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

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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<p>MODEL DEVELOPMENT</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&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 & 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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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"> • Updated industry standard lethality, ground effects and debris dispersion phenomenology codes (PEELS, PEGEM, and KIDD) • Updated threat and scene generation codes (BEST, SSGM, and OSC) • Updated Open Architecture Simulation System (OASiS) Model and Framework Specifications • Developed an OASiS-based Analysis Engine for BMDS planner • Developed a Constructive Analysis Federation Prototype 1 • Conducted OASiS middleware and simulation engine risk reduction <p>FY07 Planned Program:</p> <ul style="list-style-type: none"> • 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. • 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). • Update Common Environment and Threat Models to include threat trajectory generation, threat signatures generation, core lethality, and battlespace environment definitions. • Continue the Extended Air Defense Simulation (EADSIM) as Phase I (initial integration with BMDS SIM) • Continue development of BMDS International Simulation, and BMDS Defender (Concept Exploration simulation) • Continue migration to open architecture specifications • Continue VV&A for BMDS-level M&S events/venues • Continue M&S International Implementation support <p>FY08 Planned Program:</p> <ul style="list-style-type: none"> • Update BMDS SIM to complete integration of Element models for Aegis BMD (ADAM) and THAAD (ETE Sim). • 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. • 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 		

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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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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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<ul style="list-style-type: none">Released Accreditation Plans and Final ReportPrepared Test Event Assessment ReportsUpdated Modeling and Simulation System Engineering Management PlanUpdated Block 06 M&S Mission Needs Statement, Capabilities Requirements Document, and Implementation PlansEstablished M&S Enterprise Verification, Validation, and Accreditation ProcessEstablished M&S Enterprise Requirements Engineering Process <p>FY07 Planned Program:</p> <ul style="list-style-type: none">Accredit Models and Simulations for Core Intended UsesDevelop Accreditation ReportsProvide Facility/Test support for test eventsRelease Accreditation Plans and Final ReportPrepare Test Event Assessment ReportsUpdate Modeling and Simulation System Engineering Management PlanUpdate M&S Mission Needs Statement, Capabilities Requirements Document, and Implementation PlansContinue to refine M&S Enterprise Verification, Validation, and Accreditation ProcessRefine M&S Enterprise Requirements Engineering Process <p>FY08 Planned Program:</p> <ul style="list-style-type: none">Accredit Models and Simulations for Core Intended UsesDevelop Accreditation ReportsProvide Facility/Test support for test eventsRelease Accreditation Plans and Final ReportPrepare Test Event Assessment ReportsUpdate Modeling and Simulation System Engineering Management PlanEstablish Block 08 M&S Mission Needs Statement, Capabilities Requirements Document, and Implementation PlansContinue to refine M&S Enterprise Verification, Validation, and Accreditation ProcessRefine M&S Enterprise Requirements Engineering Process		

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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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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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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
Model Development										
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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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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Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date February 2007
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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
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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
Product Test and Operations										
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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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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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
Systems Engineering and Integration (SE&I)										
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

Remarks										
Project Total Cost			94,677	92,680		100,698		104,350		392,405

Remarks
 Previous Year funding for this effort was under the Ballistic Missile Defense System (BMDS), Program Element 0603890C, Project 0101

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

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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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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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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<p>BMDS Independent Mission Assurance & Safety Assessments</p> <ul style="list-style-type: none">• 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.• Performed continuous safety and mission assurance assessments for BMDS changes processed through the Program Control Board• Established requirement to ensure two independent safety inhibits for GMD end-to-end fire control testing.• 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.• 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.• 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.• 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).• Provided target and range support for 5 flights tests for THAAD, Aegis, and GMD. <p>MDA Assurance Provisions (MAP) Implementation</p> <ul style="list-style-type: none">• 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.• 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.• 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.• Performed Program Element review of Mission Assurance Implementation Plans (MAIP) or MDA Assurance Provisions (MAP) contract waiver assessments.• As a result of this MDA initiative, Raytheon has embraced the MAP as a performance standard for all its defense programs, not just MDA.		

