	893,040	1,122,669	1,059,103	1,129,425	1,221,650	1,067,587	1,054,753	1,089,078	8,637,305
PE 0603893C Space Tracking & Surveillance System	220,048	322,220	331,525	347,811	412,623	501,197	778,067	981,424	3,894,915
PE 0603894C Multiple Kill Vehicle	48,370	144,362	271,151	352,741	461,179	618,263	673,477	842,905	3,412,448
PE 0603895C BMD System Space Program	0	0	27,666	35,093	46,849	56,183	133,617	157,117	456,525
PE 0603896C BMD C2BMC	0	246,852	258,913	294,627	300,847	282,615	267,275	269,420	1,920,549
PE 0603897C BMD Hercules	0	49,674	53,658	54,264	54,405	55,142	53,355	54,198	374,696
PE 0603898C BMD Joint Warfighter Support	0	54,935	48,787	50,428	54,086	56,603	58,890	60,206	383,935
PE 0603904C BMD Joint National Integration Center (JNIC)	0	110,629	104,012	106,985	111,542	111,947	113,592	115,287	773,994
PE 0603905C BMD Concurrent Test and Operations	0	23,159	0	0	0	0	0	0	23,159
PE 0603906C Regarding Trench	0	0	2,000	3,000	5,000	5,000	9,000	9,000	33,000
PE 0605502C Small Business Innovative Research - MDA	133,105	0	0	0	0	0	0	0	133,105
PE 0901585C Pentagon Reservation	14,874	15,527	6,058	6,376	4,490	4,725	4,801	4,877	61,728
PE 0901598C Management Headquarters - MDA	98,609	87,059	85,906	86,453	70,355	69,855	69,855	69,855	637,947

**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.

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<b>Missile Defense Agency (MDA) Exhibit R-3 RDT&amp;E Project Cost Analysis</b>	Date <b>February 2007</b>
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<b>APPROPRIATION/BUDGET ACTIVITY</b> <b>RDT&amp;E, DW/04 Advanced Component Development and Prototypes (ACD&amp;P)</b>	<b>R-1 NOMENCLATURE</b> <b>0603890C Ballistic Missile Defense System Core</b>
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<b>I. Product Development Cost ( \$ in Thousands )</b>										
Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2007 Cost	FY 2007 Award/ Oblg Date	FY 2008 Cost	FY 2008 Award/ Oblg Date	FY 2009 Cost	FY 2009 Award/ Oblg Date	Total Cost
Subtotal Product Development										

**Remarks**

**II. Support Costs Cost ( \$ in Thousands )**

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2007 Cost	FY 2007 Award/ Oblg Date	FY 2008 Cost	FY 2008 Award/ Oblg Date	FY 2009 Cost	FY 2009 Award/ Oblg Date	Total Cost
<b>Counterintelligence</b>										
Analysis and Support	C/FFP	Beta Analytics Int'l, Inc./ Wash, DC	6,120	2,667	1/2Q	2,678	1/2Q	2,758	1/2Q	14,223
Analysis and Support	Various	Various/ Various	575	484	1/4Q	567	1/4Q	585	1/4Q	2,211
<b>Intelligence</b>										
Leverage Existing/Future Assets	MIPR	USAF/ SMC, Los Angeles, CA	7,330	0	N/A	0	N/A	0	N/A	7,330
Leverage Existing/Future Assets	Various	Various/ JNIC, CO; NSWC, VA; USAF, OH	5,646	0	N/A	0	N/A	0	N/A	5,646
Intelligence Support Center	SS/CPAF	JNIC - Northrop Grumman/ Shriever AFB, CO	3,350	1,750	1/3Q	1,802	1/3Q	1,857	1/3Q	8,759
Scenario Applications	Various	SMDC - TSC/ Huntsville, AL	7,110	2,660	1/3Q	2,832	1/3Q	2,920	1/3Q	15,522

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<b>Missile Defense Agency (MDA) Exhibit R-3 RDT&amp;E Project Cost Analysis</b>	Date <b>February 2007</b>
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<b>APPROPRIATION/BUDGET ACTIVITY</b> <b>RDT&amp;E, DW/04 Advanced Component Development and Prototypes (ACD&amp;P)</b>	<b>R-1 NOMENCLATURE</b> <b>0603890C Ballistic Missile Defense System Core</b>
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Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2007 Cost	FY 2007 Award/ Oblg Date	FY 2008 Cost	FY 2008 Award/ Oblg Date	FY 2009 Cost	FY 2009 Award/ Oblg Date	Total Cost
Characterization	SS/CPAF	JNIC - Northrop Grumman/ Shriever AFB,CO	6,198	2,253	1/3Q	2,322	1/3Q	2,392	1/3Q	13,165
Current Intelligence & Portal	Various	Various/ Various	3,224	1,606	1/3Q	1,650	1/3Q	1,723	1/3Q	8,203
Wargaming	SS/CPAF	JNIC - Northrop Grumman/ Shriever AFB,CO	1,030	822	1/2Q	1,000	1/2Q	1,089	1/2Q	3,941
Studies & Scenario Development	Various	Various/ Various	1,640	670	2/4Q	690	2/4Q	711	2/4Q	3,711
Special Intelligence Community Analysis	SS/Variou s	NASIC, ONI, NGIC, DIA, MSIC/ Washington, DC, Huntsville, AL	0	0	N/A	2,292	1/3Q	3,502	1/3Q	5,794
<b>Subtotal Support Costs</b>			<b>42,223</b>	<b>12,912</b>		<b>15,833</b>		<b>17,537</b>		<b>88,505</b>

**Remarks**

**III. Test and Evaluation Cost ( \$ in Thousands )**

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

**Remarks**

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Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis								Date February 2007		
APPROPRIATION/BUDGET ACTIVITY RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)					R-1 NOMENCLATURE 0603890C Ballistic Missile Defense System Core					
<b>IV. Management Services Cost ( \$ in Thousands )</b>										
Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2007 Cost	FY 2007 Award/ Oblg Date	FY 2008 Cost	FY 2008 Award/ Oblg Date	FY 2009 Cost	FY 2009 Award/ Oblg Date	Total Cost
<b>BMDS Certification</b>										
Certification & Validation Support	FFRDC	Multiple/ Los Angeles, CA; Ft Monmouth, NJ	3,365	3,281	1/2Q	2,925	1/2Q	3,012	1/2Q	12,583
<b>Intelligence</b>										
Project Management Support	FFRDC	SMC (Aerospace)/ Los Angeles, CA	2,490	990	1Q	1,029	1Q	1,060	1Q	5,569
Project Management	C/FFP	BAH/ McLean, VA	12,606	2,862	1/4Q	2,947	1/4Q	3,036	1/4Q	21,451
Project Management	SS/TM	PRA/ San Diego, CA	3,051	1,400	1/3Q	1,456	1/3Q	1,514	1/4Q	7,421
Subtotal Management Services			21,512	8,533		8,357		8,622		47,024
<b>Remarks</b>										
Project Total Cost			63,735	21,445		24,190		26,159		135,529
<b>Remarks</b>										





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Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail						Date February 2007		
APPROPRIATION/BUDGET ACTIVITY RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)				R-1 NOMENCLATURE 0603890C Ballistic Missile Defense System Core				
Schedule Profile	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
<b>Intelligence</b>								
Update and Maintain Foreign Missile Knowledge Base	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q
Intelligence Briefings	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q
Wargaming Support	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q
Intelligence Support Center	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q
Studies and Scenario Development	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q
<b>Counterintelligence</b>								
CI Investigations & Operations Updates	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q
Defense Threat Assessments	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q
Intelligence Information Reports	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q
Multi-Discipline CI Threat Assessments	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q
Travel Briefings & Debriefings	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q
<b>BMDS Certification</b>								
Certification and Accreditation	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q
Systems Engineering & Validation	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q

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<b>APPROPRIATION/BUDGET ACTIVITY</b>				<b>R-1 NOMENCLATURE</b>				
<b>RDT&amp;E, DW/04 Advanced Component Development and Prototypes (ACD&amp;P)</b>				<b>0603890C Ballistic Missile Defense System Core</b>				

COST (\$ in Thousands)	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
0103 Producibility & Manufacturing Technology	31,248	36,243	37,615	41,080	43,091	43,840	45,193	45,926
RDT&E Articles Qty	0	0	0	0	0	0	0	0

**A. Mission Description and Budget Item Justification**

Producibility and Manufacturing Technology is integral to MDA's capability-based acquisition strategy that emphasizes testing, spiral development, and evolutionary acquisition through the implementation of two-year capability blocks. As an essential component of strong systems engineering practices, Producibility Manufacturing provides common, integrated programs across the BMDS Elements to ensure mature industrial manufacturing capabilities are available to the Blocks through risk reduction, cost reduction/avoidance, and performance enhancement. Producibility Manufacturing furthers efforts in commonality and spreads best practices for producibility and manufacturing across the BMDS Elements by cooperatively funding and leveraging efforts.

Producibility and Manufacturing Technology provides crosscutting BMDS manufacturing risk assessments, industrial capability assessments, and near term (1-3 year) producibility enhancements. Manufacturing risk assessments are accomplished through Engineering and Manufacturing Readiness Level (EMRL) Assessments, the Producibility Manufacturing systems engineering tool that employs widespread industry and BMDS Element interaction to analyze the maturity of manufacturing processes for BMDS and the Elements that insert into the BMDS Risk Management Process. Industrial Capability Assessments (ICAs) are accomplished broadly across the BMDS Industrial Base where trades are performed to assess and analyze the original equipment manufacturers (OEMs), supplier base, and others that produce end items for the BMDS. Near term producibility enhancements are accomplished through efforts in a number of key investment areas: Power Systems, Radiation Hardening (RAD HARD), Manufacturing Process Improvements, Electro-Optics/Infrared (EO/IR), Radar RF / Electronics, Propulsion, Advanced Materials and Structures, Anti-Tamper, and additional areas as required for integration efforts of Next Generation Sensor Producibility Program. All Producibility and Manufacturing Technology investments within these areas are applied towards near term manufacturing improvements/producibility enhancements. These efforts are programmed for BMDS Element integration within a three to five year timeframe.

MDA has designated Producibility 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. Producibility and Manufacturing is also representing MDA on the OSD CPI Steering Committee which is establishing policy, procedures, and responsibilities to institutionalize continuous process improvement as a primary approach to analyze and improve DoD processes to be more efficient and effective in support of the warfighter.

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<b>B. Accomplishments/Planned Program</b>				
	FY 2006	FY 2007	FY 2008	FY 2009
Power Systems	3,000	2,500	3,206	5,626
RDT&E Articles (Quantity)	0	0	0	0
<p>The Power Systems objective is to establish a long-term, viable, world-class manufacturer of high performance thermal batteries that are responsive to requirements with respect to quality, delivery, and price for various configurations of thermal batteries. To accomplish this, Power Systems projects focus on providing alternative higher energy density power sources for BMDS systems that are more producible, reliable, and predictable. Projects also focus on developing new and improving manufacturing technologies and processes as well as the development of second source vendors with alternate technologies. These projects include advanced but available thermal power sources for interceptors, as well as other advanced primaries for Ground Based Interceptor and THAAD Program Kill Vehicles. Higher density secondary (rechargeable) power sources for missile defense applications and advanced but available solar array technology that can be hardened against natural and enhanced radiation environments are also required.</p> <p>Eagle Picher (EP) Projects: Lithium oxyhalide batteries for Ground Based Interceptor Exoatmospheric Kill Vehicles (EKV) and THAAD Kill Vehicles are mostly handmade, built from drawings and procedures that are not sufficiently capable of conveying the subtleties of construction. Improve EP responsiveness with respect to quality, delivery and price by initiating several Manufacturing and Producibility improvement projects. This includes the implementation of six-sigma lean and best manufacturing techniques in order to optimize oxyhalide battery production. Under the MDA effort, the oxyhalide manufacturing area underwent a full Value Stream Mapping (VSM) exercise that resulted in an optimized “to be” layout that improves production flow, reduces task time and production costs. EP plans to implement these changes as the EKV and THAAD production schedules allow. There is also a plan to implement a software-based expert system that allows battery assembly workers to automatically access highly detailed build and inspection procedures for lithium oxyhalide and thermal batteries. The MDA funded projects includes a program to assist Eagle-Picher in developing high fidelity battery design, performance, and process models that allow for optimized and improved design and manufacturability of MDA batteries. Lastly, next generation Lithium-Ion (Li-ion) cell manufacturing and testing for MDA space systems is scheduled to begin as part of a multi-agency effort. The objective is to supplant Nickel-Hydrogen (NiH2) cells for energy intensive applications within six years.</p> <p>ENSER Projects: Follow-on efforts for several SBIR derived improvements to thermal batteries are planned to commence. These efforts are enabling for MKV KV and Aegis BMDS TDACS batteries. Both are currently volume constrained and implementing in-situ cathode and tape-cast production processes (both proven technologies) allow these currently state-of-the art thermal batteries to achieve program stretch goals. These efforts are complemented and leveraged by Defense Production Act Title III investment at ENSER.</p>				

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<p>FY06 Program Accomplishments:</p> <ul style="list-style-type: none"><li>• Completed EP Modeling effort allowed for quick redesign of flawed SM-3 KV battery mounting bracket.</li><li>• Completed EP Modeling effort allowed for optimized redesign of OBV Stage 2 TVC battery, triggered by battery lot failures.</li><li>• Developed THAAD cathode production process enhancements for future inclusion in KVB.</li><li>• Improved THAAD cell case (a current supply chain issue) manufacturing efforts began, with production to begin in CY2007.</li><li>• Improved MDA battery manufacturing system hardware fully implemented, software integration continues.</li><li>• Finished development of an Advanced Lithium-Ion Battery and management system for space applications.</li><li>• Implemented production enhancements at ENSER for successful completion of PAC-3 CRI battery qualification.</li><li>• Completed THAAD low temperature electrolyte effort for KVB successfully passed enhanced testing, achieving all goals.</li></ul> <p>FY07 Planned Program:</p> <ul style="list-style-type: none"><li>• Complete second source battery for GBI EKV (on hold in FY06 pending program delay).</li><li>• MDA Battery Steering Group - Maintaining and prioritizing MDA/DEP Battery investments.</li><li>• Complete the majority of the Eagle Picher (EP) manufacturing improvement projects.</li><li>• Continue development of Advanced Lithium-Ion Battery for space applications.</li><li>• Begin THAAD KVB re-qualification, implementing the first round of manufacturability improvements.</li><li>• Begin optimization of THAAD electrolyte to address a reliability issue.</li><li>• Start first round validation testing of a joint EP/Sandia Labs thermal battery modeling effort.</li><li>• Demonstrate ENSER next generation thermal battery technologies.</li></ul> <p>FY08 Planned Program:</p> <ul style="list-style-type: none"><li>• Completion of all EP Projects except advanced modeling effort (reduces production process variability).</li><li>• Complete THAAD improved KVB efforts.</li><li>• MDA Battery Steering Group - Maintaining and prioritizing MDA/MP Battery investments.</li><li>• EKV second source battery ready for qualification.</li><li>• Begin life cycle testing and performance model estimations for advanced Li-ion cells.</li><li>• Complete effort for insertion of ENSER next generation thermal battery technology.</li></ul>		

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FY09 Planned Program				
<ul style="list-style-type: none"> <li>Continue projects that started in FY08 and include demonstrations that allow for the transition of producible, modular, scalable, and affordable technology to the BMDS.</li> </ul>				
	FY 2006	FY 2007	FY 2008	FY 2009
Radiation Hardening	10,456	12,098	6,284	6,672
RDT&E Articles (Quantity)	0	0	0	0
<p>The Radiation Hardening objective is to provide an integrated strategy to increase the availability of affordable Radiation Hardened (RH) and Radiation Tolerant (RT) devices for BMDS. Efforts include: support of programs at established foundries for critical devices being developed under the Radiation Hardening Oversight Council (RHOC), support programs at specified commercial foundries that utilize special Hardness by Design (HBD) rules to enhance radiation hardness with commercial manufacturing processes and practices, enhanced circuit modeling and simulation capabilities to better predict radiation hardness levels, developing a catalog of RH and RT devices available to MDA system designers, and exploring alternate hardening techniques. These generic radiation hardening advancements executed in this area do not relate to Ballistic Missile Defense System specific contractor deficiencies nor indicate security sensitivities.</p>				
FY06 Program Accomplishments:				
<ul style="list-style-type: none"> <li>Promulgated MDA core standard Common Inertial Measurement Unit (IMU), MDA-STD-005, using Institute of Electrical and Electronics Engineers (IEEE) 1394b-2002 standard for interface electronics capable of IMU interchangeability</li> <li>Completed Field Programmable Gate Array (FPGA) test structure device and radiation characterization involving the use of a commercial FPGA without the hard wired PowerPC processor cores</li> <li>Produced RH nuclear event detector for missile applications to minimize shielding and maximize survivability</li> <li>Conducted RT sensor chip assembly testing of Standard Missile three long wave two color IR and representative single color IR sensors relative to MDA core standard High Altitude Exo-Atmospheric Nuclear Survivability (HAENS), MDA-STD-001</li> <li>Conducted HAENS standard testing of focal plane array test structure devices (very long wave IR, visible and associated cryogenic read-out integrated circuits) and other commercial electronic devices including IMU relevant electronics</li> <li>Continued development, packaging and assessment of Non-Volatile Chalcogenide Random Access Memory (CRAM) and Electrically Erasable Programmable Read Out Memory (EEPROM) devices</li> <li>Completed HMX9225 RH 12-bit analog to digital converter device qualification</li> </ul>				

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**FY07 Planned Program:**

- Augment MDA-STD-005 with a MDA core standard for adaptable guidance navigation and control (GNC)
- Start Common IMU design development in support of MDA-STD-005 with interface electronics capable of IMU interchangeability
- Continue RT FPGA development and assessment involving the use of commercial FPGAs without hard wired PowerPC processor cores.
- Start RT sensor chip assembly testing of Space Tracking and Surveillance System very long wave (VLW) IR and visible sensors relative to MDA-STD-001
- Continue HAENS standard testing of focal plane array test structures (one and two color IR, visible or associated cryogenic read-out integrated circuits) and other commercial electronic devices to include Common IMU interface, IEEE 1394b-2002 electronics

**FY08 Planned Program:**

- Continue Common IMU/GNC producibility demonstration in support of MDA-STD-005 with nuclear survivability capability per MDA-STD-001
- Continue RT FPGA development and assessment involving the use of commercial FPGAs with hard wired PowerPC processor cores
- Start RT sensor chip assembly testing of Multiple Kill Vehicles long wave IR and visible sensors relative to MDA-STD-001.
- Conduct HAENS standard testing of silicon germanium radio frequency and focal plane array test devices (light amplification detection and ranging or visible sensors with associated read-out integrated circuits) and other survivable optoelectronic devices to include Common IMU optical components.

**FY 09 Planned Program:**

- The FY09 effort will continue projects that started in FY08 and include demonstrations that will aid in the transition of producible, modular, scalable, and affordable technology to the BMDS.

	FY 2006	FY 2007	FY 2008	FY 2009
Manufacturing Process Improvements	4,200	1,500	2,818	3,631
RDT&E Articles (Quantity)	0	0	0	0

The Manufacturing Process Improvements objective is to identify manufacturing processes and practices that serve both short-term and long-term MDA requirements. Efforts to accomplish this include: reducing unit cost for major subsystems in MDA systems, exploiting commercial practices to reduce capitalization costs, reducing timelines for long lead items through rapid prototyping of items with audit trail to demonstrated manufacturing heritage, eliminating hazardous or difficult to obtain materials that may add to cost and schedule, introducing metrics such as Engineering and Manufacturing Readiness Levels (EMRLs) to assure technologies are ready for insertion in MDA systems, and providing prime contractors and

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<p>major subcontractors with support to adopt best practices and lean manufacturing to enhance productivity. Additionally this area addresses overarching industrial base issues such as supply chain management, critical suppliers, parts obsolescence, and technology refresh.</p> <p>FY06 Program Accomplishments:</p> <ul style="list-style-type: none"> <li>• Completed Technology Refresh and Technology Roadmapping Management integration project on Low cost Kill Vehicle (TRENT for LCKV). The potential cost avoidance from using common designs in collaborative R&amp;D management is up to 15% of the development costs or up to \$42 Million over 3 years.</li> <li>• Completed Robust Lean Supply Network (RLSN) risk assessment project leading to the discovery and mitigation of a supply chain shortage in a sub-tier Titanium supplier. The RLSN effort led to an \$8.7 M cost avoidance and 9 month delay avoidance for the Exoatmospheric Kill Vehicle program at Raytheon Missile Systems. Total cost avoidance for all risks identified in this project was \$115 Million.</li> <li>• Developed Manufacturing Readiness Level Assist Tool web application program including MRL knowledge base questions</li> <li>• Initiated development of “Whisker Tough” Conformal Coatings, and accelerated Tin Whisker Puncture Test Technology</li> <li>• Conducted Lean Pathways events at several prime/original equipment manufacturers (OEMs) and supplier companies</li> </ul> <p>FY07 Planned Program:</p> <ul style="list-style-type: none"> <li>• Deploy an interactive supply chain map project that will allow geographic presentation of suppliers, as well as mapping by functional subsystem and across missile systems.</li> <li>• Expand risk assessment tools to include manufacturing readiness levels and Engineering Manufacturing Readiness Levels evaluation capability.</li> <li>• Enhance MRL tool features and expand/improve MRL Assist knowledge base.</li> <li>• Continue industry and government collaborative activities in technology roadmapping for obsolescence management and technology insertion management.</li> <li>• Complete Obsolescence Desk Guide for MDA.</li> <li>• Continue inter-service activities in manufacturing technology.</li> <li>• Complete PAC-3 Lean Pathways effort.</li> <li>• Begin rollout of Continuous Process Improvement in MDA.</li> <li>• Complete and issue Interim Conformal Coating Guideline and conduct Coating modeling, polymer improvements, and accelerated testing for development of “Whisker Tough” coatings.</li> <li>• Host the Defense Manufacturing Conference.</li> </ul>		

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**FY08 Planned Program:**

- Investigate Supply Chain Management of Tin Whiskers Issue leading to guidelines/best practices.
- Integrate technology refresh and critical supplier results into corporate MDA risk mitigation strategy.
- MDA Mission reliability issues- examine unique identification codes for MDA system parts to address parts quality, origin, traceability, and other performance supply chain issues
- Expand interactive supply chain mapping capability to other MDA programs
- Develop improved Imbedded Die tooling for enhanced production throughput
- Develop/deploy MRL Desktop Application including interface with Know How and BMP Databases
- Complete development of “Whisker Tough” coatings; draft and issue report/guidelines
- Initiate Continuous Process Improvement efforts for internal and external MDA customers

**FY09 Planned Program:**

- The FY09 effort will continue projects that started in FY08 and include demonstrations that will aid in the transition of producible, modular, scalable, and affordable technology to the BMDS.

	FY 2006	FY 2007	FY 2008	FY 2009
Electro-Optics/Infrared (EO/IR)	7,415	8,145	13,349	12,699
RDT&E Articles (Quantity)	0	0	0	0

The Electro-Optics/Infrared (EO/IR) objective is to implement producibility and reliability programs to assure availability of Radiation Hardened (RH) and Radiation Tolerant Infrared (RT IR) and visible Focal Plane Arrays (FPAs), readouts, cryocoolers and optics to meet the diverse requirements of BMDS systems for missile and satellite environments.

**FY06 Program Accomplishments:**

- Developed RH Scalable Missile Telescopes - low cost alternative materials and processing development and assessment.
- Developed RH SiC Mirror low cost silver reflective coating with second nitride overcoat applications.
- Produced Two Color (LW/LW) IR FPAs and gamma suppression.
- Developed RH Split cryocooler low cost and rad hard for both space and missile applications.
- Developed RH Visible low cost bulk SiCMOS arrays.
- Developed shielding device cable for neutron and warm x-ray protection.

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**FY07 Planned Program:**

- Continue to assess and develop of the RH Scalable Missile Telescopes and radiation hardening of alternative materials.
- Develop Silicon Carbide (SiC) Mirrors polishing and radiation hardened coatings technology.
- Continue the LIDAR Detector radiation hardening
- Develop and improve RH (proton radiation) large 256X256 array VLWIR Detectors for missile and satellite applications.
- Develop RH Visible Sensors for missile and satellite surveillance applications.

**FY08 Planned Program:**

- Conduct a Flight testing SiC optics 2-color IR FPAs. This will include seeking the availability of a Common sensor Electronics and a High Bandwidth Telemetry.

**FY09 Planned Program:**

- The FY09 effort will continue projects that started in FY08 and include demonstrations that will aid in the transition of producible, modular, scalable, and affordable technology to the BMDS.

	FY 2006	FY 2007	FY 2008	FY 2009
Radar RF / Electronics	1,762	3,500	2,877	2,877
RDT&E Articles (Quantity)	0	0	0	0

The Radar RF / Electronics objective is to provide subsystem improvements to enhance BMDS radar performance and sensitivity for emerging threats. Efforts to accomplish this will include: demonstrating producibility and reliability of high-power amplifiers, introducing producible materials and technologies to enhance thermal management, improving manufacturability of Transmit/Receive (T/R) Modules and Transmit/Receive Integrated Microwave Modules (TRIMMs) for cost and schedule, introducing Open System approaches and architecture to prevent parts obsolescence and stimulate competition at the subsystem level, and introducing composite materials to reduce antenna weight and improve transportability.

**FY06 Program Accomplishments:**

- Continued the High Power Electronics Reliability Test program - Conducted reliability testing of High Voltage Gallium Arsenide (GaAs) Microwave Monolithic Integrated Circuits (MMICs) at Naval Research Lab (NRL).
- Conducted reliability testing of Gallium Nitride (GaN) devices at NRL and Air Force Research Lab (AFRL).
- Completed the Joint High Voltage GaAs MMIC Producibility program - produce MMIC lots for independent reliability testing.

