| MDA Exhibit R-2 RDT&E Budget Item Justification | Date: February 2004 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603884C Ballistic Missile Defense Sensors** |

| COST ($ in Thousands) | FY 2003 | FY 2004 | FY 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 |
|---|---|---|---|---|---|---|---|
| Total PE Cost | 327,013 | 425,421 | 591,957 | 790,265 | 1,453,679 | 1,122,189 | 1,232,893 |
| 5041 Space-Based Infrared System (SBIRS) Low/Space Tracking & Surveillance System (STSS) | 249,896 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0812 Space Tracking and Surveillance System (STSS) Block 2006 | 0 | 266,601 | 273,938 | 259,620 | 182,856 | 47,274 | 51,503 |
| 0912 Space Tracking and Surveillance System (STSS) Block 2008 | 0 | 0 | 0 | 0 | 24,905 | 29,770 | 19,687 |
| 0012 Space Tracking and Surveillance System (STSS) Block 2010 | 0 | 22,263 | 47,833 | 253,828 | 637,215 | 919,830 | 1,112,973 |
| 5049 Russian-American Observation Satellite(s) Program (RAMOS) | 25,761 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0403 Russian-American Observation Satellite(s) Program (RAMOS) | 0 | 29,285 | 0 | 0 | 0 | 0 | 0 |
| 5011 Ballistic Missile Defense Radars Block 2006 | 12,000 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0811 Ballistic Missile Defense Radars Block 2006 | 0 | 99,848 | 256,101 | 260,114 | 487,212 | 216 | 221 |
| 0911 Ballistic Missile Defense Radars Block 2008 | 0 | 0 | 0 | 0 | 100,620 | 102,207 | 22,130 |
| 5060 Test & Evaluation | 4,478 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5090 Program-Wide Support | 34,878 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0602 Program-Wide Support | 0 | 7,424 | 14,085 | 16,703 | 20,871 | 22,892 | 26,379 |

*Note: The Space Tracking and Surveillance System (STSS) has been broken into three STSS capability blocks (STSS Block 2006 -- Project 0812, STSS Block 2008 -- Project 0912, and STSS Future Blocks -- Project 0012). Two of the other projects in this PE are not block specific, but have undergone project code changes. Russian-American Observation Satellites (RAMOS) (Project 5049) has been changed to Project 0403. Program-Wide Support (Project 5090) has been changed to Project 0602. Forward Deployable Radar project efforts beginning in FY 2003 (Project 5011) have been changed and divided into two Forward Deployable Radar capability blocks (Forward Deployable Radar Block 2006 -- Project 0811 and Forward Deployable Radar Block 2008 -- Project 0911).*

*The Test and Evaluation (Project 5060) activity was transferred to Project 0812 in FY 2004.*

*Due to the lack of progress on the RAMOS Government-to-Government agreement with Russia, and the uncertainty this causes, MDA intends to terminate the RAMOS program. MDA received the Russian Government's draft MOU in July 2002 and despite 17 months of discussions, have been unable to complete a government-to-government agreement. Without this agreement, which includes the fundamental issue of taxes and liabilities, the RAMOS program cannot be executed beyond the design stage.*

*MDA will continue to discuss an overarching MOU to govern defense cooperation with Russia, and is actively exploring alternative more beneficial missile defense cooperative projects with Russia, that enjoy the support of the Government of the Russian Federation.*

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

Our goal is to defend the United States and our allies, friends, and deployed forces from ballistic missiles of all ranges in all phases of flight. By the beginning of FY 2005, we will put the BMDS on alert and, for the first time, we will have a capability to defeat a ballistic missile threatening the United States. In FY 2005 and the remainder of the FYDP, we will increase the breadth and depth of our defense by adding forward-deployed, networked sensors, by adding interceptors at sea and on land, and by adding layers of increasingly capable weapons and sensors. Throughout this documentation, therefore, every activity can be tied to one of our four objectives: complete, verify and test the Initial Defensive Capability; put the Ballistic Missile Defense System on alert; develop procedures and logistics to perform and sustain concurrent testing and operations; and enhance the BMDS capability.

| MDA Exhibit R-2 RDT&E Budget Item Justification | Date<br>**February 2004** |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY<br>**RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE<br>**0603884C Ballistic Missile Defense Sensors** |

The MDA develops the Ballistic Missile Defense System (BMDS) using biennial capability blocks. These capability blocks will build on and be integrated with the predecessor blocks. This approach is the most efficient and effective way to get missile defense assets into the hands of the warfighters while allowing for the rapid insertion of emerging technology in the most affordable manner. Block capabilities are built by using elements and components to integrate a single BMDS with multiple operating modes, and provide layered defense against ballistic missiles during all phases of flight-Boost, Midcourse, and Terminal.

As a part of the total BMDS, the Sensors Program Element (PE) funds the sensor-related element portions of Blocks 2006, 2008, and 2010 and other sensor-related mission area investment activities. Technologies and capabilities developed under the Sensors Program Element include: the STSS, RAMOS, Forward Deployable Radar, and related sensor initiatives. The BMDS spiral development approach allows these sensor technologies and capabilities to be incorporated as they mature and evolve into a network of sensors at the BMDS level. Sensor elements in this PE have been developed in coordination with Missile Defense National Team (MDNT) cooperation to help ensure that the elements are focused as a single, integrated system. This sensor data is used to detect, track, and discriminate ballistic missile threats; to control interceptors; and to support kill assessment and re-targeting. The STSS project will be evaluating the utility of infrared (IR) surveillance capabilities with the specific intent to enhance BMDS engagement sequences.

Based on Presidential direction, MDA is developing an initial defensive operational capability that is based on the BMDS Test Bed and augmented with additional development assets. MDA will continue to employ the Test Bed for testing beyond initial fielding to evolve an integrated, layered Ballistic Missile Defense capability. Each of the Sensor Program Elements will be integrated into the BMDS Test Bed to ensure the technology is mature and ready for inclusion in a BMDS Block upgrade.

The efforts in this Sensors Program Element have been structured to take advantage of opportunities previously prohibited by the ABM Treaty. The treaty's demise allows MDA to extend and network land, sea, air, and space based sensors for ballistic missile defense. Therefore, MDA is investing in an integrated, layered approach to sensors that includes diversity in spectra, basing modes and technologies, as well as flexibility in sensor locations, to form a sensor network that is integrated with the BMDS through the Command & Control, Battle Management, and Communication (C2BMC) system. This strategy will minimize gaps in sensor coverage to improve track continuity and situational awareness. Overlapping sensor coverage with a diversity of sensor types will improve track discrimination and kill assessments. The extended sensor coverage and accuracy provided by a network of layered sensors makes the BMDS more efficient, thereby reducing the number of target engagements needed to ensure a sufficient probability of success.

This capability will be delivered using the BMDS Block approach by integrating and incrementally improving current sensor capabilities, initiating RDT&E programs to fill gaps in the global sensor network, and improving sensor performance, flexibility and survivability.

The STSS project is expected to provide the BMDS with the capability to globally track and discriminate ballistic missiles from the boost phase through the midcourse phase up until intercept or reentry. STSS sensors will provide data to close the fire control loop with BMDS interceptors allowing earlier and if necessary additional shots. STSS's infrared sensors, when combined with radars, provide robustness against countermeasures. The STSS project will develop a series of R&D satellites beginning in Block 2006, and a common ground station infrastructure for all Blocks. Successive R&D satellites will field increasingly advanced technology. When an STSS constellation is adequately populated and integrated into the C2BMC system, the BMDS will have a global 24-hour, 7-day-a-week capability to track all ballistic missiles extending the kinematic range of the BMDS interceptor inventory. Block 2006 provides proof of concept to the BMDS with two satellites derived from existing hardware. Block 2008 provides an incremental upgrade to the satellite ground network and software. Funding for Block 2008 capability begins in FY 2007.

The Forward Deployable Radar project will significantly enhance BMDS effectiveness by expanding the battlespace. The Forward Deployable Radar project will be a land based component but will have potential for a sea based configuration. The Forward Deployable Radar will provide early detection, tracking, and discrimination of threat missiles, providing data to the BMDS sensor network. The Forward Deployable Radar project will evaluate advanced algorithms and prototype the interfaces to the BMDS C2BMC using the TPS-X radar. In parallel, the Sensor Program will define improvements or modifications to both MDA and non-MDA owned sensors that have been identified for performance enhancement of the BMDS.

Current plans call for the initial Forward Deployable Radar to be available in CY 2006. Contract options for three additional forward based radars will be executed in FY 2005, FY 2006, and FY 2007 respectively. These additional radars will be integrated into BMDS in Block 06 and beyond. Evolving radar configurations will use additional algorithms and provide enhanced capabilities to

| MDA Exhibit R-2 RDT&E Budget Item Justification | Date: February 2004 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603884C Ballistic Missile Defense Sensors** |

support the BMDS. The Forward Deployable Radar initiative, beginning in FY 2006, will provide for continued sensor research to improve the capabilities and for a BMDS configuration(s) for Block 2008 and beyond.

Program-Wide Support under this project covers personnel and related support costs, statutory and fiscal requirements. May include funding for government civilians performing program-wide oversight functions such as contracting, program integration, safety, quality and mission assurance at Missile Defense Agency (MDA); cost estimating; audit; technology integration across all MDA projects; and assessment of schedule, cost and performance, documentation of related programmatic issues and, foreign currency fluctuations on limited number of foreign contracts. Also includes funding for charges on canceled appropriations in accordance with Public Law 101-510.

| **B. Program Change Summary** | FY 2003 | FY 2004 | FY 2005 |
|---|---|---|---|
| Previous President's Budget (FY 2004 PB) | 350,436 | 438,242 | 562,752 |
| Current President's Budget (FY 2005 PB) | 327,013 | 425,421 | 591,957 |
| Total Adjustments | -23,423 | -12,821 | 29,205 |
| Congressional Specific Program Adjustments | 0 | -8,000 | 0 |
| Congressional Undistributed Adjustments | 0 | -4,821 | 0 |
| Reprogrammings | 1,238 | 0 | 29,205 |
| SBIR/STTR Transfer | -24,661 | 0 | 0 |

The FY 2003 Sensors Program Element budget request in the FY 2004 budget compared to the FY 2005 budget showed a reduction of $23,423,000. This resulted from a reduction of $24,661,000 based on a transfer to the Small Business Innovative Research Program; and an increase of $1,238,000 based on reprogramming that is consistent with priorities.

The FY 2004 Sensors Program Element budget request in the FY 2004 budget compared to the FY 2005 budget showed a reduction of $12,821,000. This resulted from a reduction of $4,821,000 based on Congressional Undistributed Adjustments; and a reduction of $8,000,000 based on the Congressional Specified Adjustments.

The FY 2005 Sensors Program Element budget request in the FY 2004 budget compared to the FY 2005 budget showed an increase of $29,205,000. This increase reflects the Missile Defense Agency's realignment of resources to support higher Agency priorities.

| MDA Exhibit R-2A RDT&E Project Justification | Date: February 2004 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603884C Ballistic Missile Defense Sensors** |

| COST ($ in Thousands) | FY 2003 | FY 2004 | FY 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 |
|---|---|---|---|---|---|---|---|
| 5041 Space-Based Infrared System (SBIRS) Low/Space Tracking & Surveillance System (STSS) | 249,896 | 0 | 0 | 0 | 0 | 0 | 0 |
| RDT&E Articles Qty | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

*Note: The 2003 SBIRS Low/STSS development is described in a single Project, 5041. For FY 2004 and beyond, the continued STSS development effort is described in three Projects: 0812, 0912, and 0012.*

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

The STSS is an element of the BMDS. Through a spiral development process it will provide space-based infrared capability to acquire, track and discriminate ballistic missiles and supply over-the-horizon fire control to BMDS weapon systems extending their effective range. The near-term emphasis for STSS is on tracking performance, followed by improvements in the sensor's discrimination capability.

This development activity provides progressive improvements in ground station and experimental satellites, aligned with the BMDS two-year capability Blocks:

The Block 2006 STSS uses largely existing satellite hardware as a low risk opportunity to bring a space based capability into the Block 2006 BMDS Test Bed. Block 2006 consists of two satellites, to be put in low earth orbit, ground station and software to support communication of data from these satellites to the BMDS. These two satellites will be launched on a single Delta II launch vehicle in the FY 2007 timeframe. Key activities in the 2003 timeframe included initiation of a new single contract for the Block 2006 program, hardware checkout and initial testing. FY 2004 and beyond activity is described in Project 0812. The Block 2006 program also develops the STSS Surrogate Test Bed (SSTB), which will be integrated with the BMD Test Bed. The SSTB demonstrates data fusion processing of data from surrogate infrared and visible sensors such as the AF Maui Optical Station (AMOS) telescopes, and High Altitude Observatory (HALO) II aircraft, replicating the processing and interfaces of the Block 2006 satellite ground station. The SSTB is a key pathfinder for the Block 2006 integration into the BMDS. Activity in the 2003 timeframe demonstrates functionality in key BMDS tests. The FY 2004 and beyond activity is described in Project 0812.

The Block 2008 STSS upgrades the ground station and software aspects of the Block 2006 STSS configuration. There is no near-term funding for this activity. FY 2004 and beyond activity is described in Project 0912.

**B. Accomplishments/Planned Program**

| | FY 2003 | FY 2004 | FY 2005 |
|---|---|---|---|
| Block 2006 | 203,041 | | |
| RDT&E Articles (Quantity) | | | |

FY 2003 accomplishments:
- Continued surrogate sensor data collection with the AF Maui Optical Station (AMOS) telescope and High Altitude Observatory (HALO) II aircraft.
- Continued further integration with the BMDS Test Bed.
- Conducted full inventory and check-out of Flight Demonstration System hardware required for Block 2006.
- Performed analysis of the benefits of including an improved acquisition sensor on second satellite.
- Conducted Delta System Definition Review (SDR).
- Conducted Delta Preliminary Design Review (PDR).

FY 2004 and 2005 plans and schedules are described in Project 0812.

| MDA Exhibit R-2A RDT&E Project Justification | Date: February 2004 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603884C Ballistic Missile Defense Sensors** |

| | FY 2003 | FY 2004 | FY 2005 |
|---|---|---|---|
| Future Block Development | 46,855 | | |
| RDT&E Articles (Quantity) | | | |

FY 2003 accomplishments:
- Conducted trades for Block 2010 program.
- Continued other risk reduction efforts.*

* Other risk reduction activities includes cryocoolers, batteries, Radiation Hardened Parts, phenomenology, optical filters, Midcourse Space Experiment (MSX) data reduction, contamination control, focal plane arrays {visible and long-wave} and survivability.

Activity beyond the Block 2006/2008 STSS program is described elsewhere due to classification.

**C. Other Program Funding Summary**

| | FY 2003 | FY 2004 | FY 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|
| PE 0603890C Ballistic Missile Defense System Core | 0 | 445,356 | 479,764 | 492,988 | 527,541 | 539,210 | 568,365 | Continuing | Continuing |
| PE 0604861C Theater High-Altitude Area Defense System - TMD - EMD | 887,616 | 0 | 0 | 0 | 0 | 0 | 0 | Continuing | Continuing |
| PE 0604865C Patriot PAC-3 Theater Missile Defense Acquisition - EMD | 138,922 | 0 | 0 | 0 | 0 | 0 | 0 | Continuing | Continuing |
| PE 0605502C Small Business Innovative Research - MDA | 138,791 | 0 | 0 | 0 | 0 | 0 | 0 | Continuing | Continuing |
| PE 0901585C Pentagon Reservation | 7,432 | 14,327 | 13,884 | 12,958 | 12,850 | 13,158 | 13,476 | Continuing | Continuing |
| PE 0901598C Management Headquarters - MDA | 35,331 | 92,449 | 141,923 | 146,099 | 145,112 | 151,727 | 154,583 | Continuing | Continuing |
| PE 0603175C Ballistic Missile Defense Technology | 151,217 | 225,268 | 204,320 | 199,468 | 246,291 | 286,286 | 305,365 | Continuing | Continuing |
| PE 0603869C Meads Concepts - Dem/Val | 101,754 | 0 | 0 | 0 | 0 | 0 | 0 | Continuing | Continuing |
| PE 0603879C Advanced Concepts, Evaluations and Systems | 0 | 149,993 | 256,159 | 229,512 | 232,463 | 231,583 | 224,626 | Continuing | Continuing |
| PE 0603880C Ballistic Missile Defense System Segment | 1,028,016 | 0 | 0 | 0 | 0 | 0 | 0 | Continuing | Continuing |

| MDA Exhibit R-2A RDT&E Project Justification | Date: February 2004 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603884C Ballistic Missile Defense Sensors** |

| | FY 2003 | FY 2004 | FY 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|
| PE 0603881C Ballistic Missile Defense Terminal Defense Segment | 134,093 | 874,527 | 937,748 | 993,048 | 1,117,657 | 570,000 | 410,324 | Continuing | Continuing |
| PE 0603882C Ballistic Missile Defense Midcourse Defense Segment | 3,056,035 | 3,744,066 | 4,404,335 | 3,067,800 | 3,087,147 | 1,881,298 | 1,802,257 | Continuing | Continuing |
| PE 0603883C Ballistic Missile Defense Boost Defense Segment | 705,643 | 617,270 | 492,614 | 555,667 | 611,736 | 473,602 | 455,961 | Continuing | Continuing |
| PE 0603886C Ballistic Missile Defense System Interceptors | 0 | 117,719 | 511,262 | 1,118,599 | 1,717,480 | 2,196,531 | 2,449,322 | Continuing | Continuing |
| PE 0603888C Ballistic Missile Defense Test and Targets | 0 | 635,782 | 716,427 | 673,476 | 656,152 | 654,015 | 688,119 | Continuing | Continuing |
| PE 0603889C Ballistic Missile Defense Products | 0 | 305,309 | 418,608 | 421,049 | 445,971 | 456,339 | 469,621 | Continuing | Continuing |

**D. Acquisition Strategy**

The STSS follows the Missile Defense Agency's capability-based acquisition strategy that emphasizes testing, spiral development, and evolutionary acquisition through the use of two-year capability blocks.

The STSS effort is being pursued through a single prime contractor, Northrop Grumman Space Technology (NGST), formerly TRW, with subcontractors playing key roles in systems engineering, satellite bus development and sensor payloads. The program develops a ground station and series of R&D satellites aligned to the BMDS capability blocks. A contract for the Block 2006 activity and the initial definition work on Block 2010 was awarded in fourth quarter FY 2002.

The restructured program implements MDA's capability-based acquisition strategy by a) using largely existing satellite hardware as a low risk opportunity, b) building upon the lessons learned from previous development efforts and c) establishing a series of planned enhancements to bring added capability to the BMDS. From an overall system standpoint, MDA will measure the capabilities of each development cycle and make decisions about the sensor complex for eventual integration into the BMDS.

| MDA Exhibit R-3 RDT&E Project Cost Analysis | Date: February 2004 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P) | R-1 NOMENCLATURE: 0603884C Ballistic Missile Defense Sensors |

**I. Product Development Cost ( $ in Thousands )**

| Cost Categories: | Contract Method & Type | Performing Activity & Location | Total PYs Cost | FY 2004 Cost | FY 2004 Award Date | FY 2005 Cost | FY 2005 Award Date | Cost to Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|
| **Block 2006** | | | | | | | | | | |
| Capability Based R&D Contract | SS/CPAF | NGST/ CA | 187,897 | | | | | CONT. | 187,897 | CONT. |
| **Future Block Development** | | | | | | | | | | |
| Capability Based R&D Contract | SS/CPAF | NGST/ CA | 41,670 | | | | | CONT. | 41,670 | CONT. |
| Subtotal Product Development | | | 229,567 | 0 | | 0 | | 0 | 229567 | |

**Remarks**

Capability Based R&D Contract is a multi-year contract covering the testing, integration, and on-orbit operations of 2 Block 2006 satellites and system architecture trade studies of the Block 2010 effort. This contract may be extended to add the Block 2008 effort.

Beginning in FY 2004, this contract in Block 2006 continued in Project 0812. Future Block Development (Block 2010) efforts continued in Project 0012.