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<p>Key Government Site and Supplier On-Site Support MDA Assurance Representatives (MAR)</p> <ul style="list-style-type: none">• Identified a substantial amount of debris in a Solid Rocket Motor plant that could result in a catastrophic safety accident.• 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.• 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.• Established mandatory government inspection points with the Defense Contract Management Agency• 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.• Initiated part and material changes for the GBI, resulting in a no cost resolution of dissimilar materials.• 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.• Resolved a service life issues with a rocket booster supplier• Provided critical analysis determined the specific failure(s) of the THAAD missile battery; the analysis affects battery operation for other programs as well.• Conducted weekly supplier quality walk-downs at all Mission Assurance Representative (MAR) sites for addressing Foreign Object Damage (FOD) and Safety.• 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).• MARs provide to the MDA Director weekly reports on site activities relating to quality, safety, and mission assurance for critical systems <p>MDA Parts and Materials Program</p> <ul style="list-style-type: none">• Conducted a gap analysis and mission assurance audits; results identified a need to ensure standardization and uniformity between MDA programs.• Researched and identified areas of expertise needed to launch a successful parts, materials, and process program.• Completed a 133-page Parts, Materials, and Process Mission Assurance Plan (PMAP) that will serve as a contractual document for MDA programs.		

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<ul style="list-style-type: none">• 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.• Supporting the Kinetic Interceptor (KI) program by defining PMAP contractual requirements• 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 <p>Government MDA Assurance Provisions (GMAP)</p> <ul style="list-style-type: none">• 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.• GMAP requires each Program Office to incorporate best practices and continuous process improvement into its software acquisition activities.• 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.• 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. <p>BMDS Element Support</p> <ul style="list-style-type: none">• 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.• Developed GMD plan to safely maximize silo emplacement and maintenance activities at Vandenberg AFB while maintaining an operational readiness capability at the neighboring silo.• 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.• Provided system safety and safety and occupational health support to assess GMD sponsored safety and quality assessment aboard the SBX.• 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.		

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<ul style="list-style-type: none"> 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. 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). <p>Intra-Agency & Industry Activities</p> <ul style="list-style-type: none"> 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. 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. 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. 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. Formed stakeholder team with 9 major industry partners that resulted in the following four major FY06 improvements: <ul style="list-style-type: none"> Battery test failures dropping from 12 to 2 per month Lot Acceptance Test failures from 14 per month to 8 Supplier quality measurement rating from 72% to 92% On-time delivery increased from 74% to 83%. 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. Enhanced the BMDS by engaging in industry forums and abreast of emerging space-based issues: <ul style="list-style-type: none"> Participated in NASA Quality Leadership Forum (QLF) Participated in NASA Joint Audit Planning Committee (JAPC) Participated in Space Quality Improvement Council (SQIC) 		

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

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<ul style="list-style-type: none">• 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.• Develop Capability Verification and Assessment addendum detailing the capability of the BMDS to operate safely in Block 2006.• Maintain BMDS hazard tracking system via Non Advocate Safety assessment process <p>Quality, Safety and Mission Assurance Audits</p> <ul style="list-style-type: none">• Conduct up to 6 unannounced Agency large scale Mission Assurance audits to continue enhancement of quality in BMDS products.• Perform safety audits• Perform post audit corrective action assessments <p>MDA Assurance Provisions (MAP) Implementation</p> <ul style="list-style-type: none">• Update MAP which includes Inspector General requirements.• Continue working with the Program Elements to place the MAP on contract. MAP standardizes BMDS design, development, production, testing, fielding and operations. <p>On-Site Support - MDA Assurance Representatives (MAR) & BMDS Safety Officers</p> <ul style="list-style-type: none">• 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.• Increase on-site performance through the development of cognizant engineer data books aimed at improving the MARs systems engineering awareness.• 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.• Expand inter-agency outreach to address supply chain issues and involvement in initiatives for common supplier insight, leverage, and cooperation.• Manage the MDA BMDS Safety Officer Program to ensure that the BMDS is operated safely when in test or operational modes.• Maintain and coordinate safety career training program.		

