



Selected Acquisition Report (SAR)

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



Ballistic Missile Defense System (BMDS)

As of FY 2017 President's Budget

Defense Acquisition Management
Information Retrieval
(DAMIR)

Table of Contents

Common Acronyms and Abbreviations for MDAP Programs	3
Program Information	5
Responsible Office	5
References	5
Mission and Description	6
Executive Summary	7
Threshold Breaches	10
Schedule	11
Performance	12
Track to Budget	13
Cost and Funding	19
Low Rate Initial Production	28
Foreign Military Sales	29
Nuclear Costs	31
Unit Cost	32
Cost Variance	35
Contracts	39
Deliveries and Expenditures	49
Operating and Support Cost	50

Common Acronyms and Abbreviations for MDAP Programs

Acq O&M - Acquisition-Related Operations and Maintenance
ACAT - Acquisition Category
ADM - Acquisition Decision Memorandum
APB - Acquisition Program Baseline
APPN - Appropriation
APUC - Average Procurement Unit Cost
\$B - Billions of Dollars
BA - Budget Authority/Budget Activity
Blk - Block
BY - Base Year
CAPE - Cost Assessment and Program Evaluation
CARD - Cost Analysis Requirements Description
CDD - Capability Development Document
CLIN - Contract Line Item Number
CPD - Capability Production Document
CY - Calendar Year
DAB - Defense Acquisition Board
DAE - Defense Acquisition Executive
DAMIR - Defense Acquisition Management Information Retrieval
DoD - Department of Defense
DSN - Defense Switched Network
EMD - Engineering and Manufacturing Development
EVM - Earned Value Management
FOC - Full Operational Capability
FMS - Foreign Military Sales
FRP - Full Rate Production
FY - Fiscal Year
FYDP - Future Years Defense Program
ICE - Independent Cost Estimate
IOC - Initial Operational Capability
Inc - Increment
JROC - Joint Requirements Oversight Council
\$K - Thousands of Dollars
KPP - Key Performance Parameter
LRIP - Low Rate Initial Production
\$M - Millions of Dollars
MDA - Milestone Decision Authority
MDAP - Major Defense Acquisition Program
MILCON - Military Construction
N/A - Not Applicable
O&M - Operations and Maintenance
ORD - Operational Requirements Document
OSD - Office of the Secretary of Defense
O&S - Operating and Support
PAUC - Program Acquisition Unit Cost

PB - President's Budget
PE - Program Element
PEO - Program Executive Officer
PM - Program Manager
POE - Program Office Estimate
RDT&E - Research, Development, Test, and Evaluation
SAR - Selected Acquisition Report
SCP - Service Cost Position
TBD - To Be Determined
TY - Then Year
UCR - Unit Cost Reporting
U.S. - United States
USD(AT&L) - Under Secretary of Defense (Acquisition, Technology and Logistics)

Program Information

Program Name

Ballistic Missile Defense System (BMDS)

DoD Component

DoD

Responsible Office

VADM James D. Syring
Missile Defense Agency (MDA)
5700 18th Street
Fort Belvoir, VA 22060-5573

james.syring@mda.mil

Phone: 571-231-8006

Fax: 571-231-8090

DSN Phone: 289-8006

DSN Fax: 289-8090

Date Assigned: November 19, 2012

References

SAR Baseline (Planning Estimate)

National Security Presidential Directive (NSPD) - 23 dated December 16, 2002 (rescinded by Presidential Policy Directive (PPD) - 10) and PPD-10 dated July 26, 2011

Mission and Description

Mission and Description

To develop, test, and field a layered Ballistic Missile Defense System (BMDS) to defend the United States (U.S.), its deployed forces, allies, and friends from ballistic missile attacks of all ranges and in all phases of flight.

Following guidance from the President, the Secretary of Defense approved the Ballistic Missile Defense (BMD) Review Report (dated February 2010), which established the following policy priorities to frame missile defense development and acquisition program strategies:

1. The U.S. will continue to defend the homeland against the threat of limited ballistic missile attack.
2. The U.S. will defend against regional missile threats to U.S. forces, while protecting allies and partners and enabling them to defend themselves.
3. Before new capabilities are deployed, they must undergo testing that enables assessment under realistic operational conditions.
4. The commitment to new capabilities must be fiscally sustainable over the long term.
5. U.S. BMD capabilities must be flexible enough to adapt as threats change.
6. The U.S. will seek to lead expanded international efforts for missile defense.