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

| Cost Categories: | Contract Method & Type | Performing Activity & Location | Total PYs Cost | FY 2004 Cost | FY 2004 Award Date | FY 2005 Cost | FY 2005 Award Date | Cost to Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|
| **Block 2006** | | | | | | | | | | |
| Program Support (OGC) | Various | Various | 12,934 | | | | | TBD | 12,934 | CONT. |
| Program Definition Support | Various | Various | 10,149 | | | | | TBD | 10,149 | CONT. |
| SBIRS Low Surrogate Test Bed | Various | Various | 7,170 | | | | | TBD | 7,170 | CONT. |
| **Future Block Development** | | | | | | | | | | |
| Risk Reduction | Various | Various | 14,000 | | | | | TBD | 14,000 | CONT. |
| Subtotal Support Costs | | | 44,253 | 0 | | 0 | | 0 | 44253 | |

**Remarks**

All program support and program definition support costs have been allocated to Block 2006, through the launch in FY07. Program definition support has been redefined as Advanced Algorithm Development in Project 0812 under SE/PM.

| MDA Exhibit R-3 RDT&E Project Cost Analysis | Date: February 2004 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P) | R-1 NOMENCLATURE: 0603884C Ballistic Missile Defense Sensors |

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

| Cost Categories: | Contract Method & Type | Performing Activity & Location | Total PYs Cost | FY 2004 Cost | FY 2004 Award Date | FY 2005 Cost | FY 2005 Award Date | Cost to Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|
| Subtotal Test and Evaluation | | | | | | | | | | |

**Remarks**

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

| Cost Categories: | Contract Method & Type | Performing Activity & Location | Total PYs Cost | FY 2004 Cost | FY 2004 Award Date | FY 2005 Cost | FY 2005 Award Date | Cost to Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|
| **Block 2006** | | | | | | | | | | |
| FFRDC | FFRDC | AEROSPACE/ CA | 36,519 | | | | | CONT. | 36,519 | TBD |
| Subtotal Management Services | | | 36,519 | 0 | | 0 | | 0 | 36519 | |

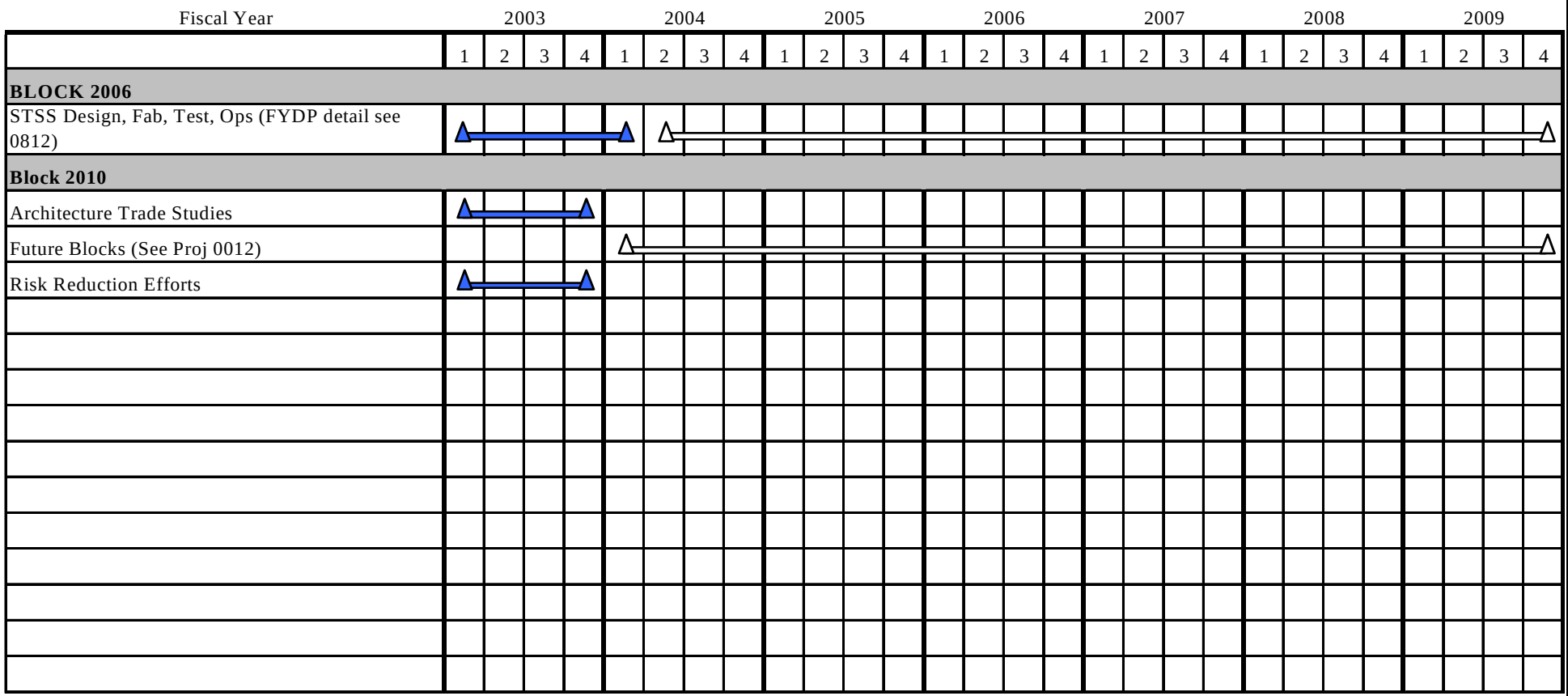
**Remarks**

All FFRDC costs have been allocated to Block 2006, through the launch in FY07.

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Project Total Cost | | | 310,339 | 0 | | 0 | | | 310,339 | |

**Remarks**

| MDA Exhibit R-4 Schedule Profile | Date: February 2004 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603884C Ballistic Missile Defense Sensors** |



| MDA Exhibit R-4A Schedule Detail | Date: February 2004 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603884C Ballistic Missile Defense Sensors** |

| Schedule Profile | FY 2003 | FY 2004 | FY 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 |
|---|---|---|---|---|---|---|---|
| **BLOCK 2006** | | | | | | | |
| STSS Design, Fab, Test, Ops (FYDP detail see 0812) | 1Q-4Q | 1Q-4Q | 1Q-4Q | 1Q-4Q | 1Q-4Q | 1Q-4Q | 1Q-4Q |
| **Block 2010** | | | | | | | |
| Architecture Trade Studies | 1Q-4Q | | | | | | |
| Future Blocks (See Proj 0012) | | 1Q-4Q | 1Q-4Q | 1Q-4Q | 1Q-4Q | 1Q-4Q | 1Q-4Q |
| Risk Reduction Efforts | 1Q-4Q | | | | | | |

| MDA Exhibit R-2A RDT&E Project Justification | Date: February 2004 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603884C Ballistic Missile Defense Sensors** |

| COST ($ in Thousands) | FY 2003 | FY 2004 | FY 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 |
|---|---|---|---|---|---|---|---|
| 0812 Space Tracking and Surveillance System (STSS) Block 2006 | 0 | 266,601 | 273,938 | 259,620 | 182,856 | 47,274 | 51,503 |
| RDT&E Articles Qty | 0 | 0 | 0 | 1 | 4 | 2 | 0 |

*Note: In FY 2003 STSS development is described in a single Project, 5041. For FY 2004 and beyond, the continued STSS development effort is described in three Projects: 0812, 0912, and 0012. This development activity provides progressive improvements in ground station and experimental satellites, aligned with the BMDS two-year capability Blocks.*

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

STSS is an element of the BMDS. Through a spiral development process it will provide space-based infrared capability to acquire, track and discriminate ballistic missiles and supply over-the-horizon fire control to BMDS weapon systems to extend its effective range. The near term emphasis for STSS is on tracking performance, followed by improvements in the sensor's discrimination capability.

The Block 2006 STSS uses largely existing satellite hardware from the Flight Demonstration System (FDS) as a low risk opportunity to bring a space based capability into the Block 2006 BMDS Test Bed. Block 2006 STSS consists of two satellites with visible and infrared sensor suites, to be put in low earth orbit for initial testing. These two satellites will provide valuable risk reduction and concept demonstration information about acquisition, tracking, and discrimination functionality including stereo data fusion, cueing radars over the horizon and providing interceptor handovers. Ultimately, Block 2006 STSS will include a performance assessment of the STSS contribution to over-the-horizon fire control to BMDS interceptors. All on-orbit testing with ballistic missile targets will be orchestrated to allow BMDS participation. The budget includes launch services for the two Block 2006 STSS satellites to be launched on a single Delta II launch vehicle in FY 2007.

Block 2006 STSS also develops the ground segment and software algorithms required to operate and process data from the Block 2006 STSS satellites with growth path to the ground system required for an expanding constellation of R&D satellites developed over subsequent blocks.

Block 2006 also provides program support and program definition support through the end of FY 2007. Funding for targets to be used in Block 2006 is included beginning in FY 2005.

The Block 2006 program also develops the STSS Surrogate Test Bed (SSTB), which will be integrated with the BMD Test Bed. The SSTB demonstrates data fusion processing of data from surrogate infrared and visible sensors such as the AF Maui Optical Station (AMOS) telescopes and High Altitude Observatory (HALO) II aircraft, replicating the processing and interfaces of the Block 2006 satellite ground station. The SSTB is a key pathfinder for the Block 2006 integration into the BMDS. The SSTB will be primarily performed by the government program office.

The STSS Surrogate Test Bed will leverage the work done on the Airborne Infrared Surveillance (AIRS) effort.

**B. Accomplishments/Planned Program**

| | FY 2003 | FY 2004 | FY 2005 |
|---|---|---|---|
| Space | | 120,427 | 159,950 |
| RDT&E Articles (Quantity) | | | |

FY 2004 Planned Program:

- Complete Track Sensor Assembly Integration and Test (AI&T)
- Conduct Delta CDR

| MDA Exhibit R-2A RDT&E Project Justification | Date: February 2004 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603884C Ballistic Missile Defense Sensors** |

- Complete Payload Software Build 2
- Complete Closed Loop testing of Sensor Payload Software
- Initial payment to NASA toward Launch Services for the 2 Block 2006 satellites

FY 2005 Planned Program:

- Complete Payload Software Build 3
- Conduct System Compatibility Tests (Payload and Satellite Bus)
- Initiate Space Vehicle Integration
- Continue payment to NASA toward Launch Services for the 2 Block 2006 satellites

| | FY 2003 | FY 2004 | FY 2005 |
|---|---|---|---|
| Ground | | 44,075 | 22,834 |
| RDT&E Articles (Quantity) | | | |

FY 2004 Planned Program:

- Mature Ground System Design
- Initiate Satellite Operation Training Plan

FY 2005 Planned Program:

- Ground Hardware Integration
- Conduct Initial Crew Training

| | FY 2003 | FY 2004 | FY 2005 |
|---|---|---|---|
| Government | | 21,345 | 23,620 |
| RDT&E Articles (Quantity) | | | |

FY 2004 Planned Program:

- FFRDC Requirements includes Aerospace and Mitre Personnel Support
- Program Office Support includes Security Support, TDY, Cost Estimating Support, Management Services, Hardware and Software purchases and maintenance, Computer Network Support, and Supplies

| MDA Exhibit R-2A RDT&E Project Justification | Date: February 2004 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603884C Ballistic Missile Defense Sensors** |

FY 2005 Planned Program:

- FFRDC Requirements includes Aerospace and Mitre Personnel Support
- Program Office Support includes Security Support, TDY, Cost Estimating Support, Management Services, Hardware and Software purchases and maintenance, Computer Network Support, and Supplies

| | FY 2003 | FY 2004 | FY 2005 |
|---|---|---|---|
| SE/PM | | 68,459 | 61,848 |
| RDT&E Articles (Quantity) | | | |

FY 2004 Planned Program:

- Perform ground test data analysis.
- Conduct initial System Compatibility Tests (Payload and Satellite Bus and Ground System)
- Advanced Algorithm Development

FY 2005 Planned Program:

- Conduct System Compatibility Tests (Payload, Satellite Bus and Ground System)
- Advanced Algorithm Development

| | FY 2003 | FY 2004 | FY 2005 |
|---|---|---|---|
| IR Engagement Sequence | | 12,295 | 5,686 |
| RDT&E Articles (Quantity) | | | |

FY 2004 Planned Program:

- Perform HALO II aircraft modifications to enhance tracking and operational performance in support of the Airborne Infrared Surveillance (AIRS) acquisition strategy
- Evaluate the utility of IR/Vis sensors in BMDS Engagement sequences using HALO II measurements
- Develop acquisition strategy for next generation airborne IR/Vis capability if supported by HALO II performance
- Continue developing connectivity and algorithms toward providing near real time IR and IR-RADAR fused data to the BMDS
- The STSS Surrogate Test Bed (SSTB) will be integrated with the Command and Control Battle Management Center(C2BMC) X-Lab at the Joint National Integration Center (JNIC)

FY 2005 Planned Program

- Continue evaluation of IR/Vis sensors' utility in BMDS Engagement sequences using HALO II measurements
- Continue developing connectivity and algorithms toward providing near real time IR and IR-RADAR fused data to the BMDS
- The SSTB Fusion Workstation will physically move from the MHPCC at Maui to the STSS Joint Satellite Control Facility (JSCF) at the Joint National Integration Center (JNIC) and become a part of the STSS Ground Segment.

| MDA Exhibit R-2A RDT&E Project Justification | Date: February 2004 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603884C Ballistic Missile Defense Sensors** |

**C. Other Program Funding Summary**

| | FY 2003 | FY 2004 | FY 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|
| PE 0603175C Ballistic Missile Defense Technology | 151,217 | 225,268 | 204,320 | 199,468 | 246,291 | 286,286 | 305,365 | Continuing | Continuing |
| PE 0603869C Meads Concepts - Dem/Val | 101,754 | 0 | 0 | 0 | 0 | 0 | 0 | Continuing | Continuing |
| PE 0603879C Advanced Concepts, Evaluations and Systems | 0 | 149,993 | 256,159 | 229,512 | 232,463 | 231,583 | 224,626 | Continuing | Continuing |
| PE 0603880C Ballistic Missile Defense System Segment | 1,028,016 | 0 | 0 | 0 | 0 | 0 | 0 | Continuing | Continuing |
| PE 0603881C Ballistic Missile Defense Terminal Defense Segment | 134,093 | 874,527 | 937,748 | 993,048 | 1,117,657 | 570,000 | 410,324 | Continuing | Continuing |
| PE 0603882C Ballistic Missile Defense Midcourse Defense Segment | 3,056,035 | 3,744,066 | 4,404,335 | 3,067,800 | 3,087,147 | 1,881,298 | 1,802,257 | Continuing | Continuing |
| PE 0603883C Ballistic Missile Defense Boost Defense Segment | 705,643 | 617,270 | 492,614 | 555,667 | 611,736 | 473,602 | 455,961 | Continuing | Continuing |
| PE 0603886C Ballistic Missile Defense System Interceptors | 0 | 117,719 | 511,262 | 1,118,599 | 1,717,480 | 2,196,531 | 2,449,322 | Continuing | Continuing |
| PE 0603888C Ballistic Missile Defense Test and Targets | 0 | 635,782 | 716,427 | 673,476 | 656,152 | 654,015 | 688,119 | Continuing | Continuing |
| PE 0603889C Ballistic Missile Defense Products | 0 | 305,309 | 418,608 | 421,049 | 445,971 | 456,339 | 469,621 | Continuing | Continuing |
| PE 0603890C Ballistic Missile Defense System Core | 0 | 445,356 | 479,764 | 492,988 | 527,541 | 539,210 | 568,365 | Continuing | Continuing |
| PE 0604861C Theater High-Altitude Area Defense System - TMD - EMD | 887,616 | 0 | 0 | 0 | 0 | 0 | 0 | Continuing | Continuing |
| PE 0604865C Patriot PAC-3 Theater Missile Defense Acquisition - EMD | 138,922 | 0 | 0 | 0 | 0 | 0 | 0 | Continuing | Continuing |
| PE 0605502C Small Business Innovative Research - MDA | 138,791 | 0 | 0 | 0 | 0 | 0 | 0 | Continuing | Continuing |
| PE 0901585C Pentagon Reservation | 7,432 | 14,327 | 13,884 | 12,958 | 12,850 | 13,158 | 13,476 | Continuing | Continuing |
| PE 0901598C Management Headquarters - MDA | 35,331 | 92,449 | 141,923 | 146,099 | 145,112 | 151,727 | 154,583 | Continuing | Continuing |

| MDA Exhibit R-2A RDT&E Project Justification | Date: February 2004 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603884C Ballistic Missile Defense Sensors** |

**D. Acquisition Strategy**

STSS follows the Missile Defense Agency's capability-based acquisition strategy that emphasizes testing, spiral development, and evolutionary acquisition through the use of two-year capability blocks.

The STSS effort is being pursued through a single prime contractor, Northrop Grumman Space Technology (NGST), formerly TRW, with subcontractors playing key roles in systems engineering, satellite bus development and sensor payloads. The program develops a ground station and series of R&D satellites aligned to the BMDS capability blocks. A contract for the Block 2006 activity and the initial definition work on Block 2010 was awarded in fourth quarter FY 2002.

The restructured program implements MDA's capability-based acquisition strategy by a) using largely existing satellite hardware as a low risk opportunity, b) building upon the lessons learned from previous development efforts and c) establishing a series of planned enhancements to bring added capability to the BMDS. From an overall system standpoint, MDA will measure the capabilities of each development cycle and make decisions about the sensor complex for eventual integration into the BMDS.

Acquisition Strategy For the AIRS Program:
- Phase I-A and Phase I-B run concurrently
- Phase I-A: HALO II demonstration effort
- Phase I-B: AIRS Acquisition Strategy Development
- Phase II (AIRS Procurement) implemented if results of Phase I warrant next step

| MDA Exhibit R-3 RDT&E Project Cost Analysis | Date: February 2004 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P) | R-1 NOMENCLATURE: 0603884C Ballistic Missile Defense Sensors |

**I. Product Development Cost ( $ in Thousands )**

| Cost Categories: | Contract Method & Type | Performing Activity & Location | Total PYs Cost | FY 2004 Cost | FY 2004 Award Date | FY 2005 Cost | FY 2005 Award Date | Cost to Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|
| **Space** | | | | | | | | | | |
| Capability Based R&D Contract | SS/CPAF | NGST/ CA | | 116,434 | | 117,050 | | CONT. | 233,484 | CONT. |
| Launch Vehicle Integration | Various | Various/ Various | | 3,993 | 1/3Q | 42,700 | 1/3Q | TBD | 46,693 | TBD |
| Target Acquisition | Various | Various/ Various | | | | 200 | 1/3Q | TBD | 200 | TBD |
| **Ground** | | | | | | | | | | |
| Capability Based R&D Contract | SS/CPAF | NGST/ CA | | 44,075 | | 22,834 | | CONT. | 66,909 | CONT. |
| **SE/PM** | | | | | | | | | | |
| Capability Based R&D Contract | SS/CPAF | NGST/ CA | | 63,694 | | 56,202 | | CONT. | 119,896 | CONT. |
| Advanced Algorithm Development | Various | Various/ Various | | 4,765 | 1/3Q | 5,646 | 1/3Q | TBD | 10,411 | TBD |
| **IR Engagement Sequence** | | | | | | | | | | |
| Airborne Infrared Surveillance (AIRS) | Various | Various/ Various | | 7,500 | 3Q | | | TBD | 7,500 | TBD |
| STSS Surrogate Test Bed | Various | Various/ Various | | 4,795 | 1/3Q | 5,686 | 1/3Q | TBD | 10,481 | TBD |
| Subtotal Product Development | | | 0 | 245,256 | | 250,318 | | 0 | 495574 | |

**Remarks**

The Capability Based R&D contract was awarded in FY 2002. Prior year and FY 2003 costs are described in Project 5041.

| MDA Exhibit R-3 RDT&E Project Cost Analysis | Date: February 2004 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P) | R-1 NOMENCLATURE: 0603884C Ballistic Missile Defense Sensors |

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

| Cost Categories: | Contract Method & Type | Performing Activity & Location | Total PYs Cost | FY 2004 Cost | FY 2004 Award Date | FY 2005 Cost | FY 2005 Award Date | Cost to Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|
| **Government** | | | | | | | | | | |
| System Program Office Support | Various | Various/ CA | | 9,905 | 1/4Q | 9,500 | 1/4Q | TBD | 19,405 | TBD |
| Subtotal Support Costs | | | 0 | 9,905 | | 9,500 | | 0 | 19405 | |

**Remarks**

All system program office support costs have been allocated to Block 2006, through the launch in FY07.