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- Continued the Joint 4-inch Diameter Semi-Insulating (SI) SiC Wafer Producibility program with AFRL.
- Conducted Hardware-in-the-Loop (HWIL) testing of Advanced Optical Processor (AOP) 2 Architecture - field testing to gather target data.

**FY07 Planned Program:**

- Continue the High Power Electronics Reliability Test program - complete reliability testing of High Voltage GaAs MMICs at NRL.
- Continue to conduct reliability testing of GaN devices and MMICs at NRL and AFRL.
- Continue the 4-inch Diameter SI SiC Wafer Producibility program - introduce second source for 4-inch SI SiC wafers.
- Initiate the Joint (with AFRL) GaN wafer Producibility Program to develop a source for large area GaN wafers to support GaN devices.

**FY08 Planned Program:**

- Continue the High Power Electronics Reliability Test program .
- Continue to conduct reliability testing of GaN devices and MMICs at NRL and AFRL.
- Complete the 4-inch Diameter SI SiC Wafer Producibility program - introduce second source for 4-inch SI SiC wafers.
- Continue the Joint (with AFRL) GaN wafer Producibility Program.
- Develop a source for large area GaN wafers to support GaN devices.

**FY09 Planned Program:**

- The FY09 effort will continue projects that started in FY08 and include demonstrations that will aid in the transition of producible, modular, scalable, and affordable technology to the BMDS.

	FY 2006	FY 2007	FY 2008	FY 2009
Propulsion	3,115	4,000	4,188	4,189
RDT&E Articles (Quantity)	0	0	0	0

The Propulsion objective is to provide affordable, reliable propulsion systems/subsystems for the BMDS Elements. Efforts to achieve this objective will include: introducing innovative high-temperature materials to replace refractory metals reducing cost, weight and manufacturing time; implementing lean manufacturing and quality control to recapture cost and schedule for affected BMDS Elements; and executing programs to address scalability in propulsion systems addressing endurance, erosion resistance and improved manufacturing processes.

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<p>FY06 Program Accomplishments:</p> <ul style="list-style-type: none"><li>• Successfully completed hot fire tests of the SM-3 Throttling Direct and Attitude Control (TDACS) in cooperation with the Aegis BMD program. Aegis BMD has incorporated the TDACS as part of the baseline for the SM-3 Block 1B kinetic warhead. This system will reduce the cost, improve manufacturing throughput and introduce modularity in a kill vehicle</li><li>• Conducted pathfinder hot fire tests of an embedded divert thruster for controllable solid DACS. These three pathfinder tests were completed and planning and engineering activities were executed to package four divert thrusters into a kill vehicle like DACS system. This program was initiated as a risk reduction activity to the original baseline multiple kill vehicle kill vehicle DACS.</li><li>• Completed detailed design and analysis and initial fabrication of the pathfinder SM-3 TDACS braided nozzle. This program uses braided C-SiC, to reduce part count and improve performance for BMDS applications.</li><li>• Completed physical and toughness characterization activities for materials generated for propulsion systems. These data are used to anchor thermal and structural models exercised by design engineers to ensure the designs are adequate reducing mission assurance concerns.</li><li>• Initiated activities to explore low cost manufacturing processes and products for liquid DACS systems.</li></ul> <p>FY07 Planned Program:</p> <ul style="list-style-type: none"><li>• Execute hot gas tests for the risk reduction program for the MKV program. These tests will provide data to verify analytic results from the design engineers. Additional activities will include a knowledge point to change the packaging techniques and size of the controllable solid DACS.</li><li>• Execute hot gas testing of braided C-SiC thruster assemblies</li><li>• Continue material characteristics testing of high temperature materials for propulsion system applications</li><li>• Generate a developmental roadmap to guide technology development for future controllable solid DACS systems</li><li>• Execute program to complete detailed design and initial hardware fabrication for low cost liquid DACS components for testing in FY08. . Execute a program to assess the capability of Lyocell as a domestically available rayon replacement material for use in solid rocket motor nozzles.</li></ul> <p>FY08 Planned Program:</p> <ul style="list-style-type: none"><li>• Conduct trade studies and hardware design and fabrication for the next generation controllable solid DACS as a risk reduction activity for MDA interceptors.</li><li>• Execute component level testing of the low cost liquid DACS components such as valves, regulators, pressurization systems and tanks.</li><li>• Continue to complete material characterization for ultra high temperature materials and components developed under the SBIR and core funded activities.</li></ul>		

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- Execute program to address near-term technology needs for future BMDS interceptor propulsion systems.

**FY09 Planned Program:**

- The FY09 effort will continue projects that started in FY08 and include demonstrations that will aid in the transition of producible, modular, scalable, and affordable technology to the BMDS.

	FY 2006	FY 2007	FY 2008	FY 2009
Advanced Materials & Structures	1,300	2,500	2,893	3,386
RDT&E Articles (Quantity)	0	0	0	0

The Advanced Materials & Structures objective is to replace exotic material such as Beryllium and Lithium Aluminum alloys with polymer matrix composites (PMCs) and metal matrix composites (MMCs) that exhibit equivalent strength and stiffness while being more easily producible at a lower cost. Program also aims to provide manufacturing processes, similar to those in commercial industry, that allow rapid prototyping and limited production without long lead times for: Interceptor and KV structures, Radar and EO Seekers, and missile canisters and launchers.

**FY06 Program Accomplishments:**

- Developed a Composite Mirror Structure assembly more amenable to radiation hardening at a reduced cost
- Developed a thermal protection system to protect the first and second stage KEI
- Developed a lightweight, composite electronic enclosure assembly
- Redesigned the wiring harness assembly for improved producibility
- Developed composite materials for the redesign of the SM3/SM6 dorsal fin for improved performance and enhanced producibility
- Produced prototype test coupons for the characterized preliminary materials for a low cost, enhanced performance KEI nosecone

**FY07 Planned Program:**

- Initiate effort to characterize and qualify Lyocell material as a substitute for rayon fiber for solid rocket motor nozzle components
- Develop a modular, scalable, low cost, producible mirror assembly structure that is more amenable to radiation hardening
- Develop a modular, scalable, low cost, producible Liquid Divert and Attitude Control System (LDACS) Structure
- Redesign the SM3/SM6 dorsal fin for improved performance and enhanced production
- Invest in producibility enhancements for KEI nosecone that passes rain erosion tests
- Develop a modular, scalable, low cost, producible bulkhead for the KEI Attitude Control System

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**FY08 Planned Program:**

- Continue to focus on advanced materials in radiation hardening, structures, mirrors, thermal management and propulsion that could assist modular or scalable efforts on kill vehicles and missile structures that reduce cycle times and enhance BMDS performance.

**FY09 Planned Program:**

- The FY09 effort will continue projects that started in FY08 and include demonstrations that will aid in the transition of producible, modular, scalable, and affordable technology to the BMDS.

	FY 2006	FY 2007	FY 2008	FY 2009
Anti-Tamper	0	2,000	2,000	2,000
RDT&E Articles (Quantity)	0	0	0	0

The Anti-Tamper objective is to provide protection against reverse engineering of BMDS critical technologies vulnerable to exploitation as a result of Battlefield Loss, Foreign Military Sales (FMS), or Cooperative Development. Robust Anti-Tamper solutions support coalition warfare and extend the effective operational life of the BMDS.

**FY06 Accomplishments:**

- Matured hard-drive destruct technology from TRL 5 to TRL 7 (system/subsystem test in an operational environment).
- Initiated development of a BMDS Anti-Tamper Standard.

**FY07 Planned Program:**

- High-level plan for FY07 involves three focus areas: (1) Command Destruct continue to mature command destruct technology to protect data residing on computer hard-drives, while limiting collateral damage to surrounding systems or personnel. (2) Software Solutions continue to develop protective software solutions that provide robust tamper protection at minimal cost and with minimal system redesign and (3) Specialized Solutions continue to leverage DoD investment in long-lead time protection technologies that will provide robust protection while minimizing non-recurring expenses.
- Leverage DoD investments to develop and mature the following protective technologies:
  - Tamper-resistant embedded processors for BMDS family of Kill Vehicles.
  - Conduct links for hidden AT circuit applications.
  - Lightweight passive and active protective coatings (X-ray obscurants, etc).
  - Energetic materials for assured destruction of critical technologies and information.

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Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date <b>February 2007</b>
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APPROPRIATION/BUDGET ACTIVITY <b>RDT&amp;E, DW/04 Advanced Component Development and Prototypes (ACD&amp;P)</b>	R-1 NOMENCLATURE <b>0603890C Ballistic Missile Defense System Core</b>
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- Technology enhancements to facilitate protection of Real Time Operating Systems (RTOS).
- Insertion of protective capabilities during legacy code re-use for JTAG protection.

**FY 08 Planned Program**

- Continue development of protective Anti-Tamper technologies.
- Continue development of tamper-resistant embedded processors for BMDS family of Kill Vehicles.
- Continue development of conductive inks for hidden AT circuit applications.
- Continue to develop lightweight passive and active protective coatings (X-ray obscurants, etc).
- Continue development of energetic materials for assured destruction of critical technologies and information.
- Continue efforts to protect Real Time Operating Systems (RTOS).
- Solidify insertion plans for protective capabilities during legacy code re-use.
- JTAG protection
- Initiate transition plans and tailor above anti-tamper technologies for utilization on and protection of BMDS systems.
- Work with the BMDS to identify critical technologies and identify anti-tamper solutions.

**FY09 Planned Program:**

- The FY09 effort will continue projects that started in FY08 and include demonstrations that will aid in the transition of producible, modular, scalable, and affordable technology to the BMDS.

**C. Other Program Funding Summary**

	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	Total Cost
PE 0603175C Ballistic Missile Defense Technology	147,270	193,307	118,569	109,540	116,014	121,008	127,917	131,291	1,064,916
PE 0603881C Ballistic Missile Defense Terminal Defense Segment	1,120,879	1,092,076	962,585	1,004,282	924,101	851,213	678,694	501,147	7,134,977
PE 0603882C Ballistic Missile Defense Midcourse Defense Segment	2,391,246	3,043,058	2,520,064	2,359,665	2,179,602	1,699,963	1,153,082	1,183,003	16,529,683
PE 0603883C Ballistic Missile Defense Boost Defense Segment	455,572	628,958	548,759	432,432	448,375	678,913	829,683	1,026,239	5,048,931
PE 0603884C Ballistic Missile Defense Sensors	284,297	514,129	778,163	984,963	939,417	791,701	723,843	603,585	5,620,098
PE 0603886C Ballistic Missile Defense System Interceptors	200,446	356,004	227,499	393,317	522,388	730,236	836,029	570,206	3,836,125

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<b>Missile Defense Agency (MDA) Exhibit R-2A RDT&amp;E Project Justification</b>	Date <b>February 2007</b>
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<b>APPROPRIATION/BUDGET ACTIVITY</b> <b>RDT&amp;E, DW/04 Advanced Component Development and Prototypes (ACD&amp;P)</b>	<b>R-1 NOMENCLATURE</b> <b>0603890C Ballistic Missile Defense System Core</b>
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	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	Total Cost
PE 0603888C Ballistic Missile Defense Test and Targets	610,619	601,782	586,150	628,364	662,984	681,511	696,037	705,210	5,172,657
PE 0603889C Ballistic Missile Defense Products	387,402	0	0	0	0	0	0	0	387,402
PE 0603891C Special Programs - MDA	271,021	353,031	323,250	305,409	369,073	526,966	789,017	792,271	3,730,038
PE 0603892C Ballistic Missile Defense Aegis	893,040	1,122,669	1,059,103	1,129,425	1,221,650	1,067,587	1,054,753	1,089,078	8,637,305
PE 0603893C Space Tracking & Surveillance System	220,048	322,220	331,525	347,811	412,623	501,197	778,067	981,424	3,894,915
PE 0603894C Multiple Kill Vehicle	48,370	144,362	271,151	352,741	461,179	618,263	673,477	842,905	3,412,448
PE 0603895C BMD System Space Program	0	0	27,666	35,093	46,849	56,183	133,617	157,117	456,525
PE 0603896C BMD C2BMC	0	246,852	258,913	294,627	300,847	282,615	267,275	269,420	1,920,549
PE 0603897C BMD Hercules	0	49,674	53,658	54,264	54,405	55,142	53,355	54,198	374,696
PE 0603898C BMD Joint Warfighter Support	0	54,935	48,787	50,428	54,086	56,603	58,890	60,206	383,935
PE 0603904C BMD Joint National Integration Center (JNIC)	0	110,629	104,012	106,985	111,542	111,947	113,592	115,287	773,994
PE 0603905C BMD Concurrent Test and Operations	0	23,159	0	0	0	0	0	0	23,159
PE 0603906C Regarding Trench	0	0	2,000	3,000	5,000	5,000	9,000	9,000	33,000
PE 0605502C Small Business Innovative Research - MDA	133,105	0	0	0	0	0	0	0	133,105
PE 0901585C Pentagon Reservation	14,874	15,527	6,058	6,376	4,490	4,725	4,801	4,877	61,728
PE 0901598C Management Headquarters - MDA	98,609	87,059	85,906	86,453	70,355	69,855	69,855	69,855	637,947

**D. Acquisition Strategy**

Producibility and Manufacturing Technology (MP) adheres to MDA's capability-based acquisition strategy that emphasizes testing, spiral development, and evolutionary acquisition through the use of two-year capability blocks. Working with the BMDS Elements, MP identifies and executes programs that improve manufacturing and producibility for the BMDS. This is accomplished by leveraging maturing manufacturing technologies with the services and other government agencies. MP also leverages industry investments and uses Element cost share in hardware for component producibility improvements. For efficiency, MP utilizes existing MDA and service contract vehicles when possible to execute the program.

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Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis								Date February 2007		
APPROPRIATION/BUDGET ACTIVITY RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)					R-1 NOMENCLATURE 0603890C Ballistic Missile Defense System Core					
<b>I. Product Development Cost ( \$ in Thousands )</b>										
Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2007 Cost	FY 2007 Award/ Oblg Date	FY 2008 Cost	FY 2008 Award/ Oblg Date	FY 2009 Cost	FY 2009 Award/ Oblg Date	Total Cost
<b>Power Systems</b>										
Battery Efforts	MIPR	NSWC/ Crane, IN	6,567	1,657	1Q	2,405	1Q	4,825	1Q	15,454
<b>Radiation Hardening</b>										
Rad Hard	CPFF	AFRL/ Kirtland, NM	9,791	4,303	1Q	1,438	1Q	1,826	1Q	17,358
Rad Hard	MIPR	SMDC/ Huntsville, AL	7,853	2,943	1Q	1,586	1Q	1,586	1Q	13,968
Rad Hard	MIPR	NRL/Wash, DC	7,845	2,700	1/2Q	1,150	1Q	1,150	1Q	12,845
<b>Manufacturing Process Improvements</b>										
Tech Refresh/RLSN	CPFF	ATI	2,200	400	1Q	900	1/2Q	900	1/2Q	4,400
Tin Whisker	CPFF	ONR/VA	908	200	1Q	800	1/2Q	800	1/2Q	2,708
Manufacturing Processes	MIPR	Crane	310	81	1/2Q	100	1Q	100	1Q	591
<b>Electro-Optics/Infrared (EO/IR)</b>										
EO/IR	MIPR	AFRL/ Kirtland, NM	10,597	2,741	1Q	5,761	1/2Q	5,761	1/2Q	24,860
EO/IR	CPFF	Fibertek/ Hendon, VA	5,044	1,260	1/2Q	2,980	1/2Q	2,080	1/2Q	11,364
EO/IR	CPFF	Ampwave/ Cleveland, OH	4,887	1,500	1Q	1,800	1Q	1,800	1Q	9,987
EO/IR	MIPR	DMEA/ MCLELLAN, CA	1,500	1,500	1Q	1,800	1Q	1,800	1Q	6,600
<b>Radar RF / Electronics</b>										
SiC MMIC	CPFF	AFRL/ Kirtland, NM	1,450	1,000	1Q	1,000	1/2Q	1,000	1/2Q	4,450

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Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis								Date February 2007		
APPROPRIATION/BUDGET ACTIVITY RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)					R-1 NOMENCLATURE 0603890C Ballistic Missile Defense System Core					
Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2007 Cost	FY 2007 Award/ Oblg Date	FY 2008 Cost	FY 2008 Award/ Oblg Date	FY 2009 Cost	FY 2009 Award/ Oblg Date	Total Cost
RF Device Test	MIPR	NRL/ Washington, DC	1,076	681	1Q	200	1/2Q	200	1/2Q	2,157
High Voltage GaAs	CPFF	Triquint/TX	1,167	600	1/2Q	600	1/2Q	600	1/2Q	2,967
RF	MIPR	AFRL/ Kirtland	1,325	300	1Q	200	1/2Q	200	1/2Q	2,025
<b>Propulsion</b>										
SMDC	CPFF	Aerojet/ Sacramento, CA	5,476	2,471	1Q	2,651	1/2Q	2,651	1/2Q	13,249
Propulsion	MIPR	NSWCCD/MD	1,047	218	1Q	232	1/2Q	232	1/2Q	1,729
Propulsion	MIPR	ATK/Elkton, MD	1,050	215	1Q	220	1/2Q	228	1/2Q	1,713
Propulsion	MIPR	China Lake, CA	1,008	219	2Q	235	1/2Q	228	1/2Q	1,690
<b>Advanced Materials &amp; Structures</b>										
Advanced Materials	CPFF	San Diego Composites/ San Diego, CA	2,666	1,093	1Q	1,492	1/2Q	1,985	N/A	7,236
Advanced Materials	CPFF	Mentis Sciences, Inc./ Manchester, NH	778	304	1Q	340	1/2Q	340	N/A	1,762
Advanced Structures	CPFF	SMDC/ Huntsville, AL	2,259	335	1Q	335	1/2Q	335	N/A	3,264
<b>Anti-Tamper</b>										
Anti-Tamper	MIPR	NSWC CRANE/ CRANE, IN	0	1,188	N/A	1,271	N/A	1,223	N/A	3,682
Subtotal Product Development			76,804	27,909		29,496		31,850		166,059
<b>Remarks</b>										

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Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis							Date February 2007			
APPROPRIATION/BUDGET ACTIVITY RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)					R-1 NOMENCLATURE 0603890C Ballistic Missile Defense System Core					
<b>II. Support Costs Cost ( \$ in Thousands )</b>										
Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2007 Cost	FY 2007 Award/ Oblg Date	FY 2008 Cost	FY 2008 Award/ Oblg Date	FY 2009 Cost	FY 2009 Award/ Oblg Date	Total Cost
<b>Power Systems</b>										
Battery Efforts	MIPR	NSWC/ Crane, IN	660	250	1/2Q	250	1/2Q	250	1Q	1,410
SETA	FFP	DRC, SPARTA/ VA	1,134	356	1Q	356	1Q	356	1Q	2,202
<b>Radiation Hardening</b>										
Rad Hard	CPFF	AFRL/ Kirtland, NM	1,086	537	1Q	537	N/A	537	N/A	2,697
Rad Hard	MIPR	SMDC/ Huntsville, AL	775	393	1Q	393	4Q	393	N/A	1,954
Rad Hard	MIPR	NSWC CRANE/ IN	804	468	1Q	468	1Q	468	N/A	2,208
SETA	FFP	DRC, SPARTA/ VA	1,269	517	1Q	517	N/A	517	N/A	2,820
<b>Manufacturing Process Improvements</b>										
Tech Support	MIPR	REDCOM/AL	276	117	1Q	278	4Q	678	N/A	1,349
Tech Support	MIPR	NSWC/ Crane, IN	237	94	1Q	114	N/A	429	N/A	874
JDMTP	MIPR	ONR/VA	151	63	2Q	123	1/2Q	221	N/A	558
SETA	FFP	DRC, SPARTA/ VA	1,040	308	1Q	308	N/A	308	N/A	1,964
<b>Electro-Optics/Infrared (EO/IR)</b>										
EO/IR	MIPR	AFRL/ Kirtland, NM	966	272	1Q	178	1Q	428	1Q	1,844
EO/IR	CPFF	Fibertek/ Herndon, VA	573	139	1Q	139	1Q	139	1Q	990

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Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis								Date February 2007		
APPROPRIATION/BUDGET ACTIVITY RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)					R-1 NOMENCLATURE 0603890C Ballistic Missile Defense System Core					
Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2007 Cost	FY 2007 Award/ Oblg Date	FY 2008 Cost	FY 2008 Award/ Oblg Date	FY 2009 Cost	FY 2009 Award/ Oblg Date	Total Cost
EO/IR	CPFF	Ampwave/ Cleveland, OH	567	193	1Q	193	1Q	193	1Q	1,146
SETA	FFP	DRC, SPARTA/ VA	1,088	303	1Q	303	1Q	303	1Q	1,997
<b>Radar RF / Electronics</b>										
SiC MMIC	CPFF	CREE/NC/ Triquint/TX	141	41	1Q	41	1Q	41	1Q	264
RF Device Test	MIPR	NRL/ Washington, DC	177	65	1Q	65	1Q	65	1Q	372
High Voltage GaAs	CPFF	Triquint/TX	181	79	1/2Q	79	1/2Q	79	1/2Q	418
RF	CPFF	AFRL Kirtland, NM	217	92	1Q	92	1Q	92	1Q	493
SETA	FFP	DRC, SPARTA/ VA	1,188	405	1Q	405	1Q	405	1Q	2,403
<b>Propulsion</b>										
SMDC	CPFF	Aerojet/ Sacramento, CA	665	182	1Q	182	1/2Q	182	1Q	1,211
Propulsion	MIPR	NSWCCD/MD	135	41	1Q	41	1/2Q	41	1Q	258
Propulsion	MIPR	ATK/Elkton, MD	135	41	1Q	41	1/2Q	41	1Q	258
Propulsion	MIPR	China Lake/CA	113	41	1/2Q	41	1/2Q	41	1/2Q	236
SETA	FFP	DRC, SPARTA/ VA	1,119	335	1Q	350	1/2Q	350	1Q	2,154
<b>Advanced Materials &amp; Structures</b>										
Advanced Materials	CPFF	San Diego Composites/ San Diego, CA	280	162	1/2Q	162	1/2Q	162	1/2Q	766

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<b>Missile Defense Agency (MDA) Exhibit R-3 RDT&amp;E Project Cost Analysis</b>	Date <b>February 2007</b>
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<b>APPROPRIATION/BUDGET ACTIVITY</b> <b>RDT&amp;E, DW/04 Advanced Component Development and Prototypes (ACD&amp;P)</b>	<b>R-1 NOMENCLATURE</b> <b>0603890C Ballistic Missile Defense System Core</b>
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Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2007 Cost	FY 2007 Award/ Oblg Date	FY 2008 Cost	FY 2008 Award/ Oblg Date	FY 2009 Cost	FY 2009 Award/ Oblg Date	Total Cost
Advanced Materials	CPFF	Mentis Sciences, Inc./ Manchester, NH	106	45	1/2Q	45	1/2Q	45	1/2Q	241
Advanced Structures	CPFF	SMDC/ Huntsville, AL	252	49	1Q	49	1Q	49	1Q	399
SETA	FFP	DRC, SPARTA/ VA	884	275	1Q	275	1Q	275	1Q	1,709
<b>Anti-Tamper</b>										
SETA	FFP	DRC, SPARTA / VA	0	375	1/2Q	334	N/A	382	1/2Q	1,091
ANTI-TAMPER	MIPR	NSWC CRANE/ CRANE, IN	0	200	1/2Q	200	N/A	200	1/2Q	600
Subtotal Support Costs			16,219	6,438		6,559		7,670		36,886

**Remarks**

**III. Test and Evaluation Cost ( \$ in Thousands )**

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

**Remarks**

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Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis							Date February 2007			
APPROPRIATION/BUDGET ACTIVITY RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)					R-1 NOMENCLATURE 0603890C Ballistic Missile Defense System Core					
<b>IV. Management Services Cost ( \$ in Thousands )</b>										
Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2007 Cost	FY 2007 Award/ Oblg Date	FY 2008 Cost	FY 2008 Award/ Oblg Date	FY 2009 Cost	FY 2009 Award/ Oblg Date	Total Cost
<b>Power Systems</b>										
Govt Personnel		MDA/VA	648	237	1/2Q	195	1/2Q	195	1/2Q	1,275
<b>Radiation Hardening</b>										
Govt Personnel		MDA/VA	648	237	1/2Q	195	1Q	195	1/2Q	1,275
<b>Manufacturing Process Improvements</b>										
Govt Personnel		MDA/VA	648	237	1Q	195	1Q	195	1Q	1,275
<b>Electro-Optics/Infrared (EO/IR)</b>										
Govt Personnel		MDA/VA	648	237	1/2Q	195	1/2Q	195	1/2Q	1,275
<b>Radar RF / Electronics</b>										
Govt Personnel		MDA/VA	648	237	1/2Q	195	1/2Q	195	1/2Q	1,275
<b>Propulsion</b>										
Govt Personnel		MDA/VA	648	237	1/2Q	195	1/2Q	195	N/A	1,275
<b>Advanced Materials &amp; Structures</b>										
Govt Personnel		MDA/VA	648	237	1/2Q	195	1/2Q	195	N/A	1,275
<b>Anti-Tamper</b>										
Govt Personnel		MDA/VA	0	237	1/2Q	195	1/2Q	195	N/A	627
Subtotal Management Services			4,536	1,896		1,560		1,560		9,552
Project Total Cost			97,559	36,243		37,615		41,080		212,497
<b>Remarks</b>										

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<b>Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile</b>	Date <b>February 2007</b>
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<b>APPROPRIATION/BUDGET ACTIVITY</b> <b>RDT&amp;E, DW/04 Advanced Component Development and Prototypes (ACD&amp;P)</b>	<b>R-1 NOMENCLATURE</b> <b>0603890C Ballistic Missile Defense System Core</b>
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Fiscal Year	2006				2007				2008				2009				2010				2011				2012				2013			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
<b>Power Systems</b>																																
Li-Ion Battery Mgmt System Line	▲————▲				▲————▲																											
Complete Eagle Picher Projects					▲																											
<b>Radiation Hardening</b>																																
Block 10/12 Hardening Projects	▲————▲				▲————▲				▲————▲				▲————▲				▲————▲				▲————▲				▲————▲							
CRAM and EEPROM Production Testing	▲————▲																															
HAENS Testing	▲————▲				▲————▲				▲————▲				▲————▲				▲————▲															
IMU Core Standard	▲————▲				▲————▲				▲————▲																							
LCKV Sensor Radiation Hardened									▲————▲																							
Radiation Tolerant FPGA Device Trials									▲————▲				▲————▲				▲————▲															
LCKV Communications Electronics	▲————▲				▲————▲				▲————▲				▲————▲																			
<b>Manufacturing Process Improvements</b>																																

