Selected Acquisition Report (SAR)

RCS: DD-A&T(Q&A)823-362

BMDS

As of December 31, 2010

Defense Acquisition Management
Information Retrieval
(DAMIR)

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Program Information

Designation And Nomenclature (Popular Name)

Ballistic Missile Defense System (BMDS)

DoD Component

DOD

Responsible Office

Responsible Office

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References

SAR Baseline (Planning Estimate)

National Security Presidential Directive (NSPD) - 23 dated December 16, 2002

Mission and Description

The mission of the Missile Defense Agency (MDA) is derived from the National Missile Defense Act of 1999; the Missile Defense Program Direction signed by the Secretary of Defense, dated January 02, 2002; National Security Presidential Directive-23 (NSPD-23), dated December 16, 2002; the MDA Charter - Department of Defense Directive 5134.09, dated September 17, 2009; and the Ballistic Missile Defense Review (BMDR) Report, dated February 01, 2010.

MDA's mission is to develop and field an integrated, layered, increasingly robust Ballistic Missile Defense System (BMDS) to defend the United States, its deployed forces, allies, and partners against all ranges of enemy ballistic missiles in all phases of flight.

Following guidance from the President, the Secretary of Defense approved the BMDR Report, which established the following policy priorities to frame missile defense development and acquisition program strategies:

1. Enhance the protection of the United States from limited ballistic missile attack
2. Continue to develop, improve, and deploy capabilities to defend U.S. forces, allies and partners against regional missile threats
3. Develop capabilities that are flight tested under operationally realistic conditions before they are deployed
4. Build capabilities to hedge against future threat uncertainties and the technical risks inherent in technology development plans
5. Deploy capabilities that are economically sustainable over the long term
6. Lead expanded international efforts and cooperation in missile defense

Executive Summary

As described below, the Missile Defense Agency (MDA) achieved a number of key goals in the programmatic areas of homeland and regional defense capabilities, enhanced testing, and development of new capabilities in Fiscal Year (FY) 2010. Also highlighted below are achievements in international efforts, planning for the future Ballistic Missile Defense System (BMDS), and MDA management initiatives.

Homeland and Regional Defense Capabilities

Among its efforts to strengthen homeland defense in FY 2010, MDA emplaced the 30th Ground Based Interceptor (GBI) in September 2010, thereby fulfilling the goal to emplace 30 GBIs by the end of the fiscal year. The Agency also completed two GBI upgrades. At Ft. Greely, Alaska (FGA), MDA initiated the missile defense complex communications infrastructure repairs to meet current Department of Defense (DoD)/Army operational standards and continued construction of the new power plant. The Agency also completed the Thule Early Warning Radar (EWR) upgrades and prepared for the Air Force's operational acceptance.

Making regional defense more robust in FY 2010, MDA procured four Aegis Weapon System (AWS) Ballistic Missile Defense (BMD) 3.6.1 ship sets and two Aegis BMD 4.0.1 ship sets; converted two Aegis BMD ships; delivered 25 Standard Missile (SM)-3 Block IA interceptors; awarded an engineering contract for Aegis Ashore; delivered Terminal High Altitude Area Defense (THAAD) Battery 2 ground components and completed Battery 1 new-equipment training and unit collective training at Ft. Bliss, Texas. In addition, MDA commenced production of Lot 1 for THAAD interceptors in September 2010. The Agency also accelerated the refurbishment of the Army Navy/Transportable Surveillance Radar – Model 2 (AN/TPY-2) radar for deployment to the U.S. European Command (USEUCOM); and prepared a Command and Control, Battle Management and Communications (C2BMC) system and a second AN/TPY-2 for deployment to U.S. Central Command (USCENTCOM).

In FY 2010, MDA continued to maintain system operational availability of the C2BMC system at the 24/7, 100-percent level across four Combatant Commands (COCOMs), including operations in the eastern Mediterranean. The Agency verified the system's ability to manage multiple sensors and demonstrated North Atlantic Treaty Organization (NATO)/U.S. C2BMC planning/situational awareness interoperability at Joint Project Optic Windmill (JPOW) 10. In addition, MDA completed the development of C2BMC Spiral 6.4.

Culminating a multi-year program restructuring transition from an element- or block-centric program delivery approach to an integrated BMD system approach, MDA completed its BMD System-Level Capability Delivery (CD)-03. By delivering and characterizing the increases in system-wide performance of the BMD components listed above, MDA has enhanced both Homeland and Regional Defense. These management process improvements are detailed in the BMD System Master Plan and vetted with the Warfighter (USSTRATCOM) and will facilitate the programmatic restructuring to meet the Congressionally and Presidentially mandated Phased Adaptive Approach.

In support of U.S. Strategic Command (USSTRATCOM), MDA led significant improvements to the cyber security and information assurance posture of the BMDS by an aggressive program of compliance validation testing and tracking, penetration testing, architectural upgrades in boundary protection, intrusion monitoring, and access control. MDA also made significant improvements to the warfighting capability of the United States, its deployed forces, and allies by implementing and testing solutions for exchanging critical data in real time across multiple security domains with COCOM and coalition partners.

Enhanced Testing

From the overall BMDS perspective, MDA continued this past year to evolve the BMDS test strategy. Working with the Director, Operational Test and Evaluation (DOT&E), the Assistant Secretary of Defense (Research and Engineering)/ Director of Developmental Test and Evaluation (DDT&E), the Service Operational Test Agencies (OTAs), and the Warfighter, MDA developed and delivered two Integrated Master Test Plan (IMTP) versions (10.1 and 10.2) during FY 2010. The Agency also improved its engagement with the Warfighting community by leading efforts in interfacing with the COCOMs to add wargames and exercises to the test portfolio. To strengthen testing, MDA successfully established target integration and launch facilities at the Reagan Test Site (RTS) and developed

the mission concept of operations (CONOPs) for Launch Vehicle (LV)-2 targets.

In terms of IMTP flight test performance in FY 2010, there were a total of 13 flight test events, of which 11 successfully achieved their testing objectives. The results of key flight and ground tests are highlighted below.

- MDA achieved the first GBI two-stage booster flight. The test collected data to characterize the two-stage booster design with first generation avionics. It also collected data to gather exoatmospheric kill vehicle (EKV) solar angle data at key test points and to gather performance data on EKV diverts. After performing fly out maneuvers, the two-stage booster delivered an EKV to a designated point in space. Several missile defense sensor assets and emerging sensor technologies observed the launch and gathered data for future analysis.
- FTG-06 was MDA's only failed interceptor test in FY10. The test was to be an intercept of an intermediate range ballistic missile with countermeasures by the Ground-Based Midcourse Defense system. Unfortunately, the GBI failed to achieve the intercept. A Failure Review Board (FRB) convened and determined the most probable cause was the separation of a thruster control cable on the Divert and Attitude Control System caused by a missing lockwire. Also during the test, MDA identified software constraints on the SBX which required modification prior to the next test.
- Japanese Maritime Self-Defense Force (JMSDF), in cooperation with MDA and the U.S. Navy, successfully intercepted a ballistic missile target with medium range ballistic missile (MRBM) characteristics using a SM-3 Block IA interceptor. Also participating in the test were the USS Lake Erie and the USS Paul Hamilton, which detected and tracked the target and conducted a simulated engagement.
- MDA and U.S. Army soldiers from Ft. Bliss, Texas conducted a successful intercept and operations test of THAAD against a unitary short range ballistic missile (SRBM). The intercept occurred in the endoatmosphere. The THAAD system acquired and tracked the target, developed a fire control solution, and launched the interceptor. The soldiers conducted launcher, fire control, and radar operations using tactics, techniques, and procedures developed by the Army’s Air Defense School.
- The THAAD system experienced a no-test due to a target failure. The air-launched target failed to separate from the carriage extraction system used to pull the target from the C-17 aircraft. An FRB determined that the failure was caused by the target contractor’s failure to follow its test setup procedures. Further investigations highlighted the need for a complete overhaul of the contractor’s quality and safety practices and resulted in the issuance of a Cure Notice. The contractor is on the road to recovery with a return to flight test in FY11.
- The USS Lake Erie simulated an Aegis BMD 4.0.1 intercept of SRBM targets to exercise the kinetic warhead downlink system and capture data to support performance predictions in the areas of multi-object threat complex engagements. This was the first formal test of the more capable signal processor and SM-3 Block IB interceptor.
- Employing computers and software ground system test runs for the record, MDA conducted a full BMDS hardware in the loop (HWIL) test using Northeast Asia and Southwest Asia scenarios. A rigorous test environment produced data in support of acceptance of Thule radar version 8.0.3 and a fielding decision for C2BMC Spiral 6.4, AN/TPY-2 Forward Based Mode (FBM) Common X-band radar software (CX) 1, and GMD Fire Control (GFC) 6B.1.5.
- The Fast Contingency Analysis and Activation Team (CAAT) East (FCE)-C distributed test event was executed as a theater-centric, focused test event conducted to support verification of new capabilities in the BMDS architecture and ground test infrastructure. It was the first test of the AN/TPY-2 radar Spiral 2 Operational Mission Profile and automatic discrimination.
- The United States Army Operational Test Command (USAOTC), Air Defense Artillery Test Directorate, successfully conducted the Force Development Experiment (FDE) and Limited User Test for the Terminal High Altitude Area Defense System at McGregor Range, Ft Bliss, Texas. These tests were conducted in support of THAAD's Material Release planned for 2011.
- MDA successfully completed the majority of environmental ground testing of the THAAD Weapon System

in support of Materiel Release. The THAAD Project Office completed Automotive Safety and Mobility testing of the Radar Prime Power Unit (PPU); Electromagnetic Environmental Effects (E3) testing of the Radar, THAAD Fire Control and Communications (TFCC), and Battery Support Center (BSC); and Altitude testing of the TFCC and BSC. In addition, MDA successfully completed a 9-month comprehensive Natural Environments testing of the integrated THAAD Weapons System; this test included a soldier's conducting a Cold Region Demonstration at the McKinley Climatic Laboratory at Eglin AFB.