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<p>MDA Parts and Materials Program (PMAP)</p> <ul style="list-style-type: none">• 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.• Perform PMAP road-shows to educate Industry, discuss requirements, and address issues associated with contract implementation.• 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.• Work with each BMDS Element to adjudicate part and material issues arising from PMAP requirements.• Begin creating an Agency preferred parts and materials list database that facilitates new system design and the resolution of part obsolescence issues. <p>Government MDA Assurance Provisions (GMAP)</p> <ul style="list-style-type: none">• Continue supporting Public Law 107-314, Section 804 "Improvement of software acquisition processes" Bob Stump National Defense Authorization Act for Fiscal Year 2003.• Develop an MDA Software Acquisition Training/Education Program (SAT/EP)• Develop an MDA Software Verification and Validation Program <p>BMDS Element Support</p> <ul style="list-style-type: none">• Continue providing mission assurance support to Kinetic Energy Interceptor (KEI), Advanced Sensors, Multiple Kill Vehicle (MKV), and Sensors Forward Based X-Band Transportable Radar (AN/TPY-2) program offices.• Continue safety support to Advanced Sensors, MKV, and AN/TPY-2 program office.• Conduct non-advocate safety assessments• Monitor and assess all program safety offices on testing and safing requirements, risk management hazards, staffing issues, and summary reports presented to MDA leadership. <p>Intra-Agency & Industry Activities</p> <ul style="list-style-type: none">• 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.• Complete the Specification and Standards Working Group for Industry acceptance of core quality standards to be applied in Supplier contracts.• Continue the sharing of lessons learned with NASA, National Reconnaissance Office (NRO) and other DOD organizations.		

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<ul style="list-style-type: none">• Maintain the Range Safety mediation, augmentation and commonality program.• 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. <p>QSMA will lead Malcom Baldrige National Award application process for the following programs:</p> <ul style="list-style-type: none">• Aegis: Virginia State Award, and Baldrige National Award• JNIC: Colorado State Award, and Baldrige National Award• THAAD: Alabama State Award <p>Safety and Occupational Health</p> <ul style="list-style-type: none">• Manage the MDA Safety and Occupational Health Mishap Investigation Program required by DoD 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. <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 & Safety Assessments</p> <ul style="list-style-type: none">• Increase QSMA expertise in the technical fields such as radar engineering, guidance & 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.		

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<ul style="list-style-type: none">• Conduct system analysis/assessments such as reliability prediction analysis, failure modes and effects criticality analysis, safety hazards analysis etc.• Continue to perform independent mission assurance assessments on GMD, THAAD and Aegis test flight tests. Additional FY08 resources will be applied to increase system cognizance and provide greater depth in assessments.• Continue independent assessments for significant ground flight tests. Additional FY08 resources will be applied to increase system cognizance and provide greater depth in assessments.• Continue to provide Independent Readiness Review Team support by providing senior specialists.• Manage the integrated MDA Software Metrics Program which provides periodic assessments on the status of the BMDS to MDA management.• Continue operating the BMDS Material and Failure Review Board to resolve significant Supplier non-conformances.• Conduct independent Safety Assessments/Reviews of MDA programs and Elements to enhance BMDS safety• Maintain the MDA Safety Review Board, MDA Range Safety Council and BMDS Safety Working Groups to ensure that all BMDS activities are conducted safely. <p>Quality, Safety and Mission Assurance Audits</p> <ul style="list-style-type: none">• Conduct up to 6 unannounced Agency large scale Mission Assurance audits to continue enhancement of quality in BMDS products.• Perform 2 safety audits based on safety concerns• Perform 2 post audit corrective action assessments as necessary to accelerate audit resolution. <p>MDA Assurance Provisions (MAP) Implementation</p> <ul style="list-style-type: none">• Update MAP to incorporate lessons learned and inputs from Industry Specification Working Group• 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) & BMDS Safety Officers• 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).• Continue to increase on-site performance through further development of cognizant engineer data books aimed at improving the MARs systems engineering awareness.• Expand BMDS Safety Officer Program by adding engineers to aid the 24/7 team to ensure that the BMDS is operated safely when in test or operational modes. Engineering support shall provide greater knowledge of fire control loop.		