Executive Summary

Introduction

The Missile Defense Agency (MDA) is committed to protecting the homeland, deployed forces, and international partners and friends from the expanding threat of ballistic missiles. Improvements in sensors, fire control, battle management, and interceptors have enabled our continued development and deployment of an increasingly integrated, layered, and affordable Ballistic Missile Defense System (BMDS) to counter threats expected over the near and far terms. MDA had many significant achievements in 2015.

Homeland Defense and Regional Defense

MDA continued to develop the Ground-based Midcourse Defense (GMD) system to enhance our capability against Intercontinental Ballistic Missiles. We are currently sustaining 30 operational Ground Based Interceptors (GBIs) to protect the U.S. against a limited attack from North Korea and Iran, while continuing to enhance booster, kill vehicle, and infrastructure capabilities and reliability. We initiated development of the redesigned Exo-atmospheric Kill Vehicle that is operationally effective, reliable, producible, cost-effective, maintainable, testable and addresses the evolving threat, better utilizes off-board sensor data, and provides hit/kill assessment messages.

MDA completed the In-Flight Interceptor Communication System Data Terminal in New York that enables GBI communication over longer distances for improved defense of the eastern U.S. We progressed toward the 2016 release of the draft Environmental Impact Statement for a potential east coast GBI site; however, the Department of Defense has not made a deployment decision. We are on track to build out homeland defenses to 44 GBIs in 2017.

MDA continued to support operations and deliver upgrades for homeland defense sensors, including the Sea-Based X-band radar, Upgraded Early Warning Radars, and Cobra Dane. We delivered Discrimination Improvement for Homeland Defense (DIHD) upgrades for Cobra Dane and the Aegis Weapon System, representing the first deployments of several time-phased DIHD deliveries. We began development of the Long Range Discrimination Radar (LRDR) and initiated the environmental assessment required to start LRDR site construction at Clear Air Force Station, Alaska in Summer 2016.

Deployment of regional ballistic missile defenses to protect our deployed forces, allies, and international partners remains one of our top priorities. Working with the U.S. Navy and our Romanian partners, MDA completed the technical capability declaration for European Phased Adaptive Approach (EPAA) Phase II which included the Aegis Ashore Missile Defense System (AAMDS) in Deveselu, Romania. The AAMDS provides Launch on Remote capability using Standard Missile-3 (SM-3) Block IB missiles, Aegis Weapon System, Army Navy/Surface Radar Surveillance - Model 1 radar (AN/SPY-1), Army Navy/Transportable Radar Surveillance - Model 2 (AN/TPY-2) forward based radar, and Command and Control, Battle Management, and Communications (C2BMC). AAMDS significantly increases coverage for defense of southern and central Europe against short- and medium-range ballistic missiles. We also fielded Cross-Area of Responsibility C2BMC capability to U.S. European Command and U.S. Central Command, allowing each to benefit from the other's Ballistic Missile Defense (BMD) assets.

MDA increased Naval BMD capability providing three new Aegis BMD Weapon System installations (increasing the total BMD fleet to 33 ships), and delivering eight additional SM-3 Block IA missiles and 20 additional SM-3 Block IB missiles to the Navy. We delivered 12 additional Terminal High Altitude Area Defense (THAAD) interceptors, ground equipment for a fifth THAAD Battery, and equipment for the Army's Institutional Training Base, while continuing to support the Army's THAAD Battery defending Guam. We continued to sustain six AN/TPY-2 radars in support of U.S. Pacific Command, U.S. European Command, and U.S. Central Command, as well as those not deployed or used for testing.

Rigorous Testing

In 2015, MDA proved the power of BMD by conducting fourteen successful flight tests of which we participated in six flight tests with international partners. The tests included many firsts with summary of highlights provided below:

The AAMDS Test Complex successfully engaged and intercepted a medium-range ballistic missile target using a SM-3 Block IB Threat Upgrade missile. This was the first intercept of a live target using AAMDS, and this operational test demonstrated that the same Aegis BMD capability that is fielded at sea is ready to be employed ashore as part of EPAA Phase II capability in Romania.

An operationally realistic test of Aegis BMD and THAAD demonstrated layered defense capabilities with THAAD intercepting two ballistic missile targets. In a concurrent test operation, Aegis BMD intercepted an anti-air warfare target.