Development of New Capabilities

Across a wide range of concept and technology development activities in FY 2010, MDA achieved substantial progress in finding new and innovative means for hedging against future threats. For the Space Tracking and Surveillance System (STSS) program, the Agency demonstrated the ability of the two STSS satellites to provide stereo, higher-fidelity tracking capabilities and to transfer tracks into C2BMC. A year-long on-orbit checkout, calibration, and functional testing of the satellites and missile tracking payloads occurred. MDA's goal for the Precision Tracking Space System (PTSS) is to provide effective, highly available early missile tracking capability from space by developing, launching and operating a set of first spacecraft articles by FY 2016. In FY 2010, the Agency conducted preliminary PTSS analyses and trade studies and defined a functional allocation to integrate PTSS into the BMDS.

For the Airborne Infrared (ABIR) program, MDA completed an Analysis of Alternatives and a Systems Concept Review and delivered two infrared sensors. The Agency conducted five risk reduction tests, which demonstrated sensor pointing performance, real-time closed loop tracking, and post-mission data fusion. Flight and ground testing led to knowledge gained in measuring the sensor's field of regard, pointing and electro-optical performance, and signal processing and tracking performance.

SM-3 Blk IIA Cooperative Development (SCD) Project completed system and missile requirements at a joint MDA/MOD Requirements Finalization Review. During FY10, the SCD Project successfully conducted the preliminary design process completing 45 section and component PDRs as planned.

MDA also completed the SM-3 Block IIB System Concept Review, which defined engineering trade space for concept development and identified priorities for technology risk reduction. Furthermore, MDA completed component design verification tests of the advanced Liquid Divert and Attitude Control System (LDACS).

In addition, the Airborne Laser Test Bed (ALTB) successfully destroyed a threat-representative boosting ballistic missile in an experiment at Point Mugu Naval Air Warfare Center. This was the first directed energy lethal intercept demonstration from an airborne platform against a liquid-fuel boosting ballistic missile target. The ALTB also destroyed a boosting solid-fuel missile and later in the year successfully engaged a diagnostic target missile at twice the range of the first lethal engagement. MDA continued to make progress towards achieving two knowledge points – low and medium power continuous operation – for the Diode Pumped Alkali Laser System (DPALS). The knowledge points are planned for completion in FY 2012.

International Efforts

In FY 2010, MDA continued to expand missile defense cooperation with key friends, allies, and partners. MDA hosted a successful visit by the NATO Secretary General to the Missile Defense Integration and Operations Center (MDIOC). A major accomplishment was securing agreement to host Aegis Ashore in Romania. MDA continued its collaboration with NATO's Active Layered Theater BMD (ALTBMD) Program Office, initiated the integration of C2BMC and ALTBMD, and participated in the NATO-led technical analysis to support the expansion of ALTBMD capability for territorial missile defense in preparation for NATO's Lisbon Summit in November 2010.

As for international efforts in Asia, the Agency continues to make significant progress with the Japanese Ministry of Defense to execute the revised SM-3 Block IIA Cooperative Development project. MDA also signed an agreement and terms of reference to initiate a joint program analysis with the Republic of Korea (ROK) to examine architecture options to protect ROK and U.S. forces from North Korean attack. Furthermore, the Agency conducted critical engineering analyses to respond to North Korean ballistic missile contingencies.

In the Middle East, MDA's leadership played a significant role in finalizing the U.S. and Israeli Governments' agreements on the Arrow 3 Upper Tier Interceptor, the David's Sling Weapon System, and the Israeli Test Bed. These agreements increase our oversight of cooperative programs while strengthening Israel's ability to protect itself. For the Upper Tier program, MDA and the Israel Missile Defense Organization (IMDO) achieved a number of knowledge points designed to begin demonstrating interceptor propulsion and kill vehicle accuracy. U.S. and Israeli forces also conducted the Juniper Cobra Joint Interoperability Exercise to validate coalition architecture and joint concept of operations. Working with the United Arab Emirates (UAE), the Agency has made significant progress in the development of a Foreign Military Sales (FMS) Letter of Offer and Acceptance for THAAD. In August 2010 UAE adjusted its FMS requirement from three THAAD batteries, 144 interceptors, four AN/TPY-2 Radars and support equipment to two THAAD batteries, 96 interceptors, two AN/TPY-2 Radars and support equipment.

Planning for the Future BMDS

Looking to the future, MDA plans to achieve the "2020 BMDS" by delivering a range of interceptor, sensor, and C2BMC capabilities in four phases. As described below, each capability delivery over the coming decade will enhance homeland and regional defenses and improve BMDS performance against all ranges of ballistic missiles by increasing the number of missile defense shot opportunities and the ability to defeat larger raid sizes and expanding coverage areas.

First Phase – Initial Capability against SRBMs, MRBMs, and Intermediate Range Ballistic Missiles (IRBMs) and Enhanced Homeland Defense by the End of 2011. MDA's goal is to strengthen homeland defense by sustaining and upgrading the current fleet of 30 GBIs and completing the second FGA missile field. The new missile field will replace older silos from Missile Field 1. Upgrades to integrate the Thule radar will make it a fully operational UEWR in the BMDS. In addition, a forward-based AN/TPY-2 X-band radar will be deployed to southeastern Europe to provide early tracking for improved homeland defense, and communications will be upgraded to ensure redundancy. Initial regional defenses will be bolstered by the European Phased Adaptive Approach (EPAA) Phase 1 capability, which will provide initial protection of southern Europe from existing SRBM and MRBM threats by 2011 using sea-based interceptors, missile defense command and control suites, and forward-based AN/TPY-2 and SPY-1 radars. Each deployment of a weapon, sensor, and C2BMC system will incrementally enhance the BMDS capability, thereby improving protection for the U.S. homeland, allies and partners. Aegis BMD ships carrying SM-3 Block IA interceptors are already deployed and on-station in forward operating areas and the remaining EPAA Phase 1 capabilities are on schedule for testing and deployments by December 2011. Additionally, THAAD batteries will be available for deployment to defend Europe. MDA expects to have delivered the following missile defense assets to the BMDS system architecture by the end of 2011:

- 30 GBIs for emplacement in silos in Alaska and California
- 23 Aegis BMD ships capable of engaging short- to medium-range missiles and performing the long-range surveillance and track (LRS&T) mission
- 111 SM-3 interceptors
- 72 SM-2 interceptors
- 2 THAAD batteries
- 26 THAAD interceptors
- 7 AN/TPY-2 radars (4 forward-base mode, 2 terminal mode, and 1 test asset)

Second Phase – Enhanced Capability against SRBMs and MRBMs by the End of 2015. During this timeframe,

MDA will improve overall BMDS performance by focusing on enhanced coordination and use of remote sensors by Aegis ships to launch earlier in an engagement. Aegis BMD 4.0.1/SM-3 Block IB capability will be able to engage increasingly long-range, more sophisticated ballistic missiles as compared to the first generation Aegis BMD 3.6.1/SM-3 Block IA. This interceptor will be part of the initial Aegis Ashore system and deployed both at sea and on land in Romania. Existing AWS and SPY-1 functionality will be used initially for missile acquisition, communications, and SM-3 engagement and control, with interceptors launched from vertical launching systems deployed at land locations. The coverage area will be increased by launching the SM-3 using remote sensor data. This capability will provide improved protection of Europe from ballistic missile threats, to include IRBM threats, with the deployment of the SM-3 Block IB at sea and at an Aegis Ashore site in Romania. MDA's technology development efforts will include prototype airborne sensor systems (Remotely Piloted Vehicles or RPVs), enhanced command and control systems, and satellite sensors. THAAD also will have a capability to launch on network sensors, such as RPVs.

Third Phase – Enhanced Capability against IRBMs by the End of 2018. Supplementing the Aegis Ashore site in Romania, the SM-3 Block IIA interceptor will be deployed at an Aegis Ashore site in Poland and at sea to provide robust protection for European NATO countries from ballistic missile threats. System improvements include expanded shooter coordination and improvements to radar discrimination. The deployment of the initial PTSS sensors in space will permit the detection and tracking of hostile ballistic missiles and enable earlier engagements to improve both homeland and regional defense. Critical technology development efforts include the enhanced SM-3 Block IIB interceptor, airborne infrared sensors, next generation command and control, and THAAD's launching on remote sensors. In addition, C2BMC upgrades will improve sensor management of multiple radars and deliver threat track information to Aegis BMD and Aegis Ashore. The planned upgrade of the Clear radar in Alaska in 2016 will improve overall BMDS performance and defense of the homeland.