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

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<b>Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile</b>	Date <b>February 2007</b>
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<b>APPROPRIATION/BUDGET ACTIVITY</b> <b>RDT&amp;E, DW/04 Advanced Component Development and Prototypes (ACD&amp;P)</b>	<b>R-1 NOMENCLATURE</b> <b>0603890C Ballistic Missile Defense System Core</b>
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Fiscal Year	2006				2007				2008				2009				2010				2011				2012				2013			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
<b>Manufacturing Process Improvements</b>																																
Robust Lean Supplier Network Demonstration	▲————▲				▲																											
Dev and Deplmnt of Sup Chain Dec Spt	▲————▲				▲	▲																										
Demonstrate Tech Refresh Tool Int Concept	▲	▲			▲	▲																										
Industrial Partnership Effort with Suppliers					▲	▲			▲	▲																						
Block 08/10 Supplier Upgrades									▲																							
<b>EO/IR</b>																																
Two Color Envnmtal and Radiation Testing	▲————▲				▲	▲			▲	▲																						
Satellite Sensor Testing			▲	▲	▲	▲			▲	▲																						
Rad Hard VLWIR FPA and Visible FPA Detector Prot				▲																												
Rad Hard 1.06um Detector Testing						▲																										
Advanced Detector Testing																	▲	▲			▲	▲										
<b>Radar &amp; RF</b>																																

**Legend**

<ul style="list-style-type: none"> <li>▲ Significant Event (complete)</li> <li>★ Milestone Decision (complete)</li> <li>◆ Element Test (complete)</li> <li>◇ System Level Test (complete)</li> <li>▲————▲ Complete Activity</li> </ul>	<ul style="list-style-type: none"> <li>▲ Significant Event (planned)</li> <li>★ Milestone Decision (planned)</li> <li>◆ Element Test (planned)</li> <li>◇ System Level Test (planned)</li> <li>▲————▲ Planned Activity</li> </ul>
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<b>Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile</b>	Date <b>February 2007</b>
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<b>APPROPRIATION/BUDGET ACTIVITY</b> <b>RDT&amp;E, DW/04 Advanced Component Development and Prototypes (ACD&amp;P)</b>	<b>R-1 NOMENCLATURE</b> <b>0603890C Ballistic Missile Defense System Core</b>
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Fiscal Year	2006				2007				2008				2009				2010				2011				2012				2013			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
<b>Radar &amp; RF</b>																																
HPA/MMIC Reliability Testing	▲	▲																														
High Voltage GaAs MMIC Producibility	▲	▲																														
4-inch Diameter SiC Water Producibility	▲	▲	▲	▲	▲			▲	▲			▲																				
SiC Device Producibility Program	▲	▲																														
Radar Sub-Array Demonstrator (MPSD)	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲																				
Block 08/10 Radar Component Upgrades													▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲								
<b>Propulsion</b>																																
KEI Thruster Development	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲																
MKV Thruster Development	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲																				
Material Characterization	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲																				
SM-3 TDACS Comp Dev and Testing	▲																															
Health Monitoring and Insensitive Munitions					▲	▲			▲	▲																						
<b>Advanced Materials and Structures</b>																																

**Legend**

<ul style="list-style-type: none"> <li>▲ Significant Event (complete)</li> <li>★ Milestone Decision (complete)</li> <li>◆ Element Test (complete)</li> <li>▼ System Level Test (complete)</li> <li>▲ Complete Activity</li> </ul>	<ul style="list-style-type: none"> <li>▲ Significant Event (planned)</li> <li>★ Milestone Decision (planned)</li> <li>◆ Element Test (planned)</li> <li>▼ System Level Test (planned)</li> <li>▲ Planned Activity</li> </ul>
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**Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile**

Date  
**February 2007**

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

**R-1 NOMENCLATURE**  
**0603890C Ballistic Missile Defense System Core**

Fiscal Year	2006				2007				2008				2009				2010				2011				2012				2013			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
<b>Advanced Materials and Structures</b>																																
CC Telescope Housing Fabrication Process Testing	▲																															
KEI Cost/Weight Reduction	▲	—	—	▲	▲	—	—	▲																								
Dorsal and Control Surf Cost Reduction		▲	—	▲	▲	—	—	▲	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—		
Block 08/10 Component Material Upgrades									▲	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—		
<b>Anti Tamper</b>																																
AT Studies	▲	—	—	▲	▲	—	▲																									
Command Destruct					▲	—	—	▲	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—		
Software Modifications									▲	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—		
Specialized Solutions									▲	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—		

**Legend**

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

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Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail						Date February 2007		
APPROPRIATION/BUDGET ACTIVITY RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)				R-1 NOMENCLATURE 0603890C Ballistic Missile Defense System Core				
Schedule Profile	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
<b>Power Systems</b>								
Battery Manufacturing Improvements	1Q-2Q							
Li-Ion Battery Mgmt System Line	1Q-4Q	1Q-4Q	1Q-4Q					
Solar & Fuel Cells, High Capacity Storage Devices	4Q							
Complete Eagle Picher Projects		4Q						
Block 08/10 Power Projects			2Q-4Q	1Q-4Q	1Q-3Q			
<b>Radiation Hardening</b>								
Block 10/12 Hardening Projects	2Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-3Q	
CRAM and EEPROM Production Testing	2Q-4Q							
HAENS Testing	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q		
IMU Core Standard	1Q-4Q	1Q-4Q	1Q-4Q					
LCKV Sensor Radiation Hardened			3Q-4Q					
Rad Hard Catalog	1Q-3Q							
Rad Hard common Processor	1Q							
Radiation Tolerant FPGA Device Trials		4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-2Q		
THAAD Detector/IMU Survivability Assessment	1Q							
LCKV Communications Electronics	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q				
<b>Manufacturing Process Improvements</b>								
Robust Lean Supplier Network Demonstration	1Q-4Q	1Q-2Q						
Dev and Deplmnt of Sup Chain Dec Spt	1Q-4Q	1Q-3Q						
Demonstrate Tech Refresh Tool Int Concpt	1Q-4Q	1Q-3Q						
Industrial Partnership Effort with Suppliers	4Q	1Q-4Q	1Q-4Q					
Block 08/10 Supplier Upgrades			2Q					
<b>EO/IR</b>								
Hybrid/Stirling Cryocooler Electronics	1Q							
Scalable SiC Mirror Assembly/Inspection	1Q							
Two Color Envnmntal and Radiation Testing	1Q-4Q	1Q-4Q	1Q-3Q					
Satellite Sensor Testing	3Q-4Q	1Q-4Q	1Q-4Q					
Hybrid Stirling/Cryocooler	4Q							
Rad Hard VLWIR FPA and Visible FPA Detector Prot	4Q							

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Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail						Date February 2007		
APPROPRIATION/BUDGET ACTIVITY RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)				R-1 NOMENCLATURE 0603890C Ballistic Missile Defense System Core				
Schedule Profile	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
Rad Hard 1.06um Detector Testing		1Q						
Visible Hybrid Detector		1Q						
Advanced Detector Testing				4Q	1Q-4Q	1Q-4Q		
<b>Radar &amp; RF</b>								
HPA/MMIC Reliability Testing	1Q-2Q							
High Voltage GaAs MMIC Producibility	1Q-2Q							
4-inch Diameter SiC Water Producibility	1Q-4Q	1Q-4Q						
SiC Device Producibility Program	1Q-2Q							
Radar Sub-Array Demonstrator (MPSD)	1Q-4Q	1Q-4Q	1Q-4Q					
Block 08/10 Radar Component Upgrades				1Q-4Q	1Q-4Q	1Q-4Q		
<b>Propulsion</b>								
KEI Thruster Development	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q				
MKV Thruster Development	1Q-4Q	1Q-4Q	1Q-3Q					
Material Characterization	1Q-4Q	1Q-4Q	1Q-4Q	1Q				
SM-3 TDACS Comp Dev and Testing	1Q							
Health Monitoring and Insensitive Munitions	4Q	1Q-4Q	1Q-3Q					
<b>Advanced Materials and Structures</b>								
CC Telescope Housing Fabrication Process Testing	1Q							
KEI Cost/Weight Reduction	1Q-4Q	1Q-4Q	1Q-3Q					
Dorsal and Control Surf Cost Reduction	2Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q			
KEI Payload Shock and Vibration Mitigation Testing		1Q						
Block 08/10 Component Material Upgrades		4Q	1Q-4Q	1Q-4Q	1Q-3Q			
<b>Anti Tamper</b>								
AT Studies	1Q-4Q	1Q-4Q						
Command Destruct		2Q-4Q	1Q-4Q	1Q-4Q	1Q			
Software Modifications		3Q-4Q	1Q-4Q	1Q-4Q	1Q-3Q			
Specialized Solutions		3Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q			

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<b>Missile Defense Agency (MDA) Exhibit R-2A RDT&amp;E Project Justification</b>	Date <b>February 2007</b>
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<b>APPROPRIATION/BUDGET ACTIVITY</b> <b>RDT&amp;E, DW/04 Advanced Component Development and Prototypes (ACD&amp;P)</b>	<b>R-1 NOMENCLATURE</b> <b>0603890C Ballistic Missile Defense System Core</b>
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COST (\$ in Thousands)	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
0104 BMD Information Management Systems	108,923	110,419	126,451	130,952	142,139	144,294	138,583	140,830
RDT&E Articles Qty	0	0	0	0	0	0	0	0

**A. Mission Description and Budget Item Justification**

Information Management Systems includes initiatives that comprise the MDA secure communications infrastructure, which are vital to the strategic mission of the Agency. The MDA Secure Communications Infrastructure includes costs required to provide and sustain access to the classified Secret Internet Protocol Router Network, MDA networks, classified and unclassified Video Teleconferencing services and the Joint Worldwide Intelligence Connectivity System (JWICS). Connectivity to the JWICS is essential to the MDA Intelligence project to obtain and provide intelligence data used to feed the Command, Control, Battle Management and Communication project, the Hercules Project, the Countermeasures/Counter-Countermeasures project, and Modeling and Simulation project. The above initiatives will provide for the efficient operation and safeguarding of all agency information.

This project also funds IM/IT operations for multiple systems in existing as well as new facilities during the MDA transition to Huntsville, AL; Dahlgren, VA and Ft Belvoir in Alexandria, VA.

This Project funds initiatives that support the MDA Systems Engineering and Integration mission for the BMDS System including:

- Information Assurance (IA) controls and Computer Network Defense of MDA networks
- Certification and Accreditation processes that support the BMDS, test assets, and administrative support networks
- IM/IT Enterprise Architecture that is compliant with Federally-mandated standards for the business and mission support activities of the MDA
- Business Management Modernization Program 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
- MDA communication networks that allow Information Management /Information Technology operations to be performed in an efficient, secure, and effective manner
- IM/IT policies, guidance, planning, oversight, and monitoring to ensure continued compliance with DoD mandated initiatives, statutes, regulations, directives, and policies
- Operations and maintenance support to provide world-class day-to-day IT operations

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<b>Missile Defense Agency (MDA) Exhibit R-2A RDT&amp;E Project Justification</b>	Date <b>February 2007</b>
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<b>APPROPRIATION/BUDGET ACTIVITY</b> <b>RDT&amp;E, DW/04 Advanced Component Development and Prototypes (ACD&amp;P)</b>	<b>R-1 NOMENCLATURE</b> <b>0603890C Ballistic Missile Defense System Core</b>
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The BMD Information Management Systems project, includes the following Task areas:

- Enterprise Architecture and Engineering
- Enterprise Communications Infrastructure
- Enterprise Information Assurance (IA)
- Enterprise Applications
- Enterprise Information Management Services
- Enterprise Video Conferencing
- Enterprise Plans and Policies
- Computing Infrastructure (USNCR)
- Computing and Network Management Services, (US National Capital Region (NCR))
- Computing Infrastructure (USSOUTH)
- Service IM/IT for Executing Agents

**B. Accomplishments/Planned Program**

	FY 2006	FY 2007	FY 2008	FY 2009
Enterprise Architecture and Engineering	3,494	3,263	3,319	3,409
RDT&E Articles (Quantity)	0	0	0	0

Enterprise Architecture and Engineering initiatives support the MDA and especially the Ballistic Missile Defense System (BMDS) Core projects through the design, and planning of an MDA Enterprise Architecture that is compliant with the DoD Federal enterprise architecture standards. The MDA enterprise architecture will improve the management of, and access to information throughout the MDA through the integration and consolidation of disparate networks and systems. These efforts will improve the value of the Information Management and Information Technology (IM/IT) infrastructure that is necessary for the design, development, modeling, and testing of the BMDS.

**FY06 Accomplishments:**

- Completed designs and improvement plans for MDA priority projects (BMDS Mission Operations Center, MDA Technical Support Center)
- Continued to make revisions to realignment and transition plans in support of the MDA transition efforts to Huntsville AL and Dahlgren, VA
- Developed designs to meet continued evolution of information assurance controls to ensure compliance with DoD Instruction 8500.2, Information Assurance (IA) Implementation (encryption device upgrades and situational awareness tools)
- Developed engineering plans to implement network protocol upgrades in accordance with recent DoD standards for the communication networks

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<b>Missile Defense Agency (MDA) Exhibit R-2A RDT&amp;E Project Justification</b>		Date <b>February 2007</b>
<b>APPROPRIATION/BUDGET ACTIVITY</b> <b>RDT&amp;E, DW/04 Advanced Component Development and Prototypes (ACD&amp;P)</b>	<b>R-1 NOMENCLATURE</b> <b>0603890C Ballistic Missile Defense System Core</b>	
<ul style="list-style-type: none"> <li>• Developed implementation plans to consolidate data management and email servers across the MDA enterprise</li> <li>• Developed disaster recovery implementation plans for classified systems in the Huntsville area</li> </ul> <p>FY07 Planned Program:</p> <ul style="list-style-type: none"> <li>• Develop designs and implementation plans for MDA enterprise communication network support to BMDS sites at Shiriki, Japan and Moor, United Kingdom</li> <li>• Continue revisions to the realignment and transition plan in support of the MDA transition efforts to Huntsville, and Ft Belvoir</li> <li>• Develop implementation plans to meet continued evolution of information assurance controls to ensure compliance with DoD Instruction 8500.2, Information Assurance (IA) Implementation (encryption device upgrades and situational awareness tools)</li> <li>• Develop designs and implementation plans for secure wireless solutions across the MDA enterprise</li> <li>• Developed disaster recovery implementation plans for unclassified systems in the Huntsville area</li> <li>• Develop implementation plans for consolidation of helpdesk services across the MDA enterprise</li> </ul> <p>FY08 Planned Program:</p> <ul style="list-style-type: none"> <li>• Develop designs and implementation plans for MDA enterprise communications network support to BMDS research facilities and operational sites at Shriever AFB, Colorado and Kirtland AFB, New Mexico</li> <li>• Continue revisions to realignment and transition plans in support of the MDA transition efforts to Dahlgren, VA</li> <li>• Develop designs and implementation plans to expand MDA enterprise network capacity to support test data transfers and research collaboration</li> <li>• Develop disaster recovery implementation plans for unclassified systems at the Joint National Integration Center, Shriever AFB, Colorado</li> </ul> <p>FY09 Planned Program:</p> <ul style="list-style-type: none"> <li>• Develop designs and implementation plans for MDA enterprise communications network support to BMDS research facilities in and operational sites at Huntsville, AL; Alexandria, VA, Ft Greeley, Alaska; Moor, United Kingdom; and Shariki Japan)</li> <li>• Continue revisions to realignment and transition plans in support of the MDA transition efforts to Huntsville and Fort Belvoir</li> <li>• Develop designs and implementation plans to expand MDA enterprise network capacity to support test data transfers and research collaboration</li> <li>• Develop disaster recovery implementation plans for unclassified systems at Alexandria, VA and Albuquerque, NM</li> </ul>		

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<b>Missile Defense Agency (MDA) Exhibit R-2A RDT&amp;E Project Justification</b>			Date <b>February 2007</b>	
<b>APPROPRIATION/BUDGET ACTIVITY</b>		<b>R-1 NOMENCLATURE</b>		
<b>RDT&amp;E, DW/04 Advanced Component Development and Prototypes (ACD&amp;P)</b>		<b>0603890C Ballistic Missile Defense System Core</b>		
	FY 2006	FY 2007	FY 2008	FY 2009
Enterprise Communications Infrastructure	17,839	15,893	12,915	13,224
RDT&E Articles (Quantity)	0	0	0	0
<p>The Enterprise Communications Infrastructure 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. The MDA Special Access Program Wide Area Network supports BMDS planning and contingency operations. Circuits and associated services are provided by the Defense Information Systems Agency as well as the Defense Research and Engineering Network. These circuits provide access to over 80 government and industry locations to enable information sharing of BMD-related data throughout the global MDA Enterprise.</p> <p><b>FY06 Accomplishments:</b></p> <ul style="list-style-type: none"> <li>• Implemented MDA Special Access Program Wide Area Network in the National Capital Region.</li> <li>• Installed Service Delivery Points to support network consolidation plans at Huntsville, AL; Los Angeles AFB, CA; Kirtland AFB, NM; Pearl Harbor Naval Base, Hawaii; Moor United Kingdom; and Shariki, Japan</li> <li>• Implemented upgrades to network equipment to comply with information assurance controls per DoD Instruction 8500.2</li> <li>• Began regional implementation of the DoD-mandated transition to Internet Protocols in support of the DoD Global Information Grid architecture plan</li> <li>• Began regional implementation of a secure wireless network for portable devices</li> <li>• Funded recurring maintenance agreements on MDA Enterprise network equipment</li> <li>• Funded MDA Enterprise leased communications</li> </ul> <p><b>FY07 Planned Program:</b></p> <ul style="list-style-type: none"> <li>• Continue implementation of the MDA Special Access Program Wide Area Network to Dahlgren, VA and Huntsville, AL</li> <li>• Continue regional upgrades to network equipment to comply with information assurance controls per DoD Instruction 8500.2</li> <li>• Continue implementation of the DoD-mandated transition to Internet Protocols in support of the DoD Global Information Grid architecture plan</li> <li>• Continue regional implementation of a secure wireless network for portable devices</li> <li>• Fund recurring maintenance agreements on MDA Enterprise network equipment</li> <li>• Fund MDA Enterprise leased communications</li> </ul>				

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<b>Missile Defense Agency (MDA) Exhibit R-2A RDT&amp;E Project Justification</b>	Date <b>February 2007</b>
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<b>APPROPRIATION/BUDGET ACTIVITY</b> <b>RDT&amp;E, DW/04 Advanced Component Development and Prototypes (ACD&amp;P)</b>	<b>R-1 NOMENCLATURE</b> <b>0603890C Ballistic Missile Defense System Core</b>
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**FY08 Planned Program:**

- Implement upgrades to network equipment to comply with information assurance controls per DoD Instruction 8500.2
- Implement the DoD-mandated transition to Internet Protocols in support of the DoD Global Information Grid architecture plan
- Implement regional implementation of a secure wireless network for portable devices
- Fund recurring maintenance agreements on MDA Enterprise network equipment
- Fund MDA Enterprise leased communications

**FY09 Planned Program:**

- Continue to upgrade network equipment to comply with information assurance controls per DoD Instruction 8500.2
- Continue implementation of the DoD-mandated transition to Internet Protocols in support of the DoD Global Information Grid architecture plan
- Continue implementation of a secure wireless network for portable devices
- Fund recurring maintenance agreements on MDA Enterprise network equipment
- Fund MDA Enterprise leased communications

	FY 2006	FY 2007	FY 2008	FY 2009
Enterprise Information Assurance	20,511	24,422	28,810	29,359
RDT&E Articles (Quantity)	0	0	0	0

This initiative is not only a Federal mandate but also a key priority of the MDA Director. This vital program of the BMDS and MDA Enterprise consists of Information and Assurance (IA), Computer Network Defense, Network Situational Awareness, and Certification and Accreditation activities, and IA Workforce training and certification to comply with DoD IA directives, instructions and guidelines. The IA program provides system security engineering, development, and testing to ensure that command, control, communications, computing and intelligence systems are protected against malicious or accidental attacks. The MDA IA program provides the network security operations centers and supporting processes to protect and defend information and information systems. The MDA Enterprise Network Operations Security Center manages network situational awareness in coordination with the Joint Task Force-Global Network Operations. This ensures the availability, integrity, authentication, confidentiality and non-repudiation of the MDA mission, test and administrative systems.

**FY06 Accomplishments:**

- Updated the BMDS Block 04 and Element interim authority to operation IATOs and System Security Authorization Agreements
- Established the BMDS Network Operations Security Center as the central management and reporting authority between the Joint Task Force-Global Network Operations and the BMDS subordinate elements

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APPROPRIATION/BUDGET ACTIVITY <b>RDT&amp;E, DW/04 Advanced Component Development and Prototypes (ACD&amp;P)</b>	R-1 NOMENCLATURE <b>0603890C Ballistic Missile Defense System Core</b>	
<ul style="list-style-type: none"> <li>• Developed and inserted Information Assurance requirements into the Test Bed System Specifications for the BMDS Block 08</li> <li>• Sustained certification and accreditation for the 21 MDA systems reported in the DoD Information Technology Portfolio Registry database</li> <li>• Coordinated the implementation of over 300 IA Vulnerability Assessments across the MDA Enterprise</li> <li>• Conducted over 100 certification evaluations of mission, test and administrative systems and assisted in the development of the Plan of Actions and Milestones to correct IA deficiencies</li> <li>• Completed annual IA user training for the MDA workforce</li> <li>• Developed and implemented an IA Workforce Improvement Program to certify IA professionals in compliance with DoD Manual 8570.1 and exceeded the DoD certification goal of 10% in CY06</li> <li>• Provided IA engineering and planning guidance for all IT acquisition programs</li> <li>• Procured IT equipment for implementation of the classified disaster recovery storage systems (Huntsville AL)</li> <li>• Procured network situational awareness tools for the Enterprise Network Operations Security Center and the Alternate Network Operations Security Center</li> <li>• Began transition to the new DoD Information Assurance Certification and Accreditation Process</li> </ul> <p>FY07 Planned Program:</p> <ul style="list-style-type: none"> <li>• Provide system security planning, engineering and test support to the spiral development of BMDS Blocks 04/06</li> <li>• Provide assistance in development of the BMDS Block 04/06 IA certification package</li> <li>• Sustain certification and accreditation for the IT systems reported to DoD and Office of Management and Budget (OMB)</li> <li>• Implement the classified disaster recovery storage systems (Huntsville AL)</li> <li>• Implement network situational awareness tools for the Enterprise Network Operations Security Center and the Alternate Network Operations Security Center</li> <li>• Coordinate the implementation of Vulnerability Assessments across the MDA Enterprise</li> <li>• Conduct certification evaluations of mission, test and administrative systems and assist in the development of the Plan of Actions and Milestones to correct IA deficiencies</li> <li>• Continue implementation of the IA Workforce Improvement Program to certify IA professionals in compliance with DoD Manual 8570.1 and achieve the DoD certification goal of 40% in FY07</li> <li>• Complete annual IA user training for the MDA workforce</li> <li>• Provide IA engineering and planning guidance for all MDA IT acquisition programs</li> <li>• Implement Public Key Infrastructure-enabled applications (MDA Portal)</li> </ul>		

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<b>Missile Defense Agency (MDA) Exhibit R-2A RDT&amp;E Project Justification</b>		Date <b>February 2007</b>
<b>APPROPRIATION/BUDGET ACTIVITY</b> <b>RDT&amp;E, DW/04 Advanced Component Development and Prototypes (ACD&amp;P)</b>	<b>R-1 NOMENCLATURE</b> <b>0603890C Ballistic Missile Defense System Core</b>	
<ul style="list-style-type: none"><li>• Install IT equipment for the classified disaster recovery storage systems (Huntsville AL)</li><li>• Continue transition to the new DoD Information Assurance Certification and Accreditation Process</li></ul> <p>FY08 Planned Program:</p> <ul style="list-style-type: none"><li>• Provide system security planning, engineering and test support to the spiral development of BMDS Blocks 06/08</li><li>• Provide assistance in development of the BMDS Block 06/08 IA certification package</li><li>• Sustain certification and accreditation for the IT systems reported to DoD and OMB</li><li>• Continue implementation of network situational awareness tools for the Enterprise Network Operations Security Center and the Alternate Network Operations Security Center</li><li>• Coordinate the implementation of Vulnerability Assessments across the MDA Enterprise</li><li>• Conduct certification evaluations of mission, test and administrative systems and assist in the development of the Plan of Actions and Milestones to correct IA deficiencies</li><li>• Continue implementation of the IA Workforce Improvement Program to certify IA professionals in compliance with DoD Manual 8570.1 and achieve the DoD certification goal of 70% in FY08</li><li>• Complete annual IA user training for the MDA workforce</li><li>• Provide IA engineering and planning guidance for all MDA IT acquisition programs</li><li>• Continue implementation of Public Key Infrastructure-enabled applications</li><li>• Continue transition to the new DoD Information Assurance Certification and Accreditation Process</li><li>• Begin implementation of the Unclassified Disaster Recovery Storage Systems at Colorado Springs, CO</li></ul> <p>FY09 Planned Program:</p> <ul style="list-style-type: none"><li>• Provide system security planning, engineering and test support to the spiral development of BMDS Blocks 08/10</li><li>• Provide assistance in development of the BMDS Block 06/08 IA certification package</li><li>• Sustain certification and accreditation for the IT systems reported to DoD and Office of Management and Budget (OMB)</li><li>• Continue implementation of network situational awareness tools for the Enterprise Network Operations Security Center and the Alternate Network Operations Security Center</li><li>• Coordinate the implementation of Vulnerability Assessments across the MDA Enterprise</li><li>• Conduct certification evaluations of mission, test and administrative systems and assist in the development of the Plan of Actions and Milestones to correct IA deficiencies</li></ul>		

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<b>Missile Defense Agency (MDA) Exhibit R-2A RDT&amp;E Project Justification</b>	Date <b>February 2007</b>
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<b>APPROPRIATION/BUDGET ACTIVITY</b> <b>RDT&amp;E, DW/04 Advanced Component Development and Prototypes (ACD&amp;P)</b>	<b>R-1 NOMENCLATURE</b> <b>0603890C Ballistic Missile Defense System Core</b>
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- Continue implementation of the IA Workforce Improvement Program to certify IA professionals in compliance with DoD Manual 8570.1 and achieve the DoD certification goal of 100% in FY09
- Complete annual IA user training for the MDA workforce
- Provide IA engineering and planning guidance for all MDA IT acquisition programs
- Continue implementation of Public Key Infrastructure-enabled applications
- Continue implementation of the Unclassified Disaster Recovery Storage Systems at Colorado Springs, CO

	FY 2006	FY 2007	FY 2008	FY 2009
Enterprise Applications	12,714	14,470	14,700	15,073
RDT&E Articles (Quantity)	0	0	0	0

In accordance with the Clinger Cohen Act, DoD Directive 5000.15, DoD Records Management Program, and OMB Circular A130, the Enterprise Applications initiative provides for the implementation of enterprise information applications which are used to collect, analyze, display and share information. DoD mandated and mission essential examples include BMD System Asset Management, BMDS Integrated Master Schedule, Electronic Records Management System, E-Tasker, Integrated Acquisition Environment, data management tool, financial management tools, personnel tracking system, MDA Identify 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.