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<ul style="list-style-type: none">• Provide further refinement in the end-of-week processing by metric processing on Quality Issues Tracking System.• Manage the MDA BMDS Safety Officer Program to ensure that the BMDS is operated safely when in test or operational modes.• Maintain and coordinate safety career training program.• Continue performing weekly mission assurance and safety walk-downs.• Using Supplier metrics, continue to pursue process improvements. MDA Parts and Materials Program• Continue to provide technical support via the Center of Excellence (COE) to address 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.• Work with each BMDS Element to adjudicate part and material issues, i.e., waivers and deviations, arising from PMAP requirements.• Using the Center-of-Excellence resources and lab capability, create test methods for new emerging technologies.• 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.• Update the Agency preferred parts and materials list database that facilitates new system design and the resolution of part obsolescence issues. <p>Government MDA Assurance Provisions (GMAP)</p> <ul style="list-style-type: none">• Continue supporting Public Law 107-314, Section 804 “Improvement of software acquisition processes” Bob Stump National Defense Authorization Act for Fiscal Year 2003. GMAP used to ensure each Program Element has a Software Acquisition Improvement Program• Update the GMAP for further refinements in software acquisition strategies.• Continue to provide metric assessments to the Director for each Program Element Senior Executive Review.• Update the MDA Software Verification and Validation Program <p>BMDS Element Support</p> <ul style="list-style-type: none">• 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.• Continue to improve safety by providing specialized support to Advanced Sensors, MKV, and AN/TPY-2 program office.• Continue providing GMD with Navy quality expertise for SBX operations.		

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<p>Intra-Agency & Industry Activities</p> <ul style="list-style-type: none"> • 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. • Coordinate the Specification and Standards Working Group for Industry acceptance of core quality standards to be applied in Supplier contracts. • Review specifications and standards issued by the Defense Standardization Program Office • Continue the sharing of lessons learned with NASA, National Reconnaissance Office (NRO) and other DOD organizations and applying their insights to MDA programs. • Maintain the Range Safety mediation, augmentation and commonality program. <p>Safety and Occupational Health</p> <ul style="list-style-type: none"> • 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 SOH 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. <p>FY09 Planned Program</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 & Safety Assessments</p> <ul style="list-style-type: none">• Administer BMDS non-conformance, risk management, and Reliability, Maintainability, and Availability (RMA) process by providing the leadership and administrative resources necessary for ensuring effective operation and metric reporting.• Conduct system analysis/assessments such as reliability prediction analysis, failure modes and effects criticality analysis, safety hazards analysis etc.• Continue to perform independent mission assurance assessments on GMD, THAAD and Aegis test flight tests. By acquiring additional resources, increase system cognizance and provide greater depth in assessments.• Continue independent assessments for significant ground flight tests. By acquiring additional resources, increase system cognizance and provide greater depth in assessments.• Continue to provide Independent Readiness Review Team support by providing senior specialists.• Manage the integrated MDA Software Metrics Program to provide information on the health of the BMDS to MDA management.• Continue operating the BMDS Material and Failure Review Board to resolve significant Supplier non-conformances.• Conduct independent Safety Assessments/Reviews of MDA programs and Elements to enhance BMDS safety• Maintain the MDA Safety Review Board, MDA Range Safety Council and BMDS Safety Working Groups to ensure that all BMDS activities are conducted safely. <p>Quality, Safety and Mission Assurance Audits</p> <ul style="list-style-type: none">• Conduct up to 6 unannounced Agency large scale Mission Assurance audits to continue enhancement of quality in BMDS products.• Perform 2 safety audits based on safety concerns• Perform 2 post audit corrective action assessments as necessary to accelerate audit resolution.• MDA Assurance Provisions (MAP) Implementation• Update MAP revision to address Lessons Learned, inputs from the Industry Specification Working Group, and to improve metric reporting throughout the Agency.• Continue working with existing Programs Elements to get the MAP on contract and to track individual Program status. <p>On-Site Support - Mission Assurance Representatives (MAR) & BMDS Safety Officers</p> <ul style="list-style-type: none">• 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.		