Fourth Phase – Early Intercept Capability against MRBMs and IRBMs; and Robust Homeland Defense Against Intercontinental Ballistic Missiles (ICBMs) from Today's Regional Threats by the End of 2020. Advanced discrimination technologies will be deployed and GMD's use of network sensors will be enabled to improve homeland defense. The architecture features the higher velocity land-based SM-3 Block IIB and enhanced command and control to intercept large raids of MRBMs and IRBMs early in flight and provide an additional defense layer against ICBMs for improved protection of the homeland from regional threats currently developing initial ICBM capability.

MDA Management Initiatives

The BMDS Accountability Report (BAR), issued to Congress in June 2010, is a key MDA management initiative aimed at holding programs accountable for delivering capabilities on cost, on schedule, and at promised performance levels and for enhancing the transparency, accountability, and oversight of the BMDS program. The BAR presented approved program baselines (schedule, technical, test, resource, operational capacity, and contract) for the following Program Elements: C2BMC, THAAD and its associated radar, AN/TPY-2; Aegis BMD; GMD; SBX; Targets; and Israeli Programs. The BAR also documented goals for the SM-3 Block IIB and PTSS programs. In the BAR issued in February 2011, MDA reported baseline changes and significant deviations (variances) from established schedule, technical, and resource baselines.

MDA acquires contractor support services mostly through headquarters contracts, contracts with Other Government Agencies (OGAs), and General Services Administration orders. MDA has had more than 200 documented legacy contracts, as well as other transactions managed by Service organizations. To gain efficiencies, MDA is now converting from the existing legacy, project-oriented Systems Engineering and Technical Assistance (SETA) construct to an enterprise-wide Advisory and Assistance Services (A&AS)[1] approach -- called Missile Defense Agency Engineering and Support Services (MiDAESS). The objectives are to implement national engineering and support services for the BMDS mission across the enterprise in a competitive environment, enhance the sharing of ballistic missile defense expertise and knowledge across the agency, centralize the acquisition of support services manpower in a more efficient manner, and reduce agency overhead costs enterprise-wide. Legacy efforts are being consolidated into approximately 35 Indefinite Delivery/Indefinite Quantity (ID/IQ) contracts that cover six functional capability groups to provide support enterprise-wide. The new MiDAESS contracts focus work tasks to be accomplished and let industry propose how they will accomplish those tasks.

Through the end of Calendar Year (CY) 2010, the Agency completed eight of 10 source selections for 27 Indefinite Delivery/Indefinite Quantity (IDIQ) contracts. It also issued 35 Requests for Task Order Proposals under the IDIQ contracts and awarded 20 Task Orders. During CY 2011, the MDA expects to award an additional two IDIQ contracts and 38 Task Orders. When fully implemented, the savings (cost avoidance) based on a cost-benefit analysis are estimated to be $18 million per year in administrative costs and $113-131 million per year in contractor labor costs.

Base Realignment and Closure (BRAC). The 2005 BRAC Commission Recommendation #134 directed the realignment of several MDA functions from the National Capital Region (NCR) to government facilities at Fort Belvoir, Virginia, and the Redstone Arsenal in Huntsville, Alabama. Specifically, a Headquarters Command Center (HQCC) for MDA will be located at Fort Belvoir, while most other MDA mission and mission support activities originally in the NCR will be realigned to Redstone Arsenal. Construction of the HQCC began in 2009 and is expected to be completed for occupancy in FY 2011. Construction of a new building at the Arsenal's Von Braun Complex began in the fall of 2008. The first phase is being readied for occupancy by April 2011, and the second phase scheduled for completion and occupancy by the BRAC deadline of September 15, 2011. Meanwhile, the transfer of government and contractor positions from the NCR is well underway. Thus far, MDA has transitioned approximately 2,053 of the planned 2,248 positions to Huntsville/Redstone Arsenal.

MDA continues to fund robust Small Business Innovation Research (SBIR) and Small Business Technology Transfer (STTR) Programs to access the innovative ideas contained in the small business community and leverage those ideas in order to improve the future capabilities of the BMDS. Additionally, MDA has increased its small business subcontracting oversight of its major prime contracts to insure they are maximizing the utilization of small businesses in order to expand the small business industrial base supporting the Agency. This includes emphasis on expanding suppliers at various levels of the supply chain to increase competition and reduce costs as well as improve quality.

There are no significant software related issues with the BMDS at this time.

[1] A&AS support includes engineering and technical services; studies, analyses, and evaluation; and management and professional services.

Threshold Breaches

APB Breaches		
Schedule		☐
Performance		☐
Cost	RDT&E	☐
	Procurement	☐
	MILCON	☐
	Acq O&M	☐
Unit Cost	PAUC	☐
	APUC	☐

Nunn-McCurdy Breaches		
Current UCR Baseline		
	PAUC	None
	APUC	None
Original UCR Baseline		
	PAUC	None
	APUC	None

Schedule

No schedule milestones exist for BMDS.

Memo
For schedule milestones see the Unclassifed Ballistic Missile Defense System (BMDS) Accountability Report (BAR) and BAR Classified Annex dated February 15, 2011.

Performance

Memo
For performance characteristics see the Unclassified Ballistic Missile Defense System (BMDS) Accountability Report (BAR) and BAR Classified Annex dated February 15, 2011.

Track To Budget

RDT&E				
APPN 0400	BA 04	PE 0207998C	(DoD)	
	Project MD36	Base Realignment and Closure (BRAC)		
	Project ZX36	Base Realignment and Closure (BRAC)		
APPN 0400	BA 03	PE 0603175C	(DoD)	
	Project MD25	Advanced Technology		
	Project MD40	Program Wide Support		
	Project WX25	Advanced Technology Development		(Sunk)
	Project ZX40	Program Wide Support		(Sunk)
APPN 0400	BA 03	PE 0603274C	(DoD)	
	Project MD81	Special Programs - MDA Technology		
APPN 0400	BA 04	PE 0603881C	(DoD)	
	Project BX07	Terminal High Altitude Area Defense (THAAD) Block 2.0		(Sunk)
	Project EX07	Terminal High Altitude Area Defense (THAAD) Block 5.0		(Sunk)
	Project MD06	Patriot Advanced Capability-3 (PAC-3)		
	Project MD07	THAAD		
	Project MD40	Program Wide Support		
	Project WX06	Patriot Advanced Capability-3 (PAC-3)		(Sunk)
	Project XX07	Terminal High Altitude Area Defense (THAAD) Sustainment		(Sunk)
	Project ZX40	Program Wide Support		(Sunk)
APPN 0400	BA 04	PE 0603882C	(DoD)	
	Project CX08	Ground Based Midcourse Defense (GMD) Block 3.0		(Sunk)
	Project MD08	Ground Based Midcourse		
	Project MD40	Program Wide Support		

	Project WX08	GM Capability Development		(Sunk)
	Project XX08	Ground Based Midcourse Defense (GMD) Sustainment		(Sunk)
	Project ZX40	Program Wide Support		(Sunk)
APPN 0400	BA 04	PE 0603883C	(DoD)	
	Project WX19	Airborne Laser Capability Development		(Sunk)
	Project ZX40	Program Wide Support		(Sunk)
APPN 0400	BA 04	PE 0603884C	(DoD)	
	Project BX11	Ballistic Missile Defense Radars Block 2.0		(Sunk)
	Project CX11	Ballistic Missile Defense Radars Block 3.0		(Sunk)
	Project EX11	Ballistic Missile Defense Radars Block 5.0		(Sunk)
	Project MD11	BMDS Radars		
	Project MD40	Program Wide Support		
	Project WX11	Ballistic Missile Defense Radars Capability Development		(Sunk)
	Project XX11	Ballistic Missile Defense Radars Sustainment		(Sunk)
	Project ZX40	Program Wide Support		(Sunk)
APPN 0400	BA 04	PE 0603888C	(DoD)	
	Project MD04	Test Program		
	Project MD05	Targets Program		
	Project MD40	Program Wide Support		
	Project MX04	BMD Test & Targets Development Support		
	Project WX04	Test & Evaluation Capability Development		(Sunk)
	Project XX04	Concurrent, Test, Training & Ops (CTTO)		(Sunk)
	Project YX04	Test & Evaluation		(Sunk)
	Project YX05	Targets & Countermeasures Core		(Sunk)
	Project ZX40	Program Wide Support		(Sunk)
APPN 0400	BA 04	PE 0603890C	(DoD)	
	Project MD24	Systems Engineering & Integration		
	Project MD28	Intelligence & Security		