**FY06 Accomplishments:**

- Implemented upgrades to the BMD System Asset Management application for web-based asset management
- Continue implementation of the E-Tasker Project, (the Agency action tracking system) and provided training to an additional 1500 users
- Integrated annual user IA training into the MDA portal and trained 99.3% of the MDA workforce
- Began implementation of a Software Asset Management Program
- Continue implementation of an Agency Electronic Records Management project and training program and trained an additional 100 users
- Implemented interim financial management applications
- Dedicated a senior IT specialist to the Business Transformation Agency to assist with defining standard financial management solutions
- Funded recurring enterprise application license fees

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<b>Missile Defense Agency (MDA) Exhibit R-2A RDT&amp;E Project Justification</b>	Date <b>February 2007</b>
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<b>APPROPRIATION/BUDGET ACTIVITY</b> <b>RDT&amp;E, DW/04 Advanced Component Development and Prototypes (ACD&amp;P)</b>	<b>R-1 NOMENCLATURE</b> <b>0603890C Ballistic Missile Defense System Core</b>
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**FY07 Planned Program:**

- Begin implementation of the BMDS Integrated Master Schedule and continue upgrades of the BMD Asset Management Tool
- Continue implementation of the Software Asset Management Program
- Continue implementation of a Collaboration Suite to support real-time research, test and operational information exchange
- Continue implementation of DoD mandated business management modernization applications
- Begin implementation of metadata taxonomy to standardize information storage and to facilitate data mining across MDA

**FY08 Planned Program:**

- Continue implementation of the IBM Collaboration Suite to support real-time research, test and operational information exchange
- Continue implementation of the Software Asset Management Program
- Continue implementation of DoD mandated business management modernization applications
- Continue implementation of metadata taxonomy to standardize information storage and to facilitate data mining across MDA
- Fund recurring enterprise application license fees

**FY09 Planned Program:**

- Continue implementation of the BMDS Integrated Master Schedule and continue upgrades of the BMD Asset Management Tool
- Continue implementation of the IBM Collaboration Suite to support real-time research, test and operational information exchange
- Continue implementation of the Software Asset Management Program
- Continue implementation of DoD mandated business management modernization applications
- Continue implementation of metadata taxonomy to standardize information storage and to facilitate data mining across MDA
- Fund recurring enterprise application license fees

	FY 2006	FY 2007	FY 2008	FY 2009
Enterprise Information Management Services	7,842	8,339	8,984	9,225
RDT&E Articles (Quantity)	0	0	0	0

The Enterprise Information Management Services initiative includes costs to develop, manage content, and operate and maintain the unclassified and classified MDA Portals. The MDA Portals are a vital asset used 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.

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<b>Missile Defense Agency (MDA) Exhibit R-2A RDT&amp;E Project Justification</b>		Date <b>February 2007</b>
APPROPRIATION/BUDGET ACTIVITY <b>RDTE&amp;E, DW/04 Advanced Component Development and Prototypes (ACD&amp;P)</b>	R-1 NOMENCLATURE <b>0603890C Ballistic Missile Defense System Core</b>	
<p>FY06 Accomplishments:</p> <ul style="list-style-type: none"><li>• Produced over 3700 graphics products per month to support Agency sponsored briefings, conferences, training, and other functions</li><li>• Began implementation of the Portal user interfaces upgrade project to improve access to BMDS data and Director's plans, policies and guidance</li><li>• Consolidated Huntsville mission element web sites into the MDA Portals</li><li>• Began implementation of the MDA information cataloging project hosted on the MDA Portal</li><li>• Implemented Phase II of the web-based training through the MDA Portals (new employee orientation, new IT user training, etc)</li><li>• Funded recurring operations and maintenance of graphic and video production capabilities</li><li>• Funded recurring operations and maintenance of Portal services</li></ul> <p>FY07 Planned Program:</p> <ul style="list-style-type: none"><li>• Continued implementation of the Portal user interfaces upgrade project to improve access to BMDS data and Director's plans, policies and guidance</li><li>• Continue implementation of the MDA information cataloging project hosted on the MDA Portal</li><li>• Develop and implement MDA Portal (web-based) training programs to include information assurance, business applications, workforce certification, security, and ethics</li><li>• Fund recurring operations and maintenance of graphic and video production capabilities</li><li>• Fund recurring operations and maintenance of Portal services</li></ul> <p>FY08 Planned Program:</p> <ul style="list-style-type: none"><li>• Continue implementation of the MDA information cataloging project hosted on the MDA Portal</li><li>• Continue implementation of MDA Portal (web-based) training programs to include information assurance, business applications, workforce certification, security, and ethics</li><li>• Fund recurring operations and maintenance of graphic and video production capabilities</li><li>• Fund recurring operations and maintenance of Portal services</li></ul> <p>FY09 Planned Program:</p> <ul style="list-style-type: none"><li>• Continue implementation of the MDA information cataloging project hosted on the MDA Portal</li><li>• Continue implementation of MDA Portal (web-based) training programs to include information assurance, business applications, workforce certification, security, and ethics</li></ul>		

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<b>Missile Defense Agency (MDA) Exhibit R-2A RDT&amp;E Project Justification</b>			Date <b>February 2007</b>	
<b>APPROPRIATION/BUDGET ACTIVITY</b> <b>RDT&amp;E, DW/04 Advanced Component Development and Prototypes (ACD&amp;P)</b>		<b>R-1 NOMENCLATURE</b> <b>0603890C Ballistic Missile Defense System Core</b>		
<ul style="list-style-type: none"> <li>• Fund recurring operations and maintenance of graphic and video production capabilities</li> <li>• Fund recurring operations and maintenance of Portal services</li> </ul>				
	FY 2006	FY 2007	FY 2008	FY 2009
Enterprise Video Teleconferencing Services	5,700	6,361	6,470	6,644
RDT&E Articles (Quantity)	0	0	0	0
<p>The Enterprise Video Teleconferencing (VTC) initiative supports management, engineering, systems integration, operation, maintenance and technical support services for the teleconferencing systems and implementation of a high-bandwidth, Video Over Internet capability to enhance resolution and reduce per-minute unit cost. Primary MDA video-teleconferencing sites include the National Capital Region, Joint National Integration Center, Airborne Laser at Kirtland Air Force Base, and Space Tracking and Surveillance System at Los Angeles AFB. Future sites will include numerous offices in Huntsville, AL including Terminal High Altitude Area Defense, Targets and Countermeasures, and Ground Based Missile Defense.</p> <p><b>FY06 Accomplishments:</b></p> <ul style="list-style-type: none"> <li>• Operated the VTC Scheduling Operations Center in support of classified and unclassified MDA mission, test and business operations</li> <li>• Standardized VTC equipment and software at MDA facilities in Huntsville AL and Los Angeles CA</li> <li>• Continued implementation of voice over Internet project to 18 MDA conference rooms in Huntsville AL</li> <li>• Planned the design of VTC capabilities at Dahlgren, VA and Huntsville, AL</li> <li>• Funded recurring operations and maintenance for VTC facilities and equipment</li> </ul> <p><b>FY07 Planned Program:</b></p> <ul style="list-style-type: none"> <li>• Operate the VTC Scheduling Operations Center capability in support of classified and unclassified MDA mission, test and business operations</li> <li>• Continue implementation of video over internet to MDA sites in Kirtland AFB, NM, Edwards AFB, CA, and Los Angeles AFB, CA</li> <li>• Expand recurring operations and maintenance support to include the new Dahlgren, VA and Huntsville, AL facilities</li> <li>• Fund recurring operations and maintenance support for VTC facilities and equipment</li> </ul> <p><b>FY08 Planned Program:</b></p> <ul style="list-style-type: none"> <li>• Operate the VTC Scheduling Operations Center in support of classified and unclassified MDA mission, test and business operations</li> <li>• Fund recurring operations and maintenance for VTC equipment in existing facilities</li> </ul>				

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<b>Missile Defense Agency (MDA) Exhibit R-2A RDT&amp;E Project Justification</b>	Date <b>February 2007</b>
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<b>APPROPRIATION/BUDGET ACTIVITY</b> <b>RDT&amp;E, DW/04 Advanced Component Development and Prototypes (ACD&amp;P)</b>	<b>R-1 NOMENCLATURE</b> <b>0603890C Ballistic Missile Defense System Core</b>
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- Fund recurring operations and maintenance for VTC equipment in new facilities at Dahlgren, VA and Huntsville, AL

**FY09 Planned Program:**

- Operate the VTC Scheduling Operations Center in support of classified and unclassified MDA mission, test and business operations
- Fund recurring operations and maintenance for VTC facilities and equipment to include the Dahlgren, VA and Huntsville, AL facilities
- Fund recurring operations and maintenance for VTC equipment in new facilities at Dahlgren, VA and Huntsville, AL

	FY 2006	FY 2007	FY 2008	FY 2009
Enterprise Plans & Policies	2,913	4,879	4,876	4,845
RDT&E Articles (Quantity)	0	0	0	0

This initiative funds efforts that support development and implementation of Agency-wide Information Management/Information Technologies (IM/IT) strategies, policies, guidelines, and management processes to ensure efficient and effective oversight of information resources. These efforts ensure a secure MDA corporate infrastructure is in place to support the BMDS mission and to comply with statutory and DoD policies including: the Clinger-Cohen Act, the Federal Information Security Management Act, the Presidents Management Agenda - E-Government reporting, and Office of Management and Budget IT budget reporting policies. Specific examples include development, implementation, and oversight of various plans, guidelines, and policies to include the MDA Information Resource Strategic Plan, the IA Program Plan, and the MDA IM/IT Capital Planning and Investment Control process. This initiative also includes budget formulation and execution as well as contract management and oversight.

**FY06 Accomplishments:**

- Developed a strategy for the DoD Information Technology Portfolio Repository that identifies an MDA system of systems approach for registering layered IT systems (adopted for all DoD)
- Developed the personnel transition plan for the MDA relocation to Huntsville, AL; Dahlgren, and Fort Belvoir, VA
- Developed, updated, coordinated and published policies, guidelines and processes to comply with applicable legislation, DoD and MDA guidance (Capital Planning, IA Program Plan, OSD transition strategy papers, and the IA Workforce Improvement Plan)
- Updated budget plans, documentation and reports for future years to comply with Office of Management and Budget (OMB), OSD and MDA guidance
- Successfully executed, tracked and reported the FY06 IT budget
- Conducted assessments, prepared status and metrics reports for MDA Senior Leadership, OSD, OMB, and DoD

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<b>APPROPRIATION/BUDGET ACTIVITY</b> <b>RDT&amp;E, DW/04 Advanced Component Development and Prototypes (ACD&amp;P)</b>	<b>R-1 NOMENCLATURE</b> <b>0603890C Ballistic Missile Defense System Core</b>
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**FY07 Planned Program:**

- Develop, update, coordinate and publish policies, guidelines and processes to comply with applicable legislation, DoD and MDA guidance
- Update budget plans, documentation and reports for future years to comply with OMB, OSD and MDA guidance
- Execute, track and report the FY07 IT budget
- Conduct assessments, prepare status and report metrics to MDA Senior Leadership, OSD, OMB, and DoD

**FY08 Planned Program:**

- Develop, update, coordinate and publish policies, guidelines and processes to comply with applicable legislation, DoD and MDA guidance
- Update budget plans, documentation and reports for future years to comply with OMB, OSD and MDA guidance
- Execute, track and report the FY08 IT budget
- Conduct assessments, prepare status and report metrics to MDA Senior Leadership, OSD, OMB, and DoD

**FY09 Planned Program:**

- Develop, update, coordinate and publish policies, guidelines and processes to comply with applicable legislation, DoD and MDA guidance
- Update budget plans, documentation and reports for future years to comply with OMB, OSD and MDA guidance
- Execute, track and report the FY08 IT budget
- Conduct assessments, prepare status and report metrics to MDA Senior Leadership, OSD, OMB, and DoD

	FY 2006	FY 2007	FY 2008	FY 2009
Computing Infrastructure (USNCR)	4,517	2,871	3,000	3,000
RDT&E Articles (Quantity)	0	0	0	0

The Computing Infrastructure initiative provides funds to support the operations and sustainment of hardware and software systems supporting the MDA Enterprise and regional support of consumables for the National Capital Region (NCR). Typical hardware devices include; network routing and switching gear, server farms, storage devices and desktop computers.

**FY06 Accomplishments:**

- Funded hardware and software maintenance agreements for the NCR
- Funded recurring maintenance for the MDA NCR classified and unclassified networks
- Procured IT consumables (printer toner cartridges, CDs, tapes)

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<b>APPROPRIATION/BUDGET ACTIVITY</b> <b>RDT&amp;E, DW/04 Advanced Component Development and Prototypes (ACD&amp;P)</b>	<b>R-1 NOMENCLATURE</b> <b>0603890C Ballistic Missile Defense System Core</b>
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FY07 / FY08 / FY09 Planned Program:

- Fund hardware and software maintenance agreements for the NCR
- Fund recurring maintenance for the MDA NCR classified and unclassified networks
- Procure IT consumables (printer toner cartridges, CDs, tapes)

	FY 2006	FY 2007	FY 2008	FY 2009
Computing & Network Management Services (USNCR)	17,580	20,402	18,260	18,751
RDT&E Articles (Quantity)	0	0	0	0

The Computing and Network Management Services initiative consists of IT support services required to operate and maintain the classified and unclassified local area networks in the National Capital Region (approximately 2500 users). 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 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.

FY06 Accomplishments:

- Sustained the BMDS Mission Operation Center
- Implemented over 300 IA Vulnerability Assessments in the National Capital Region
- Implemented IA control improvements in accordance with established Plan of Action and Milestones
- Monitored networks for user compliance with DoD policies, and reported incidents
- Maintained IT system configuration control
- Performed preventative maintenance on IT systems
- Tested and implemented software application upgrades
- Maintained the network and help desk services at 99% readiness
- Provided web-based and classroom training to MDA users on new applications and upgrades

FY07 Planned Program:

- Sustain the BMDS Mission Operation Center
- Implement IA Vulnerability Assessments in the National Capital Region
- Implement IA control improvements in accordance with established Plan of Action and Milestone

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<ul style="list-style-type: none"><li>• Monitor networks for user compliance with DoD policies, and reported incidents</li><li>• Maintain IT system configuration control</li><li>• Perform preventative maintenance on IT systems</li><li>• Test and implement software application upgrades</li><li>• Maintain the network and help desk services at 99% readiness</li><li>• Provide web-based and classroom training to MDA users on new applications and upgrades</li></ul> <p>FY08 Planned Program:</p> <ul style="list-style-type: none"><li>• Sustain the BMDS Mission Operation Center</li><li>• Implement IA Vulnerability Assessments in the National Capital Region</li><li>• Implement IA control improvements in accordance with established Plan of Action and Milestones</li><li>• Monitor networks for user compliance with DoD policies, and reported incidents</li><li>• Maintain IT system configuration control</li><li>• Perform preventative maintenance on IT systems</li><li>• Test and implement software application upgrades</li><li>• Maintain the network and help desk services at 99% readiness</li><li>• Provide web-based and classroom training to MDA users on new applications and upgrades</li></ul> <p>FY09 Planned Program:</p> <ul style="list-style-type: none"><li>• Sustain the BMDS Mission Operation Center</li><li>• Implement IA Vulnerability Assessments in the National Capital Region</li><li>• Implement IA control improvements in accordance with established Plan of Action and Milestones</li><li>• Monitor networks for user compliance with DoD policies, and reported incidents</li><li>• Maintain IT system configuration control</li><li>• Perform preventative maintenance on IT systems</li><li>• Test and implement software application upgrades</li><li>• Maintain the network and help desk services at 99% readiness</li><li>• Provide web-based and classroom training to MDA users on new applications and upgrades</li></ul>		

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	FY 2006	FY 2007	FY 2008	FY 2009
Computing Infrastructure (USSOUTH)	9,167	3,675	19,173	21,318
RDT&E Articles (Quantity)	0	0	0	0
<p>The Computing Infrastructure (US South) initiative consists of IT support services required to operate and maintain the classified and unclassified local area networks in the Huntsville 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 IM/IT operations in support of new facilities in Huntsville, AL.</p> <p><b>FY06 Accomplishments:</b></p> <ul style="list-style-type: none"> <li>• Implemented Phase I of the secure classified processing capability for all MDA users in Huntsville (eliminates dual desktop PCs)</li> <li>• Provided IT support for the transition of 452 MDA personnel from the National Capital Region (NCR) to Huntsville, AL</li> <li>• Implemented over 300 IA Vulnerability Assessments in the Huntsville Region</li> <li>• Implemented IA control improvements in accordance with established Plan of Action and Milestones</li> <li>• Monitored networks for user compliance with DoD policies, and reported incidents</li> <li>• Maintained IT system configuration control</li> <li>• Performed preventative maintenance on IT systems</li> <li>• Tested and implemented software application upgrades</li> <li>• Maintained the network and help desk services at 99% readiness</li> <li>• Provided web-based and classroom training to MDA users on new applications and upgrades</li> </ul> <p><b>FY07 Planned Program:</b></p> <ul style="list-style-type: none"> <li>• Implement IA Vulnerability Assessments in the Huntsville region</li> <li>• Implement IA control improvements in accordance with established Plan of Action and Milestones</li> <li>• Monitor networks for user compliance with DoD policies, and reported incidents</li> <li>• Maintain IT system configuration control</li> <li>• Perform preventative maintenance on IT systems</li> <li>• Test and implement software application upgrades</li> <li>• Maintain the network and help desk services at 99% readiness</li> </ul>				

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<b>APPROPRIATION/BUDGET ACTIVITY</b> <b>RDT&amp;E, DW/04 Advanced Component Development and Prototypes (ACD&amp;P)</b>	<b>R-1 NOMENCLATURE</b> <b>0603890C Ballistic Missile Defense System Core</b>
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- Provide web-based and classroom training to MDA users on new applications and upgrades

**FY08 Planned Program:**

- Implement Vulnerability Assessments in the Huntsville region
- Implement IA control improvements in accordance with established Plan of Action and Milestones
- Monitor networks for user compliance with DoD policies, and reported incidents
- Maintain IT system configuration control
- Perform preventative maintenance on IT systems
- Test and implement software application upgrades
- Maintain the network and help desk services at 99% readiness
- Provide web-based and classroom training to MDA users on new applications and upgrades

**FY09 Planned Program:**

- Implement Vulnerability Assessments in the Huntsville region
- Implement IA control improvements in accordance with established Plan of Action and Milestones
- Monitor networks for user compliance with DoD policies, and reported incidents
- Maintain IT system configuration control
- Perform preventative maintenance on IT systems
- Test and implement software application upgrades
- Maintain the network and help desk services at 99% readiness
- Provide web-based and classroom training to MDA users on new applications and upgrades

	FY 2006	FY 2007	FY 2008	FY 2009
Service IM/IT Executing Agents	6,646	5,844	5,944	6,104
RDT&E Articles (Quantity)	0	0	0	0

This initiative provides recurring funds to three MDA Executing Agents in support of BMDS research and mission related efforts. The Executing Agents include 1) U.S. Army Space and Missile Defense Command (SMDC), 2) the U.S. Army Program Executive Office, Air, Space and Missile Defense (PEO ASMD), and 3) U.S. Air Force BMD Program Executive Office (USAF PEO). Funds provided to SMDC support continuing operations and maintenance of their communications and computing infrastructure in the Von Braun I facility in Huntsville AL. This includes the

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<p>communications costs, help desk services, and hardware and software sustainment. SMDC also receives MDA funds to update and maintain the Program Resource Internet Database Environment, a database management tool used by MDA for planning and budgeting efforts. Funds provided to PEO ASMD support IT infrastructure costs for multiple MDA research contracts and projects. Funds provided to the USAF PEO support MDA related logistics, database management, and network communications costs.</p> <p>FY06 Accomplishments:</p> <ul style="list-style-type: none"><li>• Operated and maintained IT networks in support of MDA efforts in Army facilities located in Huntsville, AL</li><li>• Updated and maintained the Program Resource Internet Database Environment database management tool</li><li>• Provided helpdesk services to MDA users</li><li>• Funded recurring operations and maintenance and helpdesk services provided through SMDC in direct support of MDA personnel</li><li>• Provided IT support to MDA international programs and conferences</li><li>• Implemented a Budget Execution module in the Command Information Management System for MDA</li></ul> <p>FY07 Planned Program:</p> <ul style="list-style-type: none"><li>• Operate and maintain IT networks, systems and helpdesk services in support of MDA efforts in Army facilities located in Huntsville, AL</li><li>• Update and maintain the Program Resource Internet Database Environment database management tool</li><li>• Provide helpdesk services to MDA users</li><li>• Provide IT support to MDA international programs and conferences</li></ul> <p>FY08 Planned Program:</p> <ul style="list-style-type: none"><li>• Operate and maintain IT networks in support of MDA efforts in Army facilities located in Huntsville</li><li>• Update and maintain the Program Resource Internet Database Environment database management tool</li><li>• Provide helpdesk services to MDA users</li><li>• Provide IT support to MDA international programs and conferences</li></ul> <p>FY09 Planned Program:</p> <ul style="list-style-type: none"><li>• Operate and maintain IT networks in support of MDA efforts in Army facilities located in Huntsville, AL</li><li>• Update and maintain the Program Resource Internet Database Environment database management tool</li><li>• Provide helpdesk services to MDA users</li></ul>		

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<b>APPROPRIATION/BUDGET ACTIVITY</b> <b>RDT&amp;E, DW/04 Advanced Component Development and Prototypes (ACD&amp;P)</b>	<b>R-1 NOMENCLATURE</b> <b>0603890C Ballistic Missile Defense System Core</b>
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- Provide IT support to MDA international programs and conferences

**C. Other Program Funding Summary**

	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	Total Cost
PE 0603175C Ballistic Missile Defense Technology	147,270	193,307	118,569	109,540	116,014	121,008	127,917	131,291	1,064,916
PE 0603881C Ballistic Missile Defense Terminal Defense Segment	1,120,879	1,092,076	962,585	1,004,282	924,101	851,213	678,694	501,147	7,134,977
PE 0603882C Ballistic Missile Defense Midcourse Defense Segment	2,391,246	3,043,058	2,520,064	2,359,665	2,179,602	1,699,963	1,153,082	1,183,003	16,529,683
PE 0603883C Ballistic Missile Defense Boost Defense Segment	455,572	628,958	548,759	432,432	448,375	678,913	829,683	1,026,239	5,048,931
PE 0603884C Ballistic Missile Defense Sensors	284,297	514,129	778,163	984,963	939,417	791,701	723,843	603,585	5,620,098
PE 0603886C Ballistic Missile Defense System Interceptors	200,446	356,004	227,499	393,317	522,388	730,236	836,029	570,206	3,836,125
PE 0603888C Ballistic Missile Defense Test and Targets	610,619	601,782	586,150	628,364	662,984	681,511	696,037	705,210	5,172,657
PE 0603889C Ballistic Missile Defense Products	387,402	0	0	0	0	0	0	0	387,402
PE 0603891C Special Programs - MDA	271,021	353,031	323,250	305,409	369,073	526,966	789,017	792,271	3,730,038
PE 0603892C Ballistic Missile Defense Aegis	893,040	1,122,669	1,059,103	1,129,425	1,221,650	1,067,587	1,054,753	1,089,078	8,637,305
PE 0603893C Space Tracking & Surveillance System	220,048	322,220	331,525	347,811	412,623	501,197	778,067	981,424	3,894,915
PE 0603894C Multiple Kill Vehicle	48,370	144,362	271,151	352,741	461,179	618,263	673,477	842,905	3,412,448
PE 0603895C BMD System Space Program	0	0	27,666	35,093	46,849	56,183	133,617	157,117	456,525
PE 0603896C BMD C2BMC	0	246,852	258,913	294,627	300,847	282,615	267,275	269,420	1,920,549
PE 0603897C BMD Hercules	0	49,674	53,658	54,264	54,405	55,142	53,355	54,198	374,696
PE 0603898C BMD Joint Warfighter Support	0	54,935	48,787	50,428	54,086	56,603	58,890	60,206	383,935
PE 0603904C BMD Joint National Integration Center (JNIC)	0	110,629	104,012	106,985	111,542	111,947	113,592	115,287	773,994
PE 0603905C BMD Concurrent Test and Operations	0	23,159	0	0	0	0	0	0	23,159
PE 0603906C Regarding Trench	0	0	2,000	3,000	5,000	5,000	9,000	9,000	33,000
PE 0605502C Small Business Innovative Research - MDA	133,105	0	0	0	0	0	0	0	133,105
PE 0901585C Pentagon Reservation	14,874	15,527	6,058	6,376	4,490	4,725	4,801	4,877	61,728
PE 0901598C Management Headquarters - MDA	98,609	87,059	85,906	86,453	70,355	69,855	69,855	69,855	637,947

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<b><u>D. Acquisition Strategy</u></b> 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 (National Capital Region; Huntsville, AL; Colorado Springs, CO; Albuquerque, NM; and Los Angeles, CA).		