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

| Cost Categories: | Contract Method & Type | Performing Activity & Location | Total PYs Cost | FY 2004 Cost | FY 2004 Award Date | FY 2005 Cost | FY 2005 Award Date | Cost to Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|
| Subtotal Test and Evaluation | | | | | | | | | | |

**Remarks**

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

| Cost Categories: | Contract Method & Type | Performing Activity & Location | Total PYs Cost | FY 2004 Cost | FY 2004 Award Date | FY 2005 Cost | FY 2005 Award Date | Cost to Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|
| **Government** | | | | | | | | | | |
| FFRDC | FFRDC | AEROSPACE/ CA | | 11,440 | 1/2Q | 14,120 | 1/2Q | CONT. | 25,560 | CONT. |
| Subtotal Management Services | | | 0 | 11,440 | | 14,120 | | 0 | 25560 | |

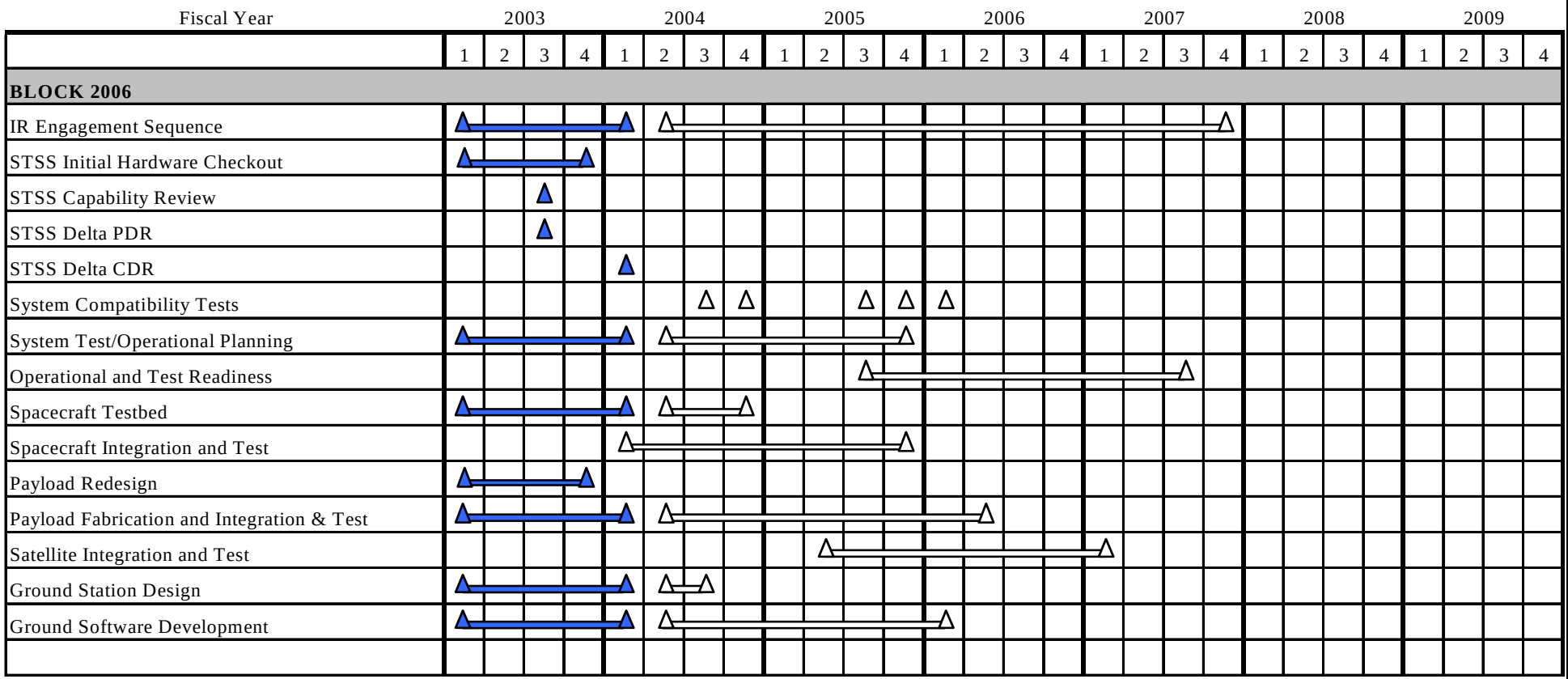
**Remarks**

All FFRDC costs have been allocated to Block 2006, through the launch in FY07.

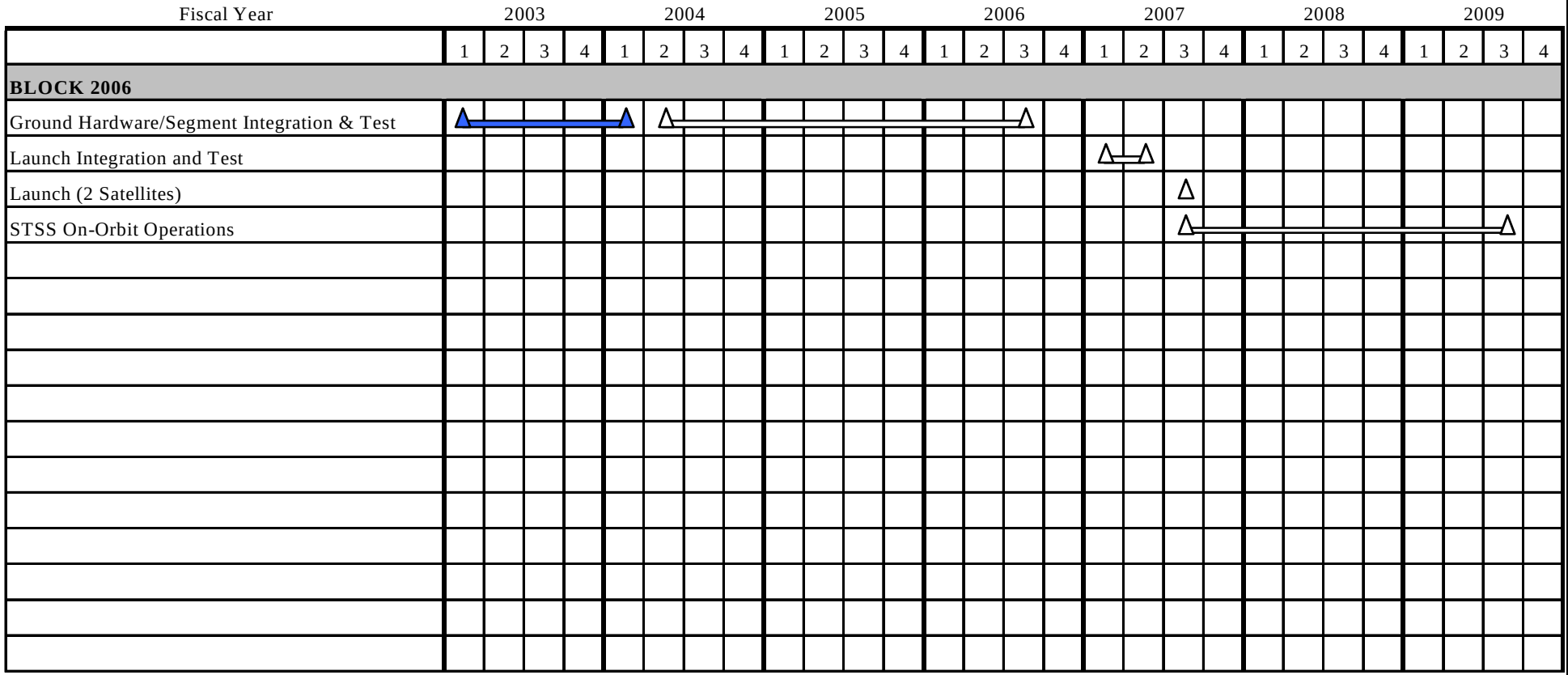
| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Project Total Cost | | | 0 | 266,601 | | 273,938 | | | 540,539 | |

**Remarks**

| MDA Exhibit R-4 Schedule Profile | Date: February 2004 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603884C Ballistic Missile Defense Sensors** |



| MDA Exhibit R-4 Schedule Profile | Date: February 2004 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603884C Ballistic Missile Defense Sensors** |



| MDA Exhibit R-4A Schedule Detail | Date: February 2004 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603884C Ballistic Missile Defense Sensors** |

| Schedule Profile | FY 2003 | FY 2004 | FY 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 |
|---|---|---|---|---|---|---|---|
| **BLOCK 2006** | | | | | | | |
| IR Engagement Sequence | 1Q-4Q | 1Q-4Q | 1Q-4Q | 1Q-4Q | 1Q-4Q | | |
| STSS Initial Hardware Checkout | 1Q-4Q | | | | | | |
| STSS Capability Review | 3Q | | | | | | |
| STSS Delta PDR | 3Q | | | | | | |
| STSS Delta CDR | | 1Q | | | | | |
| System Compatibility Tests | | 3Q,4Q | 3Q,4Q | 1Q | | | |
| System Test/Operational Planning | 1Q-4Q | 1Q-4Q | 1Q-4Q | | | | |
| Operational and Test Readiness | | | 3Q-4Q | 1Q-4Q | 1Q-3Q | | |
| Spacecraft Testbed | 1Q-4Q | 1Q-4Q | | | | | |
| Spacecraft Integration and Test | | 1Q-4Q | 1Q-4Q | | | | |
| Payload Redesign | 1Q-4Q | | | | | | |
| Payload Fabrication and Integration & Test | 1Q-4Q | 1Q-4Q | 1Q-4Q | 1Q-2Q | | | |
| Satellite Integration and Test | | | 2Q-4Q | 1Q-4Q | 1Q | | |
| Ground Station Design | 1Q-4Q | 1Q-3Q | | | | | |
| Ground Software Development | 1Q-4Q | 1Q-4Q | 1Q-4Q | 1Q | | | |
| Ground Hardware/Segment Integration & Test | 1Q-4Q | 1Q-4Q | 1Q-4Q | 1Q-3Q | | | |
| Launch Integration and Test | | | | | 1Q-2Q | | |
| Launch (2 Satellites) | | | | | 3Q | | |
| STSS On-Orbit Operations | | | | | 3Q-4Q | 1Q-4Q | 1Q-3Q |

| MDA Exhibit R-2A RDT&E Project Justification | Date: February 2004 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603884C Ballistic Missile Defense Sensors** |

| COST ($ in Thousands) | FY 2003 | FY 2004 | FY 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 |
|---|---|---|---|---|---|---|---|
| 0912 Space Tracking and Surveillance System (STSS) Block 2008 | 0 | 0 | 0 | 0 | 24,905 | 29,770 | 19,687 |
| RDT&E Articles Qty | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

*Note: In FY 2003 STSS development is described in a single Project, 5041. For FY 2004 and beyond, the continued STSS development effort is described in three Projects: 0812, 0912, and 0012. This development activity provides progressive improvements in ground station and experimental satellites, aligned with the BMDS two-year capability Blocks.*

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

STSS is an element of the BMDS. Through a spiral development process it will provide space-based infrared capability to acquire, track and discriminate ballistic missiles and supply over-the-horizon fire control to BMDS weapon systems extending their effective range. The near-term emphasis for STSS is on tracking performance to extend the effective range of BMDS interceptors, followed by improvements in the sensor's discrimination capability.

The Block 2008 STSS upgrades the ground station and software aspects of the Block 2006 STSS configuration. There is no near term funding for this activity. Funding for this Project is not programmed until FY07.

The Block 2008 STSS continues integrated operations with other BMD Elements and Test Bed activities with visible and IR tracking of a variety of short and long range test targets. All testing will be orchestrated to allow BMDS participation. Refinements will be made to ground station software to achieve near-real-time mission data processing and connectivity to the C2BMC elements.

As the Block 2008 activity builds on the Block 2006 ground segment, and operates, collects and analyses data from the Block 2006 satellites, funding in this project is not programmed until FY07.

**B. Accomplishments/Planned Program**

| | FY 2003 | FY 2004 | FY 2005 |
|---|---|---|---|
| Funding in this project is not programmed until FY07. | | | |
| RDT&E Articles (Quantity) | | | |

**C. Other Program Funding Summary**

| | FY 2003 | FY 2004 | FY 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|
| PE 0603890C Ballistic Missile Defense System Core | 0 | 445,356 | 479,764 | 492,988 | 527,541 | 539,210 | 568,365 | Continuing | Continuing |
| PE 0604861C Theater High-Altitude Area Defense System - TMD - EMD | 887,616 | 0 | 0 | 0 | 0 | 0 | 0 | Continuing | Continuing |
| PE 0604865C Patriot PAC-3 Theater Missile Defense Acquisition - EMD | 138,922 | 0 | 0 | 0 | 0 | 0 | 0 | Continuing | Continuing |

| MDA Exhibit R-2A RDT&E Project Justification | Date: February 2004 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P) | R-1 NOMENCLATURE: 0603884C Ballistic Missile Defense Sensors |

| | FY 2003 | FY 2004 | FY 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|
| PE 0605502C Small Business Innovative Research - MDA | 138,791 | 0 | 0 | 0 | 0 | 0 | 0 | Continuing | Continuing |
| PE 0901585C Pentagon Reservation | 7,432 | 14,327 | 13,884 | 12,958 | 12,850 | 13,158 | 13,476 | Continuing | Continuing |
| PE 0901598C Management Headquarters - MDA | 35,331 | 92,449 | 141,923 | 146,099 | 145,112 | 151,727 | 154,583 | Continuing | Continuing |
| PE 0603175C Ballistic Missile Defense Technology | 151,217 | 225,268 | 204,320 | 199,468 | 246,291 | 286,286 | 305,365 | Continuing | Continuing |
| PE 0603869C Meads Concepts - Dem/Val | 101,754 | 0 | 0 | 0 | 0 | 0 | 0 | Continuing | Continuing |
| PE 0603879C Advanced Concepts, Evaluations and Systems | 0 | 149,993 | 256,159 | 229,512 | 232,463 | 231,583 | 224,626 | Continuing | Continuing |
| PE 0603880C Ballistic Missile Defense System Segment | 1,028,016 | 0 | 0 | 0 | 0 | 0 | 0 | Continuing | Continuing |
| PE 0603881C Ballistic Missile Defense Terminal Defense Segment | 134,093 | 874,527 | 937,748 | 993,048 | 1,117,657 | 570,000 | 410,324 | Continuing | Continuing |
| PE 0603882C Ballistic Missile Defense Midcourse Defense Segment | 3,056,035 | 3,744,066 | 4,404,335 | 3,067,800 | 3,087,147 | 1,881,298 | 1,802,257 | Continuing | Continuing |
| PE 0603883C Ballistic Missile Defense Boost Defense Segment | 705,643 | 617,270 | 492,614 | 555,667 | 611,736 | 473,602 | 455,961 | Continuing | Continuing |
| PE 0603886C Ballistic Missile Defense System Interceptors | 0 | 117,719 | 511,262 | 1,118,599 | 1,717,480 | 2,196,531 | 2,449,322 | Continuing | Continuing |
| PE 0603888C Ballistic Missile Defense Test and Targets | 0 | 635,782 | 716,427 | 673,476 | 656,152 | 654,015 | 688,119 | Continuing | Continuing |
| PE 0603889C Ballistic Missile Defense Products | 0 | 305,309 | 418,608 | 421,049 | 445,971 | 456,339 | 469,621 | Continuing | Continuing |

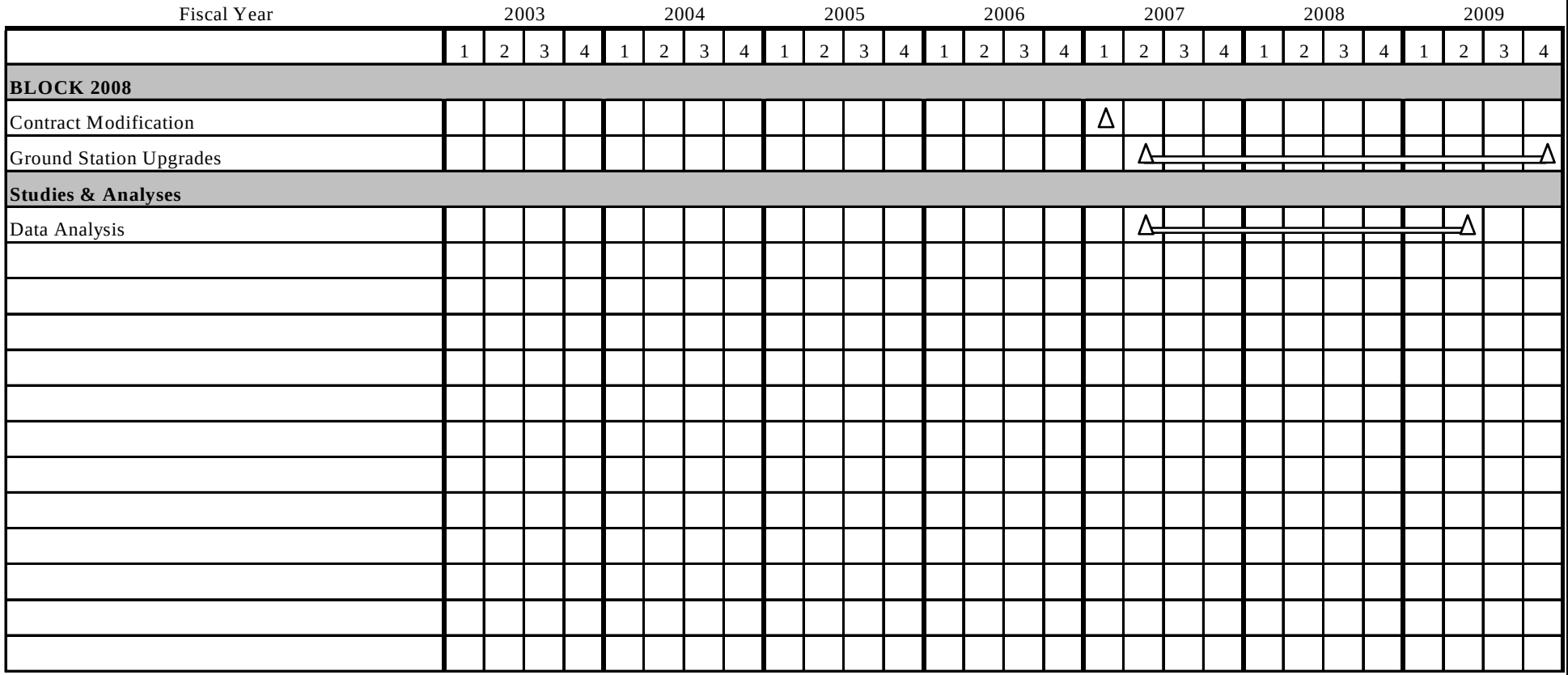
**D. Acquisition Strategy**

STSS will follow the Missile Defense Agency's capability-based acquisition strategy that emphasizes testing, spiral development and evolutionary acquisition through the use of two-year capability blocks.

The STSS effort is being pursued through a single prime contractor, Northrop Grumman Space Technology (NGST), formerly TRW, with subcontractors playing key roles in systems engineering, satellite bus development and sensor payloads. The program develops a ground station and series of R&D satellites aligned to the BMDS capability blocks. A contract for the Block 06 activity and the initial definition work on Block 10 was awarded in fourth quarter FY 2002. Additional options or new contracts will be awarded to accomplish future work on Block 08 and out.