	Project MD29	Producibility and Manufacturing Technology		(Sunk)
	Project MD30	BMD Information Management Systems		
	Project MD31	Modeling & Simulation		
	Project MD32	Quality, Safety, and Mission Assurance		
	Project MD40	Program Wide Support		
	Project YX24	Systems Engineering & Integration		(Sunk)
	Project YX28	Intelligence & Security		(Sunk)
	Project YX29	Producibility and Manufacturing Technology		(Sunk)
	Project YX30	BMD Information Management Systems		(Sunk)
	Project YX31	Modeling & Simulation		(Sunk)
	Project YX32	Quality, Safety, and Mission Assurance		(Sunk)
	Project ZX40	Program Wide Support		(Sunk)
APPN 0400	BA 04	PE 0603891C	(DoD)	
	Project MD27	Special Programs		
	Project WX27	Special Programs		(Sunk)
APPN 0400	BA 04	PE 0603892C	(DoD)	
	Project BX09	Aegis BMD Block 2.0		(Sunk)
	Project BX18	Sea-Based Terminal BMD Block 2.0		(Sunk)
	Project EX09	Aegis BMD Block 5.0		(Sunk)
	Project MD09	Aegis BMD		
	Project MD40	Program Wide Support		
	Project MX09	Aegis BMD Development Support		
	Project WX09	AB Capability Development		(Sunk)
	Project XX09	Aegis BMD Sustainment		(Sunk)
	Project ZX40	Program Wide Support		(Sunk)
APPN 0400	BA 04	PE 0603893C	(DoD)	
	Project MD12	Space Tracking & Surveillance System (STSS)		
	Project MD33	MD Space Exp Center (MDSEC)		
	Project MD40	Program Wide Support		
	Project WX12	Space Tracking & Surveillance		(Sunk)

		System Capability Development (STSS)		
APPN 0400	BA 04	PE 0603895C	(DoD)	
	Project MD33	MD Space Exp Center (MDSEC)		
	Project MD40	Program Wide Support		(Sunk)
	Project WX33	MD Space Exp Center (MDSEC)		(Sunk)
	Project ZX40	Program Wide Support		(Sunk)
APPN 0400	BA 04	PE 0603896C	(DoD)	
	Project BX01	Ballistic Missile Defense C2BMC Block 2.0		(Sunk)
	Project CX01	Ballistic Missile Defense C2BMC Block 3.0		(Sunk)
	Project MD01	Command & Control, Battle Management, Communications (C2BMC)		
	Project MD40	Program Wide Support		
	Project MX01	Command & Control, Battle Management, Communications (C2BMC) Development Support		
	Project WX01	BC Capability Development		(Sunk)
	Project XX01	Command & Control, Battle Management, Communications (C2BMC) Sustainment		(Sunk)
	Project ZX40	Program Wide Support		(Sunk)
APPN 0400	BA 04	PE 0603897C	(DoD)	
	Project WX02	Hercules Capability Development		(Sunk)
	Project ZX40	Program Wide Support		(Sunk)
APPN 0400	BA 04	PE 0603898C	(DoD)	
	Project MD03	Joint Warfighter Support		
	Project MD40	Program Wide Support		
	Project XX03	Joint Warfighter Sustainment		(Sunk)
	Project YX03	Joint Warfighter		(Sunk)
	Project ZX40	Program Wide Support		(Sunk)
APPN 0400	BA 03	PE 0603901C	(DoD)	
	Project MD40	Program Wide Support		

	Project MD69	Directed Energy Research		
APPN 0400	BA 03	PE 0603902C	(DoD)	
	Project MD40	Program-Wide Support		
	Project MD70	Standard Missile-3 Block IIB (SM-3 IIB)		
APPN 0400	BA 04	PE 0603904C	(DoD)	
	Project CX22	Missile Defense Integration & Operations Center - Block 3.0		(Sunk)
	Project MD22	Missile Defense Integration & Operations Center (MDIOC)		
	Project MD40	Program Wide Support		
	Project YX22	Missile Defense Integration & Operations Center (MDIOC) Core		(Sunk)
	Project ZX40	Program Wide Support		(Sunk)
APPN 0400	BA 04	PE 0603906C	(DoD)	
	Project MD35	Regarding Trench		
	Project WX35	Regarding Trench		(Sunk)
APPN 0400	BA 04	PE 0603907C	(DoD)	
	Project MD40	Program Wide Support		
	Project MD46	Sea Based X-Band (SBX) Sustainment		
	Project MX46	Sea Based X-Band Radar Development Support		
	Project XX46	Sea Based X-Band Radar (SBX) Sustainment		(Sunk)
APPN 0400	BA 04	PE 0603911C	(DoD)	
	Project DX48	European Capability Block 4		(Sunk)
APPN 0400	BA 04	PE 0603913C	(DoD)	
	Project MD20	Israeli Upper Tier		
	Project MD26	Israeli ARROW Program		
	Project MD34	Short Range Ballistic Missile Defense (SRBMD)		
	Project WX26	Israeli ARROW Program		(Sunk)
	Project WX34	Short Range Ballistic Missile Defense		(Sunk)

APPN 0400	BA 04	PE 0604880C	(DoD)	
	Project MD40	Program-Wide Support		
	Project MD68	Aegis Ashore		
APPN 0400	BA 04	PE 0604881C	(DoD)	
	Project MD09	SM-3 Block IIA Co-Development		
	Project MD40	Program-Wide Support		
APPN 0400	BA 04	PE 0604883C	(DoD)	
	Project MD10	Precision Tracking Space Sensor (PTSS)		
	Project MD40	Program Wide Support		
APPN 0400	BA 04	PE 0604884C	(DoD)	
	Project MD40	Program-Wide Support		
	Project MD67	Airborne Infrared (ABIR)		
APPN 0400	BA 06	PE 0605502C	(DoD)	
	Project ZX45	Small Business Innovative Research (SBIR)		(Sunk)
APPN 0400	BA 06	PE 0901585C	(DoD)	
	Project MD42	Pentagon Reservation Maintenance Reserve Fund (PRMRF)		(Sunk)
	Project ZX42	Pentagon Reservation Maintenance Reserve Fund (PRMRF)		(Sunk)
APPN 0400	BA 06	PE 0901598C	(DoD)	
	Project MD38	Management Headquarters		
	Project ZX38	Management Headquarters		(Sunk)

Procurement

APPN 0300	BA 01	PE 0208866C	(DoD)	
		THAAD		
		BMDS AN/TPY-2 Radars		

	Aegis Ashore Phase III	
	THAAD Procurement	(Sunk)
	AEGIS BMD	
	BMDS AN/TPY-2 Radars	
	Aegis Block 5 Procurement	(Sunk)

MILCON

APPN 0500 (DoD)

Land Based SM-3 Launch Facility HN1	
Airborne Infrared Facility	
Minor MILCON	
Aegis Ashore (ABA) Test Complex	
UEWR Upgrade, Clear AFS, AK	
Von Braun Complex Phase IV	
Aegis BMD Facility Expansion	

Cost and Funding

Cost Summary

Total Acquisition Cost and Quantity

	BY $M			BY2002 $M	TY $M		
Appropriation	SAR Baseline Plan Est	Current APB Objective/Threshold		Current Estimate	SAR Baseline Plan Est	Current APB Objective	Current Estimate
RDT&E	44740.1	--	--	95234.6	47217.1	--	109803.7
Procurement	0.0	--	--	9592.4	0.0	--	12125.6
Flyaway	0.0	--	--	9592.4	0.0	--	12125.6
Recurring	0.0	--	--	9592.4	0.0	--	12125.6
Non Recurring	0.0	--	--	0.0	0.0	--	0.0
Support	0.0	--	--	0.0	0.0	--	0.0
Other Support	0.0	--	--	0.0	0.0	--	0.0
Initial Spares	0.0	--	--	0.0	0.0	--	0.0
MILCON	0.0	--	--	357.7	0.0	--	433.3
Acq O&M	0.0	--	--	0.0	0.0	--	0.0
Total	44740.1	--	--	105184.7	47217.1	--	122362.6

Quantity	SAR Baseline Plan Est	Current APB	Current Estimate
RDT&E	0	0	0
Procurement	0	0	0
Total	0	0	0

Quantities of key BMDS assets (grouped by appropriation)

Element	Component	# Funded by $RDT&E	# Funded by $Procurement
THAAD	Batteries	2	7
	Interceptors	50	427
Aegis BMD	SM-3 Block I/IA Interceptors	71	42
	SM-3 Block IB Interceptors	34	339
GMD	GBIs	52	0
Sensors	AN/TPY-2 Radars	7	11

Cost and Funding

Funding Summary

Appropriation and Quantity Summary
FY2012 President's Budget / December 2010 SAR (TY$ M)

Appropriation	Prior	FY2011	FY2012	FY2013	FY2014	FY2015	FY2016	To Complete	Total
RDT&E	70550.0	7463.3	6577.1	6602.8	6229.2	6101.9	6279.4	0.0	109803.7
Procurement	1042.3	953.0	1778.7	1769.2	2036.1	2355.2	2191.1	0.0	12125.6
MILCON	201.7	0.0	67.2	109.3	35.3	9.7	10.1	0.0	433.3
Acq O&M	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
PB 2012 Total	71794.0	8416.3	8423.0	8481.3	8300.6	8466.8	8480.6	0.0	122362.6
PB 2011 Total	71793.2	8416.3	8729.6	9237.9	9204.8	9322.1	0.0	0.0	116703.9
Delta	0.8	0.0	-306.6	-756.6	-904.2	-855.3	8480.6	0.0	5658.7