Multi-Mission Warfare Events 1 through 4 demonstrated successful intercepts of two short-range ballistic missiles and two cruise missile targets by a destroyer, configured with Aegis Baseline 9.C1, and using SM-6 Dual I and SM-2 Block IV missiles. Event 1 was the first live fire of the SM-6 Dual I missile.

Two Aegis BMD 4.0.2 Weapon System configured destroyers used automated coordination to determine the preferred shooter, and simulated SM-3 Block IB missile engagements of a raid of three short-range ballistic missile targets.

MDA, U.S. Navy, and Japan Ministry of Defense executed two interceptor-only flight tests of the SM-3 Block IIA missile.

MDA and the Israel Missile Defense Organization (IMDO) conducted two series of flight tests of the David's Sling Weapon System, where threat representative targets were successfully intercepted. MDA and the IMDO also successfully conducted the first intercept of a ballistic missile target with the Arrow-3 interceptor.

MDA and the Maritime Theater Missile Defense Forum successfully conducted simultaneous engagements of a ballistic missile target and an anti-ship cruise missile target; the first demonstration of this capability in the European theater.

MDA executed seven system-level ground tests and participated in over 30 multi-event exercises and wargames.

MDA enhanced BMDS cyber security and was rated Excellent during a U.S. Cyber Command Readiness Inspection.

BMD Technology Initiatives

MDA continued to advance BMD technology to meet the future challenges of the evolving worldwide ballistic missile threat. We are developing Multi-Object Kill Vehicle (MOKV) concepts to engage expanding and increasingly complex threats by establishing the technology foundation to kill multiple lethal objects from a single GBI. Based on three contractor defined concepts, we will target investments to reduce MOKV development risk and improve performance.

MDA continued advancement of high-energy lasers for multiple BMD applications and development of Unmanned Aircraft System-based advanced sensors. MDA completed separate studies with five Industry partners to examine concepts for an airborne Low Power Laser Demonstrator.

We also continued to make advancements in components and processes to improve reliability of our existing interceptor fleet. We are developing a domestic source composite nosecone for Arrow-3 and SM-3 missiles, radiation hardened electro-optical components for kill vehicles, and tungsten-based non-eroding nozzles for propulsion systems to improve interceptor performance and reliability.

International Cooperation

In addition to the EPAA Phase II achievements and flight tests with international partners, MDA participated in missile defense-related projects and studies with over 20 countries and NATO partners.

In the Middle East, MDA delivered the first of two THAAD Batteries to the United Arab Emirates, including the AN/TPY-2 radar and 24 interceptors. Prior to delivery, we successfully executed end-to-end tracking of a ballistic missile target with this first export-configured THAAD Battery. We continued engagement with other Gulf Cooperation Council (GCC) countries on requests for THAAD Batteries and AN/TPY-2 radars as they consider potential acquisitions. We began formulating a proposed approach to the GCC request for a potential integrated Ballistic Missile Early Warning System.

In Israel, MDA continued work under existing agreements for the Arrow Weapon Systems, David's Sling, the Upper Tier

Interceptor programs, Iron Dome, and to facilitate interoperability with the U.S. BMDS.

In Europe, MDA continued to collaborate closely with Poland as we progress toward EPAA Phase III delivery in 2018.

In the Asia-Pacific region, MDA continued to seek opportunities to expand established relationships with Australia, Japan, and Republic of Korea. We continued cooperative development with Japan on the SM-3 Block IIA Program.

General

Program funding and production quantities listed in this SAR are consistent with the FY 2017 PB.

There are no significant software-related issues with this program at this time.

Threshold Breaches

APB Breaches

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

Nunn-McCurdy Breaches

Current UCR Baseline		
	PAUC	None
	APUC	None
Original UCR Baseline		
	PAUC	None
	APUC	None

Schedule

No schedule events exist for BMDS.

Notes

For schedule milestones see the Unclassified BMDS Accountability Report (BAR) and BAR Classified Annex dated February 29, 2016.

Performance

No performance characteristics exist for BMDS.

Notes

For performance characteristics see the Unclassified BMDS Accountability Report (BAR) and BAR Classified Annex dated February 29, 2016.

Track to Budget

General Notes

Reflects the latest budget structure for PB 2017.