Project 0912 activity is not included in the Block 06 contract. Work planned for the upgrades to the Block 06 ground configuration and software may be accomplished through modification to the Block 2006 contract. Based on the Block 2006 plan, such modification may take place in the FY 2007 timeframe.

| MDA Exhibit R-4 Schedule Profile | Date: February 2004 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603884C Ballistic Missile Defense Sensors** |



| MDA Exhibit R-4A Schedule Detail | Date: February 2004 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603884C Ballistic Missile Defense Sensors** |

| Schedule Profile | FY 2003 | FY 2004 | FY 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 |
|---|---|---|---|---|---|---|---|
| **BLOCK 2008** | | | | | | | |
| Contract Modification | | | | | 1Q | | |
| Ground Station Upgrades | | | | | 2Q-4Q | 1Q-4Q | 1Q-4Q |
| **Studies & Analyses** | | | | | | | |
| Data Analysis | | | | | 2Q-4Q | 1Q-4Q | 1Q-2Q |

| MDA Exhibit R-2A RDT&E Project Justification | Date: February 2004 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603884C Ballistic Missile Defense Sensors** |

| COST ($ in Thousands) | FY 2003 | FY 2004 | FY 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 |
|---|---|---|---|---|---|---|---|
| 0012 Space Tracking and Surveillance System (STSS) Block 2010 | 0 | 22,263 | 47,833 | 253,828 | 637,215 | 919,830 | 1,112,973 |
| RDT&E Articles Qty | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

*Note: Activity beyond the Block 2006/2008 STSS program is described elsewhere due to classification.*

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

Activity beyond the Block 2006/2008 STSS program is described elsewhere due to classification.

**B. Accomplishments/Planned Program**

| | FY 2003 | FY 2004 | FY 2005 |
|---|---|---|---|
| Future Block Development | | 22,263 | 47,833 |
| RDT&E Articles (Quantity) | | | |

Activity beyond the Block 2006/2008 STSS program is described elsewhere due to classification.

**C. Other Program Funding Summary**

| | FY 2003 | FY 2004 | FY 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|
| PE 0603175C Ballistic Missile Defense Technology | 151,217 | 225,268 | 204,320 | 199,468 | 246,291 | 286,286 | 305,365 | Continuing | Continuing |
| PE 0603869C Meads Concepts - Dem/Val | 101,754 | 0 | 0 | 0 | 0 | 0 | 0 | Continuing | Continuing |
| PE 0603879C Advanced Concepts, Evaluations and Systems | 0 | 149,993 | 256,159 | 229,512 | 232,463 | 231,583 | 224,626 | Continuing | Continuing |
| PE 0603880C Ballistic Missile Defense System Segment | 1,028,016 | 0 | 0 | 0 | 0 | 0 | 0 | Continuing | Continuing |
| PE 0603881C Ballistic Missile Defense Terminal Defense Segment | 134,093 | 874,527 | 937,748 | 993,048 | 1,117,657 | 570,000 | 410,324 | Continuing | Continuing |
| PE 0603882C Ballistic Missile Defense Midcourse Defense Segment | 3,056,035 | 3,744,066 | 4,404,335 | 3,067,800 | 3,087,147 | 1,881,298 | 1,802,257 | Continuing | Continuing |
| PE 0603883C Ballistic Missile Defense Boost Defense Segment | 705,643 | 617,270 | 492,614 | 555,667 | 611,736 | 473,602 | 455,961 | Continuing | Continuing |

| MDA Exhibit R-2A RDT&E Project Justification | Date: February 2004 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603884C Ballistic Missile Defense Sensors** |

| | FY 2003 | FY 2004 | FY 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|
| PE 0603886C Ballistic Missile Defense System Interceptors | 0 | 117,719 | 511,262 | 1,118,599 | 1,717,480 | 2,196,531 | 2,449,322 | Continuing | Continuing |
| PE 0603888C Ballistic Missile Defense Test and Targets | 0 | 635,782 | 716,427 | 673,476 | 656,152 | 654,015 | 688,119 | Continuing | Continuing |
| PE 0603889C Ballistic Missile Defense Products | 0 | 305,309 | 418,608 | 421,049 | 445,971 | 456,339 | 469,621 | Continuing | Continuing |
| PE 0603890C Ballistic Missile Defense System Core | 0 | 445,356 | 479,764 | 492,988 | 527,541 | 539,210 | 568,365 | Continuing | Continuing |
| PE 0604861C Theater High-Altitude Area Defense System - TMD - EMD | 887,616 | 0 | 0 | 0 | 0 | 0 | 0 | Continuing | Continuing |
| PE 0604865C Patriot PAC-3 Theater Missile Defense Acquisition - EMD | 138,922 | 0 | 0 | 0 | 0 | 0 | 0 | Continuing | Continuing |
| PE 0605502C Small Business Innovative Research - MDA | 138,791 | 0 | 0 | 0 | 0 | 0 | 0 | Continuing | Continuing |
| PE 0901585C Pentagon Reservation | 7,432 | 14,327 | 13,884 | 12,958 | 12,850 | 13,158 | 13,476 | Continuing | Continuing |
| PE 0901598C Management Headquarters - MDA | 35,331 | 92,449 | 141,923 | 146,099 | 145,112 | 151,727 | 154,583 | Continuing | Continuing |

**D. Acquisition Strategy**

Activity beyond the Block 2006/2008 STSS program is described elsewhere due to classification.

| MDA Exhibit R-2A RDT&E Project Justification | Date: February 2004 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603884C Ballistic Missile Defense Sensors** |

| COST ($ in Thousands) | FY 2003 | FY 2004 | FY 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 |
|---|---|---|---|---|---|---|---|
| 5049 Russian-American Observation Satellite(s) Program (RAMOS) | 25,761 | 0 | 0 | 0 | 0 | 0 | 0 |
| RDT&E Articles Qty | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

*Note: The FY04 funding for RAMOS is captured in PE 0603884C in Project 0403.*

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

Due to the lack of progress on the RAMOS Government-to-Government agreement with Russia, and the uncertainty this causes, MDA intends to terminate the RAMOS program. MDA received the Russian Government's draft MOU in July 2002 and despite 17 months of discussions, have been unable to complete a government-to-government agreement. Without this agreement, which includes the fundamental issue of taxes and liabilities, the RAMOS program cannot be executed beyond the design stage.

MDA will continue to discuss an overarching MOU to govern defense cooperation with Russia, and is actively exploring alternative more beneficial missile defense cooperative projects with Russia that enjoy the support of the Government of the Russian Federation.

**B. Accomplishments/Planned Program**

| | FY 2003 | FY 2004 | FY 2005 |
|---|---|---|---|
| Design and Development | 19,469 | 0 | 0 |
| RDT&E Articles (Quantity) | | | |

FY 2003 accomplishments:
- Completed preliminary design of the payload, satellite, and science experiment program
- Conducted a US-only Preliminary Design Review of the US payload, and a Joint Preliminary Design Review of the RAMOS system
- Continued preliminary design of the ground system
- Began detailed design of the satellite sensors, payload support equipment, ground support equipment, and all associated projects to accomplish the space experiments

| | FY 2003 | FY 2004 | FY 2005 |
|---|---|---|---|
| RAMOS Solar Arrays | 6,292 | 0 | 0 |
| RDT&E Articles (Quantity) | | | |

Activities are aimed at demonstrating improved efficiencies associated with amorphous silicon substrate based solar cell technology, space-qualification of prototype units, and successful integration of a "blanket" of solar cells for test and evaluation of future space vehicle applications. The goal is to increase the specific power of a Si solar cell from 400 W/kg to greater than 500 W/kg.

FY 2003 accomplishments:
- Optimized front and back bus bar design and materials to minimize mass and electrical losses
- Began trials to reduce substrate thickness to 0.5 mil
- Developed automated interconnect technology

| MDA Exhibit R-2A RDT&E Project Justification | Date: February 2004 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P) | R-1 NOMENCLATURE: 0603884C Ballistic Missile Defense Sensors |

**C. Other Program Funding Summary**

| | FY 2003 | FY 2004 | FY 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|
| PE 0603175C Ballistic Missile Defense Technology | 151,217 | 225,268 | 204,320 | 199,468 | 246,291 | 286,286 | 305,365 | Continuing | Continuing |
| PE 0603869C Meads Concepts - Dem/Val | 101,754 | 0 | 0 | 0 | 0 | 0 | 0 | Continuing | Continuing |
| PE 0603879C Advanced Concepts, Evaluations and Systems | 0 | 149,993 | 256,159 | 229,512 | 232,463 | 231,583 | 224,626 | Continuing | Continuing |
| PE 0603880C Ballistic Missile Defense System Segment | 1,028,016 | 0 | 0 | 0 | 0 | 0 | 0 | Continuing | Continuing |
| PE 0603881C Ballistic Missile Defense Terminal Defense Segment | 134,093 | 874,527 | 937,748 | 993,048 | 1,117,657 | 570,000 | 410,324 | Continuing | Continuing |
| PE 0603882C Ballistic Missile Defense Midcourse Defense Segment | 3,056,035 | 3,744,066 | 4,404,335 | 3,067,800 | 3,087,147 | 1,881,298 | 1,802,257 | Continuing | Continuing |
| PE 0603883C Ballistic Missile Defense Boost Defense Segment | 705,643 | 617,270 | 492,614 | 555,667 | 611,736 | 473,602 | 455,961 | Continuing | Continuing |
| PE 0603886C Ballistic Missile Defense System Interceptors | 0 | 117,719 | 511,262 | 1,118,599 | 1,717,480 | 2,196,531 | 2,449,322 | Continuing | Continuing |
| PE 0603888C Ballistic Missile Defense Test and Targets | 0 | 635,782 | 716,427 | 673,476 | 656,152 | 654,015 | 688,119 | Continuing | Continuing |
| PE 0603889C Ballistic Missile Defense Products | 0 | 305,309 | 418,608 | 421,049 | 445,971 | 456,339 | 469,621 | Continuing | Continuing |
| PE 0603890C Ballistic Missile Defense System Core | 0 | 445,356 | 479,764 | 492,988 | 527,541 | 539,210 | 568,365 | Continuing | Continuing |
| PE 0604861C Theater High-Altitude Area Defense System - TMD - EMD | 887,616 | 0 | 0 | 0 | 0 | 0 | 0 | Continuing | Continuing |
| PE 0604865C Patriot PAC-3 Theater Missile Defense Acquisition - EMD | 138,922 | 0 | 0 | 0 | 0 | 0 | 0 | Continuing | Continuing |
| PE 0605502C Small Business Innovative Research - MDA | 138,791 | 0 | 0 | 0 | 0 | 0 | 0 | Continuing | Continuing |
| PE 0901585C Pentagon Reservation | 7,432 | 14,327 | 13,884 | 12,958 | 12,850 | 13,158 | 13,476 | Continuing | Continuing |
| PE 0901598C Management Headquarters - MDA | 35,331 | 92,449 | 141,923 | 146,099 | 145,112 | 151,727 | 154,583 | Continuing | Continuing |

**D. Acquisition Strategy**

This program has been terminated.

| MDA Exhibit R-3 RDT&E Project Cost Analysis | Date: February 2004 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P) | R-1 NOMENCLATURE: 0603884C Ballistic Missile Defense Sensors |

**I. Product Development Cost ( $ in Thousands )**

| Cost Categories: | Contract Method & Type | Performing Activity & Location | Total PYs Cost | FY 2004 Cost | FY 2004 Award Date | FY 2005 Cost | FY 2005 Award Date | Cost to Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|
| **Design and Development** | | | | | | | | | | |
| U.S. Hardware Development | SS/CPFF | Utah State Univ/SDL/ Logan, UT | 41,167 | | | | | | 41,167 | |
| R.F. Hardware Development | SS | Rosoboronexport, RF | 33,828 | | | | | | 33,828 | |
| Engineering & Integration Supt | C/CPAF | Ball Aerospace & Tech Corp/ Broomfield, CO | 21,561 | | | | | | 21,561 | |
| **RAMOS Solar Arrays** | | | | | | | | | | |
| Design and Development | MIPR | AFRL/Kirtland AFB, NM | 6,292 | | | | | | 6,292 | |
| Subtotal Product Development | | | 102,848 | 0 | | 0 | | 0 | 102848 | |

**Remarks**

Follow-on FY 2004 contract activity involves termination of this program and is described in this PE's Project 0403 R3 Remarks. The RAMOS program has been terminated in FY 2004 due to continuing lack of progress with Russia. The funds originally designated for this program have been used to fund the Agency's Block 2006 fielding increment as described in the President's Budget FY 2005 Overview.

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

| Cost Categories: | Contract Method & Type | Performing Activity & Location | Total PYs Cost | FY 2004 Cost | FY 2004 Award Date | FY 2005 Cost | FY 2005 Award Date | Cost to Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|
| **Design and Development** | | | | | | | | | | |
| Development Support | MIPR | AFRL/ Hansom AFB, MA | 1,946 | | | | | | 1,946 | |
| Subtotal Support Costs | | | 1,946 | 0 | | 0 | | 0 | 1946 | |

**Remarks**

Provide support to US and Joint US-RF data management and data system definition, coordination, development, testing, and operations efforts. Includes support to the RAMOS Program Office with scientific analysis, modeling and simulation, user-community coordination, data processing and database development, and calibration method definition and execution to assure that RAMOS measurement data and scientific data products satisfy the overall RAMOS mission objectives.

| MDA Exhibit R-3 RDT&E Project Cost Analysis | Date: February 2004 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P) | R-1 NOMENCLATURE: 0603884C Ballistic Missile Defense Sensors |

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

| Cost Categories: | Contract Method & Type | Performing Activity & Location | Total PYs Cost | FY 2004 Cost | FY 2004 Award Date | FY 2005 Cost | FY 2005 Award Date | Cost to Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|
| Subtotal Test and Evaluation | | | | | | | | | | |

**Remarks**

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

| Cost Categories: | Contract Method & Type | Performing Activity & Location | Total PYs Cost | FY 2004 Cost | FY 2004 Award Date | FY 2005 Cost | FY 2005 Award Date | Cost to Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|
| **Design and Development** | | | | | | | | | | |
| Security Monitoring Supt | MIPR | DTSA | 230 | | | | | | 230 | |
| Interpreter Support | MIPR | DOS | 480 | | | | | | 480 | |
| Subtotal Management Services | | | 710 | 0 | | 0 | | 0 | 710 | |

**Remarks**

DTSA Provides security monitoring (ITAR and TAA compliance) support services during US-RF technical interchange meetings in the United States and Russian Federation.
DOS provides Russian-English interpreting support during US-RF technical interchange meetings in the United States and Russian Federation.

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Project Total Cost | | | 105,504 | 0 | | 0 | | | 105,504 | |

**Remarks**

| MDA Exhibit R-4 Schedule Profile | Date: February 2004 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603884C Ballistic Missile Defense Sensors** |

| Fiscal Year | 2003 | | | | 2004 | | | | 2005 | | | | 2006 | | | | 2007 | | | | 2008 | | | | 2009 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 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 |
| **PDR** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| RAMOS Joint Preliminary Design Review | | | ▲ | | | | | | | | | | | | | | | | | | | | | | | | | |
| **Decisions** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Start Detailed Design | | | | ▲ | | | | | | | | | | | | | | | | | | | | | | | | |

| MDA Exhibit R-4A Schedule Detail | Date: February 2004 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603884C Ballistic Missile Defense Sensors** |

| Schedule Profile | FY 2003 | FY 2004 | FY 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 |
|---|---|---|---|---|---|---|---|
| **PDR** | | | | | | | |
| RAMOS Joint Preliminary Design Review | 3Q | | | | | | |
| **Decisions** | | | | | | | |
| Start Detailed Design | 4Q | | | | | | |

| MDA Exhibit R-2A RDT&E Project Justification | Date: February 2004 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603884C Ballistic Missile Defense Sensors** |

| COST ($ in Thousands) | FY 2003 | FY 2004 | FY 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 |
|---|---|---|---|---|---|---|---|
| 0403 Russian-American Observation Satellite(s) Program (RAMOS) | 0 | 29,285 | 0 | 0 | 0 | 0 | 0 |
| RDT&E Articles Qty | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

*Note: The FY03 funding for RAMOS is captured in PE 0603884C in Project 5049.*

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

Due to the lack of progress on the RAMOS Government-to-Government agreement with Russia, and the uncertainty this causes, MDA intends to terminate the RAMOS program. MDA received the Russian Government's draft MOU in July 2002 and despite 17 months of discussions, have been unable to complete a government-to-government agreement. Without this agreement, which includes the fundamental issue of taxes and liabilities, the RAMOS program cannot be executed beyond the design stage.

MDA will continue to discuss an overarching MOU to govern defense cooperation with Russia, and is actively exploring alternative more beneficial missile defense cooperative projects with Russia that enjoy the support of the Government of the Russian Federation.

**B. Accomplishments/Planned Program**

| | FY 2003 | FY 2004 | FY 2005 |
|---|---|---|---|
| Design and Development | 0 | 28,877 | 0 |
| RDT&E Articles (Quantity) | | | |

FY 2004 activities:
- Continue detailed design of the satellite sensors, payload support equipment, ground support equipment, and all associated projects to accomplish the space experiments
- Continue preliminary design of ground facilities
- Design and begin fabricating sensor prototypes to be used during interface testing
- Begin writing sensor software
- Continue development of models and simulations to test the design and concepts

| | FY 2003 | FY 2004 | FY 2005 |
|---|---|---|---|
| RAMOS Solar Arrays | 0 | 408 | 0 |
| RDT&E Articles (Quantity) | | | |

Activities are aimed at demonstrating improved efficiencies associated with amorphous silicon substrate based solar cell technology, space-qualification of prototype units, and successful integration of a "blanket" of solar cells for test and evaluation of future space vehicle applications. The goal is to increase the specific power of a Si solar cell from 400 W/kg to greater than 500 W/kg.