Quantity	Undistributed	Prior	FY2011	FY2012	FY2013	FY2014	FY2015	FY2016	To Complete	Total
Development	0	0	0	0	0	0	0	0	0	0
Production	0	0	0	0	0	0	0	0	0	0
PB 2012 Total	0	0	0	0	0	0	0	0	0	0
PB 2011 Total	0	0	0	0	0	0	0	0	0	0
Delta	0	0	0	0	0	0	0	0	0	0

Cost and Funding

Annual Funding By Appropriation

Annual Funding TY$
0400 | RDT&E | Research, Development, Test, and Evaluation, Defense-Wide

Fiscal Year	Quantity	End Item Recurring Flyaway TY $M	Non End Item Recurring Flyaway TY $M	Non Recurring Flyaway TY $M	Total Flyaway TY $M	Total Support TY $M	Total Program TY $M
2002	--	--	--	--	--	--	6618.8
2003	--	--	--	--	--	--	6446.3
2004	--	--	--	--	--	--	7566.8
2005	--	--	--	--	--	--	8826.7
2006	--	--	--	--	--	--	7690.2
2007	--	--	--	--	--	--	9381.3
2008	--	--	--	--	--	--	8655.3
2009	--	--	--	--	--	--	8407.3
2010	--	--	--	--	--	--	6957.3
2011	--	--	--	--	--	--	7463.3
2012	--	--	--	--	--	--	6577.1
2013	--	--	--	--	--	--	6602.8
2014	--	--	--	--	--	--	6229.2
2015	--	--	--	--	--	--	6101.9
2016	--	--	--	--	--	--	6279.4
Subtotal	**--**	**--**	**--**	**--**	**--**	**--**	**109803.7**

Annual Funding BY$
0400 | RDT&E | Research, Development, Test, and Evaluation, Defense-Wide

Fiscal Year	Quantity	End Item Recurring Flyaway BY 2002 $M	Non End Item Recurring Flyaway BY 2002 $M	Non Recurring Flyaway BY 2002 $M	Total Flyaway BY 2002 $M	Total Support BY 2002 $M	Total Program BY 2002 $M
2002	--	--	--	--	--	--	6567.6
2003	--	--	--	--	--	--	6295.8
2004	--	--	--	--	--	--	7214.0
2005	--	--	--	--	--	--	8158.5
2006	--	--	--	--	--	--	6910.1
2007	--	--	--	--	--	--	8232.1
2008	--	--	--	--	--	--	7457.6
2009	--	--	--	--	--	--	7159.4
2010	--	--	--	--	--	--	5859.8
2011	--	--	--	--	--	--	6199.8
2012	--	--	--	--	--	--	5381.4
2013	--	--	--	--	--	--	5314.6
2014	--	--	--	--	--	--	4930.1
2015	--	--	--	--	--	--	4748.6
2016	--	--	--	--	--	--	4805.2
Subtotal	**--**	**--**	**--**	**--**	**--**	**--**	**95234.6**

Since there is no separate appropriation for Base Realignment and Closure (BRAC), FY 2006 - FY 2011 BRAC is included in the RDT&E appropriation.

Annual Funding TY$
0300 | Procurement | Procurement, Defense-Wide

Fiscal Year	Quantity	End Item Recurring Flyaway TY $M	Non End Item Recurring Flyaway TY $M	Non Recurring Flyaway TY $M	Total Flyaway TY $M	Total Support TY $M	Total Program TY $M
2009	--	--	206.6	--	206.6	--	206.6
2010	--	--	835.7	--	835.7	--	835.7
2011	--	--	953.0	--	953.0	--	953.0
2012	--	--	1778.7	--	1778.7	--	1778.7
2013	--	--	1769.2	--	1769.2	--	1769.2
2014	--	--	2036.1	--	2036.1	--	2036.1
2015	--	--	2355.2	--	2355.2	--	2355.2
2016	--	--	2191.1	--	2191.1	--	2191.1
Subtotal	**--**	**--**	**12125.6**	**--**	**12125.6**	**--**	**12125.6**

Annual Funding BY$
0300 | Procurement | Procurement, Defense-Wide

Fiscal Year	Quantity	End Item Recurring Flyaway BY 2002 $M	Non End Item Recurring Flyaway BY 2002 $M	Non Recurring Flyaway BY 2002 $M	Total Flyaway BY 2002 $M	Total Support BY 2002 $M	Total Program BY 2002 $M
2009	--	--	174.9	--	174.9	--	174.9
2010	--	--	698.9	--	698.9	--	698.9
2011	--	--	785.6	--	785.6	--	785.6
2012	--	--	1443.4	--	1443.4	--	1443.4
2013	--	--	1412.0	--	1412.0	--	1412.0
2014	--	--	1597.8	--	1597.8	--	1597.8
2015	--	--	1817.4	--	1817.4	--	1817.4
2016	--	--	1662.4	--	1662.4	--	1662.4
Subtotal	**--**	**--**	**9592.4**	**--**	**9592.4**	**--**	**9592.4**

Annual Funding TY$
0500 | MILCON | Military Construction, Defense-Wide

Fiscal Year	Total Program TY $M
2002	8.2
2003	24.9
2004	24.4
2005	22.3
2006	4.9
2007	--
2008	--
2009	18.3
2010	98.7
2011	--
2012	67.2
2013	109.3
2014	35.3
2015	9.7
2016	10.1
Subtotal	**433.3**

Annual Funding BY$
0500 | MILCON | Military Construction, Defense-Wide

Fiscal Year	Total Program BY 2002 $M
2002	8.0
2003	23.7
2004	22.6
2005	20.1
2006	4.3
2007	--
2008	--
2009	15.3
2010	81.6
2011	--
2012	53.8
2013	86.0
2014	27.3
2015	7.4
2016	7.6
Subtotal	**357.7**

Low Rate Initial Production

There is no Low Rate Initial Production for this program.

Foreign Military Sales

Country	Date of Sale	Quantity	Total Cost $M	Memo
Japan	3/9/2010	2	20.0	FMS Case JA-P-FON, SM-3 BLK IA Spares and Return, Repair, Re-shipment (RRR). Deliveries: Kinetic Warhead SM-3 Standard (KW); MK72 Rocket Booster Motor.
Japan	12/22/2009	0	7.8	FMS Case JA-P-FPX, Japan Hardware in the Loop (HWIL). Deliveries: no major deliveries.
Japan	9/16/2008	0	21.0	FMS Case JA-P-CAM, Japan Computer Program Test Site JABMD Upgrade. Deliveries: no major deliveries.
Japan	8/13/2008	0	12.0	FMS Case JA-P-FQV, SM-3 BLK IA Spares. Deliveries: no major deliveries.
Japan	7/28/2008	0	59.0	FMS Case JA-P-CAN, JS KIRISHIMA (DDG 174) Firing Event. Deliveries: Execution of Firing Event; no major hardware deliveries. Completed.
Japan	12/26/2007	0	53.0	FMS Case JA-P-CAE, JS MYOKO (DDG 175) Firing Event. Deliveries: Execution of firing event; no major hardware deliveries. Completed.
Japan	11/21/2007	0	2.9	FMS Case JA-P-FLU, Defining the Interface between Japan Aerospace Defense Ground Environment (JADGE) and Japan Aegis BMD. Deliveries: No hardware deliveries. Completed.
Japan	11/12/2007	9	202.0	FMS Case JA-P-LWA, Japan Aegis BMD Block 2004 Upgrade of JS KIRISHIMA (DDG 174). Deliveries: 1 JBMD BLK 04 Computer Program, Peripherals, and SM-3 BLK IA Missiles. Completed. Due to sensitivity from the Customer about the quantity in the past, we used Qty 1. However, since the case is now completed, we now want to recognize the correct number of SM-3 BLK IA Missiles delivered.
Netherlands	8/25/2006	0	6.9	FMS Case NE-P-GLK, Participation in ABMD Test Events and Trade Studies. Deliveries: No hardware deliveries. Additional funding was added to the FMS Case.
Japan	8/1/2006	0	55.0	FMS Case JA-P-BIR, JS CHOKAI (DDG 176) Firing Event. Deliveries: Execution of firing event; no major hardware deliveries. Completed.
Japan	7/27/2006	9	209.6	FMS Case JA-P-LVK, Japan Aegis BMD Block 2004 Upgrade of JS MYOKO (DDG 175). Deliveries: 1 JBMD BLK 04 Computer Program, Peripherals, and SM-3 BLK IA Missiles. Completed. Due to sensitivity from the Customer about the quantity in the past, we used Qty 1. However, since the case in now completed, we now want to recognize the correct number of SM-3 BLK IA Missiles delivered.
Japan	10/1/2005	9	230.0	FMS Case JA-P-LUX, Japan Aegis BMD Block 2004 Upgrade of JS CHOKAI (DDG 176).