RDT&E

Appn	BA	PE
Defense-Wide	0400	04 0305103C
	Project	Name
	MDCS	Cyber Security Initiative
Defense-Wide	0400	03 0603176C
	Project	Name
	MD40	Program-Wide Support
	MD71	Advanced Concepts and Performance Assessments
Defense-Wide	0400	03 0603177C
	Project	Name
	MC95	Cyber Operations
	MD40	Program-Wide Support
	MD95	Discrimination Sensor Technology
	MT95	Discrimination Sensor Tech-Flight Test Execution
Defense-Wide	0400	03 0603178C
	Project	Name
	MD40	Program-Wide Support
	MD69	Directed Energy Research
	MD72	Interceptor Technology
Defense-Wide	0400	03 0603179C
	Project	Name
	MD40	Program Wide Support
	MD73	Advanced C4ISR
Defense-Wide	0400	03 0603180C
	Project	Name
	MD25	Advanced Technology Development
	MD40	Program-Wide Support
Defense-Wide	0400	03 0603274C
	Project	Name
	MD81	Special Programs - MDA Technology
Defense-Wide	0400	03 0603294C
	Project	Name
	MD40	Program-Wide Support
	MD85	Common Kill Vehicle Technology
Defense-Wide	0400	04 0603881C

			Project	Name
			MC07	Cyber Program
			MD06	Patriot Advanced Capability-3 (PAC-3)
			MD07	THAAD
			MD40	Program Wide Support
Defense-Wide	0400	04	0603882C	
			Project	Name
			MC08	Cyber Operations
			MD08	Ground Based Midcourse
			MD40	Program Wide Support
Defense-Wide	0400	04	0603884C	
			Project	Name
			MC11	Cyber Program
			MD11	BMDs Radars
			MD40	Program Wide Support
Defense-Wide	0400	04	0603890C	
			Project	Name
			MC30	Cyber Operations
			MC31	M&S Cyber Operations
			MD24	System Engineering & Integration
			MD28	Intelligence & Security
			MD30	BMD Information Management Systems
			MD31	Modeling & Simulation
			MD32	Quality, Safety, and Mission Assurance
			MD40	Program Wide Support
			MT23	Enabling - Test
Defense-Wide	0400	04	0603891C	
			Project	Name
			MD27	Special Programs
Defense-Wide	0400	04	0603892C	
			Project	Name
			MC09	Cyber Operations
			MD09	Aegis BMD
			MD40	Program Wide Support
			MX09	Aegis BMD Development Support
Defense-Wide	0400	04	0603893C	
			Project	Name
			MD12	Space Tracking & Surveillance System (STSS)
			MD40	Program Wide Support
Defense-Wide	0400	04	0603895C	
			Project	Name
			MD33	MD Space Exp Center (MDSEC)
			MD40	Program Wide Support
Defense-Wide	0400	04	0603896C	
			Project	Name

	MC01		Cyber Operations
	MD01		Command & Control, Battle Management, Communications (C2BMC)
	MD40		Program Wide Support
	MT01		C2BMC Test
	MX01		C2BMC Development Support
Defense-Wide	0400	04	0603898C
	Project	Name	
	MD03		Joint Warfighter Support
	MD40		Program Wide Support
	MT03		Joint Warfighter Support Test
Defense-Wide	0400	04	0603904C
	Project	Name	
	MC22		Cyber Operations
	MD22		Missile Defense Integration & Operations Center (MDIOC)
	MD40		Program Wide Support
Defense-Wide	0400	04	0603906C
	Project	Name	
	MD35		Regarding Trench
Defense-Wide	0400	04	0603907C
	Project	Name	
	MD40		Program Wide Support
	MX46		Sea Based X-Band Radar Development Support
Defense-Wide	0400	04	0603913C
	Project	Name	
	MD20		Israeli Upper Tier
	MD26		Israeli ARROW Program
	MD34		Short Range Ballistic Missile Defense (SRBMD)
Defense-Wide	0400	04	0603914C
	Project	Name	
	MC04		Cyber Operations
	MD40		Program Wide Support
	MT04		BMDS Test Program
Defense-Wide	0400	04	0603915C
	Project	Name	
	MD40		Program Wide Support
	MT05		BMDS Targets Program
Defense-Wide	0400	04	0604115C
	Project	Name	
	MC98		Cyber Operations
	MD40		Program Wide Support
	MD98		Directed Energy Prototype Development
	MD99		Discrimination Sensor Prototype Development
	MT99		Technology Maturation Initiatives Test

Defense-Wide 0400 04 0604873C

Project	Name
MD40	Program Wide Support
MD96	Long Range Discrim Radar (LRDR)