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Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis								Date February 2007		
APPROPRIATION/BUDGET ACTIVITY RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)					R-1 NOMENCLATURE 0603890C Ballistic Missile Defense System Core					
<b>I. Product Development Cost ( \$ in Thousands )</b>										
Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2007 Cost	FY 2007 Award/ Oblg Date	FY 2008 Cost	FY 2008 Award/ Oblg Date	FY 2009 Cost	FY 2009 Award/ Oblg Date	Total Cost
Subtotal Product Development										
<b>Remarks</b>										
<b>II. Support Costs Cost ( \$ in Thousands )</b>										
Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2007 Cost	FY 2007 Award/ Oblg Date	FY 2008 Cost	FY 2008 Award/ Oblg Date	FY 2009 Cost	FY 2009 Award/ Oblg Date	Total Cost
<b>Enterprise Architecture and Engineering</b>										
Enterprise Architecture & Engineering	MIPR	FEDSIM/SRA/VA	3,182	3,097	2Q	3,150	2Q	3,236	N/A	12,665
SETA Support	CPFF	Anteon/VA	312	166	3Q	169	N/A	173	N/A	820
<b>Enterprise Communications Infrastructure</b>										
Leased Communications	MIPR	DISA/IL	852	1,063	1/3Q	1,082	1/3Q	1,111	1/3Q	4,108
Leased Communications	MIPR	Army Rsch Lab/MD	2,583	2,444	1/2Q	2,487	1/2Q	2,553	1/2Q	10,067
WAN Transport	C/CPAF	Northrop Grumman/CO	9,334	11,215	2Q	8,155	2Q	8,337	2Q	37,041
Hub Services	MIPR	AFRL Hanscom/MA	10	10	1Q	10	1Q	10	1Q	40
Leased Communications	MIPR	DTSW/VA	126	663	1/3Q	675	1/3Q	693	1/3Q	2,157
SETA Support	CPFF	Anteon/VA	478	498	1/3Q	506	1/3Q	520	1/3Q	2,002
Special Access WAN	MIPR	FEDSIM/SRA/VA	4,438	0	N/A	0	N/A	0	N/A	4,438

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Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis							Date February 2007			
APPROPRIATION/BUDGET ACTIVITY RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)					R-1 NOMENCLATURE 0603890C Ballistic Missile Defense System Core					
Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2007 Cost	FY 2007 Award/Oblg Date	FY 2008 Cost	FY 2008 Award/Oblg Date	FY 2009 Cost	FY 2009 Award/Oblg Date	Total Cost
<b>Enterprise Information Assurance</b>										
Certification & Accreditation Support	MIPR	FEDSIM/VA	2,879	1,590	1/2Q	1,617	1/2Q	1,460	1/2Q	7,546
SETA C&A Support	MIPR	Anteon/VA	3,650	3,812	1/3Q	3,876	1/3Q	3,981	1/3Q	15,319
NCR Info Assurance	C/CPAF	ZEN Tech/VA	4,753	5,054	1/2Q	5,678	1/2Q	5,831	1/2Q	21,316
Enterprise Network Op Security Center	C/CPAF	Northrop Grumman/CO	6,319	11,226	2Q	11,420	2Q	11,726	2Q	40,691
Disaster Recovery	C/CPAF	Northrop Grumman/CO	1,224	0	4Q	2,035	N/A	2,054	N/A	5,313
PKI Support	C/CPAF	FEDSIM/VA	811	572	2Q	582	1/2Q	598	1/2Q	2,563
Info Assurance Training	C/CPAF	FEDSIM/VA	300	0	4Q	1,396	N/A	1,443	N/A	3,139
IA & BMDS NOSC support	C/CPFF	Booz Allen Hamilton/CO	875	1,354	N/A	1,378	N/A	1,415	N/A	5,022
SETA Support	C/CPAF	JTAAS/CO	0	814	N/A	828	N/A	851	N/A	2,493
Network Operations Analysis	C/CPFF	Booz Allen Hamilton/CO	250	0	N/A	0	N/A	0	N/A	250
<b>Enterprise Applications</b>										
Enterprise Application	C/CPAF	FEDSIM/VA	7,635	7,155	1/2Q	7,278	1/2Q	7,474	1/2Q	29,542
PRIDE Maintenance and Support	MIPR	SMDC/CIMS/AL	999	984	1Q	981	1Q	985	1Q	3,949
SETA Support	CPFF	Anteon/VA	1,560	1,658	1/3Q	1,687	1/3Q	1,733	1/3Q	6,638
Application support	C/CPAF	Northrop Grumman/CO	2,520	4,673	2Q	4,754	2Q	4,881	2Q	16,828
<b>Enterprise Information Management Services</b>										
Portal and VIPC support	SS/CPFF	CSC/VA	7,842	8,339	1/2Q	0	N/A	0	N/A	16,181
TBD			0	0	N/A	8,984	3Q	9,225	3Q	18,209

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Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis							Date February 2007			
APPROPRIATION/BUDGET ACTIVITY RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)					R-1 NOMENCLATURE 0603890C Ballistic Missile Defense System Core					
Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2007 Cost	FY 2007 Award/ Oblg Date	FY 2008 Cost	FY 2008 Award/ Oblg Date	FY 2009 Cost	FY 2009 Award/ Oblg Date	Total Cost
<b>Enterprise Video Teleconferencing Services</b>										
VTC Support and Maintenance	SS/CPAF	SGICOM/VA	5,388	6,029	3/4Q	0	N/A	0	N/A	11,417
SETA Support	C/CPFF	Anteon/VA	312	332	3Q	337	N/A	347	N/A	1,328
VTC Support & Maintenance		TBD	0	0	N/A	6,133	3Q	6,297	3Q	12,430
<b>Enterprise Plans &amp; Policies</b>										
SETA Support	C/CPFF	Anteon/VA	1,760	2,224	1/3Q	2,268	1/3Q	2,330	1/3Q	8,582
CIO Support	Various	Various/CO	401	1,342	1/2Q	1,275	N/A	1,150	N/A	4,168
CIO Support	C/CPFF	Decisive Analytics/VA	650	957	N/A	973	N/A	1,000	N/A	3,580
CIO Travel			102	150	N/A	150	N/A	150	N/A	552
SETA	CPAF	SRS/CO	194	0	N/A	0	N/A	0	N/A	194
Publications			207	206	1/4Q	210	1/4Q	215	1/4Q	838
<b>Computing Infrastructure (USNCR)</b>										
Cabling	C/TM	Crawford/MD	300	0	N/A	0	N/A	0	N/A	300
IT HW/SW Equipment	MIPR	various	4,217	2,871	N/A	3,000	N/A	3,000	N/A	13,088
<b>Computing &amp; Network Management Services (USNCR)</b>										
Computing & Network Services	C/CPFF	ZEN Tech/MD	14,148	16,229	2/3Q	14,015	N/A	14,392	N/A	58,784
IM/IT SETA Support	C/CPFF	Anteon/VA	2,980	4,173	3Q	4,245	N/A	4,359	N/A	15,757
<b>Computing Infrastructure (USSOUTH)</b>										
IT Equipment	C/Various	Various	0	0	N/A	3,000	N/A	3,081	N/A	6,081
IT HW/SW	C/CPAF	GSA/FEDSIM/VA	5,255	0	N/A	0	N/A	0	N/A	5,255
Write & Eng Support	C/CPAF	GSA/FEDSIM/VA	900	1,536	N/A	1,377	N/A	1,414	N/A	5,227

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<b>Missile Defense Agency (MDA) Exhibit R-3 RDT&amp;E Project Cost Analysis</b>	Date <b>February 2007</b>
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<b>APPROPRIATION/BUDGET ACTIVITY</b> <b>RDT&amp;E, DW/04 Advanced Component Development and Prototypes (ACD&amp;P)</b>	<b>R-1 NOMENCLATURE</b> <b>0603890C Ballistic Missile Defense System Core</b>
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Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2007 Cost	FY 2007 Award/ Oblg Date	FY 2008 Cost	FY 2008 Award/ Oblg Date	FY 2009 Cost	FY 2009 Award/ Oblg Date	Total Cost
IT Integration Support	C/CPAF	ASD/AL	1,220	1,626	N/A	14,254	N/A	16,266	N/A	33,366
SETA Support	C/TM	Anteon/AL	156	166	1/3Q	179	1/3Q	184	1/3Q	685
SETA Support	C/TM	Anteon/NM	156	166	1/3Q	179	1/3Q	184	1/3Q	685
IT Integration Support	C/CPAF	GSA/Synergy/ AL	1,480	0	N/A	0	N/A	0	N/A	1,480
IT HW/SW		Various/NM	0	181	1Q	184	N/A	189	N/A	554
<b>Service IM/IT Executing Agents</b>										
Service IM/IT	C/CPAF	SMDC/SAIC/AL	6,000	5,317	1/2Q	5,408	N/A	5,553	N/A	22,278
Service IM/IT	C/CPAF	PEO ASMD/SAIC/AL	300	319	N/A	324	N/A	333	N/A	1,276
Service IM/IT	C/CPFF	USAF/SAIC/CA	346	208	1/2Q	212	N/A	218	N/A	984
Subtotal Support Costs			109,404	110,419		126,451		130,952		477,226

**Remarks**

**III. Test and Evaluation Cost ( \$ in Thousands )**

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

**Remarks**

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<b>Missile Defense Agency (MDA) Exhibit R-3 RDT&amp;E Project Cost Analysis</b>	Date <b>February 2007</b>
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APPROPRIATION/BUDGET ACTIVITY <b>RDT&amp;E, DW/04 Advanced Component Development and Prototypes (ACD&amp;P)</b>	R-1 NOMENCLATURE <b>0603890C Ballistic Missile Defense System Core</b>
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**IV. Management Services Cost ( \$ in Thousands )**

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

**Remarks**

Project Total Cost			109,404	110,419		126,451		130,952		477,226
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**Remarks**

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<b>Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile</b>	Date <b>February 2007</b>
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<b>APPROPRIATION/BUDGET ACTIVITY</b> <b>RDT&amp;E, DW/04 Advanced Component Development and Prototypes (ACD&amp;P)</b>	<b>R-1 NOMENCLATURE</b> <b>0603890C Ballistic Missile Defense System Core</b>
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Fiscal Year	2006				2007				2008				2009				2010				2011				2012				2013							
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4				
<b>Enterprise Architecture and Engineering</b>																																				
Plan disaster recovery capability	▲				▲				▲				▲				▲				▲				▲				▲				▲			
Design/upgrade IA Architecture and Plans	▲				▲				▲				▲				▲				▲				▲				▲				▲			
Develop plans to transition comms networks	▲				▲				▲				▲				▲				▲				▲				▲				▲			
Plan server/helpdesk consolidation	▲				▲				▲				▲				▲				▲				▲				▲				▲			
<b>Enterprise Communications Infrastructure</b>																																				
Upgrade/Consolidate comms networks	▲				▲				▲				▲				▲				▲				▲				▲				▲			
Implement Secure Wireless Network	▲				▲				▲				▲				▲				▲				▲				▲				▲			
Implement, O&M Special Access Program WAN	▲				▲				▲				▲				▲				▲				▲				▲				▲			
Migrate comms to IV V6 per DoDI 8500.2	▲				▲				▲				▲				▲				▲				▲				▲				▲			
<b>Enterprise Information Assurance</b>																																				
IA rqmts for Test Bed Sys Spec for Block 08	▲				▲				▲				▲				▲				▲				▲				▲				▲			
Implement PKI/CAC enabled applications	▲				▲				▲				▲				▲				▲				▲				▲				▲			
Establish/sustain IA Workforce Improvement Prog.	▲				▲				▲				▲				▲				▲				▲				▲				▲			

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

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<b>Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile</b>	Date <b>February 2007</b>
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<b>APPROPRIATION/BUDGET ACTIVITY</b> <b>RDT&amp;E, DW/04 Advanced Component Development and Prototypes (ACD&amp;P)</b>	<b>R-1 NOMENCLATURE</b> <b>0603890C Ballistic Missile Defense System Core</b>
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Fiscal Year	2006				2007				2008				2009				2010				2011				2012				2013							
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4				
<b>Enterprise Information Assurance</b>																																				
Implement Phased Disaster Recovery Capability	▲				▲				▲				▲				▲				▲				▲				▲				▲			
Implement, O&M Primary & Alt NOSC	▲				▲				▲				▲				▲				▲				▲				▲				▲			
Test and accredit MDA networks and systems	▲				▲				▲				▲				▲				▲				▲				▲				▲			
Update BMDS Block 04/06 DIACAP	▲				▲				▲				▲				▲				▲				▲				▲				▲			
<b>Enterprise Applications</b>																																				
Implement Collaborative Tools	▲				▲				▲				▲				▲				▲				▲				▲				▲			
Implement Phased Elec Records Mgmt	▲				▲				▲				▲				▲				▲				▲				▲				▲			
Implement DoD-mandated improvements	▲				▲				▲				▲				▲				▲				▲				▲				▲			
Transition financial management applications	▲				▲				▲				▲				▲				▲				▲				▲				▲			
<b>Enterprise Information Management Services</b>																																				
Improve portal access to BMDS data	▲				▲				▲				▲				▲				▲				▲				▲				▲			
Consolidate GM/THAAD websites to MDA Portal	▲				▲				▲				▲				▲				▲				▲				▲				▲			
Sustain Video Information Production Center (VIPIC)	▲				▲				▲				▲				▲				▲				▲				▲				▲			

Legend			
▲	Significant Event (complete)	▲	Significant Event (planned)
★	Milestone Decision (complete)	★	Milestone Decision (planned)
◆	Element Test (complete)	◆	Element Test (planned)
▼	System Level Test (complete)	▼	System Level Test (planned)
▲	Complete Activity	▲	Planned Activity

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<b>Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile</b>	Date <b>February 2007</b>
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<b>APPROPRIATION/BUDGET ACTIVITY</b> <b>RDT&amp;E, DW/04 Advanced Component Development and Prototypes (ACD&amp;P)</b>	<b>R-1 NOMENCLATURE</b> <b>0603890C Ballistic Missile Defense System Core</b>
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Fiscal Year	2006				2007				2008				2009				2010				2011				2012				2013							
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4				
<b>Enterprise Information Management Services</b>																																				
Fund recurring O&M of the MDA Portals	▲				▲				▲				▲				▲				▲				▲				▲				▲			
<b>Enterprise Video Conferencing</b>																																				
Implement VOIP across the MDA					▲				▲																											
Sustain BMDS VTC O&M	▲				▲				▲				▲				▲				▲				▲				▲							
<b>Enterprise Plans and Policies</b>																																				
Develop strategic IT plans and policies	▲				▲				▲				▲				▲				▲				▲				▲							
Develop agency IT budgets and monitor execution	▲				▲				▲				▲				▲				▲				▲				▲							
Submit annual FISMA Report					▲				▲				▲				▲				▲				▲				▲							
<b>Computing Infrastructure (USNCR)</b>																																				
Sustain O&M of IM/IT infrastructure (USNCR)	▲				▲				▲				▲				▲				▲				▲				▲							
<b>Computing Infrastructure (USSOUTH)</b>																																				
Sustain O&M of IM/IT infrastructure (USSOUTH)	▲				▲				▲				▲				▲				▲				▲				▲							
<b>Service IM/IT Executing Agents</b>																																				

Legend			
▲	Significant Event (complete)	▲	Significant Event (planned)
★	Milestone Decision (complete)	★	Milestone Decision (planned)
◆	Element Test (complete)	◆	Element Test (planned)
▼	System Level Test (complete)	▼	System Level Test (planned)
▲	Complete Activity	▲	Planned Activity



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Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail						Date February 2007		
APPROPRIATION/BUDGET ACTIVITY RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)				R-1 NOMENCLATURE 0603890C Ballistic Missile Defense System Core				
Schedule Profile	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
<b>Enterprise Architecture and Engineering</b>								
Plan disaster recovery capability	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q
Design/upgrade IA Architecture and Plans	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q
Develop plans to transition comms networks	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q
Plan server/helpdesk consolidation	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q				
<b>Enterprise Communications Infrastructure</b>								
Support recurring maintenance agreements	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q
Sustain operations of the MDA Wide Area Network	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q
Upgrade/Consolidate comms networks	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q
Execute Service Level Agreements for hub services	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q
Fund Agency leased communications	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q
Implement Secure Wireless Network	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q			
Implement, O&M Special Access Program WAN	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q
Migrate comms to IV V6 per DoDI 8500.2	1Q-4Q	1Q-4Q	1Q-2Q					
<b>Enterprise Information Assurance</b>								
IA rqmts for Test Bed Sys Spec for Block 08	1Q-3Q							
Implement PKI/CAC enabled applications	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q				
Establish/sustain IA Workforce Improvement Prog.	2Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q
Implement Phased Disaster Recovery Capability	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q
Implement, O&M Primary & Alt NOSC	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q
Test and accredit MDA networks and systems	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q
Update BMDS Block 04/06 DIACAP	1Q-4Q	1Q-4Q	1Q-4Q					
Implemented smartcard-only logon	2Q-4Q							
Annual update of IA Program Plan	4Q	4Q	4Q	4Q	4Q	4Q	4Q	4Q
Provide Annual IA User Training	4Q	4Q	4Q	4Q	4Q	4Q	4Q	4Q
<b>Enterprise Applications</b>								
Fund recurring enterprise application license fees	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q
Implement Collaborative Tools	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q			
Implement Phased Elec Records Mgmt	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q
Consolidate Microsoft licenses to Enterprise	1Q-4Q	1Q-2Q						

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Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail						Date February 2007		
APPROPRIATION/BUDGET ACTIVITY RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)				R-1 NOMENCLATURE 0603890C Ballistic Missile Defense System Core				
Schedule Profile	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
Implement DoD-mandated improvements	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q
Implement a Software asset management program	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q				
Implement a System Development Schedule	1Q-4Q							
Implemented Personnel Tracking System	1Q-2Q							
Transition financial management applications	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q			
<b>Enterprise Information Management Services</b>								
Improve portal access to BMDS data	1Q-4Q	1Q-4Q						
Consolidate GM/THAAD websites to MDA Portal	1Q-4Q							
Sustain Video Information Production Center (VIPIC)	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q
Develop/provide Portal-based training	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q
Fund recurring O&M of the MDA Portals	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q
Implement phased information cataloging to Portal	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q
<b>Enterprise Video Teleconferencing</b>								
Implement VOIP across the MDA	4Q	1Q-4Q						
Sustain BMDS VTC O&M	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q
Design/Engineer VTC capability for MDA sites	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q				
<b>Enterprise Plans and Policies</b>								
Develop strategic IT plans and policies	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q
Develop agency IT budgets and monitor execution	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q
Provide PMA/E-Gov Updates	1Q,2Q,3Q,4Q	1Q,2Q,3Q,4Q	1Q,2Q,3Q,4Q	1Q,2Q,3Q,4Q	1Q,2Q,3Q,4Q	1Q,2Q,3Q,4Q	1Q,2Q,3Q,4Q	1Q,2Q,3Q,4Q
Provide Quarterly DITPR Updates	1Q,2Q,3Q,4Q	1Q,2Q,3Q,4Q	1Q,2Q,3Q,4Q	1Q,2Q,3Q,4Q	1Q,2Q,3Q,4Q	1Q,2Q,3Q,4Q	1Q,2Q,3Q,4Q	1Q,2Q,3Q,4Q
Submit annual FISMA Report	3Q	3Q	3Q	3Q	3Q	3Q	3Q	3Q
Measure performance against IT strategic goals	4Q	4Q	4Q	4Q	4Q	4Q	4Q	4Q
Submit biannual DOJ Section 508 survey		1Q		1Q		1Q		1Q
<b>Computing Infrastructure (USNCR)</b>								
Sustain O&M of IM/IT infrastructure (USNCR)	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q
Update/maintain SW licenses for USNCR	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q
<b>Computing &amp; Network Mgmt Services (USNCR)</b>								
Continue operations of the NCR LAN/WAN	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q
Support BRAC and transition planning	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q		
<b>Computing Infrastructure (USSOUTH)</b>								

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Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail						Date February 2007		
APPROPRIATION/BUDGET ACTIVITY RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)				R-1 NOMENCLATURE 0603890C Ballistic Missile Defense System Core				
Schedule Profile	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
Sustain O&M of IM/IT infrastructure (USSOUTH)	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q
Update/maintain SW licenses for USSOUTH	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q
<b>Service IM/IT Executing Agents</b>								
Sustain O&M of IM/IT for MDA Research support	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q
Update/maintain SW licenses	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q

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<b>Missile Defense Agency (MDA) Exhibit R-2A RDT&amp;E Project Justification</b>						Date <b>February 2007</b>		
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<b>APPROPRIATION/BUDGET ACTIVITY</b>				<b>R-1 NOMENCLATURE</b>				
<b>RDT&amp;E, DW/04 Advanced Component Development and Prototypes (ACD&amp;P)</b>				<b>0603890C Ballistic Missile Defense System Core</b>				

COST (\$ in Thousands)	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
0106 Modeling & Simulation	89,550	92,680	100,698	104,350	108,649	109,570	112,953	114,784
RDT&E Articles Qty	0	0	0	0	0	0	0	0

**A. Mission Description and Budget Item Justification**

The Missile Defense Agency is developing the capability to defend the homeland, its friends, allies and deployed forces against ballistic missiles of all ranges, in all phases of their flight. The Ballistic Missile Defense System exploits maturing capabilities, both national and in the theater to build an integrated, highly capable defense. As new capabilities are brought to the war fighter, the “plug and fight” missile defense system increases its effectiveness through the use of new engagement sequence groups. These engagement sequences take advantage of air, land, sea and space components to maximize the probability of kill, expand the area that can be defended and decreases the area from which our enemy can launch, as well as minimizes the number of weapons needed in the inventory. Likewise, a modeling and simulation framework is being developed that reflects the open architecture envisioned for the Ballistic Missile Defense System.

The mission of the Agency's Modeling and Simulation program is to establish a tool set and computational facilities/resources at the Advanced Research Center (ARC) and Simulation Center (SimCtr) for planning, engineering, testing and operating an integrated ballistic missile defense system. Specific modeling and simulation products map to the six agency venues: system ground tests, system flight tests, war games/exercises, analysis, training and element testing. For each of these venues and their stakeholders, we define, design, develop, deploy and maintain system simulations, including their constituent subsystem, threat and environment models, and provide user and analytical support services. In addition, we are responsible for requirements development, configuration control, verification, validation and accreditation, facility and infrastructure planning, information assurance and risk management.

The modeling and simulation enterprise uses a centrally managed - distributed execution management paradigm drawing on the existing geographically dispersed workforce to accurately and credibly represent the system, its threats and the multitude of environments. Our implementation teams consisting of the Element project offices and our Modeling and Simulation (M&S) Centers of Excellence at the U.S. Army Space and Missile Defense Command Center in Huntsville, Alabama and the Agency's Joint National Integration Center in Colorado Springs, Colorado have highly capable teams and state of the art facilities servicing the design, development and testing needs of the Agency. The Agency's Modeling and Simulation Directorate is comprised of a simulation-literate team of government, Research and Development Centers and University Affiliated Research Center staff; it sets policy, leads system engineering and centrally manages the Agency-wide enterprise.

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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 System Core	
<p><b>MODEL DEVELOPMENT</b></p> <p>Modeling and simulation is required in every facet of fielding a credible missile defense system from capability needs analysis to activation of the system. The Agency's system engineering process guides our program strategy and implementation.</p> <p>Our comprehensive Modeling and Simulation plan based on Agency and Warfighter needs (described in the Needs Statement and subordinate requirements documents) includes modifying and sustaining our legacy tools, developing an integrated simulation based on an open architecture and framework, implementing a Common Environment and Threat Model and sustaining the M&amp;S foundation for MDA's international missile defense initiatives.</p> <p>We are implementing a Ballistic Missile Defense System (BMDS) simulation architecture that mirrors the BMDS open architecture. Significant benefits include fully integrated element models that are benchmarked to Element engineering-level models anchored to BMDS test data, and supplemented with verification and validation data. With this multi-layer modeling and simulation framework, the integrated models described above operate and, infrastructure is economized. In FY06 we defined framework standards and specifications. In FY07 - FY09, we apply resources to reconfigure Block 08 models to meet these standards.</p> <p>Over the last decade, the Agency has developed a number of element, component and system tools. These tools evolved to meet the needs of our formerly stand-alone theater and strategic weapons. Our approach leverages investments already made in these legacy assets, including the Ballistic Missile Defense System Simulation (BMDS SIM) and the Missile Defense System Exerciser (MDSE) to meet near term needs while we migrate to the framework and standards described.</p> <p>In FY06 we applied funds to BMDS SIM to support war fighter exercises, wargames, C2BMC spiral testing, Interim Capability Assessment Report (ICAR) 2006 and the GT-01 ground test campaign. In FY07, we fund upgrades to evolve the tool to continue to support these venues for Block 2006 as well as initiate our integration of Element models for the GMD Fire Control (GFC), PATRIOT, THAAD and Aegis weapon systems.</p> <p>We invested FY06 resources to evolve the MDSE architecture for Block 2004 system ground testing to include CGT 06-1 &amp; 2 and IGT 06-1. FY07 and out year resources modify the tool architecture to permit testing of the Block 2006 system ground testing, IGT 06-2 and migrate to Open Architecture Simulation System (OASiS) standards.</p> <p>To respond to a rapidly changing threat and take advantage of advances in technology, we have defined and are implementing an Agency-wide Common Environment and Threat Model. The model provides standardized tools and capabilities for representing the battle space environment and</p>		

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adversary capabilities. The domain of the model includes active and passive signatures of threat objects and their kinematics and operational behaviors, the relevant natural and perturbed battle space environment, the effects of this environment on threats and defensive systems, and a common way of dealing with the consequences (debris) of missile defense engagements. We applied FY06 resources to define the tools and consolidate existing phenomenology tools to include Parametric Endo-Exo Lethality Simulation (PEELS), Post Engagement Ground Effects Model (PEGEM), Kinetic Impact Debris Distribution (KIDD), Performance Assessment Workbench Software (PAWS), CT-Analyst, Battlespace Environment and Signatures Toolkit (BEST), Strategic Scene Generation Model (SSGM), and Optical Signature Code (OSC).