				Deliveries: 1 JBMD BLK 04 Computer Program, Peripherals, and SM-3 BLK IA Missiles. Completed. Due to sensitivity from the Customer about the quantify in the past, we used Qty 1. However, since the case is now completed, we now want to recognize the correct number of SM-3 BLK IA Missiles delivered.
Japan	9/1/2005	0	55.0	FMS Case JA-P-BIN, JS KONGO (DDG 173) Firing Event. Deliveries: Execution of Firing Event; no major hardware deliveries. Completed.
Japan	8/1/2004	9	309.0	FMS Case JA-P-LUH, Japan Aegis BMD Block 2004 Upgrade of JS KONGO (DDG 173). Deliveries: 1 JBMD BLK 04 Computer Program, Peripherals, and SM-3 BLK IA Missiles. Completed. Due to sensitivity from the Customer about the quantity in the past, we used Qty 1. However, since the case is now completed, we now want to recognize the correct number of SM-3 BLK IA Missiles delivered.

Nuclear Cost

None.

Unit Cost

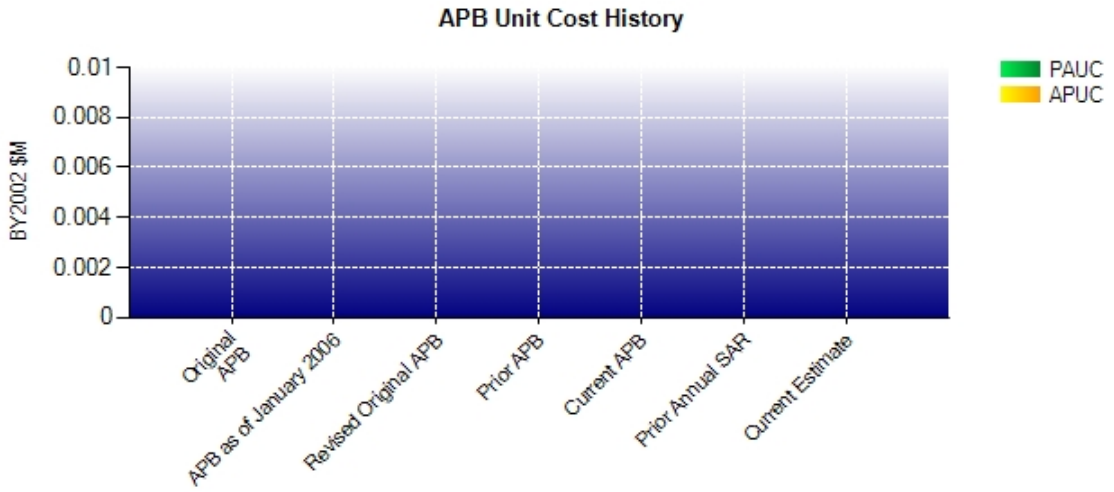
Unit Cost Report

Unit Cost	BY2002 $M Current UCR Baseline	BY2002 $M Current Estimate (DEC 2010 SAR)	BY % Change
Program Acquisition Unit Cost (PAUC)			
Cost	--	105184.7	
Quantity	--	0	
Unit Cost	--	--	--
Average Procurement Unit Cost (APUC)			
Cost	--	9592.4	
Quantity	--	0	
Unit Cost	--	--	--

Unit Cost	BY2002 $M Original UCR Baseline	BY2002 $M Current Estimate (DEC 2010 SAR)	BY % Change
Program Acquisition Unit Cost (PAUC)			
Cost	--	105184.7	
Quantity	--	0	
Unit Cost	--	--	--
Average Procurement Unit Cost (APUC)			
Cost	--	9592.4	
Quantity	--	0	
Unit Cost	--	--	--

For major defense acquisition programs, DoD requires an acquisition program baseline (APB) at program initiation. The APB establishes cost, quantity, schedule, and performance parameters that form the basis for unit cost reporting under 10 U.S.C. Sec. 2433. As a single integrated system of systems, the BMDS does not have an APB. In response to other statutory requirements, however, MDA provides the Congress with an annual BMDS Accountability Report (BAR), which includes schedule, technical, test, operational capacity, resource, and contract baselines that guide development of ballistic missile defense capabilities. The BARs include unit cost baselines for key assets (e.g. GBIs and AN/TPY-2 radars) comprising the BMDS.

Unit Cost History



		BY2002 $M		TY $M	
	Date	PAUC	APUC	PAUC	APUC
Original APB	N/A	N/A	N/A	N/A	N/A
APB as of January 2006	N/A	N/A	N/A	N/A	N/A
Revised Original APB	N/A	N/A	N/A	N/A	N/A
Prior APB	N/A	N/A	N/A	N/A	N/A
Current APB	N/A	N/A	N/A	N/A	N/A
Prior Annual SAR	DEC 2009	N/A	N/A	N/A	N/A
Current Estimate	DEC 2010	N/A	N/A	N/A	N/A

SAR Unit Cost History

Current SAR Baseline to Current Estimate (TY $M)

Initial PAUC Plan Est	Changes								PAUC Current Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Current SAR Baseline to Current Estimate (TY $M)

Initial APUC Plan Est	Changes								APUC Current Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

SAR Baseline History

Item/Event	SAR Planning Estimate (PE)	SAR Development Estimate (DE)	SAR Production Estimate (PdE)	Current Estimate
Milestone A	N/A	N/A	N/A	N/A
Milestone B	N/A	N/A	N/A	N/A
Milestone C	N/A	N/A	N/A	N/A
IOC	N/A	N/A	N/A	N/A
Total Cost (TY $M)	47217.1	N/A	N/A	122362.6
Total Quantity	0	N/A	N/A	0
Prog. Acq. Unit Cost (PAUC)	N/A	N/A	N/A	N/A

Cost Variance

Cost Variance Summary

Summary Then Year $M				
	RDT&E	Proc	MILCON	Total
SAR Baseline (Plan Est)	47217.1	--	--	47217.1
Previous Changes				
Economic	+1152.8	--	-19.7	+1133.1
Quantity	--	--	--	--
Schedule	-1684.3	--	--	-1684.3
Engineering	+49288.4	--	--	+49288.4
Estimating	-3484.2	--	+373.4	-3110.8
Other	--	--	--	--
Support	--	--	--	--
Subtotal	+45272.7	--	+353.7	+45626.4
Current Changes				
Economic	-60.6	-17.5	+0.9	-77.2
Quantity	--	--	--	--
Schedule	--	--	--	--
Engineering	+1399.9	+399.0	--	+1798.9
Estimating	-4606.8	+32.7	+30.5	-4543.6
Other	--	--	--	--
Support	--	--	--	--
Subtotal	-3267.5	+414.2	+31.4	-2821.9
Adjustments	+20581.4	+11711.4	+48.2	+32341.0
Total Changes	+62586.6	+12125.6	+433.3	+75145.5
CE - Cost Variance	109803.7	12125.6	433.3	122362.6
CE - Cost & Funding	109803.7	12125.6	433.3	122362.6

Summary Base Year 2002 $M				
	RDT&E	**Proc**	**MILCON**	**Total**
SAR Baseline (Plan Est)	44740.1	--	--	44740.1
Previous Changes				
Economic	--	--	--	--
Quantity	--	--	--	--
Schedule	-1417.0	--	--	-1417.0
Engineering	+41657.4	--	--	+41657.4
Estimating	-3202.0	--	+296.1	-2905.9
Other	--	--	--	--
Support	--	--	--	--
Subtotal	+37038.4	--	+296.1	+37334.5
Current Changes				
Economic	--	--	--	--
Quantity	--	--	--	--
Schedule	--	--	--	--
Engineering	+1112.4	+315.6	--	+1428.0
Estimating	-3665.7	+31.9	+24.6	-3609.2
Other	--	--	--	--
Support	--	--	--	--
Subtotal	-2553.3	+347.5	+24.6	-2181.2
Adjustments	+16009.4	+9244.9	+37.0	+25291.3
Total Changes	+50494.5	+9592.4	+357.7	+60444.6
CE - Cost Variance	95234.6	9592.4	357.7	105184.7
CE - Cost & Funding	95234.6	9592.4	357.7	105184.7

Previous Estimate: December 2009

Cost Variance Memo

	Then-Year $M				Base-Year $M			
	RDTE	PROC	MILCON	TOTAL	RDTE	PROC	MILCON	TOTAL
Dec 09 SAR Adjustments	14302.0	9520.3	38.1	23860.4	11204.2	7582.5	29.4	18816.1
Dec 10 SAR Adjustments	6279.4	2191.1	10.1	8480.6	4805.2	1662.4	7.6	6475.2
Total Adjustments	20581.4	11711.4	48.2	32341.0	16009.4	9244.9	37.0	25291.3

The December 2010 SAR adjustments above reflect the addition of the FY 2016 funding for RDT&E, Procurement, and MILCON; previous reports limited total funding through FY 2015.