Defense-Wide 0400 04 0604874C

Project	Name
MD40	Program Wide Support
MD97	Improved HD Interceptors

Defense-Wide 0400 04 0604876C

Project	Name
MD40	Program Wide Support
MT07	THAAD Test

Defense-Wide 0400 04 0604878C

Project	Name
MD40	Program Wide Support
MT09	Aegis BMD Test

Defense-Wide 0400 04 0604879C

Project	Name
MD40	Program Wide Support
MT11	BMDs Radars Test

Defense-Wide 0400 04 0604880C

Project	Name
MD40	Program-Wide Support
MD68	Aegis Ashore
MT68	Aegis Ashore Test

Defense-Wide 0400 04 0604881C

Project	Name
MD09	SM-3 Block IIA Co-Development
MD40	Program-Wide Support
MT09	SM-3 Block IIA Co-Development Test

Defense-Wide 0400 04 0604887C

Project	Name
MD40	Program Wide Support
MT08	Midcourse Test

Defense-Wide 0400 04 0604894C

Project	Name
MD40	Program-Wide Support
MD85	Multi Object Kill Vehicle

Defense-Wide 0400 04 0605502C

Project	Name
MD45	Small Business Innovative Research

Defense-Wide 0400 06 0901598C

Project	Name
MD38	Management Headquarters

Procurement

Appn	BA	PE
------	----	----

Defense-Wide 0300 01 0208866C

Line Item	Name
MD07	THAAD
MD09	Aegis BMD
MD11	BMDs AN/TPY-2 Radars
MD73	Aegis Ashore Phase III
MD83	Iron Dome
MD90	Aegis BMD Hardware and Software

MILCON

Appn	BA	PE
------	----	----

Defense-Wide 0500 02

Project	Name
17999902	Minor MILCON
18999902	Minor MILCON

Defense-Wide 0500 03

Project	Name
18999903	MILCON Planning and Design

Defense-Wide 0500 02

Project	Name
19999902	Minor MILCON

Defense-Wide 0500 03

Project	Name
19999903	MILCON Planning and Design

Defense-Wide 0500 02

Project	Name
20999902	Minor MILCON

Defense-Wide 0500 03

Project	Name
20999903	MILCON Planning and Design

Defense-Wide 0500 02

Project	Name
21999902	Minor MILCON

Defense-Wide 0500 03

Project	Name
21999903	MILCON Planning and Design

Defense-Wide 0500 01

Project	Name
D1700653	Missile Defense Cmplx Switchgear Facility, Ft. Greely, AK
D1700657	Long Range Discrimination Radar Cmplx, Clear

AFS, AK, Ph 1
D1700662 Test Support Facility, Wake Island
D1900659 Long Range Discrimination Radar Cmplx, Clear
AFS, AK, Ph 2

Cost and Funding

Cost Summary

Total Acquisition Cost						
Appropriation	BY \$M			BY 2002 \$M	TY \$M	
	SAR Baseline Planning Estimate	Current APB Objective/Threshold		Current Estimate	SAR Baseline Planning Estimate	Current APB Objective
RDT&E	44740.1	--	--	114556.0	47217.1	--
Procurement	0.0	--	--	13087.2	0.0	--
Flyaway	--	--	--	13087.2	--	--
Recurring	--	--	--	13087.2	--	--
Non Recurring	--	--	--	0.0	--	--
Support	--	--	--	0.0	--	--
Other Support	--	--	--	0.0	--	--
Initial Spares	--	--	--	0.0	--	--
MILCON	0.0	--	--	917.6	0.0	--
Acq O&M	0.0	--	--	0.0	0.0	--
Total	44740.1	--	--	128560.8	47217.1	--

Cost Notes

For Major Defense Acquisition Programs, DoD requires an 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, Missile Defense Agency provides the Congress with an annual BMDS Accountability Report (BAR), which includes schedule, technical, operational capacity, resource, and contract baselines that guide development of ballistic missile defense capabilities. The BAR includes unit cost baselines for key assets (e.g. Ground-Based Interceptors and AN/TPY-2 radars) comprising the BMDS.