To support Agency and Department international goals, we are building a foundation for international missile defense initiatives by partnering on defining requirements and interfaces for an open system modeling framework. Defining our modeling and simulation requirements up front with our friends and allies, we can ensure compatibility of our simulation architecture at all levels with future missile defense partners. Compatibility of our simulation architecture significantly increases our ability to develop interoperable missile defense elements both theater and global. It also establishes a laboratory for exploring concept of operations, battle management command and control networks and capability assessment. In FY06, we established cooperative work with the North Atlantic Treaty Organization, Australia and the United Kingdom. In FY07, we plan additional bi-lateral initiatives in both the Pacific and European regions.

**TEST AND OPERATIONS**

One of our key cornerstones is promoting the Agency's simulation-based acquisition of the Ballistic Missile Defense System. Models and simulations anchored to data from flight and ground tests are fundamental tools for verifying and assessing system performance. The Agency employs an integrated approach to testing, bringing together the contributions of various elements into combined system tests. The Agency's Integrated Master Test Plan specifies the tests that require modeling and simulation products as well as the sources of real-world data to anchor those products.

The Agency's Modeling and Simulation program contributes to the BMDS Current Test, Training and Operations (CTTO) activities that will safely separate test, evaluation, and training venues from real-world activities; and allow injection of high-fidelity simulations to run realistic scenarios on operational equipment and networks. CTTO will enable end-to-end testing of the BMDS and enable BMDS training that allows operators to exercise any or all BMDS elements, as needed.

The Modeling and Simulation Strategic Plan allocates resources to the M&S Centers of Excellence for execution. The HardWare In-the-Loop (HWIL) Center of Excellence at the U.S. Army Space and Missile Defense Command operates and maintains the ARC, SimCtr and other facilities and infrastructure necessary to execute distributed ground testing. The Missile Defense System Exerciser facilitates these ground tests.

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Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date <b>February 2007</b>
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APPROPRIATION/BUDGET ACTIVITY <b>RDT&amp;E, DW/04 Advanced Component Development and Prototypes (ACD&amp;P)</b>	R-1 NOMENCLATURE <b>0603890C Ballistic Missile Defense System Core</b>
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**MODELING AND SIMULATION ENGINEERING AND INTEGRATION**

The M&S Program Directorate leads an integrated Agency team leveraging skills from the Element program offices, the modeling and simulation Centers of Excellence, industry and academia to accomplish the mission. In addition to establishing Agency policy and strategic direction, one of the primary responsibilities of the program is to develop, proliferate and maintain common standards across the enterprise including the architecture, framework, models, interfaces and quality assurance.

To help meet this responsibility, the Directorate establishes enterprise-wide processes including requirements engineering, schedule development, architectural engineering, and verification, validation and accreditation (VV&A), and configuration tracking. We use the requirements engineering process to develop requirements based on stakeholder needs (including the Block Test Bed System Specifications), estimate implementation costs and risks and develop modeling and simulation support plans. We use the architectural engineering process to formulate implementation concepts and design specifications to enable these requirements. Development of software, integration and test, checkout and deployment of M&S capabilities to the venues are then scrutinized via the VV&A process. The VV&A process ensures that the models and simulation we implement meet the designer's intent, adequately represent reality and are appropriate for their intended use. We use the configuration tracking process to archive and manage modeling and simulation-related programmatic data, design and interface information, as well as control upgrade and release of model and simulation components.

In FY06 we initiated the formal Verification, Validation, and Accreditation process for BMDS-level system models. Within this process the responsible Centers of Excellence identify and deliver the required validation evidence with Element assistance including plans and reports needed for model accreditation. The Modeling and Simulation Program Directorate is responsible for configuration and accrediting the M&S Tools to meet Agency needs.

**B. Accomplishments/Planned Program**

	FY 2006	FY 2007	FY 2008	FY 2009
Model Development	65,225	63,277	70,320	72,981
RDT&E Articles (Quantity)	0	0	0	0

Modeling and simulation is required in every facet of fielding a credible missile defense system from capability needs analysis to activation of the system.

**FY06 Accomplishments:**

- Updated BMDS Simulations (BMDS SIM, MDSE) for Ground Test and Missile Defense Exercises

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<ul style="list-style-type: none"> <li>• Updated industry standard lethality, ground effects and debris dispersion phenomenology codes (PEELS, PEGEM, and KIDD)</li> <li>• Updated threat and scene generation codes (BEST, SSGM, and OSC)</li> <li>• Updated Open Architecture Simulation System (OASiS) Model and Framework Specifications</li> <li>• Developed an OASiS-based Analysis Engine for BMDS planner</li> <li>• Developed a Constructive Analysis Federation Prototype 1</li> <li>• Conducted OASiS middleware and simulation engine risk reduction</li> </ul> <p>FY07 Planned Program:</p> <ul style="list-style-type: none"> <li>• Update BMDS SIM to integrate additional Element models (PSEM for PATRIOT, ETE Sim for THAAD, ADAM for Aegis BMD, and the GFC model) to support warfighter events and training.</li> <li>• Upgrade the MDSE framework to begin the implementation of performance assessment for the GT-02 Test Campaign; begin initial Radar Digital Simulation Injection Stimulator (RDSIS) integration effort with THAAD as an HWIL proof of concept for adding radar signal and data processors; and upgrade all remote environments (REs).</li> <li>• Update Common Environment and Threat Models to include threat trajectory generation, threat signatures generation, core lethality, and battlespace environment definitions.</li> <li>• Continue the Extended Air Defense Simulation (EADSIM) as Phase I (initial integration with BMDS SIM)</li> <li>• Continue development of BMDS International Simulation, and BMDS Defender (Concept Exploration simulation)</li> <li>• Continue migration to open architecture specifications</li> <li>• Continue VV&amp;A for BMDS-level M&amp;S events/venues</li> <li>• Continue M&amp;S International Implementation support</li> </ul> <p>FY08 Planned Program:</p> <ul style="list-style-type: none"> <li>• Update BMDS SIM to complete integration of Element models for Aegis BMD (ADAM) and THAAD (ETE Sim).</li> <li>• Complete BMDS SIM software development of models representing Ground Based Interceptors (GBIs) and the TPY-2 radar for FBX-T; complete BMDS SIM code restructuring.</li> <li>• Update the MDSE framework for full performance assessment required to support the GT-03 Test Campaign; begin upgrades for CTTO to include integrating GMD's exercise trainer (ET) into the MDSE framework; establish an additional development Test Exercise Controller (TEC) and Operational TEC to support CTTO; develop and integrate RDSIS for Upgraded Early Warning Radars (UEWR) and Sea-based X band Radar (SBX) into the MDSE framework; begin integration of ABL, STSS, and other Block 08 elements not already part of the MDSE framework</li> </ul>		

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<b>APPROPRIATION/BUDGET ACTIVITY</b> <b>RDT&amp;E, DW/04 Advanced Component Development and Prototypes (ACD&amp;P)</b>	<b>R-1 NOMENCLATURE</b> <b>0603890C Ballistic Missile Defense System Core</b>
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- Upgrade Common Environment and Threat Models to include threat trajectory generation, threat signatures generation, core lethality, and battlespace environment definitions
- Integrate the EADSIM into the BMDS SIM framework for Phase II
- Continue the BMDS International Simulation, and BMDS Defender
- Continue migration to open architecture specifications
- Continue VV&A for BMDS-level M&S events/venues
- Continue M&S International Implementation support

**FY09 Planned Program:**

- Continue updates of BMDS SIM and MDSE to support BMDS and Element Testing, Warfighter Events, Performance Assessment and Training
- Continue updates of Common Environment and Threat Models to include improved trajectory generation, threat signatures generation, core lethality, and battlespace environment definitions
- Complete integration of the EADSIM (Phase III) with BMDS SIM
- Continue the BMDS International Simulation, and BMDS Defender efforts
- Continue VV&A for BMDS-level Modeling and Simulation events/venues
- Continue M&S International Implementation support for critical bilateral events

	FY 2006	FY 2007	FY 2008	FY 2009
Product Test and Operations	12,025	13,300	13,586	13,871
RDT&E Articles (Quantity)	0	0	0	0

Models and simulations anchored to data from well-contrived flight tests are fundamental tools for verifying and assessing system performance. The Agency employs an integrated approach to testing and bringing together the contributions of various elements into combined system tests.

The Advanced Research Center (ARC) in Huntsville, AL, provides computational resources, infrastructure, and IT subject matter experts who support both system and element-level flight and ground testing. The infrastructure includes Element test beds and lab space, connectivity to multiple classified and unclassified DoD networks, and robust information assurance capabilities.

The Simulation Center (SimCtr) on Redstone Arsenal in Huntsville, AL, provides a shared asset, high performance computing center with scientific workstations to supercomputers, high bandwidth networks, and large storage capacity supporting RDT&E missile defense, threat, and sensor

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<b>APPROPRIATION/BUDGET ACTIVITY</b> <b>RDT&amp;E, DW/04 Advanced Component Development and Prototypes (ACD&amp;P)</b>	<b>R-1 NOMENCLATURE</b> <b>0603890C Ballistic Missile Defense System Core</b>
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technologies. The SimCtr supports multiple Agency projects and activities to include lethality/impact, plume, and flow fields; target signature/radar cross-section analysis; trajectories; and development/test support to KEI, Aegis, and Sensors.

**FY06 Accomplishments:**

- Supported test events including GTX-01a, GTX-01b, and GTI-01
- Sustained core facilities (ARC and SimCtr) and capabilities

**FY07 Planned Program:**

- Sustain core facilities (ARC, SimCtr)
- Support test events including GTD-01, GTX-02a, GTI-02, and initial GTD-02 planning

**FY08 Planned Program:**

- Sustain core facilities (ARC, SimCtr)
- Support test events including GTD-02, WG 06-3, WG 06-4, the GT-03 Test Campaign, and initial Concurrent Test, Training, and Operations (CTTO) activities

**FY09 Planned Program:**

- Sustain core facilities (ARC, SimCtr)
- Support BMDS test and war game events.

	FY 2006	FY 2007	FY 2008	FY 2009
Systems Engineering and Integration (SE&I)	12,300	16,103	16,792	17,498
RDT&E Articles (Quantity)	0	0	0	0

The Modeling and Simulation Program Directorate leads an integrated Agency team leveraging skills from the Element program offices, the modeling and simulation Centers of Excellence, industry, and academia to accomplish the mission.

**FY06 Accomplishments:**

- Accredited Models and Simulations for Core Intended Uses
- Developed Accreditation Reports
- Provided Facility/Test support for test events

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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 System Core	
<ul style="list-style-type: none"><li>Released Accreditation Plans and Final Report</li><li>Prepared Test Event Assessment Reports</li><li>Updated Modeling and Simulation System Engineering Management Plan</li><li>Updated Block 06 M&amp;S Mission Needs Statement, Capabilities Requirements Document, and Implementation Plans</li><li>Established M&amp;S Enterprise Verification, Validation, and Accreditation Process</li><li>Established M&amp;S Enterprise Requirements Engineering Process</li></ul> <p>FY07 Planned Program:</p> <ul style="list-style-type: none"><li>Accredit Models and Simulations for Core Intended Uses</li><li>Develop Accreditation Reports</li><li>Provide Facility/Test support for test events</li><li>Release Accreditation Plans and Final Report</li><li>Prepare Test Event Assessment Reports</li><li>Update Modeling and Simulation System Engineering Management Plan</li><li>Update M&amp;S Mission Needs Statement, Capabilities Requirements Document, and Implementation Plans</li><li>Continue to refine M&amp;S Enterprise Verification, Validation, and Accreditation Process</li><li>Refine M&amp;S Enterprise Requirements Engineering Process</li></ul> <p>FY08 Planned Program:</p> <ul style="list-style-type: none"><li>Accredit Models and Simulations for Core Intended Uses</li><li>Develop Accreditation Reports</li><li>Provide Facility/Test support for test events</li><li>Release Accreditation Plans and Final Report</li><li>Prepare Test Event Assessment Reports</li><li>Update Modeling and Simulation System Engineering Management Plan</li><li>Establish Block 08 M&amp;S Mission Needs Statement, Capabilities Requirements Document, and Implementation Plans</li><li>Continue to refine M&amp;S Enterprise Verification, Validation, and Accreditation Process</li><li>Refine M&amp;S Enterprise Requirements Engineering Process</li></ul>		

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<b>APPROPRIATION/BUDGET ACTIVITY</b> <b>RDT&amp;E, DW/04 Advanced Component Development and Prototypes (ACD&amp;P)</b>	<b>R-1 NOMENCLATURE</b> <b>0603890C Ballistic Missile Defense System Core</b>
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**FY09 Planned Program:**

- 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
- Update Modeling and Simulation System Engineering Management Plan
- Update Block 08 M&S Mission Needs Statement, Capabilities Requirements Document, and Implementation Plans
- Continue M&S Enterprise Verification, Validation, and Accreditation
- Revise M&S Enterprise Requirements Engineering Process

**C. Other Program Funding Summary**

	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	Total Cost
PE 0603175C Ballistic Missile Defense Technology	147,270	193,307	118,569	109,540	116,014	121,008	127,917	131,291	1,064,916
PE 0603881C Ballistic Missile Defense Terminal Defense Segment	1,120,879	1,092,076	962,585	1,004,282	924,101	851,213	678,694	501,147	7,134,977
PE 0603882C Ballistic Missile Defense Midcourse Defense Segment	2,391,246	3,043,058	2,520,064	2,359,665	2,179,602	1,699,963	1,153,082	1,183,003	16,529,683
PE 0603883C Ballistic Missile Defense Boost Defense Segment	455,572	628,958	548,759	432,432	448,375	678,913	829,683	1,026,239	5,048,931
PE 0603884C Ballistic Missile Defense Sensors	284,297	514,129	778,163	984,963	939,417	791,701	723,843	603,585	5,620,098
PE 0603886C Ballistic Missile Defense System Interceptors	200,446	356,004	227,499	393,317	522,388	730,236	836,029	570,206	3,836,125
PE 0603888C Ballistic Missile Defense Test and Targets	610,619	601,782	586,150	628,364	662,984	681,511	696,037	705,210	5,172,657
PE 0603889C Ballistic Missile Defense Products	387,402	0	0	0	0	0	0	0	387,402
PE 0603891C Special Programs - MDA	271,021	353,031	323,250	305,409	369,073	526,966	789,017	792,271	3,730,038
PE 0603892C Ballistic Missile Defense Aegis	893,040	1,122,669	1,059,103	1,129,425	1,221,650	1,067,587	1,054,753	1,089,078	8,637,305
PE 0603893C Space Tracking & Surveillance System	220,048	322,220	331,525	347,811	412,623	501,197	778,067	981,424	3,894,915
PE 0603894C Multiple Kill Vehicle	48,370	144,362	271,151	352,741	461,179	618,263	673,477	842,905	3,412,448
PE 0603895C BMD System Space Program	0	0	27,666	35,093	46,849	56,183	133,617	157,117	456,525
PE 0603896C BMD C2BMC	0	246,852	258,913	294,627	300,847	282,615	267,275	269,420	1,920,549

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<b>APPROPRIATION/BUDGET ACTIVITY</b> <b>RDT&amp;E, DW/04 Advanced Component Development and Prototypes (ACD&amp;P)</b>	<b>R-1 NOMENCLATURE</b> <b>0603890C Ballistic Missile Defense System Core</b>
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	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	Total Cost
PE 0603897C BMD Hercules	0	49,674	53,658	54,264	54,405	55,142	53,355	54,198	374,696
PE 0603898C BMD Joint Warfighter Support	0	54,935	48,787	50,428	54,086	56,603	58,890	60,206	383,935
PE 0603904C BMD Joint National Integration Center (JNIC)	0	110,629	104,012	106,985	111,542	111,947	113,592	115,287	773,994
PE 0603905C BMD Concurrent Test and Operations	0	23,159	0	0	0	0	0	0	23,159
PE 0603906C Regarding Trench	0	0	2,000	3,000	5,000	5,000	9,000	9,000	33,000
PE 0605502C Small Business Innovative Research - MDA	133,105	0	0	0	0	0	0	0	133,105
PE 0901585C Pentagon Reservation	14,874	15,527	6,058	6,376	4,490	4,725	4,801	4,877	61,728
PE 0901598C Management Headquarters - MDA	98,609	87,059	85,906	86,453	70,355	69,855	69,855	69,855	637,947

**D. Acquisition Strategy**

The M&S acquisition strategy is to build upon an integrated open system framework. We implement a centralized movement and decentralized execution approach to achieving this goal. We leverage the use of legacy M&S Tools and element M&S Tools to fit within this new framework and support the spiral development of the BMDS. The Modeling and Simulation Centers of Excellence at Colorado Springs and Huntsville execute modeling and simulation implementation plans to deliver the desired capabilities and tools. The results of M&S requirements engineering, architecture engineering, and knowledge-based requirements will drive future investments.

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<b>Missile Defense Agency (MDA) Exhibit R-3 RDT&amp;E Project Cost Analysis</b>	Date <b>February 2007</b>
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<b>APPROPRIATION/BUDGET ACTIVITY</b> <b>RDT&amp;E, DW/04 Advanced Component Development and Prototypes (ACD&amp;P)</b>	<b>R-1 NOMENCLATURE</b> <b>0603890C Ballistic Missile Defense System Core</b>
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**I. Product Development Cost ( \$ in Thousands )**

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

**Remarks**

**II. Support Costs Cost ( \$ in Thousands )**

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2007 Cost	FY 2007 Award/ Oblg Date	FY 2008 Cost	FY 2008 Award/ Oblg Date	FY 2009 Cost	FY 2009 Award/ Oblg Date	Total Cost
<b>Model Development</b>										
Consolidated and Integrated M&S (CIMS)	C/CPAF	Northrop Grumman /CO	24,912	16,164	1Q	13,204	1Q	15,327	1Q	69,607
V&V	C/CPAF	Northrop Grumman /CO	2,790	2,830	1Q	2,972	1Q	3,120	1Q	11,712
MDSE	C/CPFF	TBE/ AL	7,031	9,209	1Q	7,116	1Q	7,432	1Q	30,788
MDSE - Patriot	MIPR	AMRDEC SED/ AL	766	1,080	1Q	1,558	1Q	1,200	1Q	4,604
MDSE - Aegis BMD	SS/CPAF	Lockheed Martin/NJ	1,108	1,350	1Q	1,500	1Q	1,550	1Q	5,508
MDSE - Aegis BMD	MIPR	NSWC Dahlgren/VA	640	1,200	1Q	1,450	1Q	1,500	1Q	4,790
MDSE - SBIRS	SS/CPAF	Northrop Grumman/CA	686	576	1Q	720	1Q	750	1Q	2,732
MDSE - JTAGS	SS/CPFF	Northrop Grumman/CA	600	1,177	1Q	700	1Q	750	1Q	3,227
MDSE - GMD	C/CPFF	Boeing/AL	1,400	2,400	1Q	3,750	1Q	3,462	1Q	11,012
MDSE - FBX-T	SS/CPAF	Raytheon/MA	0	0	N/A	2,500	1Q	2,650	1Q	5,150

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Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis							Date February 2007			
APPROPRIATION/BUDGET ACTIVITY RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)					R-1 NOMENCLATURE 0603890C Ballistic Missile Defense System Core					
Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2007 Cost	FY 2007 Award/Oblg Date	FY 2008 Cost	FY 2008 Award/Oblg Date	FY 2009 Cost	FY 2009 Award/Oblg Date	Total Cost
MDSE - TCES	MIPR	SSC San Diego/CA	1,885	824	1Q	2,000	1Q	1,500	1Q	6,209
MDSE - THAAD	SS/CPAF	TMI/AL	2,000	765	1Q	750	1Q	800	1Q	4,315
V&V - Verification	C/CPFF	BFA Systems/AL	870	940	1/2Q	1,103	1Q	970	1Q	3,883
V&V - Element Validation	MIPR	Various	2,000	2,160	1Q	2,264	1Q	2,364	1Q	8,788
Risk Reduction	MIPR	Boeing/VA	1,321	0	N/A	0	N/A	0	N/A	1,321
Risk Reduction	C/CPAF	Lockheed Martin/VA	500	0	N/A	0	N/A	0	N/A	500
Risk Reduction	C/CPAF	Lockheed Martin and Boeing/VA	2,033	3,778	1Q	0	N/A	0	N/A	5,811
Phenomenology	C/CPFF	TSI/AL	3,000	3,117	1Q	3,184	1Q	3,251	1Q	12,552
CETM / Lethality	Various	Various	2,575	2,575	1Q	2,630	1Q	2,686	1Q	10,466
OASIS	Various	Various	3,508	0	N/A	0	N/A	0	N/A	3,508
EADSIM	C/CPFF	TBE/AL	1,840	1,600	1/2Q	1,632	1/2Q	1,664	1/2Q	6,736
International	MIPR	MITRE/VA	100	0	N/A	0	N/A	0	N/A	100
International	MIPR	SPARTA/VA	705	738	1Q	0	N/A	0	N/A	1,443
International	MIPR	PRA/VA	370	387	1Q	0	N/A	0	N/A	757
International	Various	Various	425	546	1Q	404	1Q	412	1Q	1,787
M&S Tools	Various	Various	1,798	7,541	2/3Q	7,692	2/3Q	7,846	2/3Q	24,877
MDSE - DMOC	MIPR	USAF DMOC/NM	400	250	1Q	500	1Q	525	1Q	1,675
MDSE - MCUSMC	SS/CPFF	Sensis Corp/CA	400	250	1Q	725	1Q	760	1Q	2,135
EADTB	C/CPAF	Raytheon/AL	250	0	4Q	0	N/A	0	N/A	250
MDSE - ABL	MIPR	Boeing/NM	0	0	N/A	1,300	1Q	1,350	1Q	2,650
MDSE - UEWR Beale	MIPR	Raytheon/MA	0	0	N/A	1,100	1Q	1,150	1Q	2,250
MDSE - UEWR Clear	MIPR	Raytheon/MA	0	0	N/A	1,100	1Q	1,150	1Q	2,250
MDSE - UEWR Thule	MIPR	Raytheon/MA	0	0	N/A	1,100	1Q	1,150	1Q	2,250

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<b>Missile Defense Agency (MDA) Exhibit R-3 RDT&amp;E Project Cost Analysis</b>	Date <b>February 2007</b>
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<b>APPROPRIATION/BUDGET ACTIVITY</b> <b>RDT&amp;E, DW/04 Advanced Component Development and Prototypes (ACD&amp;P)</b>	<b>R-1 NOMENCLATURE</b> <b>0603890C Ballistic Missile Defense System Core</b>
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Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2007 Cost	FY 2007 Award/ Oblg Date	FY 2008 Cost	FY 2008 Award/ Oblg Date	FY 2009 Cost	FY 2009 Award/ Oblg Date	Total Cost
MDSE - SBX	MIPR	AMRDEC/RSA/AL	0	0	N/A	1,100	1Q	1,150	1Q	2,250
MDSE - SBIRS STAR	MIPR	Northrop Grumman/CO	0	0	N/A	1,100	1Q	1,150	1Q	2,250
MDSE - STSS	MIPR	Raytheon/CA	0	0	N/A	1,100	1Q	1,150	1Q	2,250
MDSE - KEI	MIPR	Northrop Grumman/WDC	0	0	N/A	1,100	1Q	1,150	1Q	2,250
MDSE - MKV	MIPR	Lockheed Martin/WDC	0	0	N/A	1,100	1Q	1,150	1Q	2,250
MDSE - Test Infrastructure	MIPR	JNIC/ICT/CO	0	850	1Q	875	1Q	900	1Q	2,625
MDSE Requirement	C/CPFF	TBD/Competitive	864	970	1Q	991	1Q	1,012	1Q	3,837
<b>Product Test and Operations</b>										
Computational Facilities	Various	COLSA/Madison Research/AL	13,300	13,300	1Q	13,586	1Q	13,871	1Q	54,057
Subtotal Support Costs			80,077	76,577		83,906		86,852		327,412

**Remarks**

**III. Test and Evaluation Cost ( \$ in Thousands )**

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

**Remarks**

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Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis							Date February 2007			
APPROPRIATION/BUDGET ACTIVITY RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)					R-1 NOMENCLATURE 0603890C Ballistic Missile Defense System Core					
<b>IV. Management Services Cost ( \$ in Thousands )</b>										
Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2007 Cost	FY 2007 Award/ Oblg Date	FY 2008 Cost	FY 2008 Award/ Oblg Date	FY 2009 Cost	FY 2009 Award/ Oblg Date	Total Cost
<b>Systems Engineering and Integration (SE&amp;I)</b>										
Requirements Engineering (UARC)	SS/CPFF	JHU/APL/MD	2,210	2,271	1Q	2,385	1Q	2,504	1Q	9,370
M&S Architecture (FFRDC)	SS/MIPR	MIT/LL/MA	1,471	1,596	1Q	1,676	1Q	1,760	1Q	6,503
Program Plans (FFRDC)	SS/CPFF	MITRE/VA	2,210	2,261	1Q	2,375	1Q	2,493	1Q	9,339
Gov't Personnel		MDA/VA	1,124	1,149	1Q	1,174	1Q	1,200	1Q	4,647
Travel		MDA/VA	100	50	1Q	50	1Q	50	1Q	250
Gov't Personnel		SMDC/AL	2,443	2,643	1Q	2,700	1Q	2,757	1Q	10,543
Travel		SMDC/AL	250	250	1Q	255	1Q	261	1Q	1,016
SETA	C	SMDC/AL	1,792	2,250	1Q	2,298	1Q	2,347	1Q	8,687
SETA	C	SRS/JNIC / CO	700	733	1Q	770	1Q	809	1Q	3,012
MDSE Systems Engineering	C	AMRDEC/RSA/AL	2,100	2,500	1Q	2,700	1Q	2,900	1Q	10,200
MDSE Configuration Management	C	SMDC/AL	200	400	1Q	409	1Q	417	1Q	1,426
Subtotal Management Services			14,600	16,103		16,792		17,498		64,993
<b>Remarks</b>										
Project Total Cost			94,677	92,680		100,698		104,350		392,405
<b>Remarks</b> Previous Year funding for this effort was under the Ballistic Missile Defense System (BMDS), Program Element 0603890C, Project 0101										