RDT&E	$M	
Current Change Explanations	**Base Year**	**Then Year**
Revised escalation indices. (Economic)	N/A	-60.6
Adjustment for current and prior escalation. (Estimating)	+7.7	+8.7
Transferred Aegis Ashore Phase III from RDT&E to Procurement (Estimating)	-164.6	-211.5
Special Programs Adjustments classified (Estimating)	+206.2	+252.9
Revised Integrated Master Test Plan (IMTP 10.2) (Estimating)	+341.8	+427.3
Transferred Terminal High Altitude Area Defense (THAAD) content to Procurement and O&M (Estimating)	-131.5	-169.2
Navy transfer to complete acceleration of Aegis BMD ship conversion (Estimating)	+6.1	+7.5
Efficiency Task Force and Secretary of Defense reductions (Estimating)	-2327.3	-2926.8
Realigned funding for operation and maintenance of AN/TPY-2 radars from RDT&E to O&M (Estimating)	-569.5	-715.4
AN/TPY-2 #8 accelerated and transferred to Procurement (Estimating)	-160.9	-191.1
Adjustments to realign to higher priorities (Estimating)	-873.7	-1089.2
Added new SM-3 Block IIB development effort (Engineering)	+1121.9	+1412.9
Transferred to National Geospatial-Intelligence Agency (NGA) for implementing 6 capability levels identified by the Joint Overhead Persistent Infrared (OPIR) Ground Study (Engineering)	-52.9	-67.0
Added East Coast Comm Terminal (Engineering)	+43.4	+54.0
RDT&E Subtotal	-2553.3	-3267.5

Procurement	$M	
Current Change Explanations	**Base Year**	**Then Year**
Revised escalation indices. (Economic)	N/A	-17.5
Adjustment for current and prior escalation. (Estimating)	+1.1	+1.3
Realigned THAAD and Aegis from RDT&E (Estimating)	+111.1	+143.3
Transferred Aegis Ashore Phase III from RDT&E to Procurement (Estimating)	+163.2	+211.5
Accelerated AN/TPY-2 radars resulting in revised cost estimates (Estimating)	-169.8	-228.2
Efficiency Task Force and Secretary of Defense reductions (Estimating)	-61.8	-80.0
Non Pay, Non-fuel Purchase inflation (Estimating)	-11.9	-15.2
Added two (2) additional AN/TPY-2 radars through 2015 (Engineering)	+315.6	+399.0
Procurement Subtotal	+347.5	+414.2

MILCON	$M	
Current Change Explanations	**Base Year**	**Then Year**
Revised escalation indices. (Economic)	N/A	+0.9
Adjustment for current and prior escalation. (Estimating)	-0.3	-0.3
Added Von Braun IV construction (Estimating)	+48.0	+60.0
Clear Early Warning Radar upgrade (Estimating)	+13.0	+16.5
Refined estimates for Aegis Ashore Test Facility (PMRF) and Aegis Ashore Batteries (Estimating)	-34.4	-43.6
Revised cost estimates and other adjustments (Estimating)	-1.7	-2.1
MILCON Subtotal	+24.6	+31.4

Contracts

General Contract Memo

The C2BMC program will transition from the current Other Transaction Agreement (OTA) to a Federal Acquisition Regulation (FAR) based contract in the 1Q FY 2012. Efforts are underway within the program office to develop a task order based contract for Spiral 6.4 operations and sustainment (O&S) and completion of Spiral 8.2 development/test/fielding. This contract is planned as a sole source acquisition and will posture the program to award follow-on (post 8.2) spiral development/test/fielding utilizing full and open competition.

Appropriation: RDT&E

Contract Name	**STSS**
Contractor	Northrop Grumman
Contractor Location	Redondo Beach, CA 90278
Contract Number, Type	F04701-02-C-0009, CPAF/CPFF
Award Date	April 18, 2002
Definitization Date	August 16, 2002

Initial Contract Price ($M)			Current Contract Price ($M)			Estimated Price At Completion ($M)	
Target	Ceiling	Qty	Target	Ceiling	Qty	Contractor	Program Manager
868.7	N/A	N/A	1090.7	N/A	N/A	1376.7	1348.7

Variance	Cost Variance	Schedule Variance
Cumulative Variances To Date	-460.2	-4.8
Previous Cumulative Variances	-256.5	-15.6
Net Change	-203.7	+10.8

Cost And Schedule Variance Explanations

Cost Variance: The unfavorable variance is driven by troubleshoot/repair/re-work/re-test of hardware anomalies (Spacecraft Ground Link System (SGLS) units, Spacecraft Control Processor (SCP), additional manpower during Integration & Test (I&T) to support procedure development, Payload (PL) Integration, and unforeseen issues during Spaced Vehicle (SV) Testing, and to perform launch site activities). Since the September 2009 launch, the Cost Variance has grown as a result of additional manpower to resolve post-launch anomalies, complete Early On-Orbit Testing (EOT), and unplanned software builds.

Schedule Variance: A favorable improvement of schedule variance was observed due to the program recovering from earlier delays in Payload Integration and Space Vehicle Thermal Vacuum testing. In addition, the completion of launch in CY09 and completion of Early On-orbit Testing (EOT) in CY10 allowed for significant earned value accomplishment. Finally, settlement of the Software Upgrades CLIN 12 in December 2010 also relieved artificial schedule variance caused by earlier funding reductions.

The Cost Variance Net Change value reflects a three-year reporting gap. This contract was first reported in the 2007 BMDS SAR and was not considered one of the six largest contracts for SAR reporting requirements until 2010.

Contract Comments

The Current Contract Price increase from the Initial Contract Price is driven by several in scope changes including the definitization of the STSS Demonstrators re-plan in FY 2007 and addition of STSS Demos Software Upgrade (SDSU) in FY 2007. However, the Contract Price decreased in CY 2011 due to the $51M de-scope of SDSU.

The program office established an Undefinitized Contract Action (UCA) on October 1, 2010. The current baseline for the UCA is a NTE of $46M for six months, through March 2011. The program office plans to definitize the new O&S Contract Line Item Number (CLIN) structure to extend the contract an additional three years by April 2011 with an Integrated Baseline Review (IBR) to be performed in the summer of 2011. The proposed contract extension price is $156.7M.

This contract is more than 90% complete and will no longer be reported.

Appropriation: RDT&E

Contract Name	**Targets and Countermeasures Prime Contract**
Contractor	Lockheed Martin Corporation Space Systems Company
Contractor Location	Huntsville, AL 35806
Contract Number, Type	HQ0006-04-D-0006, CPAF
Award Date	December 09, 2003
Definitization Date	April 19, 2004

Initial Contract Price ($M)			Current Contract Price ($M)			Estimated Price At Completion ($M)	
Target	Ceiling	Qty	Target	Ceiling	Qty	Contractor	Program Manager
210.7	N/A	N/A	1905.0	N/A	N/A	1964.5	1974.9

Variance	Cost Variance	Schedule Variance
Cumulative Variances To Date	-54.1	-6.9
Previous Cumulative Variances	--	--
Net Change	-54.1	-6.9

Cost And Schedule Variance Explanations

Cost Variance: The unfavorable cumulative cost variance of -$54.1M is attributed primarily to Delivery Order #8 - Flexible Target Family (FTF) due to technical challenges for the Avionics Control Module (ACM) component production, the associated software modifications required, and increased cost of materials and labor. The labor costs increased due to application of additional manpower to resolve technical issues with the Avionics Control Module and attempt to maintain schedule.

Schedule Variance: The unfavorable cumulative schedule variance of -$6.9M is attributed primarily to Delivery Order #22 Targets and Countermeasures Hardware, which, in turn, depended on delivery of several components for Flight Test Ground-Based Interceptor (FTG)-06A and Flight Test Standard Missile (FTM)-15 targets. All components are expected to be delivered in time for Lockheed Martin Space System Company (LMSSC) to deliver targets on time to meet mission dates.

Contract Comments

In 2010, the total Prime Contract value increased by $547.1 million.

Contractual modifications totaled $547.1 million on the following delivery orders: Delivery Order #12 Medium Range Targets, added the additional scope for changing the Best Estimated Test Date to 4th quarter 2011 ($11.9M); Delivery Order #20 Foreign Military Assets, added three additional target preparation and launch missions ($9.4M); Delivery Order #22 Target and Countermeasures Hardware, added the integration and mission tailoring required for FTG-06A and FTM-15 and added the non recurring engineering and production cost for five extended Medium Range Ballistic Missile targets ($455.3M); Delivery Order #23 Sustainment of Courtland Facility, added the effort to sustain the Courtland facility for FY 10 ($39.1M); Delivery Order #24 Mission Support, added mission support activities for FTG-06A, FTG-08 and FTM-15 and other engineering studies ($16.2M); and Delivery Order #25 (Launch Operations) which segregated mission test costs from hardware costs (Delivery Order #22), specifically FTG-06 and FTG-06A ($15.1M).

Each Delivery Order is awarded and then definitized as we progress with adding work to the contract.

This is the first time this contract is being reported.