FY 2004 activities:
- Optimize interconnect technology, minimizing both electrical and area losses
- Develop stowing/deployment mechanism for flexible thin-film photovoltaic blankets
- Develop new area design to optimize total area cell efficiency and minimize area losses
- Optimize substrate thinning process

| MDA Exhibit R-2A RDT&E Project Justification | Date: February 2004 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P) | R-1 NOMENCLATURE: 0603884C Ballistic Missile Defense Sensors |

**C. Other Program Funding Summary**

| | FY 2003 | FY 2004 | FY 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|
| PE 0603175C Ballistic Missile Defense Technology | 151,217 | 225,268 | 204,320 | 199,468 | 246,291 | 286,286 | 305,365 | Continuing | Continuing |
| PE 0603869C Meads Concepts - Dem/Val | 101,754 | 0 | 0 | 0 | 0 | 0 | 0 | Continuing | Continuing |
| PE 0603879C Advanced Concepts, Evaluations and Systems | 0 | 149,993 | 256,159 | 229,512 | 232,463 | 231,583 | 224,626 | Continuing | Continuing |
| PE 0603880C Ballistic Missile Defense System Segment | 1,028,016 | 0 | 0 | 0 | 0 | 0 | 0 | Continuing | Continuing |
| PE 0603881C Ballistic Missile Defense Terminal Defense Segment | 134,093 | 874,527 | 937,748 | 993,048 | 1,117,657 | 570,000 | 410,324 | Continuing | Continuing |
| PE 0603882C Ballistic Missile Defense Midcourse Defense Segment | 3,056,035 | 3,744,066 | 4,404,335 | 3,067,800 | 3,087,147 | 1,881,298 | 1,802,257 | Continuing | Continuing |
| PE 0603883C Ballistic Missile Defense Boost Defense Segment | 705,643 | 617,270 | 492,614 | 555,667 | 611,736 | 473,602 | 455,961 | Continuing | Continuing |
| PE 0603886C Ballistic Missile Defense System Interceptors | 0 | 117,719 | 511,262 | 1,118,599 | 1,717,480 | 2,196,531 | 2,449,322 | Continuing | Continuing |
| PE 0603888C Ballistic Missile Defense Test and Targets | 0 | 635,782 | 716,427 | 673,476 | 656,152 | 654,015 | 688,119 | Continuing | Continuing |
| PE 0603889C Ballistic Missile Defense Products | 0 | 305,309 | 418,608 | 421,049 | 445,971 | 456,339 | 469,621 | Continuing | Continuing |
| PE 0603890C Ballistic Missile Defense System Core | 0 | 445,356 | 479,764 | 492,988 | 527,541 | 539,210 | 568,365 | Continuing | Continuing |
| PE 0604861C Theater High-Altitude Area Defense System - TMD - EMD | 887,616 | 0 | 0 | 0 | 0 | 0 | 0 | Continuing | Continuing |
| PE 0604865C Patriot PAC-3 Theater Missile Defense Acquisition - EMD | 138,922 | 0 | 0 | 0 | 0 | 0 | 0 | Continuing | Continuing |
| PE 0605502C Small Business Innovative Research - MDA | 138,791 | 0 | 0 | 0 | 0 | 0 | 0 | Continuing | Continuing |
| PE 0901585C Pentagon Reservation | 7,432 | 14,327 | 13,884 | 12,958 | 12,850 | 13,158 | 13,476 | Continuing | Continuing |
| PE 0901598C Management Headquarters - MDA | 35,331 | 92,449 | 141,923 | 146,099 | 145,112 | 151,727 | 154,583 | Continuing | Continuing |

**D. Acquisition Strategy**

This program has been terminated.

| MDA Exhibit R-3 RDT&E Project Cost Analysis | Date: February 2004 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P) | R-1 NOMENCLATURE: 0603884C Ballistic Missile Defense Sensors |

**I. Product Development Cost ( $ in Thousands )**

| Cost Categories: | Contract Method & Type | Performing Activity & Location | Total PYs Cost | FY 2004 Cost | FY 2004 Award Date | FY 2005 Cost | FY 2005 Award Date | Cost to Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|
| **Design and Development** | | | | | | | | | | |
| U.S. Hardware Development | SS/CPFF | Utah State Univ/SDL/ Logan, UT | 41,267 | 14,177 | | | | 12,400 | 67,844 | |
| R.F. Hardware Development | SS | Rosoboronexport, RF | 33,828 | 7,510 | | | | 0 | 41,338 | |
| Engineering & Integration Supt | C/CPAF | Ball Aerospace & Tech Corp/ Broomfield, CO | 21,561 | 5,400 | | | | 1,000 | 27,961 | |
| **RAMOS Solar Arrays** | | | | | | | | | | |
| Design and Development | MIPR | AFRL/Kirtland AFB, NM | 6,292 | 408 | | | | | 6,700 | |
| Subtotal Product Development | | | 102,948 | 27,495 | | 0 | | 0 | 143843 | |

**Remarks**

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

| Cost Categories: | Contract Method & Type | Performing Activity & Location | Total PYs Cost | FY 2004 Cost | FY 2004 Award Date | FY 2005 Cost | FY 2005 Award Date | Cost to Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|
| **Design and Development** | | | | | | | | | | |
| Development Support | MIPR | AFRL/ Hansom AFB, MA | 1,946 | 1,440 | | | | | 3,386 | |
| Subtotal Support Costs | | | 1,946 | 1,440 | | 0 | | 0 | 3386 | |

**Remarks**

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

| Cost Categories: | Contract Method & Type | Performing Activity & Location | Total PYs Cost | FY 2004 Cost | FY 2004 Award Date | FY 2005 Cost | FY 2005 Award Date | Cost to Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|
| Subtotal Test and Evaluation | | | | | | | | | | |

**Remarks**

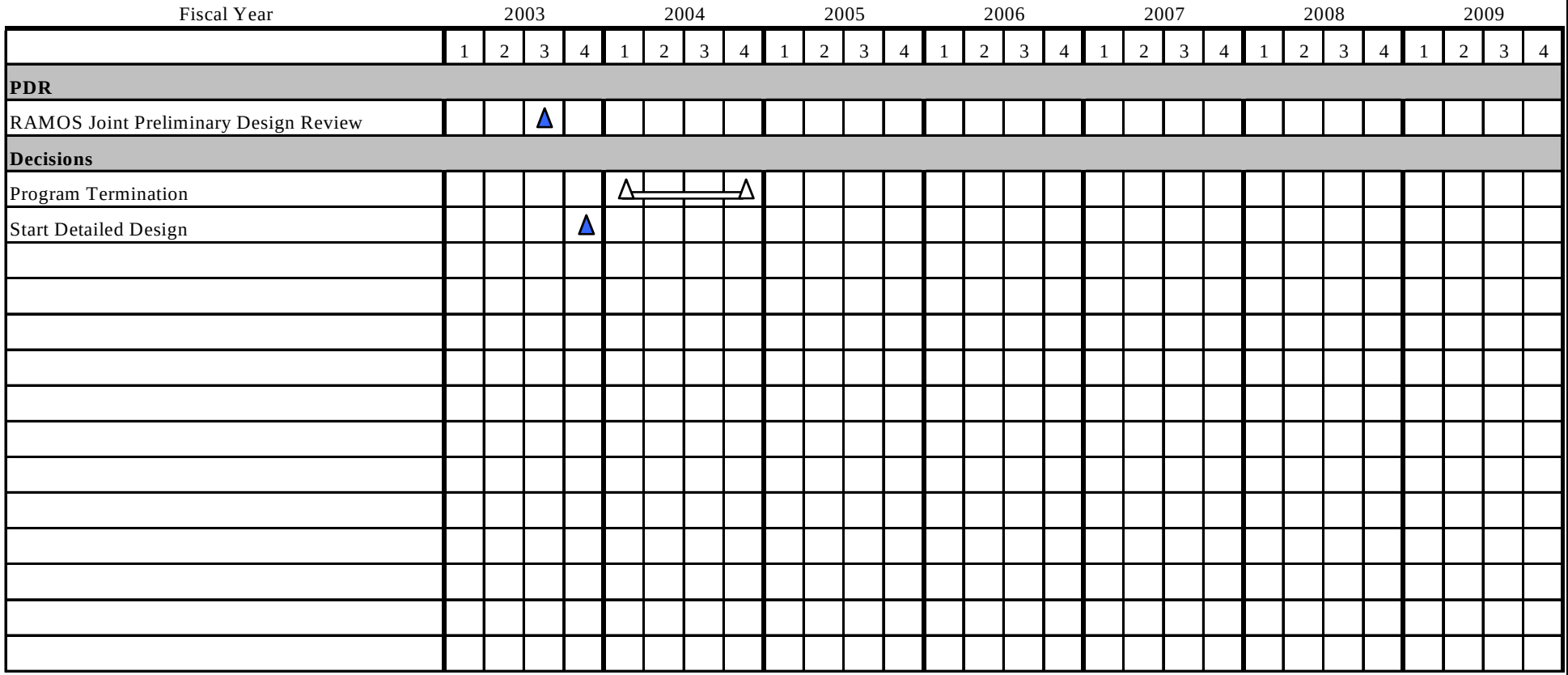
| MDA Exhibit R-3 RDT&E Project Cost Analysis | Date: February 2004 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P) | R-1 NOMENCLATURE: 0603884C Ballistic Missile Defense Sensors |

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

| Cost Categories: | Contract Method & Type | Performing Activity & Location | Total PYs Cost | FY 2004 Cost | FY 2004 Award Date | FY 2005 Cost | FY 2005 Award Date | Cost to Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|
| **Design and Development** | | | | | | | | | | |
| Security Monitoring Supt | MIPR | DTSA | 230 | 50 | | | | | 280 | |
| Interpreter Support | MIPR | DOS | 480 | 300 | | | | | 780 | |
| Subtotal Management Services | | | 710 | 350 | | 0 | | 0 | 1060 | |
| **Remarks** | | | | | | | | | | |
| Project Total Cost | | | 105,604 | 29,285 | | 0 | | | 148,289 | |

**Remarks**

| MDA Exhibit R-4 Schedule Profile | Date: February 2004 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603884C Ballistic Missile Defense Sensors** |



| MDA Exhibit R-4A Schedule Detail | Date: February 2004 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603884C Ballistic Missile Defense Sensors** |

| Schedule Profile | FY 2003 | FY 2004 | FY 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 |
|---|---|---|---|---|---|---|---|
| **PDR** | | | | | | | |
| RAMOS Joint Preliminary Design Review | 3Q | | | | | | |
| **Decisions** | | | | | | | |
| Program Termination | | 1Q-4Q | | | | | |
| Start Detailed Design | 4Q | | | | | | |

| MDA Exhibit R-2A RDT&E Project Justification | Date: February 2004 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603884C Ballistic Missile Defense Sensors** |

| COST ($ in Thousands) | FY 2003 | FY 2004 | FY 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 |
|---|---|---|---|---|---|---|---|
| 5011 Ballistic Missile Defense Radars Block 2006 | 12,000 | 0 | 0 | 0 | 0 | 0 | 0 |
| RDT&E Articles Qty | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

*Note: The FY 2003 Forward Deployable Radar development is described in Project 5011. For FY 2004 and beyond, the Forward Deployable Radar effort is described in two Projects: 0811 and 0911.*

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

Block 2006. The Forward Deployable Radar will enhance the BMDS capability to defend the United States and our allies, friends, and deployed forces from ballistic missiles of all ranges in all phases of flight. The objective of the Forward Deployable Radar project is to validate the BMDS sensor-layering concept and to validate and integrate forward-based algorithms. This effort makes use of existing radar configurations. The BMDS Radar provides a sensor with capability for detection of ballistic missiles early in their flight and for providing precise tracking information for use by other elements of the BMD System for engagement of targets.

Due to the demise of the ABM Treaty the BMDS can deploy forward based radars ( both land and sea based) supporting a layered sensor strategy. This approach provides overlapping sensor coverage and the potential for BMDS weapons to extend their effective range beyond local sensors by using more sophisticated engagement strategies. The Forward Deployable Radar will pass target data to the command and control system for use by mid-course sensors and weapons for tracking and subsequent interception. Earlier detection with forward based radars coupled with layered sensors, gives the BMDS a continuous tracking and discrimination capability with more time and opportunities to engage the target, resulting in an increased probability of success.

The forward based radar broadens BMDS capability in the near future, adding robustness against a wide range of threats and may be used to provide support for increased protection of forward based military assets, allies, and friends. In recognition of the difficulty in predicting our adversaries or the location of future battlefields, the Forward Deployable Radar is planned to be ground based with the potential for sea basing. The Forward Deployable Radar capability now under development will: extend the BMDS battlespace; allow for more sophisticated engagement strategies; allow for rapid reconfiguration of the BMDS; and reduce vulnerability to countermeasures, complicating an enemy's ability to penetrate the defense system. Analysis of the capabilities that the Forward Deployable Radar adds to the Ballistic Missile Defense System was coordinated with Missile Defense National Team (MDNT) assistance.

Forward Deployable Radar will consist of existing X-band radar hardware, modified software algorithms for tracking and discrimination, and a direct interface with the BMDS command and control system. The Forward Deployable Radar design leverages existing radar configurations and technologies. This commonality allows for the accelerated procurement/development of the Forward Deployable Radar to satisfy Block 2006 capability requirements. Hercules algorithms will be used to enhance the Forward Deployable Radar software. The TPS-X radar will serve as a Test Bed to validate the algorithms and interface with the C2BMC prior to their inclusion in the Forward Deployable radar design. The TPS-X may also support forward based capability and enhancement of the BMDS Block 2004, if required.

In FY 2003, Forward Deployable Radar executed $32.219 million for the program and technical support used to establish the Forward Deployable Radar program, including SETA, FFRDC, UARC; and provide initial funding for the Forward Deployable Radar letter contract. In addition, the BMDS program executed $12.0 million to improve the TPS-X as a Test Bed which will be use as a risk reduction asset to mature, validate and test the tracking and discrimination algorithms prior to the delivery of the Forward Deployable Radar equipment.

The project also provides analysis of multi-spectral sensor enhancements for the BMDS leading to a sensor architecture and roadmap defining the paths for future sensor capabilities. The roadmap includes the evaluation of EO-IR sensors as enhancements to BMDS.

| MDA Exhibit R-2A RDT&E Project Justification | Date: February 2004 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603884C Ballistic Missile Defense Sensors** |

**B. Accomplishments/Planned Program**

| | FY 2003 | FY 2004 | FY 2005 |
|---|---|---|---|
| Capability Development | 12,000 | | |
| RDT&E Articles (Quantity) | | | |

FY 2003 Accomplishments:

- Completed Forward Deployable Radar project planning
- Initiated and completed definition of acquisition strategy for Block 2006 radar configuration
- Awarded letter contract to meet block 2006 delivery
- Identified and initiated TPS-X radar improvements for use as a test asset for advanced algorithm validation and risk reduction on C2BMC interfaces
- Finalized Concept Validation (CV) plans for the initial set of algorithms
- Identified additional sensors to enhance BMDS mission performance

FY 2004 and 2005 are described in Project 0811.

**C. Other Program Funding Summary**

| | FY 2003 | FY 2004 | FY 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|
| PE 0603175C Ballistic Missile Defense Technology | 151,217 | 225,268 | 204,320 | 199,468 | 246,291 | 286,286 | 305,365 | Continuing | Continuing |
| PE 0603869C Meads Concepts - Dem/Val | 101,754 | 0 | 0 | 0 | 0 | 0 | 0 | Continuing | Continuing |
| PE 0603879C Advanced Concepts, Evaluations and Systems | 0 | 149,993 | 256,159 | 229,512 | 232,463 | 231,583 | 224,626 | Continuing | Continuing |
| PE 0603880C Ballistic Missile Defense System Segment | 1,028,016 | 0 | 0 | 0 | 0 | 0 | 0 | Continuing | Continuing |
| PE 0603881C Ballistic Missile Defense Terminal Defense Segment | 134,093 | 874,527 | 937,748 | 993,048 | 1,117,657 | 570,000 | 410,324 | Continuing | Continuing |
| PE 0603882C Ballistic Missile Defense Midcourse Defense Segment | 3,056,035 | 3,744,066 | 4,404,335 | 3,067,800 | 3,087,147 | 1,881,298 | 1,802,257 | Continuing | Continuing |
| PE 0603883C Ballistic Missile Defense Boost Defense Segment | 705,643 | 617,270 | 492,614 | 555,667 | 611,736 | 473,602 | 455,961 | Continuing | Continuing |
| PE 0603886C Ballistic Missile Defense System Interceptors | 0 | 117,719 | 511,262 | 1,118,599 | 1,717,480 | 2,196,531 | 2,449,322 | Continuing | Continuing |
| PE 0603888C Ballistic Missile Defense Test and Targets | 0 | 635,782 | 716,427 | 673,476 | 656,152 | 654,015 | 688,119 | Continuing | Continuing |

| MDA Exhibit R-2A RDT&E Project Justification | Date: February 2004 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603884C Ballistic Missile Defense Sensors** |

| | FY 2003 | FY 2004 | FY 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|
| PE 0603889C Ballistic Missile Defense Products | 0 | 305,309 | 418,608 | 421,049 | 445,971 | 456,339 | 469,621 | Continuing | Continuing |
| PE 0603890C Ballistic Missile Defense System Core | 0 | 445,356 | 479,764 | 492,988 | 527,541 | 539,210 | 568,365 | Continuing | Continuing |
| PE 0604861C Theater High-Altitude Area Defense System - TMD - EMD | 887,616 | 0 | 0 | 0 | 0 | 0 | 0 | Continuing | Continuing |
| PE 0604865C Patriot PAC-3 Theater Missile Defense Acquisition - EMD | 138,922 | 0 | 0 | 0 | 0 | 0 | 0 | Continuing | Continuing |
| PE 0605502C Small Business Innovative Research - MDA | 138,791 | 0 | 0 | 0 | 0 | 0 | 0 | Continuing | Continuing |
| PE 0901585C Pentagon Reservation | 7,432 | 14,327 | 13,884 | 12,958 | 12,850 | 13,158 | 13,476 | Continuing | Continuing |
| PE 0901598C Management Headquarters - MDA | 35,331 | 92,449 | 141,923 | 146,099 | 145,112 | 151,727 | 154,583 | Continuing | Continuing |

**D. Acquisition Strategy**

The Forward Deployable Radar project will follow the Missile Defense Agency's capability-based acquisition strategy that emphasizes testing, spiral development, and evolutionary acquisition through the use of two-year capability blocks.

The Forward Deployable Radar project acquisition strategy leverages existing radar configurations and technologies as part of the development of the forward based Forward Deployable Radar. The project awarded a letter contract to build a radar using X-band technology and existing radar designs to minimize development costs and schedule. Design enhancements will focus on software changes for the forward based algorithms and modified C2BMC connectivity. The contract is a cost plus-award fee effort, and includes options for up to three additional radars.

An ECP to the TPS-X test instrumentation radar was funded to implement improvements so the radar could be used as Test Bed to support Forward Deployable Radar software development. This is a risk reduction asset that will be used to mature, validate and test the Hercules based tracking and discrimination algorithms. The TPS-X also will be used to test the C2BMC communications before they are integrated into the forward based radar. The TPS-X will allow testing to begin a year earlier providing more time for maturing the software prior to the Forward Deployable Radar equipment delivery.

The Forward Deployable Radar project is planned to include a research and development program to provide for upgrades to future radars or sensors as required to support BMDS spiral development.

| MDA Exhibit R-3 RDT&E Project Cost Analysis | Date: February 2004 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P) | R-1 NOMENCLATURE: 0603884C Ballistic Missile Defense Sensors |

**I. Product Development Cost ( $ in Thousands )**

| Cost Categories: | Contract Method & Type | Performing Activity & Location | Total PYs Cost | FY 2004 Cost | FY 2004 Award Date | FY 2005 Cost | FY 2005 Award Date | Cost to Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|
| **Capability Development** | | | | | | | | | | |
| RADAR | | | | | | | | | | |
| Capability Based R&D Contract | SS/CPAF | Raytheon/ MA | 12,000 | | | | | | 12,000 | |
| Subtotal Product Development | | | 12,000 | 0 | | 0 | | 0 | 12000 | |

**Remarks**

In FY 2003, the Forward Deployable Radar project executed $18.0 million for a Forward Deployable Radar contract to meet the Block 2006 delivery requirement schedule and $6.0 million for improvements to the TPS-X for use as a Test Bed to validate algorithms and test C2BMC. The radar project was funded from PE 0603884C project 5011, $12.0 million; PE 0604861C project 2018, $10.5 million; and PE 0603882C project 3021, $1.5 million. The $1.5 million was part of the Congressional earmarked $9.719 million.

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

| Cost Categories: | Contract Method & Type | Performing Activity & Location | Total PYs Cost | FY 2004 Cost | FY 2004 Award Date | FY 2005 Cost | FY 2005 Award Date | Cost to Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|
| **Capability Development** | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| Subtotal Support Costs | | | 0 | 0 | | 0 | | 0 | 0 | |

**Remarks**

In FY 2003, Congressional earmark $9.719 million from PE 0603882C project 3021 of which $3.310 million, was used for program and engineering support to the Forward Deployable Radar project. The program and engineering efforts supported the completion of the Forward Deployable Radar project planning, the awarding of a letter contract to meet the block 2006 delivery, identified and initiated TPS-X radar improvement, and finalized Concept Validation (CV) plans for the initial set of algorithms.