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<b>Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile</b>	Date <b>February 2007</b>
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<b>APPROPRIATION/BUDGET ACTIVITY</b> RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	<b>R-1 NOMENCLATURE</b> 0603890C Ballistic Missile Defense System Core
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Fiscal Year	2006				2007				2008				2009				2010				2011				2012				2013			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
<b>Modeling and Simulation</b>																																
Model Build Releases				△	—————																								△			
GTX-01a		▲																														
GTX-01b			▲																													
GTI-01				▲																												
GTI-02								△																								
Constructive Analysis CAR Blk04								△																								
Constructive Analysis CAR Blk06												△																				
WG 04-5 (IMD-5.4)	▲																															
WG 06-2 (IMD-6.2)			▲																													
WG 06-3 (IMD-7.1)								△																								
WG 06-4 (IMD-7.2)								△																								
Ground Test Campaigns									—————																							
War game Events									—————																							

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

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<b>Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile</b>	Date <b>February 2007</b>
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<b>APPROPRIATION/BUDGET ACTIVITY</b> RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	<b>R-1 NOMENCLATURE</b> 0603890C Ballistic Missile Defense System Core
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Fiscal Year	2006				2007				2008				2009				2010				2011				2012				2013							
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4				
<b>Modeling and Simulation</b>																																				
Interim Constructive Analysis ICAR Blk04								Δ																												
Interim Constructive Analysis ICAR Blk06												Δ																								
BMDS SIM v2.0 Release								Δ																												
BMDS SIM v1.1 Release				▲																																
BMDS Network Centric Planner Demo			▲					Δ																												
BMDS SIM v1.0 Release		▲																																		
BMDS Analysis Federation Phase II								Δ																												
MDSE 6.0			▲																																	
MDSE 6.1								▲																												

Legend			
▲	Significant Event (complete)	▲	Significant Event (planned)
★	Milestone Decision (complete)	★	Milestone Decision (planned)
◆	Element Test (complete)	◆	Element Test (planned)
▼	System Level Test (complete)	▼	System Level Test (planned)
▲	Complete Activity	▲	Planned Activity

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Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail						Date February 2007		
APPROPRIATION/BUDGET ACTIVITY RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)				R-1 NOMENCLATURE 0603890C Ballistic Missile Defense System Core				
Schedule Profile	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
<b>Modeling and Simulation</b>								
Legacy M&S Tools Development	1Q-4Q							
Legacy M&S Tools Integration	3Q-4Q	1Q-4Q	1Q-4Q					
MS Requirements Engineering	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q				
Model Build Releases	4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q		
GTX-01a	2Q							
GTX-01b	3Q							
GTI-01	4Q							
GTI-02		4Q						
MS O&F	1Q-4Q							
Capabilities Requirements Document	1Q-4Q							
Implementation Plan	4Q	1Q-4Q						
International Seminar	1Q							
USFJ Demo	2Q							
JPOW	2Q							
JEFX -Event	3Q							
Constructive Analysis CAR Blk04		4Q						
Constructive Analysis CAR Blk06			3Q					
WG 04-5 (IMD-5.4)	1Q							
WG 06-2 (IMD-6.2)	3Q							
WG 06-3 (IMD-7.1)		1Q						
WG 06-4 (IMD-7.2)		1Q						
Ground Test Campaigns			1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q		
War game Events			1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q		
OASiS Framework Specs	1Q-4Q							
Legacy M&S Tools Maintenance	1Q-4Q							
Interim Constructive Analysis ICAR Blk04		2Q						
Interim Constructive Analysis ICAR Blk06			2Q					
BMDS SIM v2.0 Release		1Q						
BMDS SIM v1.1 Release	4Q							
BMDS Network Centric Planner Demo	3Q	1Q						

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<b>Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail</b>						Date <b>February 2007</b>		
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<b>APPROPRIATION/BUDGET ACTIVITY</b> <b>RDTE&amp;E, DW/04 Advanced Component Development and Prototypes (ACD&amp;P)</b>				<b>R-1 NOMENCLATURE</b> <b>0603890C Ballistic Missile Defense System Core</b>				
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Schedule Profile	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
BMDS SIM v1.0 Release	2Q							
BMDS Analysis Federation Phase II		2Q						
MDSE 6.0	3Q							
MDSE 6.1		1Q						
Vigilant Shield 07	4Q	1Q						
GTD-01		1Q-2Q						
GTX-02a		2Q						
MDSE 7.0		2Q						
MDSE 7.1		3Q						
MDSE 7.2		4Q						
GTD-02			1Q					

Common Environment and Threat Model, CETM; War Game, WG

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<b>Missile Defense Agency (MDA) Exhibit R-2A RDT&amp;E Project Justification</b>						Date <b>February 2007</b>		
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<b>APPROPRIATION/BUDGET ACTIVITY</b>				<b>R-1 NOMENCLATURE</b>				
<b>RDT&amp;E, DW/04 Advanced Component Development and Prototypes (ACD&amp;P)</b>				<b>0603890C Ballistic Missile Defense System Core</b>				

COST (\$ in Thousands)	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
0107 Safety, Quality and Mission Assurance	20,207	23,218	29,720	39,070	39,173	39,432	40,649	41,308
RDT&E Articles Qty	0	0	0	0	0	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, enhanced statistical controls, cultural changes, and best practices. The Raytheon Missile System Exo-atmospheric Kill Vehicle (EKV) program made drastic improvements within a year, making the EKV program a benchmark for quality improvement.

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

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Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date <b>February 2007</b>
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APPROPRIATION/BUDGET ACTIVITY <b>RDT&amp;E, DW/04 Advanced Component Development and Prototypes (ACD&amp;P)</b>	R-1 NOMENCLATURE <b>0603890C Ballistic Missile Defense System Core</b>
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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.

**B. Accomplishments/Planned Program**

	FY 2006	FY 2007	FY 2008	FY 2009
Quality, Safety and Mission Assurance	20,207	23,218	29,720	39,070
RDT&E Articles (Quantity)	0	0	0	0

**FY06 Accomplishments**

**Quality, Safety and Mission Assurance Audits**

QSMA audits are a primary BMDS risk mitigation activity. Audits examine mission assurance and safety practices and procedures, focusing on contractual requirements, internal policies, and industry best practices for design, manufacturing, integration and test. Audit teams are typically composed of 20-25 personnel from MDA, National Reconnaissance Office (NRO), National Aeronautics and Space Administration (NASA), United States Army Aviation and Missile Research Development and Engineering Center (AMRDEC), Federally Funded Research and Development Centers (FFRDC), and Naval Sea Systems Command (NAVSEA). Audit findings are recorded as a deficiency or observation. Observations identify shortcomings against aerospace industry best practices; deficiencies are contractual.

- QSMA conducted 7 audits on 6 programs in 6 different locations (2 government and 4 contractor facilities).
- Total deficiencies and observations were reduced last year from 569 to 419.
- Average number of findings decreased per audit by 15%.
- Audit results for Raytheon Missile Systems (RMS) include reducing sensor delivery by 7 days and critical path cycle time by 3 weeks.
- Other programs which have made significant changes as a direct result of audits:
  - Exoatmospheric Kill Vehicle (EKV) program met all cost targets and GMD met or exceeded all primary and secondary test objectives.
  - RMS overhauled within 1 year - dramatic improvements making this program a quality benchmark
  - EKV test program restructured
  - GBI service life/aging programs instituted
  - THAAD configuration management changes
  - MIT/LL created a quality and mission assurance organization

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Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification		Date February 2007
APPROPRIATION/BUDGET ACTIVITY RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE 0603890C Ballistic Missile Defense System Core	
<p>BMDS Independent Mission Assurance &amp; Safety Assessments</p> <ul style="list-style-type: none"><li>• Performed independent safety and mission assurance assessments: Pre-test flight assessments provided to the Director on FTG-01, FTG-02, FTT-02, FTT-03, and FTT-04.</li><li>• Performed continuous safety and mission assurance assessments for BMDS changes processed through the Program Control Board</li><li>• Established requirement to ensure two independent safety inhibits for GMD end-to-end fire control testing.</li><li>• Created GMD and THAAD risk management boards that provide independent assessments and are integrated into Program Element and Supplier Integrated Process Teams (IPT). Independent assessments achieved for test flights involving THAAD and GMD.</li><li>• Contributed to the success of flight test FTG-02 by working with GMD Program Office, Boeing and Orbital Sciences to completely identify and mitigate safety hazards associated with many single failure points in their ordnance which could have led to inadvertent stage ignition and/or disabling of autodestruct capability.</li><li>• Presented residual risk acceptance briefings for numerous programs and activities including Capability Readiness Demonstrations, Warfighter Demonstrations, and BMDS Configuration Changes, Airborne Laser tests, Aegis BMD tests, GMD tests, THAAD Tests, Target tests, and Mobile Launch Platform Transportable Telemetry System test support.</li><li>• Formed an exploratory committee to analyze the cost/benefits of a BMDS hazard tracking system through the MDA Non Advocate Safety Assessment (NSA) process. Coordinated efforts with the MDA Chief Information Office Directorate (CIO).</li><li>• Provided target and range support for 5 flights tests for THAAD, Aegis, and GMD.</li></ul> <p>MDA Assurance Provisions (MAP) Implementation</p> <ul style="list-style-type: none"><li>• The MAP provides a measurable, standardized set of quality, safety, and mission assurance requirements to be applied to developers for mission and safety critical items (where failure would directly affect system or personnel safety, mission success, or operational readiness) in support of evolutionary acquisition and deployment of MDA systems.</li><li>• The MAP outlines 14 provisions in 144 sections with over 2,000 requirements. The MAP also includes 50 industry standards impacting the design, manufacturing, test and producibility of safety and mission critical hardware.</li><li>• Seven programs put the MAP on contract: Sensors Forward Based X-Band Radar Transportable (AN/TPY-2), Sensors Contract Logistics Support (CLS), THAAD, Kinetic Energy Interceptor (KEI), C2BMC, JNIC, and Test and Targets Directorate.</li><li>• Performed Program Element review of Mission Assurance Implementation Plans (MAIP) or MDA Assurance Provisions (MAP) contract waiver assessments.</li><li>• As a result of this MDA initiative, Raytheon has embraced the MAP as a performance standard for all its defense programs, not just MDA.</li></ul>		

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Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification		Date February 2007
APPROPRIATION/BUDGET ACTIVITY RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE 0603890C Ballistic Missile Defense System Core	
<p>Key Government Site and Supplier On-Site Support MDA Assurance Representatives (MAR)</p> <ul style="list-style-type: none"><li>• Identified a substantial amount of debris in a Solid Rocket Motor plant that could result in a catastrophic safety accident.</li><li>• Resolved numerous technical issues critical to the success of the BMDS: provided broad, non-advocate insight, guidance, influence at critical prime and sub-tier supplier sites as well as government sites test ranges, interceptor sites, and program offices.</li><li>• Developed comprehensive QSMA Safety Career Training program. This program is one of only two within MDA to place stringent safety training requirements on selected personnel. Training areas include: systems safety, software safety, and laser safety officer training.</li><li>• Established mandatory government inspection points with the Defense Contract Management Agency</li><li>• Facilitated a major turnaround for the Exoatmospheric Kill Vehicle (EKV) facility, a cultural change towards Space rated hardware resulting in management changes and a focus on greater conservatism.</li><li>• Initiated part and material changes for the GBI, resulting in a no cost resolution of dissimilar materials.</li><li>• Established a Raytheon sub-tier supplier audit process focusing on plant quality controls. Nine audits performed in FY06 covering wire harnesses, circuit boards, inertial measurement units, and Electrical, Electronic and Electromechanical (EEE) parts.</li><li>• Resolved a service life issues with a rocket booster supplier</li><li>• Provided critical analysis determined the specific failure(s) of the THAAD missile battery; the analysis affects battery operation for other programs as well.</li><li>• Conducted weekly supplier quality walk-downs at all Mission Assurance Representative (MAR) sites for addressing Foreign Object Damage (FOD) and Safety.</li><li>• Provided leadership for the BMDS Safety Officer (BSO) team, optimized activities and situational awareness based on needs in the field. Efforts have led to the provision of a C2BMC engineering work station and browser for BSO and BMDS Watch Officer (BWO) for use in the MDA Test Support Center (MTSC).</li><li>• MARs provide to the MDA Director weekly reports on site activities relating to quality, safety, and mission assurance for critical systems</li></ul> <p>MDA Parts and Materials Program</p> <ul style="list-style-type: none"><li>• Conducted a gap analysis and mission assurance audits; results identified a need to ensure standardization and uniformity between MDA programs.</li><li>• Researched and identified areas of expertise needed to launch a successful parts, materials, and process program.</li><li>• Completed a 133-page Parts, Materials, and Process Mission Assurance Plan (PMAP) that will serve as a contractual document for MDA programs.</li></ul>		

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Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification		Date February 2007
APPROPRIATION/BUDGET ACTIVITY RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE 0603890C Ballistic Missile Defense System Core	
<ul style="list-style-type: none"> <li>The PMAP outlines 5 major hardware categories: space (satellites), launch (missiles), aircraft systems (airborne laser), sea-based (Aegis ship), and ground systems (trucks). Stringent part selection, identification, and testing in these five areas form the backbone of the program. With counterfeit parts and obsolescence issues causing increasing concern, especially for satellites and rockets that are not repairable, the PMAP will unify all MDA programs while providing efficient means to make the BMDS successful.</li> <li>Supporting the Kinetic Interceptor (KI) program by defining PMAP contractual requirements</li> <li>Closed out over 400 part and material waivers and deviations for government acceptance submitted by Boeing for Ground Based Midcourse Defense Program, GBI and EKV</li> </ul> <p>Government MDA Assurance Provisions (GMAP)</p> <ul style="list-style-type: none"> <li>Completed the GMAP which requires each Program Office to comply with Public Law 107-314, Section 804 "Improvement of software acquisition processes" Bob Stump National Defense Authorization Act for Fiscal Year 2003.</li> <li>GMAP requires each Program Office to incorporate best practices and continuous process improvement into its software acquisition activities.</li> <li>GMAP establishes a path to provide significant and measurable improvement in MDA's software acquisition activities through the effective application of critical best practices, metrics, and establishment of continuous process improvement.</li> <li>Incorporation of GMAP practices into the MDA's acquisition management activities will allow MDA to evaluate and improve its acquisition of mission and safety critical software and firmware.</li> </ul> <p>BMDS Element Support</p> <ul style="list-style-type: none"> <li>Conducted the Block 04 Non-Advocate Safety Assessment (NSA) with associated Elements. Identified residual safety risks categorized at the "serious" level. The hazard/mishap risk index has four categories, high, serious, medium, and low. The safety group developed plans to mitigate all "serious" hazards to "medium" with C2BMC, GMD, and Sensors.</li> <li>Developed GMD plan to safely maximize silo emplacement and maintenance activities at Vandenberg AFB while maintaining an operational readiness capability at the neighboring silo.</li> <li>Supported GMD safety team on issues such as end-to-end testing requirements, missile field maintenance safing requirements, and safety analysis of hazards to FGA by near-by populations as a result nominal or off nominal launches.</li> <li>Provided system safety and safety and occupational health support to assess GMD sponsored safety and quality assessment aboard the SBX.</li> <li>Sensors Forward Based X-Band Radar Transportable (AN/TPY-2) - reduced fifty "serious" hazards to five in one week. Worked with Sensors and Raytheon to close out other safety hazards.</li> </ul>		

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<ul style="list-style-type: none"> <li>• Partnered with Airborne Laser (ABL) System Program Office (SPO) and Aegis BMD SPO to establish and staff a QSMA matrixed Environmental, Safety and Health lead for the program.</li> <li>• Provided safety and mission assurance engineering support to the Kinetic Energy Interceptor (KEI) program, the Sensors (SN) program, the Multiple Kill Vehicle (MKV) program, the U.S. missile defense site in Europe program, and the High Altitude Airship (HAA).</li> </ul> <p>Intra-Agency &amp; Industry Activities</p> <ul style="list-style-type: none"> <li>• Developed the 2006 MDA Insensitive Munitions Strategic Plan (IMSP) recognized by the Office of the Secretary of Defense (OSD). QSMA has partnered with the Army, Navy, Air Force and OSD to develop Insensitive Munitions (IM) topics and choose promising proposals related to solid rocket motors benefiting MDA and the Department of Defense (DOD). Over the past year, MDA has awarded ten Phase 1 and two Phase 2 awards.</li> <li>• Created a Supplier Road Map Database categorizing over 800 suppliers in 2000 fields by program, location (state or foreign supplier), and product. Key information such as identifying sole source suppliers is recorded for issuing industry advisories on non-conforming sibling concerns.</li> <li>• Ten MDA Advisories (MAA) have been sent to MDA suppliers. MAA for Honeywell prevented flight Inertial Measurement Units (IMU) from having an inert gas leak that would have resulted in flight navigation errors. As advised, Honeywell made production process improvements to prevent potential problems.</li> <li>• Established a specification and standards working group to address common quality standards applicable to all key suppliers. Out of the 14 major subject areas in the MDA Assurance Provisions (MAP), only three remain to be evaluated; the purpose is to ensure key standards called out in all key supplier contracts.</li> <li>• Formed stakeholder team with 9 major industry partners that resulted in the following four major FY06 improvements:             <ul style="list-style-type: none"> <li>○ Battery test failures dropping from 12 to 2 per month</li> <li>○ Lot Acceptance Test failures from 14 per month to 8</li> <li>○ Supplier quality measurement rating from 72% to 92%</li> <li>○ On-time delivery increased from 74% to 83%.</li> </ul> </li> <li>• Mission Assurance Group (MAG) QSMA Director established this group of industry mission assurance executives, meeting twice a year where initiatives tackle complex issues such as sole source suppliers, standards and specifications industry workshops, and counterfeit parts.</li> <li>• Enhanced the BMDS by engaging in industry forums and abreast of emerging space-based issues:             <ul style="list-style-type: none"> <li>○ Participated in NASA Quality Leadership Forum (QLF)</li> <li>○ Participated in NASA Joint Audit Planning Committee (JAPC)</li> <li>○ Participated in Space Quality Improvement Council (SQIC)</li> </ul> </li> </ul>		

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<ul style="list-style-type: none"> <li>○ Participated in American Society for Quality's Conference on Quality in Space and Defense Industries (CQSDI)</li> <li>○ Participated in American Institute of Aeronautics and Astronautics (AIAA) conferences</li> </ul> <p>Safety and Occupational Health</p> <ul style="list-style-type: none"> <li>● Established MDA safety policies and requirements as required by law and DOD regulations</li> <li>● Developed requirements the MDA Directive 6055.03 "Requirements for Hazardous and Safety Critical Procedures".</li> <li>● Oversaw development and publication of the Safety Investigations manual used by MDA</li> <li>● Oversaw development and ongoing publication efforts of the MDA Directive "Work Time Restrictions for Safety and Mission Essential Personnel During MDA Tests" Minimizes fatigue to personnel performing critical tasks prior to and during tests and thus reducing the possibility of associated mishaps.</li> <li>● Conducted 6 safety and occupational health inspections and program assessment to ensure safety of the work environment.</li> <li>● Provided mishap/accident investigation coverage designed to identify causes to prevent recurrence of similar mishaps involving MDA personnel and property.</li> <li>● Partnered with MDA human resources to provide 600 new MDA employees the federally mandated employee safety training</li> <li>● Created and conducted the emergency response awareness/general hazard awareness staff certification course.</li> <li>● Developed an MDA computer-based collateral duty safety training program. Began tracking training of appointed MDA employees enhancing safety awareness across the BMDS.</li> </ul> <p>FY07 Planned Program</p> <p>BMDS Independent Mission Assurance &amp; Safety Assessments</p> <ul style="list-style-type: none"> <li>● Create and maintain a BMDS Material and Failure Review Board to resolve significant non-conformance issues.</li> <li>● Continue to perform independent mission assurance assessments on GMD, THAAD and Aegis BMD test flight tests</li> <li>● Begin in-depth assessments for significant ground flight tests, such as GTI-02, GTD-02, GTX-02a by participating in the Joint Analysis Team, Combined Task Force, and the BMDS Operational and Capability Assessment team.</li> <li>● Manage the integrated MDA Software Metrics Program to provide information on the health of the BMDS to MDA management.</li> <li>● Conduct independent Safety Assessments/Reviews of MDA programs and Elements to enhance BMDS safety</li> <li>● Maintain the MDA Safety Review Board, MDA Range Safety Council and BMDS Safety Working Groups to ensure that all BMDS activities are conducted safely.</li> </ul>		

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<ul style="list-style-type: none"> <li>• Support 400+ per year requests for Agency and BMDS system document reviews, such as system specifications, internal policy memos, internal procedures, organizational charters, data requests, front office actions, etc.</li> <li>• Develop Capability Verification and Assessment addendum detailing the capability of the BMDS to operate safely in Block 2006.</li> <li>• Maintain BMDS hazard tracking system via Non Advocate Safety assessment process</li> </ul> <p>Quality, Safety and Mission Assurance Audits</p> <ul style="list-style-type: none"> <li>• Conduct up to 6 unannounced Agency large scale Mission Assurance audits to continue enhancement of quality in BMDS products.</li> <li>• Perform safety audits</li> <li>• Perform post audit corrective action assessments</li> </ul> <p>MDA Assurance Provisions (MAP) Implementation</p> <ul style="list-style-type: none"> <li>• Update MAP which includes Inspector General requirements.</li> <li>• Continue working with the Program Elements to place the MAP on contract. MAP standardizes BMDS design, development, production, testing, fielding and operations.</li> </ul> <p>On-Site Support - MDA Assurance Representatives (MAR) &amp; BMDS Safety Officers</p> <ul style="list-style-type: none"> <li>• Implement the new on-site Quality Issues Tracking System (QITS) used to log MAR or Program Element support issues and ensure their proper root cause and resolution.</li> <li>• Increase on-site performance through the development of cognizant engineer data books aimed at improving the MARs systems engineering awareness.</li> <li>• Expand Key Supplier and Program Office support by placing two MARs at Pacific Missile Range Facility (PMRF) for Target integration, a MAR at ATK Elkton, MD; and one at the Air Borne Laser Program Office.</li> <li>• Expand inter-agency outreach to address supply chain issues and involvement in initiatives for common supplier insight, leverage, and cooperation.</li> <li>• Manage the MDA BMDS Safety Officer Program to ensure that the BMDS is operated safely when in test or operational modes.</li> <li>• Maintain and coordinate safety career training program.</li> </ul>		

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<p>MDA Parts and Materials Program (PMAP)</p> <ul style="list-style-type: none"><li>• Perform Parts, Materials and Processes cost / impact assessment on several key programs characterizing the costs associated with implementing the MDA Parts Materials and Processes Assurance Plan (PMAP) on key BMDS assets.</li><li>• Perform PMAP road-shows to educate Industry, discuss requirements, and address issues associated with contract implementation.</li><li>• Establish the Agency’s Parts, Materials and Processes Board (PMPB) and the lower level Program Element Part Material and Processes Control Boards (PMPCB). Agency PMPB ensures uniformity; PMPCB is the Program Element decision board that works directly with the Suppliers.</li><li>• Work with each BMDS Element to adjudicate part and material issues arising from PMAP requirements.</li><li>• Begin creating an Agency preferred parts and materials list database that facilitates new system design and the resolution of part obsolescence issues.</li></ul> <p>Government MDA Assurance Provisions (GMAP)</p> <ul style="list-style-type: none"><li>• Continue supporting Public Law 107-314, Section 804 “Improvement of software acquisition processes” Bob Stump National Defense Authorization Act for Fiscal Year 2003.</li><li>• Develop an MDA Software Acquisition Training/Education Program (SAT/EP)</li><li>• Develop an MDA Software Verification and Validation Program</li></ul> <p>BMDS Element Support</p> <ul style="list-style-type: none"><li>• 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.</li><li>• Continue safety support to Advanced Sensors, MKV, and AN/TPY-2 program office.</li><li>• Conduct non-advocate safety assessments</li><li>• Monitor and assess all program safety offices on testing and safing requirements, risk management hazards, staffing issues, and summary reports presented to MDA leadership.</li></ul> <p>Intra-Agency &amp; Industry Activities</p> <ul style="list-style-type: none"><li>• Perform the next Supplier Initiative. Leveraging the cooperation of several prime Supplier contracts, create a task force to address quality concerns associated with a particular supplier. FY07 is on a major Ordinance supplier.</li><li>• Complete the Specification and Standards Working Group for Industry acceptance of core quality standards to be applied in Supplier contracts.</li><li>• Continue the sharing of lessons learned with NASA, National Reconnaissance Office (NRO) and other DOD organizations.</li></ul>		