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<ul style="list-style-type: none"> • Expand BMDS Safety Officer Program by adding engineers to aid the 24/7 team in ensuring that the BMDS is operated safely when in test or operational modes. Engineering support shall provide greater knowledge of fire control loop. • Provide further refinement in the end-of-week processing by metric processing on Quality Issues Tracking System. • Manage the MDA BMDS Safety Officer Program to ensure that the BMDS is operated safely when in test or operational modes. • Maintain and coordinate safety career training program. • Continue performing weekly mission assurance and safety walk-downs. • Using Supplier metrics, continue to pursue process improvements. <p>MDA Parts and Materials Program</p> <ul style="list-style-type: none"> • Continue to provide technical support via the Center of Excellence (COE) to address Program Element and Supplier part and material issues arising from the Agency Part, Material, and Processes Board (PMPB); and the Program Element Parts, Materials, and Processes Control Boards (PMPCB). Agency PMPB ensures uniformity; PMPCB is the Program Element decision board that works directly with the Suppliers. • Work with each Program Element to adjudicate part and material issues, i.e., waivers and deviations, arising from PMAP requirements. • Using the COE resources and lab capability, create test methods for new emerging technologies. • Using data from cost assessments and industry road shows, update the MDA PMAP. Incorporate in the revision Industry practices known to increase product reliability. • Update the Agency preferred parts and materials list database that facilitates new system design and the resolution of part obsolescence issues. <p>Government MDA Assurance Provisions (GMAP)</p> <ul style="list-style-type: none"> • Continue supporting Public Law 107-314, Section 804 “Improvement of software acquisition processes” Bob Stump National Defense Authorization Act for Fiscal Year 2003. GMAP used to ensure each Program Element has a Software Acquisition Improvement Program • Update the GMAP for further refinements in software acquisition strategies. • Continue to provide metric assessments to the Director for each Program Element Senior Executive Review. • Update the MDA Software Verification and Validation Program <p>Program Support</p> <ul style="list-style-type: none"> • Continue providing mission assurance support to Kinetic Energy Interceptor (KEI), Advanced Sensors, Multiple Kill Vehicle (MKV), and Sensors Forward Based X-Band Transportable Radar (AN/TPY-2) program offices. • Continue safety support to Advanced Sensors, MKV, and AN/TPY-2 program office. 		

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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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	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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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
Quality, Safety and Mission Assurance										
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

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
Quality, Safety and Mission Assurance										
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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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
Subtotal Support Costs			12,293	15,098		19,511		26,538		73,440

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					
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
Quality, Safety and Mission Assurance										
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
Remarks										
Project Total Cost			18,708	23,218		29,720		39,070		110,716
Remarks										

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

Date
February 2007

APPROPRIATION/BUDGET ACTIVITY

R-1 NOMENCLATURE

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

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
Safety, Quality, and Mission Assurance																																
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
Safety, Quality, and Mission Assurance								
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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Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date February 2007
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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
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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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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				
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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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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