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

| Cost Categories: | Contract Method & Type | Performing Activity & Location | Total PYs Cost | FY 2004 Cost | FY 2004 Award Date | FY 2005 Cost | FY 2005 Award Date | Cost to Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|
| Subtotal Test and Evaluation | | | | | | | | | | |

**Remarks**

| MDA Exhibit R-3 RDT&E Project Cost Analysis | Date: February 2004 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603884C Ballistic Missile Defense Sensors** |

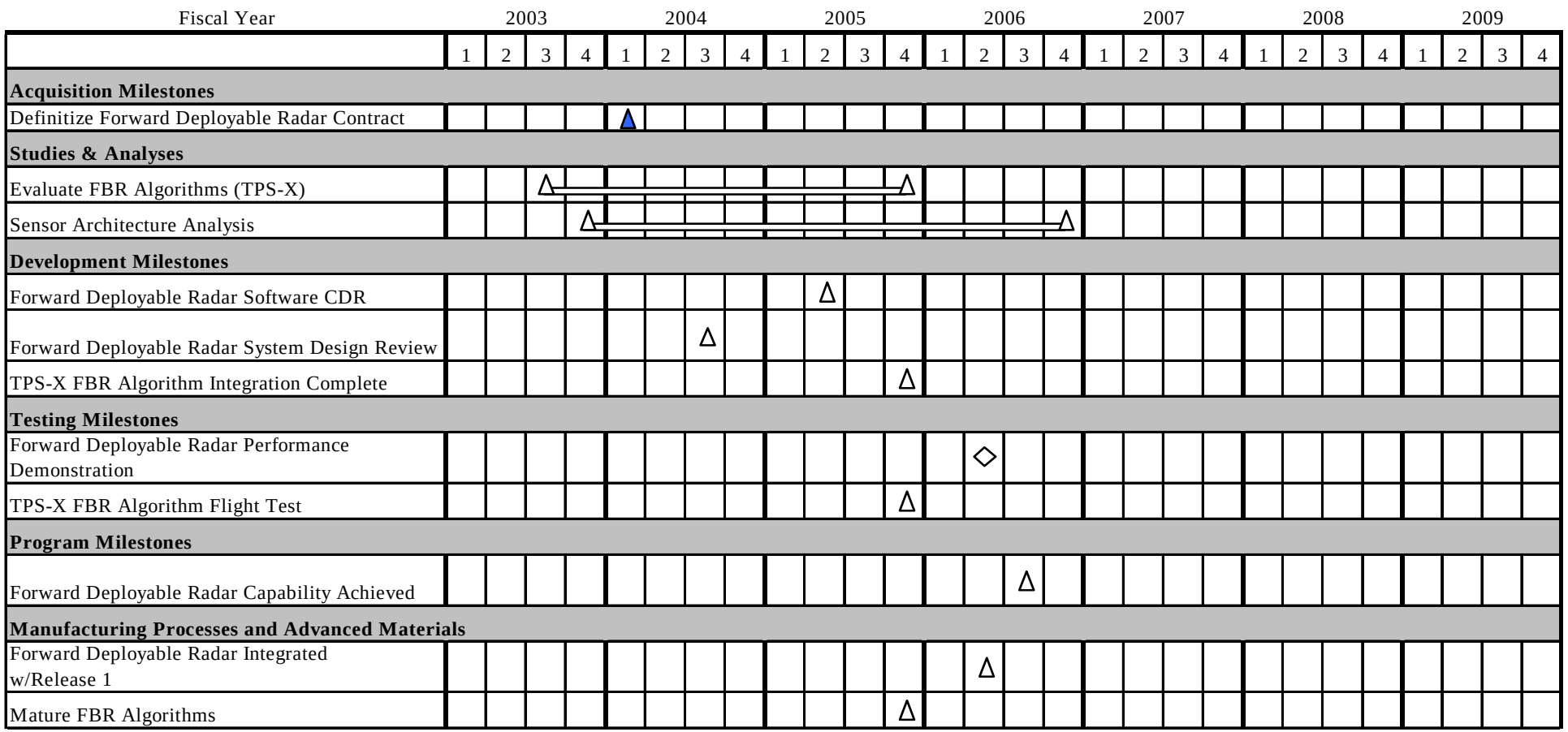
**IV. Management Services Cost ( $ in Thousands )**

| Cost Categories: | Contract Method & Type | Performing Activity & Location | Total PYs Cost | FY 2004 Cost | FY 2004 Award Date | FY 2005 Cost | FY 2005 Award Date | Cost to Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|
| Subtotal Management Services | | | | | | | | | | |
| **Remarks** | | | | | | | | | | |
| Project Total Cost | | | 12,000 | 0 | | 0 | | | 12,000 | |

**Remarks**

Forward Deployable Radar project executed $4.908 million from the $9.719 million Congressional earmark from PE 0603882C project 3021 in FY 2003 for management services. These services were for the FFRDC/UARC support to the Forward Deployable Radar project. This effort supported the completion of the Forward Deployable Radar project planning, identified and initiated TPS-X radar improvement, and finalized Concept Validation (CV) plans for the initial set of algorithms.

| MDA Exhibit R-4 Schedule Profile | Date: February 2004 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603884C Ballistic Missile Defense Sensors** |



| MDA Exhibit R-4A Schedule Detail | Date: February 2004 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603884C Ballistic Missile Defense Sensors** |

| Schedule Profile | FY 2003 | FY 2004 | FY 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 |
|---|---|---|---|---|---|---|---|
| **Acquisition Milestones** | | | | | | | |
| Award Forward Deployable Radar Letter Contract | 3Q | | | | | | |
| Definitize Forward Deployable Radar Contract | | 1Q | | | | | |
| Finalize TPS-X FBR Task Order | | 1Q | | | | | |
| **Studies & Analyses** | | | | | | | |
| Evaluate FBR Algorithms (TPS-X) | 3Q-4Q | 1Q-4Q | 1Q-4Q | | | | |
| Sensor Architecture Analysis | 4Q | 1Q-4Q | 1Q-4Q | 1Q-4Q | | | |
| **Development Milestones** | | | | | | | |
| Forward Deployable Radar Software CDR | | | 2Q | | | | |
| Forward Deployable Radar Software PDR | | 4Q | | | | | |
| Forward Deployable Radar System Design Review | | 3Q | | | | | |
| Forward Deployable Radar System Rqmts Review (SRR) | | 1Q | | | | | |
| TPS-X FBR Algorithm Integration Complete | | | 4Q | | | | |
| TPS-X FBR Algorithm PDR | | 1Q | | | | | |
| TPS-X RBR Algorithm CDR | | 3Q | | | | | |
| **Testing Milestones** | | | | | | | |
| Forward Deployable Radar Performance Demonstration | | | | 2Q | | | |
| TPS-X FBR Algorithm Flight Test | | 2Q | | | | | |
| Forward Deployable Radar Software Funct Qual Test | | | 3Q | | | | |
| Forward Deployable Radar Near Field Range Test | | | 1Q | | | | |
| Forward Deploy Radar High Power & Integration Test | | | 2Q | | | | |
| TPS-X FBR Algorithm Flight Test | | | 1Q,2Q,3Q,4Q | | | | |
| **Program Milestones** | | | | | | | |
| Forward Deploy Radar Integration & Test Complete | | | 3Q | | | | |
| Forward Deploy Radar System Rqmts Phase Complete | | 3Q | | | | | |
| Forward Deployable Radar Capability Achieved | | | | 3Q | | | |

| MDA Exhibit R-4A Schedule Detail | Date: February 2004 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603884C Ballistic Missile Defense Sensors** |

| Schedule Profile | FY 2003 | FY 2004 | FY 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 |
|---|---|---|---|---|---|---|---|
| TPS-X FBR Algorithm Progress Reviews | | | 1Q,3Q,4Q | | | | |
| **Manufacturing Processes and Advanced Materials** | | | | | | | |
| Forward Deployable Radar Integrated w/Release 1 | | | | 2Q | | | |
| Mature FBR Algorithms | | | 4Q | | | | |

| MDA Exhibit R-2A RDT&E Project Justification | Date: February 2004 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603884C Ballistic Missile Defense Sensors** |

| COST ($ in Thousands) | FY 2003 | FY 2004 | FY 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 |
|---|---|---|---|---|---|---|---|
| 0811 Ballistic Missile Defense Radars Block 2006 | 0 | 99,848 | 256,101 | 260,114 | 487,212 | 216 | 221 |
| RDT&E Articles Qty | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

*Note: In FY 2003 Forward Deployable Radar development is described in Project 5011. For FY 2004 and beyond, the BMDS development effort is described in two Projects: 8011 and 0911.*

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

Block 2006. The Forward Deployable Radar will enhance the BMDS capability to defend the United States and our allies, friends, and deployed forces from ballistic missiles of all ranges in all phases of flight. The objective of the Forward Deployable Radar project is to validate the BMDS sensor-layering concept. The Forward Deployable Radar provides a sensor with capability for detection of ballistic missiles early in their flight and for providing precise tracking information for use by other elements of the BMD System for engagement of targets.

Due to the demise of the ABM Treaty the BMDS can deploy forward based radars (both land and sea based) supporting a layered sensor strategy. This approach provides overlapping sensor coverage and the potential for BMDS weapons to extend their effective range beyond local sensors by using more sophisticated engagement strategies. The Forward Deployable Radar will pass target data to the command and control system for use by mid-course sensors and weapons for tracking and subsequent interception. Earlier detection with forward based radars coupled with layered sensors gives the BMDS a continuous tracking and discrimination capability with more time and opportunities to engage the target, resulting in an increased probability of success.

The forward based radar broadens BMDS capability in the near future, adding robustness against a wide range of threats and may be used to provide support for increased protection of forward based military assets, allies, and friends. In recognition of the difficulty in predicting our adversaries or the location of future battlefields, the Forward Deployable Radar is planned to be ground based with the potential for sea basing. The Forward Deployable Radar capability now under development will: extend the BMDS battlespace; allow for more sophisticated engagement strategies; allow for rapid reconfiguration of the BMDS; and reduce vulnerability to countermeasures, complicating an enemy's ability to penetrate the defense system. Analysis of the capabilities that the Forward Deployable Radar add to the Ballistic Missile Defense System was coordinated with Missile Defense National Team (MDNT) assistance.

The Forward Deployable Radar will consist of existing X-band radar hardware, modified software algorithms for tracking and discrimination, and a direct interface with the BMDS command and control system. The Forward Deployable Radar design leverages existing radar configurations and technologies. This commonality allows for the accelerated procurement/development of the Forward Deployable Radar to satisfy Block 2006 capability requirements. Hercules algorithms will be used to enhance the Forward Deployable Radar software. The TPS-X radar will serve as a Test Bed to validate the algorithms and interface with the C2BMC prior to their inclusion in the Forward Deployable radar design. The TPS-X may also support forward based capability and enhancement of the BMDS Block 2004, if required.

The addition of forward-based radars in the ESG for Block 06 adds to the BMDS by eliminating sensor coverage gaps in certain areas where a ballistic missile threat exists. Forward basing the radars gives the BMDS improved initial search, early detection and tracking capabilities in various forward locations as needed to counter ballistic missiles in the early or boost stage of flight, and hand off tracking responsibility to other BMDS sensors as part of a layered defense. This allows better information about the threat to improve system performance. Forward basing allows the radar to provide a cue to interceptors as a launch on remote capability. The mobility of the forward based radars gives the BMDS the flexibility to adjust sensor coverage to suite changes in the threat environments.

In FY 2003, Forward Deployable Radar executed $32.219 million for program and technical support used to establish the Forward Deployable Radar program, including SETA, FFRDC, UARC; and provide initial funding for the Forward Deployable Radar letter contract. In addition, the BMDS program executed $12.0 million to improve the TPS-X as a Test Bed which will be use as a risk reduction asset to mature, validate and test the tracking and discrimination algorithms prior to the delivery of the Forward Deployable Radar equipment.

The project also provides analysis of multi-spectral sensor enhancements for the BMDS leading to a sensor architecture and roadmap defining the paths for future sensor capabilities. The roadmap includes the evaluation of EO-IR sensors as enhancements to BMDS.

| MDA Exhibit R-2A RDT&E Project Justification | Date: February 2004 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603884C Ballistic Missile Defense Sensors** |

**B. Accomplishments/Planned Program**

| | FY 2003 | FY 2004 | FY 2005 |
|---|---|---|---|
| Capability Development | 0 | 99,848 | 256,101 |
| RDT&E Articles (Quantity) | | | |

FY 2003 Accomplishments: (Funded in Project 5011)

- Completed Forward Deployable Radar project planning
- Initiated and completed definition of acquisition strategy for Block 2006 radar configuration
- Awarded letter contract to meet block 2006 delivery
- Identified and initiated TPS-X radar improvements for use as a test asset for advanced algorithm validation and risk reduction on C2BMC interfaces
- Finalized Concept Validation (CV) plans for the initial set of algorithms
- Identified additional sensors to enhance BMDS mission performance

FY 2004 Planned Program:

- Define Forward Deployable Radar letter contract for Block 2006 radar configuration
- Continue Forward Deployable Radar integration
- Define a BMDS sensor architecture and roadmap
- Complete sensor analysis to support definition of BMDS sensor architecture
- Continue to evaluate tracking and discrimination algorithms
- Develop test plans and begin algorithm assessment with TPS-X radar

FY 2005 Planned Program:

- Delivery of Forward Deployable Radar hardware for field-testing
- Delivery of engineering software release 1
- Continue Forward Deployable Radar integration and tests efforts
- Update sensor architecture and roadmap
- Deliver validated algorithms for Forward Deployable Radar
- Continue TPS-X advanced algorithm assessments
- Continue assessment of advanced algorithms in software release 1
- Execute Forward Deployable Radar C2BMC and platform integration efforts
- Initiate development of BMDS sensor enhancements to support BMDS spiral upgrades
- Execute contract option for 2nd Forward Deployable Radar

| MDA Exhibit R-2A RDT&E Project Justification | Date: February 2004 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P) | R-1 NOMENCLATURE: 0603884C Ballistic Missile Defense Sensors |

**C. Other Program Funding Summary**

| | FY 2003 | FY 2004 | FY 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|
| PE 0603175C Ballistic Missile Defense Technology | 151,217 | 225,268 | 204,320 | 199,468 | 246,291 | 286,286 | 305,365 | Continuing | Continuing |
| PE 0603869C Meads Concepts - Dem/Val | 101,754 | 0 | 0 | 0 | 0 | 0 | 0 | Continuing | Continuing |
| PE 0603879C Advanced Concepts, Evaluations and Systems | 0 | 149,993 | 256,159 | 229,512 | 232,463 | 231,583 | 224,626 | Continuing | Continuing |
| PE 0603880C Ballistic Missile Defense System Segment | 1,028,016 | 0 | 0 | 0 | 0 | 0 | 0 | Continuing | Continuing |
| PE 0603881C Ballistic Missile Defense Terminal Defense Segment | 134,093 | 874,527 | 937,748 | 993,048 | 1,117,657 | 570,000 | 410,324 | Continuing | Continuing |
| PE 0603882C Ballistic Missile Defense Midcourse Defense Segment | 3,056,035 | 3,744,066 | 4,404,335 | 3,067,800 | 3,087,147 | 1,881,298 | 1,802,257 | Continuing | Continuing |
| PE 0603883C Ballistic Missile Defense Boost Defense Segment | 705,643 | 617,270 | 492,614 | 555,667 | 611,736 | 473,602 | 455,961 | Continuing | Continuing |
| PE 0603886C Ballistic Missile Defense System Interceptors | 0 | 117,719 | 511,262 | 1,118,599 | 1,717,480 | 2,196,531 | 2,449,322 | Continuing | Continuing |
| PE 0603888C Ballistic Missile Defense Test and Targets | 0 | 635,782 | 716,427 | 673,476 | 656,152 | 654,015 | 688,119 | Continuing | Continuing |
| PE 0603889C Ballistic Missile Defense Products | 0 | 305,309 | 418,608 | 421,049 | 445,971 | 456,339 | 469,621 | Continuing | Continuing |
| PE 0603890C Ballistic Missile Defense System Core | 0 | 445,356 | 479,764 | 492,988 | 527,541 | 539,210 | 568,365 | Continuing | Continuing |
| PE 0604861C Theater High-Altitude Area Defense System - TMD - EMD | 887,616 | 0 | 0 | 0 | 0 | 0 | 0 | Continuing | Continuing |
| PE 0604865C Patriot PAC-3 Theater Missile Defense Acquisition - EMD | 138,922 | 0 | 0 | 0 | 0 | 0 | 0 | Continuing | Continuing |
| PE 0605502C Small Business Innovative Research - MDA | 138,791 | 0 | 0 | 0 | 0 | 0 | 0 | Continuing | Continuing |
| PE 0901585C Pentagon Reservation | 7,432 | 14,327 | 13,884 | 12,958 | 12,850 | 13,158 | 13,476 | Continuing | Continuing |
| PE 0901598C Management Headquarters - MDA | 35,331 | 92,449 | 141,923 | 146,099 | 145,112 | 151,727 | 154,583 | Continuing | Continuing |

| MDA Exhibit R-2A RDT&E Project Justification | Date: February 2004 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603884C Ballistic Missile Defense Sensors** |

**D. Acquisition Strategy**

The Forward Deployable Radar project will follow the Missile Defense Agency's capability-based acquisition strategy that emphasizes testing, spiral development, and evolutionary acquisition through the use of two-year capability blocks.

The Forward Deployable Radar project acquisition strategy leverages existing radar configurations and technologies as part of the development of the forward based Forward Deployable Radar. The project awarded a letter contract to build a radar using X-band technology and existing radar designs to minimize development costs and schedule. Design enhancements will focus on software changes for the forward based algorithms and modified C2BMC connectivity. The contract is a cost plus-award fee effort, and includes options for up to three additional radars. Contract options for three additional forward based radars will be executed in FY 2005, FY 2006 and FY 2007, respectively.

An ECP to the TPS-X test instrumentation radar was funded to implement improvements so the radar could be used as a Test Bed to support Forward Deployable Radar software development. This is a risk reduction asset that will be used to mature, validate and test the Hercules based tracking and discrimination algorithms. The TPS-X also will be used to test the C2BMC communications before they are integrated into the forward based radar. The TPS-X will allow testing to begin a year earlier providing more time for maturing the software prior to the Forward Deployable Radar equipment delivery.

The Forward Deployable Radar project is planned to include a research and development program to provide for upgrades to future radars or sensors as required to support BMDS spiral development.

| MDA Exhibit R-3 RDT&E Project Cost Analysis | Date: February 2004 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P) | R-1 NOMENCLATURE: 0603884C Ballistic Missile Defense Sensors |

**I. Product Development Cost ( $ in Thousands )**

| Cost Categories: | Contract Method & Type | Performing Activity & Location | Total PYs Cost | FY 2004 Cost | FY 2004 Award Date | FY 2005 Cost | FY 2005 Award Date | Cost to Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|
| **Capability Development** | | | | | | | | | | |
| RADAR | | | | | | | | | | |
| Capability Based R&D Contract | SS/CPAF | Raytheon/ MA | | 79,125 | 1Q | 149,477 | 1Q | CONT. | 228,602 | TBD |
| Additional Forward Deployable Radars | SS/CPAF | Raytheon/ MA | | | | 75,000 | 1Q | CONT. | 75,000 | TBD |
| TPS-X | | | | | | | | | | |
| Capability Based R&D Contract | SS/CPAF | Raytheon/ MA | | 1,424 | 1Q | 3,050 | 1Q | CONT. | 4,474 | TBD |
| Capability Based R&D Contract | MIPR | MIT/LL/ MA | | 10,009 | 1Q | 9,650 | 1Q | CONT. | 19,659 | TBD |
| Capability Based R&D Contract | MIPR | PMRF | | | | 1,750 | 1Q | | 1,750 | |
| TPS-X O&S | | | | | | | | | | |
| Maintain Test Asset | SS/CPAF | Raytheon/ MA | | | | 4,200 | 1Q | | 4,200 | |
| Maintain Test Asset | MIPR | MIT/LL/ MA | | | | 1,200 | 1Q | | 1,200 | |
| | | | | | | | | | | |
| Subtotal Product Development | | | 0 | 90,558 | | 244,327 | | 0 | 334885 | |

**Remarks**

FY 2003 Project Costs are described in Project 5011.