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<ul style="list-style-type: none"> <li>• Maintain the Range Safety mediation, augmentation and commonality program.</li> <li>• Continue to provide support in the area of Insensitive Munitions (IM) for Small Business Innovative Research (SBIR) and Small Business Technology Transfer (STTR) IM programs associated with the Department of Defense (DOD) military services.</li> </ul> <p>QSMA will lead Malcom Baldrige National Award application process for the following programs:</p> <ul style="list-style-type: none"> <li>• Aegis: Virginia State Award, and Baldrige National Award</li> <li>• JNIC: Colorado State Award, and Baldrige National Award</li> <li>• THAAD: Alabama State Award</li> </ul> <p>Safety and Occupational Health</p> <ul style="list-style-type: none"> <li>• Manage the MDA Safety and Occupational Health Mishap Investigation Program required by DoD Directives.</li> <li>• Perform all required Occupational Safety and Health Inspections of MDA facilities</li> <li>• Maintain MDA's Safety and Quality Concerns Hotline</li> <li>• Conduct required Federal and Department of Defense safety training</li> <li>• Represent MDA at Office of Secretary of Defense (OSD) level safety meetings and task forces</li> <li>• Ensure safety and occupational health involvement in facilities planning</li> <li>• Prepare reports for MDA, DOD and other Federal safety presentations.</li> <li>• Support quality, mission assurance, and safety audits and assessments.</li> </ul> <p>FY08 Planned Program</p> <p>The FY08 planned program improves the ability of QSMA to identify and track issues impacting both operational and test assets. QSMA needs dedicated personnel for key mission critical assets, for Ground Based Interceptors, Radars, and C2BMC etc., enabling cradle to grave participation. This participation would facilitate process improvements while minimizing cost impacts. Further, the ability to perform critical studies on emerging or changing systems is paramount to ensure BMDS operations are safe and effective.</p> <p>BMDS Independent Mission Assurance &amp; Safety Assessments</p> <ul style="list-style-type: none"> <li>• Increase QSMA expertise in the technical fields such as radar engineering, guidance &amp; navigation and control, parts and materials, range safety, ordnance systems, optics, etc. creating a center of excellence to support programs, MARs, and emerging acquisition strategies.</li> </ul>		

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<ul style="list-style-type: none"><li>• Conduct system analysis/assessments such as reliability prediction analysis, failure modes and effects criticality analysis, safety hazards analysis etc.</li><li>• Continue to perform independent mission assurance assessments on GMD, THAAD and Aegis test flight tests. Additional FY08 resources will be applied to increase system cognizance and provide greater depth in assessments.</li><li>• Continue independent assessments for significant ground flight tests. Additional FY08 resources will be applied to increase system cognizance and provide greater depth in assessments.</li><li>• Continue to provide Independent Readiness Review Team support by providing senior specialists.</li><li>• Manage the integrated MDA Software Metrics Program which provides periodic assessments on the status of the BMDS to MDA management.</li><li>• Continue operating the BMDS Material and Failure Review Board to resolve significant Supplier non-conformances.</li><li>• Conduct independent Safety Assessments/Reviews of MDA programs and Elements to enhance BMDS safety</li><li>• Maintain the MDA Safety Review Board, MDA Range Safety Council and BMDS Safety Working Groups to ensure that all BMDS activities are conducted safely.</li></ul> <p>Quality, Safety and Mission Assurance Audits</p> <ul style="list-style-type: none"><li>• Conduct up to 6 unannounced Agency large scale Mission Assurance audits to continue enhancement of quality in BMDS products.</li><li>• Perform 2 safety audits based on safety concerns</li><li>• Perform 2 post audit corrective action assessments as necessary to accelerate audit resolution.</li></ul> <p>MDA Assurance Provisions (MAP) Implementation</p> <ul style="list-style-type: none"><li>• Update MAP to incorporate lessons learned and inputs from Industry Specification Working Group</li><li>• Continue working with existing BMDS Elements to get the MAP on contract and to track individual Program status. On-Site Support - Mission Assurance Representatives (MAR) &amp; BMDS Safety Officers</li><li>• Expand on-site reporting to include engineers at key locations where design work occurs. FY08 expansion includes Boeing, Anaheim, CA (GMD support), Orbital Sciences Dulles, VA (where the Ground Based Interceptor is designed) and Raytheon in Andover, MA (where radar sensors are designed and built) and the Joint National Integration Center (where the Ground Flight Control exists).</li><li>• Continue to increase on-site performance through further development of cognizant engineer data books aimed at improving the MARs systems engineering awareness.</li><li>• Expand BMDS Safety Officer Program by adding engineers to aid the 24/7 team to ensure that the BMDS is operated safely when in test or operational modes. Engineering support shall provide greater knowledge of fire control loop.</li></ul>		

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<ul style="list-style-type: none"><li>• Provide further refinement in the end-of-week processing by metric processing on Quality Issues Tracking System.</li><li>• Manage the MDA BMDS Safety Officer Program to ensure that the BMDS is operated safely when in test or operational modes.</li><li>• Maintain and coordinate safety career training program.</li><li>• Continue performing weekly mission assurance and safety walk-downs.</li><li>• Using Supplier metrics, continue to pursue process improvements. MDA Parts and Materials Program</li><li>• Continue to provide technical support via the Center of Excellence (COE) to address BMDS Element and Supplier part and material issues arising from the Agency Part, Material, and Processes Board (PMPB); and the BMDS 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.</li><li>• Work with each BMDS Element to adjudicate part and material issues, i.e., waivers and deviations, arising from PMAP requirements.</li><li>• Using the Center-of-Excellence resources and lab capability, create test methods for new emerging technologies.</li><li>• Using data from cost assessments and industry road shows, update the MDA Parts, Materials, and Processes Mission Assurance Provisions. Incorporate in the revision Industry practices known to increase product reliability.</li><li>• Update the Agency preferred parts and materials list database that facilitates new system design and the resolution of part obsolescence issues.</li></ul> <p>Government MDA Assurance Provisions (GMAP)</p> <ul style="list-style-type: none"><li>• 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</li><li>• Update the GMAP for further refinements in software acquisition strategies.</li><li>• Continue to provide metric assessments to the Director for each Program Element Senior Executive Review.</li><li>• Update the MDA Software Verification and Validation Program</li></ul> <p>BMDS Element Support</p> <ul style="list-style-type: none"><li>• Continue to enhance mission assurance by providing specialized 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.</li><li>• Continue to improve safety by providing specialized support to Advanced Sensors, MKV, and AN/TPY-2 program office.</li><li>• Continue providing GMD with Navy quality expertise for SBX operations.</li></ul>		

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<p><b>Intra-Agency &amp; Industry Activities</b></p> <ul style="list-style-type: none"><li>• 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.</li><li>• Coordinate the Specification and Standards Working Group for Industry acceptance of core quality standards to be applied in Supplier contracts.</li><li>• Review specifications and standards issued by the Defense Standardization Program Office</li><li>• Continue the sharing of lessons learned with NASA, National Reconnaissance Office (NRO) and other DOD organizations and applying their insights to MDA programs.</li><li>• Maintain the Range Safety mediation, augmentation and commonality program.</li></ul> <p><b>Safety and Occupational Health</b></p> <ul style="list-style-type: none"><li>• Continue management oversight of MDA safety policies and requirements addressed in DoD safety directives.</li><li>• Perform all required Occupational Safety and Health Inspections of MDA facilities</li><li>• Maintain MDA's Safety and Quality Concerns Hotline</li><li>• Conduct required Federal and Department of Defense safety training</li><li>• Represent MDA at Office of Secretary of Defense (OSD) level safety meetings and task forces</li><li>• Ensure SOH involvement in facilities planning</li><li>• Prepare reports for MDA, DOD and other Federal safety presentations.</li><li>• Support quality, mission assurance, and safety audits and assessments.</li><li>• 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.</li></ul> <p><b>FY09 Planned Program</b></p> <p>The FY09 planned program builds upon the previous years 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 mimics requirements and that any anomalous behavior is documented, tracked, measured, and resolved.</p>		

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<p>BMDS Independent Mission Assurance &amp; Safety Assessments</p> <ul style="list-style-type: none"> <li>• 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.</li> <li>• Conduct system analysis/assessments such as reliability prediction analysis, failure modes and effects criticality analysis, safety hazards analysis etc.</li> <li>• 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.</li> <li>• Continue independent assessments for significant ground flight tests. By acquiring additional resources, increase system cognizance and provide greater depth in assessments.</li> <li>• Continue to provide Independent Readiness Review Team support by providing senior specialists.</li> <li>• Manage the integrated MDA Software Metrics Program to provide information on the health of the BMDS to MDA management.</li> <li>• Continue operating the BMDS Material and Failure Review Board to resolve significant Supplier non-conformances.</li> <li>• Conduct independent Safety Assessments/Reviews of MDA programs and Elements to enhance BMDS safety</li> <li>• Maintain the MDA Safety Review Board, MDA Range Safety Council and BMDS Safety Working Groups to ensure that all BMDS activities are conducted safely.</li> </ul> <p>Quality, Safety and Mission Assurance Audits</p> <ul style="list-style-type: none"> <li>• Conduct up to 6 unannounced Agency large scale Mission Assurance audits to continue enhancement of quality in BMDS products.</li> <li>• Perform 2 safety audits based on safety concerns</li> <li>• Perform 2 post audit corrective action assessments as necessary to accelerate audit resolution.</li> <li>• MDA Assurance Provisions (MAP) Implementation</li> <li>• Update MAP revision to address Lessons Learned, inputs from the Industry Specification Working Group, and to improve metric reporting throughout the Agency.</li> <li>• Continue working with existing Programs Elements to get the MAP on contract and to track individual Program status.</li> </ul> <p>On-Site Support - Mission Assurance Representatives (MAR) &amp; BMDS Safety Officers</p> <ul style="list-style-type: none"> <li>• 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.</li> </ul>		

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<ul style="list-style-type: none"> <li>• 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.</li> <li>• Provide further refinement in the end-of-week processing by metric processing on Quality Issues Tracking System.</li> <li>• Manage the MDA BMDS Safety Officer Program to ensure that the BMDS is operated safely when in test or operational modes.</li> <li>• Maintain and coordinate safety career training program.</li> <li>• Continue performing weekly mission assurance and safety walk-downs.</li> <li>• Using Supplier metrics, continue to pursue process improvements.</li> </ul> <p><b>MDA Parts and Materials Program</b></p> <ul style="list-style-type: none"> <li>• 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.</li> <li>• Work with each Program Element to adjudicate part and material issues, i.e., waivers and deviations, arising from PMAP requirements.</li> <li>• Using the COE resources and lab capability, create test methods for new emerging technologies.</li> <li>• Using data from cost assessments and industry road shows, update the MDA PMAP. Incorporate in the revision Industry practices known to increase product reliability.</li> <li>• Update the Agency preferred parts and materials list database that facilitates new system design and the resolution of part obsolescence issues.</li> </ul> <p><b>Government MDA Assurance Provisions (GMAP)</b></p> <ul style="list-style-type: none"> <li>• 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</li> <li>• Update the GMAP for further refinements in software acquisition strategies.</li> <li>• Continue to provide metric assessments to the Director for each Program Element Senior Executive Review.</li> <li>• Update the MDA Software Verification and Validation Program</li> </ul> <p><b>Program Support</b></p> <ul style="list-style-type: none"> <li>• 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.</li> <li>• Continue safety support to Advanced Sensors, MKV, and AN/TPY-2 program office.</li> </ul>		

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- 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 in
- 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 Office of Secretary of Defense (OSD) level 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

**C. Other Program Funding Summary**

	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	Total Cost
PE 0603175C Ballistic Missile Defense Technology	147,270	193,307	118,569	109,540	116,014	121,008	127,917	131,291	1,064,916
PE 0603881C Ballistic Missile Defense Terminal Defense Segment	1,120,879	1,092,076	962,585	1,004,282	924,101	851,213	678,694	501,147	7,134,977
PE 0603882C Ballistic Missile Defense Midcourse Defense Segment	2,391,246	3,043,058	2,520,064	2,359,665	2,179,602	1,699,963	1,153,082	1,183,003	16,529,683

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<b>Missile Defense Agency (MDA) Exhibit R-2A RDT&amp;E Project Justification</b>	Date <b>February 2007</b>
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<b>APPROPRIATION/BUDGET ACTIVITY</b> <b>RDT&amp;E, DW/04 Advanced Component Development and Prototypes (ACD&amp;P)</b>	<b>R-1 NOMENCLATURE</b> <b>0603890C Ballistic Missile Defense System Core</b>
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	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	Total Cost
PE 0603883C Ballistic Missile Defense Boost Defense Segment	455,572	628,958	548,759	432,432	448,375	678,913	829,683	1,026,239	5,048,931
PE 0603884C Ballistic Missile Defense Sensors	284,297	514,129	778,163	984,963	939,417	791,701	723,843	603,585	5,620,098
PE 0603886C Ballistic Missile Defense System Interceptors	200,446	356,004	227,499	393,317	522,388	730,236	836,029	570,206	3,836,125
PE 0603888C Ballistic Missile Defense Test and Targets	610,619	601,782	586,150	628,364	662,984	681,511	696,037	705,210	5,172,657
PE 0603889C Ballistic Missile Defense Products	387,402	0	0	0	0	0	0	0	387,402
PE 0603891C Special Programs - MDA	271,021	353,031	323,250	305,409	369,073	526,966	789,017	792,271	3,730,038
PE 0603892C Ballistic Missile Defense Aegis	893,040	1,122,669	1,059,103	1,129,425	1,221,650	1,067,587	1,054,753	1,089,078	8,637,305
PE 0603893C Space Tracking & Surveillance System	220,048	322,220	331,525	347,811	412,623	501,197	778,067	981,424	3,894,915
PE 0603894C Multiple Kill Vehicle	48,370	144,362	271,151	352,741	461,179	618,263	673,477	842,905	3,412,448
PE 0603895C BMD System Space Program	0	0	27,666	35,093	46,849	56,183	133,617	157,117	456,525
PE 0603896C BMD C2BMC	0	246,852	258,913	294,627	300,847	282,615	267,275	269,420	1,920,549
PE 0603897C BMD Hercules	0	49,674	53,658	54,264	54,405	55,142	53,355	54,198	374,696
PE 0603898C BMD Joint Warfighter Support	0	54,935	48,787	50,428	54,086	56,603	58,890	60,206	383,935
PE 0603904C BMD Joint National Integration Center (JNIC)	0	110,629	104,012	106,985	111,542	111,947	113,592	115,287	773,994
PE 0603905C BMD Concurrent Test and Operations	0	23,159	0	0	0	0	0	0	23,159
PE 0603906C Regarding Trench	0	0	2,000	3,000	5,000	5,000	9,000	9,000	33,000
PE 0605502C Small Business Innovative Research - MDA	133,105	0	0	0	0	0	0	0	133,105
PE 0901585C Pentagon Reservation	14,874	15,527	6,058	6,376	4,490	4,725	4,801	4,877	61,728
PE 0901598C Management Headquarters - MDA	98,609	87,059	85,906	86,453	70,355	69,855	69,855	69,855	637,947

**D. Acquisition Strategy**

The execution of program activities is a collaborative effort involving subject matter experts from Government, Federally Funded Research and Development Centers (FFRDC), University Affiliated Research Centers (UARC), Science and Engineering and Technical Assistance (SETA), and Industry. In addition extensive involvement by the major defense contractors responsible for implementation of the MAP requirements is required. Safety, Quality, and Mission Assurance and Software Acquisition Improvement initiatives will be executed by MDA directorates and industry contractors.

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<b>Missile Defense Agency (MDA) Exhibit R-3 RDT&amp;E Project Cost Analysis</b>	Date <b>February 2007</b>
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<b>APPROPRIATION/BUDGET ACTIVITY</b> <b>RDT&amp;E, DW/04 Advanced Component Development and Prototypes (ACD&amp;P)</b>	<b>R-1 NOMENCLATURE</b> <b>0603890C Ballistic Missile Defense System Core</b>
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<b>I. Product Development Cost ( \$ in Thousands )</b>										
Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2007 Cost	FY 2007 Award/ Oblg Date	FY 2008 Cost	FY 2008 Award/ Oblg Date	FY 2009 Cost	FY 2009 Award/ Oblg Date	Total Cost
<b>Quality, Safety and Mission Assurance</b>										
S/W AC	C/FFP	Sparta/ AL, MD, VA	300	0	N/A	0	N/A	0	N/A	300
Subtotal Product Development			300	0		0		0		300

**Remarks**

<b>II. Support Costs Cost ( \$ in Thousands )</b>										
Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2007 Cost	FY 2007 Award/ Oblg Date	FY 2008 Cost	FY 2008 Award/ Oblg Date	FY 2009 Cost	FY 2009 Award/ Oblg Date	Total Cost
<b>Quality, Safety and Mission Assurance</b>										
OGA Sept/Audits	SS/MIPR	NSWC Corona/ CA, VA	2,500	2,400	1/2Q	2,628	N/A	3,700	N/A	11,228
Safety & Quality/Audits	C/FFP	SRS Tech/ VA, MD	4,200	7,300	1/2Q	8,500	N/A	9,800	N/A	29,800
Mission Assurance/Audits	C/FFP	Swales/ VA, MD, NM, CA	2,800	3,000	1/2Q	4,433	N/A	6,500	N/A	16,733
OGA Sept	SS/MIPR	NSWC Crane/ IN, VA	585	678	1/2Q	1,200	N/A	2,350	N/A	4,813
Go vt Sept	SS/MIPR	NSWC VA Beach/VA	200	150	1Q	150	N/A	300	N/A	800
S/W Acquisition	C/FFRDC	SEI/PA, VA	300	250	1Q	250	N/A	400	N/A	1,200
Energy Review Board	C/FFRDC	Aerospace, SEI/ PA, CA, VA	0	400	1/2Q	450	N/A	500	N/A	1,350

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<b>Missile Defense Agency (MDA) Exhibit R-3 RDT&amp;E Project Cost Analysis</b>	Date <b>February 2007</b>
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<b>APPROPRIATION/BUDGET ACTIVITY</b> <b>RDT&amp;E, DW/04 Advanced Component Development and Prototypes (ACD&amp;P)</b>	<b>R-1 NOMENCLATURE</b> <b>0603890C Ballistic Missile Defense System Core</b>
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Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2007 Cost	FY 2007 Award/ Oblg Date	FY 2008 Cost	FY 2008 Award/ Oblg Date	FY 2009 Cost	FY 2009 Award/ Oblg Date	Total Cost
Parts Material Pro	SS/MIPR	NSWC, Crane/ IN, VA	0	750	1/2Q	1,600	N/A	2,588	N/A	4,938
Parts Material Pro	SS/MIPR	AMRDEC/AL	0	170	1/2Q	300	N/A	400	N/A	870
Metrics SW/AC	C/FFP	BAE/SMDC/ AL, VA, MD	1,708	0	N/A	0	N/A	0	N/A	1,708
<b>Subtotal Support Costs</b>			<b>12,293</b>	<b>15,098</b>		<b>19,511</b>		<b>26,538</b>		<b>73,440</b>

**Remarks**

**III. Test and Evaluation Cost ( \$ in Thousands )**

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

**Remarks**

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Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis							Date February 2007			
APPROPRIATION/BUDGET ACTIVITY RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)					R-1 NOMENCLATURE 0603890C Ballistic Missile Defense System Core					
IV. Management Services Cost ( \$ in Thousands )										
Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2007 Cost	FY 2007 Award/ Oblg Date	FY 2008 Cost	FY 2008 Award/ Oblg Date	FY 2009 Cost	FY 2009 Award/ Oblg Date	Total Cost
<b>Quality, Safety and Mission Assurance</b>										
QS Civilian Salaries	TM	MDA/ VA, MD, AL, CA, AZ, HI, AK, MA, NJ, FL, AR, UT, MH	5,240	7,320	N/A	9,323	N/A	11,300	N/A	33,183
Travel	TM	MDA/ VA, MD, AL, CA, AZ, HI, AK, MA, NJ, FL, AR, UT, MH	875	800	N/A	886	N/A	1,232	N/A	3,793
Subtotal Management Services			6,115	8,120		10,209		12,532		36,976
<b>Remarks</b>										
Project Total Cost			18,708	23,218		29,720		39,070		110,716
<b>Remarks</b>										

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

Date  
**February 2007**

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

**R-1 NOMENCLATURE**  
**0603890C Ballistic Missile Defense System Core**

Fiscal Year	2006				2007				2008				2009				2010				2011				2012				2013			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
<b>Safety, Quality, and Mission Assurance</b>																																
Quality, Safety and Mission Assurance Audits	▲	▲	▲	▲	▲																											
BMDs Independent Mission Assurance & Safety Assmnts	▲	▲	▲	▲	▲																											
MDA Assurance Provisions Implementation	▲	▲	▲	▲	▲																											
Government and Supplier On-site Support	▲	▲	▲	▲	▲																											
MDA Parts, Materials, and Process Program	▲	▲	▲	▲	▲																											
Government MDA Assurance Provisions	▲	▲	▲	▲	▲																											
Program Element Support	▲	▲	▲	▲	▲																											
Intra-Agency and Industry Activities	▲	▲	▲	▲	▲																											
Safety and Occupational Health	▲	▲	▲	▲	▲																											

**Legend**

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

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Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail						Date February 2007		
APPROPRIATION/BUDGET ACTIVITY RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)				R-1 NOMENCLATURE 0603890C Ballistic Missile Defense System Core				
Schedule Profile	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
<b>Safety, Quality, and Mission Assurance</b>								
Quality, Safety and Mission Assurance Audits	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q				
BMDS Independent Mission Assurance & Safety Assmnts	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q				
MDA Assurance Provisions Implementation	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q				
Government and Supplier On-site Support	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q				
MDA Parts, Materials, and Process Program	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q				
Government MDA Assurance Provisions	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q				
Program Element Support	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q				
Intra-Agency and Industry Activities	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q				
Safety and Occupational Health	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q				
Support Baldrige Application Process		1Q-4Q						

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<b>Missile Defense Agency (MDA) Exhibit R-2A RDT&amp;E Project Justification</b>	Date <b>February 2007</b>
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<b>APPROPRIATION/BUDGET ACTIVITY</b> <b>RDT&amp;E, DW/04 Advanced Component Development and Prototypes (ACD&amp;P)</b>	<b>R-1 NOMENCLATURE</b> <b>0603890C Ballistic Missile Defense System Core</b>
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COST (\$ in Thousands)	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
0602 Program-Wide Support	15,880	21,414	29,688	32,947	40,757	36,385	29,603	29,855
RDT&E Articles Qty	0	0	0	0	0	0	0	0

**A. Mission Description and Budget Item Justification**

Program-Wide Support provides funding for common non-headquarters support functions across the entire program such as strategic planning, program integration, business management, cost estimating, contracting, and financial management, to include preparation of financial statements, reimbursement of financial services provided by DFAS, internal review and audit, earned-value management, and program assessment. Includes costs for both government civilians performing these functions, as well as outside services and support contractors that augment government staff in these areas. Many of these costs reside within the Missile Defense Agency Executing Agents in the Services: Army Space and Missile Defense Command, Army PEO Space and Missile Defense, Office of Naval Research, and various Air Force laboratory and acquisition activities, although some functions and costs within this program element are performed by MDA employees assigned within the National Capital Region (NCR). Other costs included herein provide facility capabilities for MDA Executing Agent locations, such as physical and technical security, legal services, travel and training, office and equipment leases, utilities and communications, supplies and maintenance, and similar operating expenses. Also includes funding for charges on canceled appropriations in accordance with Public Law 101-510, legal settlements, and foreign currency fluctuation on a limited number of foreign contracts.

**B. Accomplishments/Planned Program**

	FY 2006	FY 2007	FY 2008	FY 2009
Civilian Salaries and Support	15,880	21,414	29,688	32,947
RDT&E Articles (Quantity)	0	0	0	0

See Section A: Mission Description and Budget Item Justification

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<b>Missile Defense Agency (MDA) Exhibit R-2A RDT&amp;E Project Justification</b>	Date <b>February 2007</b>
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<b>APPROPRIATION/BUDGET ACTIVITY</b> <b>RDT&amp;E, DW/04 Advanced Component Development and Prototypes (ACD&amp;P)</b>	<b>R-1 NOMENCLATURE</b> <b>0603890C Ballistic Missile Defense System Core</b>
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<b>C. Other Program Funding Summary</b>									
	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	Total Cost
PE 0603175C Ballistic Missile Defense Technology	147,270	193,307	118,569	109,540	116,014	121,008	127,917	131,291	1,064,916
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PE 0603888C Ballistic Missile Defense Test and Targets	610,619	601,782	586,150	628,364	662,984	681,511	696,037	705,210	5,172,657
PE 0603889C Ballistic Missile Defense Products	387,402	0	0	0	0	0	0	0	387,402
PE 0603891C Special Programs - MDA	271,021	353,031	323,250	305,409	369,073	526,966	789,017	792,271	3,730,038
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PE 0603894C Multiple Kill Vehicle	48,370	144,362	271,151	352,741	461,179	618,263	673,477	842,905	3,412,448
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PE 0603897C BMD Hercules	0	49,674	53,658	54,264	54,405	55,142	53,355	54,198	374,696
PE 0603898C BMD Joint Warfighter Support	0	54,935	48,787	50,428	54,086	56,603	58,890	60,206	383,935
PE 0603904C BMD Joint National Integration Center (JNIC)	0	110,629	104,012	106,985	111,542	111,947	113,592	115,287	773,994
PE 0603905C BMD Concurrent Test and Operations	0	23,159	0	0	0	0	0	0	23,159
PE 0603906C Regarding Trench	0	0	2,000	3,000	5,000	5,000	9,000	9,000	33,000
PE 0605502C Small Business Innovative Research - MDA	133,105	0	0	0	0	0	0	0	133,105
PE 0901585C Pentagon Reservation	14,874	15,527	6,058	6,376	4,490	4,725	4,801	4,877	61,728
PE 0901598C Management Headquarters - MDA	98,609	87,059	85,906	86,453	70,355	69,855	69,855	69,855	637,947

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Project: 0602 Program-Wide Support MDA Exhibit R-2A (PE 0603890C)

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Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification		Date February 2007
APPROPRIATION/BUDGET ACTIVITY RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE 0603890C Ballistic Missile Defense System Core	

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