Appropriation: RDT&E

Contract Name	**THAAD Fire Unit Fielding**
Contractor	Lockheed Martin Space Systems Company, Missiles & Space Operations
Contractor Location	Sunnyvale, CA 94085
Contract Number, Type	HQ0147-07-C-0196, CPIF/CPFF/FFP
Award Date	December 22, 2006
Definitization Date	December 22, 2006

Initial Contract Price ($M)			Current Contract Price ($M)			Estimated Price At Completion ($M)	
Target	Ceiling	Qty	Target	Ceiling	Qty	Contractor	Program Manager
619.2	N/A	N/A	867.2	N/A	N/A	891.6	891.6

Variance	Cost Variance	Schedule Variance
Cumulative Variances To Date	+0.5	+0.9
Previous Cumulative Variances	--	--
Net Change	+0.5	+0.9

Cost And Schedule Variance Explanations

Cost Variance: The favorable Cum Cost Variance of $0.5M which was spread among most of the components is primarily due to a slow start up on Fire Unit Fielding (FUF) LOE Activities. The favorable cost variance burn down during this last year was primarily caused by the Missile and Launcher components. Missile's degradation of favorable cost performance during the last several quarters was due to the Optical Block Redesign, unplanned rework of Flight Safety Assembly's (FSAs) and Flight Termination Assembly's (FTAs), Heat Shield redesign, canister design changes, and mission Computer refurbishment due to identification of used flash memory. Launcher's degradation of favorable cost performance during the last several quarters was due to Camden Inter Work Transfer Authorizations (IWTA) which had delays in delivery, testing and Acceptance Test Procedure (ATP) of Launchers 10 and 11 causing extended hardware engineering support. Charges are continuing with no corresponding budget until all Launchers are DD250'd.

Schedule Variance: The favorable cumulative Schedule Variance of $0.9M was primarily due to transfer of excess Development Contract hardware to the FUF Contract. The favorable Schedule Variance burndown during the last several quarters was due to missile components delayed interceptor build activity at Troy which is driven by multiple supplier hardware issues, primarily driven by the Flight Safety Assembly (FSA) Laser Firing Unit (LFU) deliveries. These have delayed Troy assembly efforts at various stages for interceptor vehicles.

Contract Comments

Contract Price: The $248.0M increase to Initial Contract Price was primarily driven by addition of long lead and lifetime buys for parts obsolescence on procurement appropriated funds. In addition, an equitable adjustment to contract price for increased contract scope to address design changes.

This is the first time the Fire Unit Fielding Contract has been reported.

This contract is more than 93% complete and will no longer be reported.

Appropriation: RDT&E

Contract Name	**Ground Based-Midcourse Defense Program**
Contractor	Boeing, Co. Missile Defense Systems
Contractor Location	Huntsville, AL 35806
Contract Number, Type	HQ0147-09-C-0008, CPFF/CPAF
Award Date	December 30, 2008
Definitization Date	June 25, 2009

Initial Contract Price ($M)			Current Contract Price ($M)			Estimated Price At Completion ($M)	
Target	Ceiling	Qty	Target	Ceiling	Qty	Contractor	Program Manager
397.8	N/A	N/A	1480.0	N/A	N/A	1480.0	1443.0

Variance	Cost Variance	Schedule Variance
Cumulative Variances To Date	+43.6	-10.8
Previous Cumulative Variances	--	--
Net Change	+43.6	-10.8

Cost And Schedule Variance Explanations

Cost Variance: The favorable cumulative $43.6M cost variance was driven primarily by underruns in Level of Effort (LOE) activities. The Prime Contractor incorporated lean initiatives and experienced favorable results. Also, Boeing and their subcontractors all experienced favorable year-end overhead rate adjustments.

Schedule Variance: Drivers of the unfavorable cumulative $10.8M schedule variance include the replan of Ground-based Midcourse Defense Simulation (GMDSIM) 2.2 (Software) Formal Qualification Test, Ground Based Interceptor 21R upgrade slip, material orders for labs; Missile Support System Lab (MSSL), Prime Consolidated Integration Lab 2 (PCIL 2) and Test Information Analysis Center (TIAC), slips in Flight Test Ground-Based Interceptor (FTG)-06A post flight analysis, delayed activity based on changing program requirements, and delayed 10V chamber 10.1 test execution.

Contract Comments

Letter Contract -0008 was awarded December 30, 2008, at a not-to-exceed (NTE) cost of $397.8M for performance through June 30, 2009. Mod P00004 dated June 25, 2009, definitized the NTE at $325.3M and extended performance through July 31, 2009. An undefinitized change order was issued on August 7, 2009, to extend performance through January 31, 2010, at an NTE value of $310.1M. On September 4, 2009, a proposal was requested from Boeing for the extension January 31, 2010, plus an additional extension through January 31, 2012. A total contract value of $1,422.4M was awarded March 10, 2010, under Mod P00032 for extended performance through December 31, 2011. Issuance of Task Instructions and other contract actions have increased the current contract value to $1,480.0M. The current ongoing contract action is the Boeing 0008 Not Less Than (NLT) Proposal. The NLT estimate received January 24, 2011, is currently being reviewed. The NLT proposal is currently due March 28, 2011. Negotiations are planned to complete in May 31, 2011, with award planned for June 30, 2011.

This is the first time this contract is being reported.

Appropriation: RDT&E

Contract Name	**SM-3 Technology Development of Block IA/IB Missiles**
Contractor	Raytheon Missile Systems
Contractor Location	Tuscon, AZ 85706
Contract Number, Type	HQ0276-08-C-0001, CPAF
Award Date	December 31, 2007
Definitization Date	December 31, 2007

Initial Contract Price ($M)			Current Contract Price ($M)			Estimated Price At Completion ($M)	
Target	Ceiling	Qty	Target	Ceiling	Qty	Contractor	Program Manager
656.0	N/A	N/A	839.0	N/A	N/A	832.0	832.0

Variance	Cost Variance	Schedule Variance
Cumulative Variances To Date	-94.0	-28.0
Previous Cumulative Variances	--	--
Net Change	-94.0	-28.0

Cost And Schedule Variance Explanations

Cost Variance: The unfavorable cumulative -$94M cost variance was primarily driven by cost growth at the subcontract Aerojet plant. Aerojet is developing the Throttleable Divert Attitude Control System (TDACS). The TDACS development effort has taken more time and engineering support than planned. Also contributing to the unfavorable variance is the Boeing Avionics Assembly (AA's) development effort, System Test Equipment (STE) and Computer in the Loop (CIL). More effort than planned was also required for AA Design Reviews and TDACS Demonstration Unit-3 (TDU-3).

Schedule Variance: The unfavorable cumulative $-28M schedule variance delays were driven primarily by the TDU-3 test delay, and STE delivery delays. Late production level drawings and Boeing AA late CIL functionality also contributed to the behind schedule condition.

Contract Comments

The contract price increased in value from $656M to $839M at direction from Director, Missile Defense Agency, to increase the ceiling and extend the effort to support complexity issues with Throttleable Divert Attitude Control System (TDACS) development. Current contract ended February 28, 2011. Expected follow-on effort to be issued in early March 2011.

This is the first time this contract is being reported.

Appropriation: RDT&E

Contract Name	**SM-3 Technology Development of Production Missiles**
Contractor	Ratheyon Missile Systems
Contractor Location	Tuscon, AZ 85706
Contract Number, Type	N00024-07-C-6119, CPIF
Award Date	May 14, 2007
Definitization Date	May 14, 2007

Initial Contract Price ($M)			Current Contract Price ($M)			Estimated Price At Completion ($M)	
Target	Ceiling	Qty	Target	Ceiling	Qty	Contractor	Program Manager
146.9	N/A	N/A	998.3	N/A	N/A	990.3	998.3

Variance	Cost Variance	Schedule Variance
Cumulative Variances To Date	+7.0	-2.0
Previous Cumulative Variances	--	--
Net Change	+7.0	-2.0

Cost And Schedule Variance Explanations

Cost Variance: The favorable cumulative cost variances $7M for the Contract Line Item Number (CLIN) 1 Missile Production effort. The positive variance is driven primarily by efficiencies at Raytheon Missile Systems with the Block 1A missiles. The last few CLINs of 1As have cost less than planned. This trend continues as Program Planning and Control cost requirements decline, as well as vendor cost reductions as they experience learning curve efficiencies.

Schedule Variance: The unfavorable cumulative schedule variance is -$2M for the CLIN 1 Missile Production effort. The behind schedule condition is representative of the delays on Booster delivery from Aerojet (major subcontractor), and delays in delivery of Thrust Vector Assembly's (TVA's) within the first stage-booster due to issues with test equipment. Delays experienced did not affect the program missile delivery schedule. Raytheon's cost and schedule trends were reported against an accelerated baseline. Although the resulting SV is unfavorable in this reporting period, Raytheon delivered all CLIN 1 missiles ahead of schedule.

Contract Comments

CLIN 1 is complete with all missiles delivered under cost and ahead of schedule. CLIN 3 is now in progress delivering the next group of IA missiles. Initial Contract Price Target of $146.9m was for CLIN 1 only; Current Contract Price Target of $998.3m represents procurement through CLIN 4.

This is the first time this contract is being reported.

Deliveries and Expenditures

Deliveries To Date	Plan To Date	Actual To Date	Total Quantity	Percent Delivered
Development	0	0	0	--
Production	0	0	0	--
Total Program Quantities Delivered	0	0	0	--

Expenditures and Appropriations (TY $M)			
Total Acquisition Cost	122362.6	Years Appropriated	10
Expenditures To Date	62423.2	Percent Years Appropriated	66.67%
Percent Expended	51.01%	Appropriated to Date	80210.3
Total Funding Years	15	Percent Appropriated	65.55%

Operating and Support Cost

There are no Operating & Support Costs data to display.