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

| Cost Categories: | Contract Method & Type | Performing Activity & Location | Total PYs Cost | FY 2004 Cost | FY 2004 Award Date | FY 2005 Cost | FY 2005 Award Date | Cost to Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|
| **Capability Development** | | | | | | | | | | |
| Program Management | | | | | | | | | | |
| | FFP | TASC/ VA | | 2,500 | 1Q | 2,600 | 1Q | | 5,100 | |

| MDA Exhibit R-3 RDT&E Project Cost Analysis | Date: February 2004 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P) | R-1 NOMENCLATURE: 0603884C Ballistic Missile Defense Sensors |

| Cost Categories: | Contract Method & Type | Performing Activity & Location | Total PYs Cost | FY 2004 Cost | FY 2004 Award Date | FY 2005 Cost | FY 2005 Award Date | Cost to Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|
| Engineering Support | | | | | | | | | | |
| | FFP | CSC/ VA | | 2,300 | 1Q | 2,400 | 1Q | | 4,700 | |
| Program Support | | | | | | | | | | |
| | Various | Various | | 472 | 1Q | 1,304 | 1Q | | 1,776 | |
| Subtotal Support Costs | | | 0 | 5,272 | | 6,304 | | 0 | 11576 | |

**Remarks**
FY 2003 Project Costs are described in Project 5011.

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

| Cost Categories: | Contract Method & Type | Performing Activity & Location | Total PYs Cost | FY 2004 Cost | FY 2004 Award Date | FY 2005 Cost | FY 2005 Award Date | Cost to Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|
| Subtotal Test and Evaluation | | | | | | | | | | |

**Remarks**

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

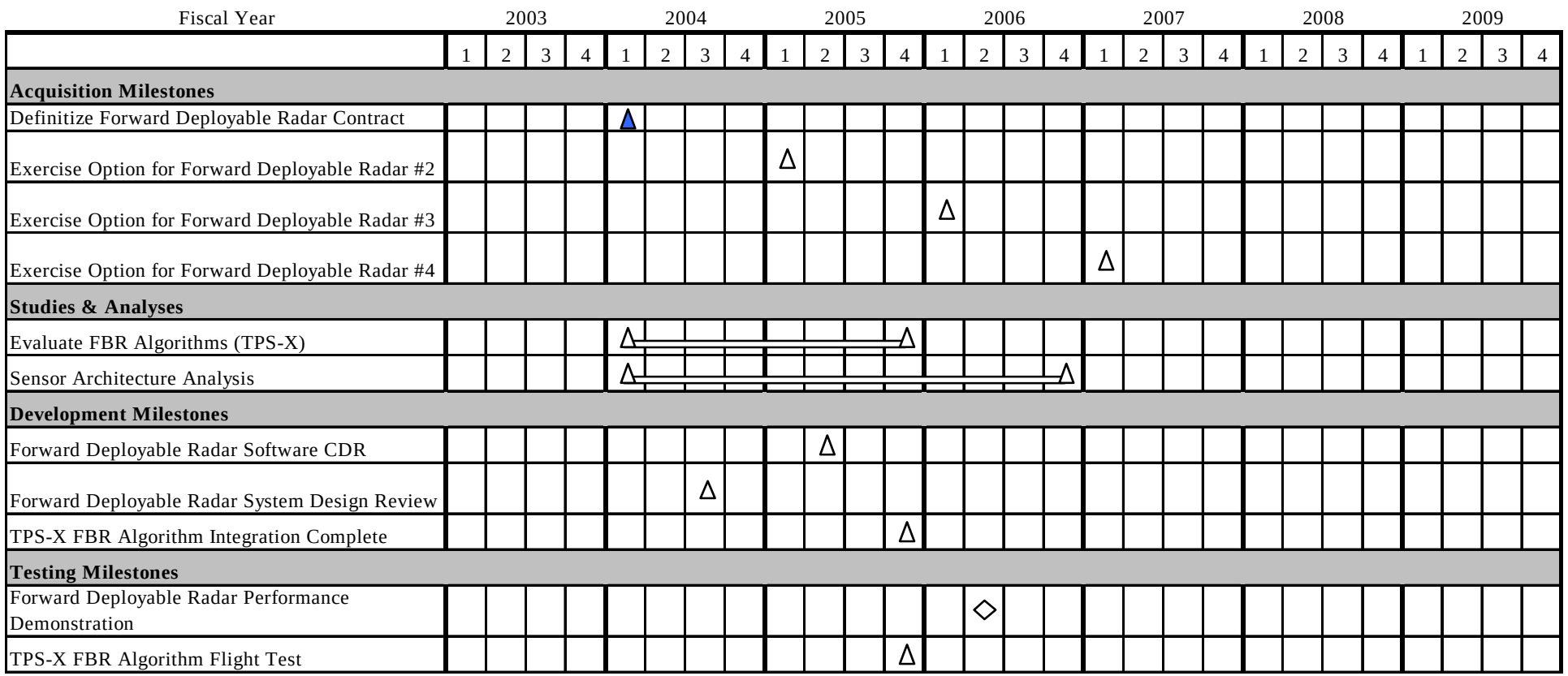
| Cost Categories: | Contract Method & Type | Performing Activity & Location | Total PYs Cost | FY 2004 Cost | FY 2004 Award Date | FY 2005 Cost | FY 2005 Award Date | Cost to Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|
| **Capability Development** | | | | | | | | | | |
| FFRDC/UARC | Various | MIT/LL, MITRE, JHU/APL | | 4,018 | 1Q | 5,470 | 1Q | | 9,488 | |
| Subtotal Management Services | | | 0 | 4,018 | | 5,470 | | 0 | 9488 | |

**Remarks**
FY 2003 Project Costs are described in Project 5011.

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Project Total Cost | | | 0 | 99,848 | | 256,101 | | | 355,949 | |

**Remarks**
FY 2003 Project Costs are described in Project 5011.

| MDA Exhibit R-4 Schedule Profile | Date: February 2004 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603884C Ballistic Missile Defense Sensors** |



| MDA Exhibit R-4 Schedule Profile | Date: February 2004 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603884C Ballistic Missile Defense Sensors** |

| Fiscal Year | 2003 | | | | 2004 | | | | 2005 | | | | 2006 | | | | 2007 | | | | 2008 | | | | 2009 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 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 |
| **Program Milestones** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Deliver Forward Deployable Radar #2 | | | | | | | | | | | | | | | | | Δ | | | | | | | | | | | |
| Deliver Forward Deployable Radar #3 | | | | | | | | | | | | | | | | | | | | | Δ | | | | | | | |
| Deliver Forward Deployable Radar #4 | | | | | | | | | | | | | | | | | | | | | | | | | Δ | | | |
| Forward Deployable Radar Capability Achieved | | | | | | | | | | | | | | | Δ | | | | | | | | | | | | | |
| **Manufacturing Processes and Advanced Materials** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Mature FBR Algorithms | | | | | | | | | | | | Δ | | | | | | | | | | | | | | | | |
| Forward Deployable Radar Integrated w/Release 1 | | | | | | | | | | | | | | Δ | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

| MDA Exhibit R-4A Schedule Detail | Date: February 2004 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603884C Ballistic Missile Defense Sensors** |

| Schedule Profile | FY 2003 | FY 2004 | FY 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 |
|---|---|---|---|---|---|---|---|
| **Acquisition Milestones** | | | | | | | |
| Finalize TPS-X FBR Task Order | | 1Q | | | | | |
| Definitize Forward Deployable Radar Contract | | 1Q | | | | | |
| Exercise Option for Forward Deployable Radar #2 | | | 1Q | | | | |
| Exercise Option for Forward Deployable Radar #3 | | | | 1Q | | | |
| Exercise Option for Forward Deployable Radar #4 | | | | | 1Q | | |
| **Studies & Analyses** | | | | | | | |
| Evaluate FBR Algorithms (TPS-X) | | 1Q-4Q | 1Q-4Q | | | | |
| Sensor Architecture Analysis | | 1Q-4Q | 1Q-4Q | 1Q-4Q | | | |
| **Development Milestones** | | | | | | | |
| BMDS Radar Software PDR | | 4Q | | | | | |
| BMDS Radar System Requirements Review (SRR) | | 1Q | | | | | |
| Forward Deployable Radar Software CDR | | | 2Q | | | | |
| Forward Deployable Radar System Design Review | | 3Q | | | | | |
| TPS-X FBR Algorithm CDR | | 3Q | | | | | |
| TPS-X FBR Algorithm Integration Complete | | | 4Q | | | | |
| TPS-X FBR Algorithm PDR | | 1Q | | | | | |
| **Testing Milestones** | | | | | | | |
| TPS-X FBR Algorithm Flight Test | | 2Q | | | | | |
| BMDS Radar Software Functional Qualification Test | | | 3Q | | | | |
| Forward Deployable Radar Performance Demonstration | | | | 2Q | | | |
| TPS-X FBR Algorithm Flight Test | | | 1Q,2Q,3Q | | | | |
| BMDS Radar High Power & Integration Test | | | 2Q | | | | |
| BMDS Radar Near Field Range Test | | | 1Q | | | | |
| TPS-X FBR Algorithm Flight Test | | | 4Q | | | | |
| **Program Milestones** | | | | | | | |
| BMDS Radar System Requirements Phase Complete | | 3Q | | | | | |
| BMDS Radar Integration and Test Complete | | | 3Q | | | | |
| Deliver Forward Deployable Radar #2 | | | | | 1Q | | |
| Deliver Forward Deployable Radar #3 | | | | | | 1Q | |
| Deliver Forward Deployable Radar #4 | | | | | | | 1Q |

| MDA Exhibit R-4A Schedule Detail | Date: February 2004 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603884C Ballistic Missile Defense Sensors** |

| Schedule Profile | FY 2003 | FY 2004 | FY 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 |
|---|---|---|---|---|---|---|---|
| Forward Deployable Radar Capability Achieved | | | | 3Q | | | |
| TPS-X FBR Algorithm Progress Reviews | | | 1Q,3Q,4Q | | | | |
| **Manufacturing Processes and Advanced Materials** | | | | | | | |
| Mature FBR Algorithms | | | 4Q | | | | |
| Forward Deployable Radar Integrated w/Release 1 | | | | 2Q | | | |

| MDA Exhibit R-2A RDT&E Project Justification | Date: February 2004 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603884C Ballistic Missile Defense Sensors** |

| COST ($ in Thousands) | FY 2003 | FY 2004 | FY 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 |
|---|---|---|---|---|---|---|---|
| 0911 Ballistic Missile Defense Radars Block 2008 | 0 | 0 | 0 | 0 | 100,620 | 102,207 | 22,130 |
| RDT&E Articles Qty | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

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

Block 2008: This project will enhance the BMDS capability to defend the United States and our allies, friends, and deployed forces from ballistic missiles of all ranges in all phases of flight. Enhancement of the existing sensor architecture will be based on continued sensor coverage gap analysis and architecture studies. The studies will take into account existing sensors (land, sea, air and space based), new sensor technologies and techniques to enhance sensor coverage and advanced sensor algorithms. The studies will examine integration of a Larger Phased Array, SBX Radar, dish radars, passive and active Electro-Optical/Infrared (EO/IR) sensors, and the Forward Deployable Radar into BMDS. The analysis will result in various options to increase coverage, the best of which will be subject to cost-study trade-offs and feasibility for inclusion in Block 08 acquisition, and follow-on spiral development efforts.

Continuing from the Block 2006 design effort, Block 2008 is a spiral enhancement of the BMDS with additional algorithms and software to increase the robustness of the radar. In parallel with new sensor hardware capabilities derived from the studies, the Forward Deployable Radar software will be upgraded to enhance discrimination and tracking as needed to support the BMDS Block 2008 sensor architecture. Options for additional radar or non-radar sensor hardware offer the potential to expand locations and sensor network.

**B. Accomplishments/Planned Program**

| | FY 2003 | FY 2004 | FY 2005 |
|---|---|---|---|
| Funding in this period is not programmed until FY07 | | | |
| RDT&E Articles (Quantity) | | | |

**C. Other Program Funding Summary**

| | FY 2003 | FY 2004 | FY 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|
| PE 0603890C Ballistic Missile Defense System Core | 0 | 445,356 | 479,764 | 492,988 | 527,541 | 539,210 | 568,365 | Continuing | Continuing |
| PE 0604861C Theater High-Altitude Area Defense System - TMD - EMD | 887,616 | 0 | 0 | 0 | 0 | 0 | 0 | Continuing | Continuing |
| PE 0604865C Patriot PAC-3 Theater Missile Defense Acquisition - EMD | 138,922 | 0 | 0 | 0 | 0 | 0 | 0 | Continuing | Continuing |
| PE 0605502C Small Business Innovative Research - MDA | 138,791 | 0 | 0 | 0 | 0 | 0 | 0 | Continuing | Continuing |
| PE 0901585C Pentagon Reservation | 7,432 | 14,327 | 13,884 | 12,958 | 12,850 | 13,158 | 13,476 | Continuing | Continuing |

| MDA Exhibit R-2A RDT&E Project Justification | Date: February 2004 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P) | R-1 NOMENCLATURE: 0603884C Ballistic Missile Defense Sensors |

| | FY 2003 | FY 2004 | FY 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|
| PE 0901598C Management Headquarters - MDA | 35,331 | 92,449 | 141,923 | 146,099 | 145,112 | 151,727 | 154,583 | Continuing | Continuing |
| PE 0603175C Ballistic Missile Defense Technology | 151,217 | 225,268 | 204,320 | 199,468 | 246,291 | 286,286 | 305,365 | Continuing | Continuing |
| PE 0603869C Meads Concepts - Dem/Val | 101,754 | 0 | 0 | 0 | 0 | 0 | 0 | Continuing | Continuing |
| PE 0603879C Advanced Concepts, Evaluations and Systems | 0 | 149,993 | 256,159 | 229,512 | 232,463 | 231,583 | 224,626 | Continuing | Continuing |
| PE 0603880C Ballistic Missile Defense System Segment | 1,028,016 | 0 | 0 | 0 | 0 | 0 | 0 | Continuing | Continuing |
| PE 0603881C Ballistic Missile Defense Terminal Defense Segment | 134,093 | 874,527 | 937,748 | 993,048 | 1,117,657 | 570,000 | 410,324 | Continuing | Continuing |
| PE 0603882C Ballistic Missile Defense Midcourse Defense Segment | 3,056,035 | 3,744,066 | 4,404,335 | 3,067,800 | 3,087,147 | 1,881,298 | 1,802,257 | Continuing | Continuing |
| PE 0603883C Ballistic Missile Defense Boost Defense Segment | 705,643 | 617,270 | 492,614 | 555,667 | 611,736 | 473,602 | 455,961 | Continuing | Continuing |
| PE 0603886C Ballistic Missile Defense System Interceptors | 0 | 117,719 | 511,262 | 1,118,599 | 1,717,480 | 2,196,531 | 2,449,322 | Continuing | Continuing |
| PE 0603888C Ballistic Missile Defense Test and Targets | 0 | 635,782 | 716,427 | 673,476 | 656,152 | 654,015 | 688,119 | Continuing | Continuing |
| PE 0603889C Ballistic Missile Defense Products | 0 | 305,309 | 418,608 | 421,049 | 445,971 | 456,339 | 469,621 | Continuing | Continuing |

**D. Acquisition Strategy**

The Forward Deployable Radar project will follow the Missile Defense Agency's capability-based acquisition strategy that emphasizes testing, spiral development, and evolutionary acquisition through the use of two-year capability blocks.

Planning for spiral upgrades for Blocks 2008 and 2010 will proceed consistent with the Block 2006 Forward Deployable Radar acquisition strategy and could be impacted by the decision to procure additional radars or sensors.

| MDA Exhibit R-4 Schedule Profile | Date: February 2004 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603884C Ballistic Missile Defense Sensors** |

| Fiscal Year | 2003 | | | | 2004 | | | | 2005 | | | | 2006 | | | | 2007 | | | | 2008 | | | | 2009 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 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 |
| **Acquisition Milestones** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Initiate Acquisition of SBX 2 | | | | | | | | | | | | | | | | | | | Δ | | | | | | | | | |
| **Development Milestones** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Insert Mature Technologies into Existing Sensors | | | | | | | | | | | | | | | | | | Δ | | | | | | | | | | |
| Sensor Diversity both in RF Radar and in OE/IR | | | | | | | | | | | | | | | | | | | | | Δ | | | | | | | |

| MDA Exhibit R-4A Schedule Detail | Date: February 2004 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603884C Ballistic Missile Defense Sensors** |

| Schedule Profile | FY 2003 | FY 2004 | FY 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 |
|---|---|---|---|---|---|---|---|
| **Acquisition Milestones** | | | | | | | |
| Initiate Acquisition of SBX 2 | | | | | 3Q | | |
| **Development Milestones** | | | | | | | |
| Insert Mature Technologies into Existing Sensors | | | | | 2Q | | |
| Sensor Diversity both in RF Radar and in OE/IR | | | | | | 1Q | |

| MDA Exhibit R-2A RDT&E Project Justification | Date: February 2004 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603884C Ballistic Missile Defense Sensors** |

| COST ($ in Thousands) | FY 2003 | FY 2004 | FY 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 |
|---|---|---|---|---|---|---|---|
| 5060 Test & Evaluation | 4,478 | 0 | 0 | 0 | 0 | 0 | 0 |
| RDT&E Articles Qty | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

*Note: FY 2002 funding is for Advanced Concept Studies under the Advanced Systems Deputate. Funding for this activity continues under PE 0603880C in FY 2003. The above FY 2003 funding is for the congressionally directed Airborne Infrared Surveillance (AIRS) Project. Funding for AIRS in FY 2002 was under the BMD Technology PE (0603175C).*

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

The Advanced Concept Studies were managed under Project Hercules in FY 2002 and has become part of the Advanced Systems Deputate. The goal of this funding was to establish the Advanced Systems Innovation Cell, the Small Business Innovation Research evaluation group, and to allow the creation of a decision architecture prototype.

The Airborne Infrared Surveillance Project (AIRS) is a demonstration activity to provide a pathfinder for airborne infrared surveillance and fire control in the Ballistic Missile Defense (BMDS) Block 2006 or earlier. These activities will include maturing techniques and technologies that provide a bridge between the Test and Evaluation (T&E) data collection asset and a mature airborne infrared surveillance and fire control asset. Specifically, activities will include efforts on self-cueing, communications, and real-time discrimination.

**B. Accomplishments/Planned Program**

| | FY 2003 | FY 2004 | FY 2005 |
|---|---|---|---|
| Airborne Infrared Surveillance System | 4,478 | | |
| RDT&E Articles (Quantity) | | | |

FY 2003 AIRS ACCOMPLISHMENTS

Continued sensor and pointing system improvements. Evaluated deploying the Heimdall sensor suite on platforms such as the Global Hawk and Predator B UAVs. Collected prelaunch and boost phase data on a TEL on the ADE 4 mission. Demonstrated the ability to develop fire control quality 3-D tracks on the ASFT (Red Dog) missions. Completed AIRS Software Critical Design Review (CDR) for integration of tracking system enhancements, integration of communications systems, and hosting GFE discrimination algorithms. (TRL 3-5)

**C. Other Program Funding Summary**

| | FY 2003 | FY 2004 | FY 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|
| PE 0603175C Ballistic Missile Defense Technology | 151,217 | 225,268 | 204,320 | 199,468 | 246,291 | 286,286 | 305,365 | Continuing | Continuing |
| PE 0603869C Meads Concepts - Dem/Val | 101,754 | 0 | 0 | 0 | 0 | 0 | 0 | Continuing | Continuing |
| PE 0603879C Advanced Concepts, Evaluations and Systems | 0 | 149,993 | 256,159 | 229,512 | 232,463 | 231,583 | 224,626 | Continuing | Continuing |

| MDA Exhibit R-2A RDT&E Project Justification | Date: February 2004 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603884C Ballistic Missile Defense Sensors** |

| | FY 2003 | FY 2004 | FY 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|
| PE 0603880C Ballistic Missile Defense System Segment | 1,028,016 | 0 | 0 | 0 | 0 | 0 | 0 | Continuing | Continuing |
| PE 0603881C Ballistic Missile Defense Terminal Defense Segment | 134,093 | 874,527 | 937,748 | 993,048 | 1,117,657 | 570,000 | 410,324 | Continuing | Continuing |
| PE 0603882C Ballistic Missile Defense Midcourse Defense Segment | 3,056,035 | 3,744,066 | 4,404,335 | 3,067,800 | 3,087,147 | 1,881,298 | 1,802,257 | Continuing | Continuing |
| PE 0603883C Ballistic Missile Defense Boost Defense Segment | 705,643 | 617,270 | 492,614 | 555,667 | 611,736 | 473,602 | 455,961 | Continuing | Continuing |
| PE 0603886C Ballistic Missile Defense System Interceptors | 0 | 117,719 | 511,262 | 1,118,599 | 1,717,480 | 2,196,531 | 2,449,322 | Continuing | Continuing |
| PE 0603888C Ballistic Missile Defense Test and Targets | 0 | 635,782 | 716,427 | 673,476 | 656,152 | 654,015 | 688,119 | Continuing | Continuing |
| PE 0603889C Ballistic Missile Defense Products | 0 | 305,309 | 418,608 | 421,049 | 445,971 | 456,339 | 469,621 | Continuing | Continuing |
| PE 0604865C Patriot PAC-3 Theater Missile Defense Acquisition - EMD | 138,922 | 0 | 0 | 0 | 0 | 0 | 0 | Continuing | Continuing |
| PE 0605502C Small Business Innovative Research - MDA | 138,791 | 0 | 0 | 0 | 0 | 0 | 0 | Continuing | Continuing |
| PE 0901585C Pentagon Reservation | 7,432 | 14,327 | 13,884 | 12,958 | 12,850 | 13,158 | 13,476 | Continuing | Continuing |
| PE 0901598C Management Headquarters - MDA | 35,331 | 92,449 | 141,923 | 146,099 | 145,112 | 151,727 | 154,583 | Continuing | Continuing |
| PE 0603890C Ballistic Missile Defense System Core | 0 | 445,356 | 479,764 | 492,988 | 527,541 | 539,210 | 568,365 | Continuing | Continuing |
| PE 0604861C Theater High-Altitude Area Defense System - TMD - EMD | 887,616 | 0 | 0 | 0 | 0 | 0 | 0 | Continuing | Continuing |

**D. Acquisition Strategy**

Acquisition strategy is to leverage existing T&E asset to mature necessary functions and aspects of surveillance and fire control and to serve as part of a contingency/emergency capability as a part of the BMDS Test Bed. Technology and techniques developed under AIRS will serve as a pathfinder for similar technologies in the high altitude, long endurance, stratospheric airship under study as well as the Spaced Based Infrared Radar (SBIR) technology. The contracting strategy for FY 2003 as a follow on effort to FY 2002 is the sole source of approximately 80% of the effort. They have met the necessary criteria in that no other source is available with the necessary technical expertise, the availability of access and modification of the HALO II aircraft.

| MDA Exhibit R-3 RDT&E Project Cost Analysis | Date: February 2004 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603884C Ballistic Missile Defense Sensors** |

**I. Product Development Cost ( $ in Thousands )**

| Cost Categories: | Contract Method & Type | Performing Activity & Location | Total PYs Cost | FY 2004 Cost | FY 2004 Award Date | FY 2005 Cost | FY 2005 Award Date | Cost to Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|
| **Airborne Infrared Surveillance System** | | | | | | | | | | |
| AIRS | CPFF | | 4,478 | | | | | | 4,478 | |
| Subtotal Product Development | | | 4,478 | 0 | | 0 | | 0 | 4478 | |

**Remarks**

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

| Cost Categories: | Contract Method & Type | Performing Activity & Location | Total PYs Cost | FY 2004 Cost | FY 2004 Award Date | FY 2005 Cost | FY 2005 Award Date | Cost to Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|
| Subtotal Support Costs | | | | | | | | | | |

**Remarks**

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

| Cost Categories: | Contract Method & Type | Performing Activity & Location | Total PYs Cost | FY 2004 Cost | FY 2004 Award Date | FY 2005 Cost | FY 2005 Award Date | Cost to Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|
| Subtotal Test and Evaluation | | | | | | | | | | |

**Remarks**

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

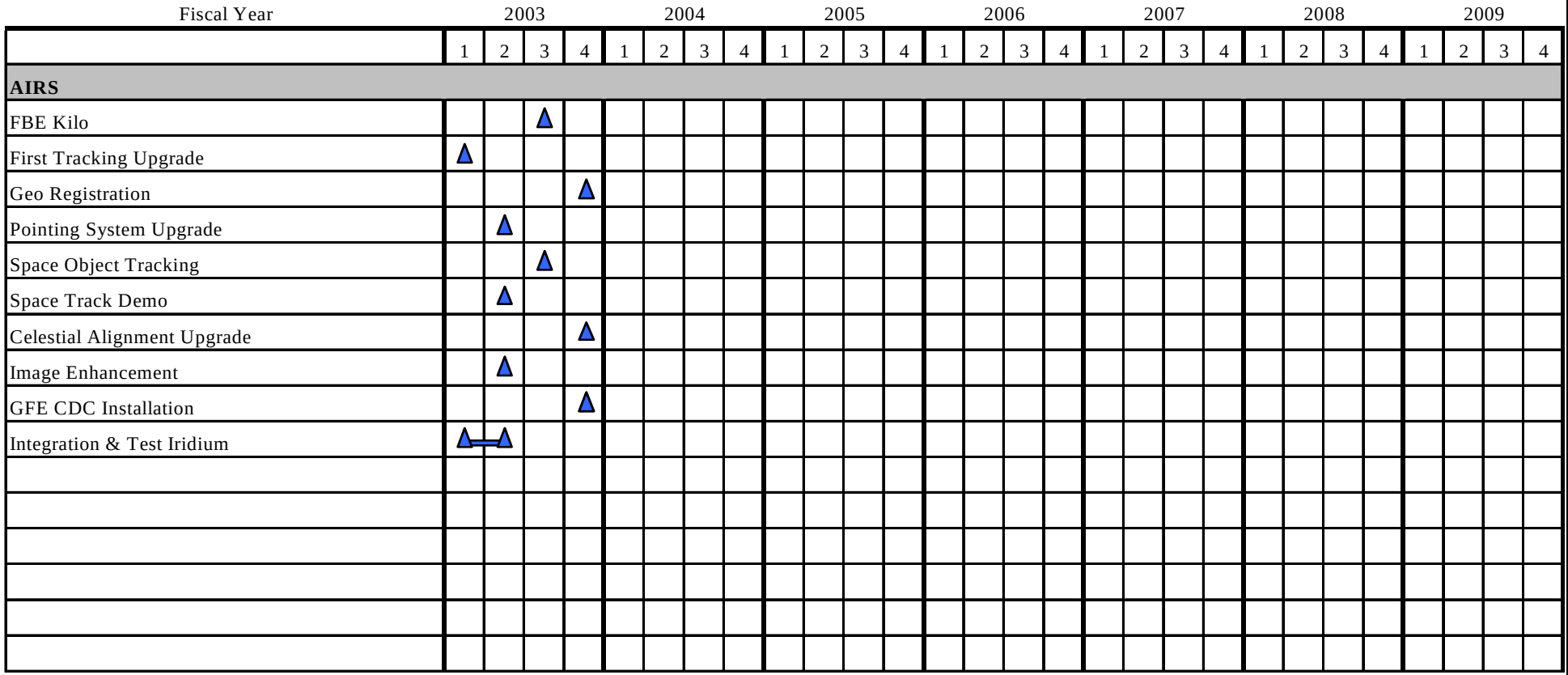
| Cost Categories: | Contract Method & Type | Performing Activity & Location | Total PYs Cost | FY 2004 Cost | FY 2004 Award Date | FY 2005 Cost | FY 2005 Award Date | Cost to Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|
| Subtotal Management Services | | | | | | | | | | |

**Remarks**

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Project Total Cost | | | 4,478 | 0 | | 0 | | | 4,478 | |

**Remarks**

| MDA Exhibit R-4 Schedule Profile | Date: February 2004 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603884C Ballistic Missile Defense Sensors** |



| MDA Exhibit R-4A Schedule Detail | Date: February 2004 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603884C Ballistic Missile Defense Sensors** |

| Schedule Profile | FY 2003 | FY 2004 | FY 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 |
|---|---|---|---|---|---|---|---|
| **AIRS** | | | | | | | |
| FBE Kilo | 3Q | | | | | | |
| First Tracking Upgrade | 1Q | | | | | | |
| Geo Registration | 4Q | | | | | | |
| Pointing System Upgrade | 2Q | | | | | | |
| Space Object Tracking | 3Q | | | | | | |
| Space Track Demo | 2Q | | | | | | |
| Celestial Alignment Upgrade | 4Q | | | | | | |
| Image Enhancement | 2Q | | | | | | |
| GFE CDC Installation | 4Q | | | | | | |
| Integration & Test Iridium | 1Q-2Q | | | | | | |

| MDA Exhibit R-2A RDT&E Project Justification | Date: February 2004 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603884C Ballistic Missile Defense Sensors** |

| COST ($ in Thousands) | FY 2003 | FY 2004 | FY 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 |
|---|---|---|---|---|---|---|---|
| 5090 Program-Wide Support | 34,878 | 0 | 0 | 0 | 0 | 0 | 0 |
| RDT&E Articles Qty | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

*Note: Fiscal Year 2003 is reflected in project 5090 and Fiscal Years 2004 and out are in project 0602.*

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

This project covers personnel and related support costs, statutory and fiscal requirements.

Personnel covers government civilians performing program-wide oversight functions such as contracting, program integration, safety, quality and mission assurance at Missile Defense Agency (MDA), Executing Agents within the US Army Space & Missile Defense Command, US Army PEO Air and Missile Defense, US Navy PEO for Theater Surface Combatants, Office of Naval Research, and US Air Force.

Assistance required to support Missile Defense Agency program-wide management functions is also contained in this project. Typical efforts include cost estimating; audit; technology integration across MDA projects; and assessment of schedule, cost and performance, with attendant documentation of the many related programmatic issues. The requirements for this area are based on most economical and efficient utilization of contractors versus government personnel.

Fiscal Requirements include reimbursable services acquired through the Defense Working Capital Fund (DWCF) such as accounting services provided by the Defense Finance and Accounting Services (DFAS); reserves for special termination costs on designated contracts; and provisions for terminating other programs as required. MDA has additional requirements to provide for foreign currency fluctuations on its limited number of foreign contracts. Also includes funding for charges to canceled appropriations in accordance with Public Law 101-510.

**B. Accomplishments/Planned Program**

| | FY 2003 | FY 2004 | FY 2005 |
|---|---|---|---|
| Civilian Salaries and Support | 34,878 | 0 | 0 |
| RDT&E Articles (Quantity) | | | |

Personnel:
Provides funding for government salaries and benefits at the Missile Defense Agency that are associated with program-wide support.

Management Support:
Funds the contract SETA support costs directly associated with Missile Defense Agency program-wide support organizations. This effort provides the funding for the Missile Defense Agency's executing agents (Army Space and Missile Defense Command, Army PEO-AMD, Air Force, and Navy) including government salaries & benefits, SETA support, and various management/overhead costs.

Fiscal Requirements:
This effort funds various requirements at the Missile Defense Agency, to include accounting services, special termination costs foreign currency fluctuations, and charges from cancelled appropriations.

| MDA Exhibit R-2A RDT&E Project Justification | Date: February 2004 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603884C Ballistic Missile Defense Sensors** |

IM/IT Operations:
This effort pays for Information Management/Information Technology requirements within the Missile Defense Agency. These requirements are moved to the Management Headquarters Program Element in Fiscal Years 2004-2009.

**C. Other Program Funding Summary**

| | FY 2003 | FY 2004 | FY 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|
| PE 0603175C Ballistic Missile Defense Technology | 151,217 | 225,268 | 204,320 | 199,468 | 246,291 | 286,286 | 305,365 | Continuing | Continuing |
| PE 0603869C Meads Concepts - Dem/Val | 101,754 | 0 | 0 | 0 | 0 | 0 | 0 | Continuing | Continuing |
| PE 0603879C Advanced Concepts, Evaluations and Systems | 0 | 149,993 | 256,159 | 229,512 | 232,463 | 231,583 | 224,626 | Continuing | Continuing |
| PE 0603880C Ballistic Missile Defense System Segment | 1,028,016 | 0 | 0 | 0 | 0 | 0 | 0 | Continuing | Continuing |
| PE 0603881C Ballistic Missile Defense Terminal Defense Segment | 134,093 | 874,527 | 937,748 | 993,048 | 1,117,657 | 570,000 | 410,324 | Continuing | Continuing |
| PE 0603882C Ballistic Missile Defense Midcourse Defense Segment | 3,056,035 | 3,744,066 | 4,404,335 | 3,067,800 | 3,087,147 | 1,881,298 | 1,802,257 | Continuing | Continuing |
| PE 0603883C Ballistic Missile Defense Boost Defense Segment | 705,643 | 617,270 | 492,614 | 555,667 | 611,736 | 473,602 | 455,961 | Continuing | Continuing |
| PE 0603886C Ballistic Missile Defense System Interceptors | 0 | 117,719 | 511,262 | 1,118,599 | 1,717,480 | 2,196,531 | 2,449,322 | Continuing | Continuing |
| PE 0603888C Ballistic Missile Defense Test and Targets | 0 | 635,782 | 716,427 | 673,476 | 656,152 | 654,015 | 688,119 | Continuing | Continuing |
| PE 0603889C Ballistic Missile Defense Products | 0 | 305,309 | 418,608 | 421,049 | 445,971 | 456,339 | 469,621 | Continuing | Continuing |
| PE 0603890C Ballistic Missile Defense System Core | 0 | 445,356 | 479,764 | 492,988 | 527,541 | 539,210 | 568,365 | Continuing | Continuing |
| PE 0604861C Theater High-Altitude Area Defense System - TMD - EMD | 887,616 | 0 | 0 | 0 | 0 | 0 | 0 | Continuing | Continuing |
| PE 0604865C Patriot PAC-3 Theater Missile Defense Acquisition - EMD | 138,922 | 0 | 0 | 0 | 0 | 0 | 0 | Continuing | Continuing |

| MDA Exhibit R-2A RDT&E Project Justification | Date: February 2004 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603884C Ballistic Missile Defense Sensors** |

| | FY 2003 | FY 2004 | FY 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|
| PE 0605502C Small Business Innovative Research - MDA | 138,791 | 0 | 0 | 0 | 0 | 0 | 0 | Continuing | Continuing |
| PE 0901585C Pentagon Reservation | 7,432 | 14,327 | 13,884 | 12,958 | 12,850 | 13,158 | 13,476 | Continuing | Continuing |
| PE 0901598C Management Headquarters - MDA | 35,331 | 92,449 | 141,923 | 146,099 | 145,112 | 151,727 | 154,583 | Continuing | Continuing |

| MDA Exhibit R-2A RDT&E Project Justification | Date: February 2004 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603884C Ballistic Missile Defense Sensors** |

| COST ($ in Thousands) | FY 2003 | FY 2004 | FY 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 |
|---|---|---|---|---|---|---|---|
| 0602 Program-Wide Support | 0 | 7,424 | 14,085 | 16,703 | 20,871 | 22,892 | 26,379 |
| RDT&E Articles Qty | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

*Note: Fiscal Year 2003 is reflected in project 5090 and Fiscal Years 2004 and out are in project 0602.*

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

This project covers personnel and related support costs, statutory and fiscal requirements.

Personnel covers government civilians performing program-wide oversight functions such as contracting, program integration, safety, quality and mission assurance at Missile Defense Agency (MDA), Executing Agents within the US Army Space & Missile Defense Command, US Army PEO Air and Missile Defense, US Navy PEO for Theater Surface Combatants, Office of Naval Research, and US Air Force.

Assistance required to support Missile Defense Agency program-wide management functions is also contained in this project. Typical efforts include cost estimating; audit; technology integration across MDA projects; and assessment of schedule, cost and performance, with attendant documentation of the many related programmatic issues. The requirements for this area are based on most economical and efficient utilization of contractors versus government personnel.

Fiscal Requirements include reimbursable services acquired through the Defense Working Capital Fund (DWCF) such as accounting services provided by the Defense Finance and Accounting Services (DFAS); reserves for special termination costs on designated contracts; and provisions for terminating other programs as required. MDA has additional requirements to provide for foreign currency fluctuations on its limited number of foreign contracts. Also includes funding for charges to canceled appropriations in accordance with Public Law 101-510.

**B. Accomplishments/Planned Program**

| | FY 2003 | FY 2004 | FY 2005 |
|---|---|---|---|
| Civilian Salaries and Support | 0 | 7,424 | 14,085 |
| RDT&E Articles (Quantity) | | | |

Personnel:
Provides funding for government salaries and benefits at the Missile Defense Agency that are associated with program-wide support.

Management Support:
Funds the contract SETA support costs directly associated with Missile Defense Agency program-wide support organizations. This effort provides the funding for the Missile Defense Agency's executing agents (Army Space and Missile Defense Command, Army PEO-AMD, Air Force, and Navy) including government salaries & benefits, SETA support, and various management/overhead costs.

Fiscal Requirements:
This effort funds various requirements at the Missile Defense Agency, to include accounting services, special termination costs foreign currency fluctuations, and charges from cancelled appropriations.

| MDA Exhibit R-2A RDT&E Project Justification | Date: February 2004 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603884C Ballistic Missile Defense Sensors** |

IM/IT Operations:
This effort pays for Information Management/Information Technology requirements within the Missile Defense Agency. These requirements are moved to the Management Headquarters Program Element in Fiscal Years 2004-2009.

**C. Other Program Funding Summary**

| | FY 2003 | FY 2004 | FY 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|
| PE 0603890C Ballistic Missile Defense System Core | 0 | 445,356 | 479,764 | 492,988 | 527,541 | 539,210 | 568,365 | Continuing | Continuing |
| PE 0604861C Theater High-Altitude Area Defense System - TMD - EMD | 887,616 | 0 | 0 | 0 | 0 | 0 | 0 | Continuing | Continuing |
| PE 0604865C Patriot PAC-3 Theater Missile Defense Acquisition - EMD | 138,922 | 0 | 0 | 0 | 0 | 0 | 0 | Continuing | Continuing |
| PE 0605502C Small Business Innovative Research - MDA | 138,791 | 0 | 0 | 0 | 0 | 0 | 0 | Continuing | Continuing |
| PE 0901585C Pentagon Reservation | 7,432 | 14,327 | 13,884 | 12,958 | 12,850 | 13,158 | 13,476 | Continuing | Continuing |
| PE 0901598C Management Headquarters - MDA | 35,331 | 92,449 | 141,923 | 146,099 | 145,112 | 151,727 | 154,583 | Continuing | Continuing |
| PE 0603175C Ballistic Missile Defense Technology | 151,217 | 225,268 | 204,320 | 199,468 | 246,291 | 286,286 | 305,365 | Continuing | Continuing |
| PE 0603869C Meads Concepts - Dem/Val | 101,754 | 0 | 0 | 0 | 0 | 0 | 0 | Continuing | Continuing |
| PE 0603879C Advanced Concepts, Evaluations and Systems | 0 | 149,993 | 256,159 | 229,512 | 232,463 | 231,583 | 224,626 | Continuing | Continuing |
| PE 0603880C Ballistic Missile Defense System Segment | 1,028,016 | 0 | 0 | 0 | 0 | 0 | 0 | Continuing | Continuing |
| PE 0603881C Ballistic Missile Defense Terminal Defense Segment | 134,093 | 874,527 | 937,748 | 993,048 | 1,117,657 | 570,000 | 410,324 | Continuing | Continuing |
| PE 0603882C Ballistic Missile Defense Midcourse Defense Segment | 3,056,035 | 3,744,066 | 4,404,335 | 3,067,800 | 3,087,147 | 1,881,298 | 1,802,257 | Continuing | Continuing |
| PE 0603883C Ballistic Missile Defense Boost Defense Segment | 705,643 | 617,270 | 492,614 | 555,667 | 611,736 | 473,602 | 455,961 | Continuing | Continuing |

| MDA Exhibit R-2A RDT&E Project Justification | Date: February 2004 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603884C Ballistic Missile Defense Sensors** |

| | FY 2003 | FY 2004 | FY 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|
| PE 0603886C Ballistic Missile Defense System Interceptors | 0 | 117,719 | 511,262 | 1,118,599 | 1,717,480 | 2,196,531 | 2,449,322 | Continuing | Continuing |
| PE 0603888C Ballistic Missile Defense Test and Targets | 0 | 635,782 | 716,427 | 673,476 | 656,152 | 654,015 | 688,119 | Continuing | Continuing |
| PE 0603889C Ballistic Missile Defense Products | 0 | 305,309 | 418,608 | 421,049 | 445,971 | 456,339 | 469,621 | Continuing | Continuing |