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

Quantity Notes

Quantities of Key BMDS Assets (grouped by appropriation, total buys from FY 2002-21):

Program	Component	RDT&E	Proc
Terminal High Altitude Area Defense (THAAD)	Batteries	2	5
	Interceptors	50	376
Aegis	SM-3 Block I/IIA	79	71
	SM-3 Block IB	21	394
Ground-Based Midcourse Defense (GMD)	Ground-Based Interceptors (GBIs)	58	0
Sensors	AN/TPY-2	7	5

Cost and Funding

Funding Summary

Appropriation Summary									
FY 2017 President's Budget / December 2015 SAR (TY\$ M)									
Appropriation	Prior	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	To Complete	Total
RDT&E	102015.5	6215.4	5892.8	5544.0	5174.6	5316.9	5289.4	0.0	135448.6
Procurement	8466.9	1489.2	988.5	1390.7	1499.5	1618.0	1781.8	0.0	17234.6
MILCON	645.2	184.2	178.6	9.4	159.4	10.6	10.8	0.0	1198.2
Acq O&M	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
PB 2017 Total	111127.6	7888.8	7059.9	6944.1	6833.5	6945.5	7082.0	0.0	153881.4
PB 2016 Total	111097.9	7694.6	7354.7	6891.5	6799.1	6964.4	0.0	0.0	146802.2
Delta	29.7	194.2	-294.8	52.6	34.4	-18.9	7082.0	0.0	7079.2

Quantity Summary										
FY 2017 President's Budget / December 2015 SAR (TY\$ M)										
Quantity	Undistributed	Prior	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	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 2017 Total	0	0	0	0	0	0	0	0	0	0
PB 2016 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							
0400 RDT&E Research, Development, Test, and Evaluation, Defense-Wide							
Fiscal Year	Quantity	TY \$M					
		End Item Recurring Flyaway	Non End Item Recurring Flyaway	Non Recurring Flyaway	Total Flyaway	Total Support	Total Program
2002	--	--	--	--	--	--	6618.8
2003	--	--	--	--	--	--	6446.3
2004	--	--	--	--	--	--	7566.8
2005	--	--	--	--	--	--	8826.7
2006	--	--	--	--	--	--	7690.3
2007	--	--	--	--	--	--	9382.8
2008	--	--	--	--	--	--	8655.3
2009	--	--	--	--	--	--	8411.9
2010	--	--	--	--	--	--	6945.9
2011	--	--	--	--	--	--	7406.7
2012	--	--	--	--	--	--	6809.2
2013	--	--	--	--	--	--	5867.3
2014	--	--	--	--	--	--	5731.4
2015	--	--	--	--	--	--	5656.1
2016	--	--	--	--	--	--	6215.4
2017	--	--	--	--	--	--	5892.8
2018	--	--	--	--	--	--	5544.0
2019	--	--	--	--	--	--	5174.6
2020	--	--	--	--	--	--	5316.9
2021	--	--	--	--	--	--	5289.4
Subtotal	--	--	--	--	--	--	135448.6

Annual Funding							
0400 RDT&E Research, Development, Test, and Evaluation, Defense-Wide							
Fiscal Year	Quantity	BY 2002 \$M					
		End Item Recurring Flyaway	Non End Item Recurring Flyaway	Non Recurring Flyaway	Total Flyaway	Total Support	Total Program
2002	--	--	--	--	--	--	6496.7
2003	--	--	--	--	--	--	6238.0
2004	--	--	--	--	--	--	7320.1
2005	--	--	--	--	--	--	8432.1
2006	--	--	--	--	--	--	7078.7
2007	--	--	--	--	--	--	8350.7
2008	--	--	--	--	--	--	7655.5
2009	--	--	--	--	--	--	7195.8
2010	--	--	--	--	--	--	5901.4
2011	--	--	--	--	--	--	6223.6
2012	--	--	--	--	--	--	5636.8
2013	--	--	--	--	--	--	4718.8
2014	--	--	--	--	--	--	4497.3
2015	--	--	--	--	--	--	4351.5
2016	--	--	--	--	--	--	4729.8
2017	--	--	--	--	--	--	4434.7
2018	--	--	--	--	--	--	4093.9
2019	--	--	--	--	--	--	3746.2
2020	--	--	--	--	--	--	3773.8
2021	--	--	--	--	--	--	3680.6
Subtotal	--	--	--	--	--	--	114556.0

Annual Funding							
0300 Procurement Procurement, Defense-Wide							
Fiscal Year	Quantity	TY \$M					
		End Item Recurring Flyaway	Non End Item Recurring Flyaway	Non Recurring Flyaway	Total Flyaway	Total Support	Total Program
2009	--	--	206.6	--	206.6	--	206.6
2010	--	--	835.7	--	835.7	--	835.7
2011	--	--	1070.8	--	1070.8	--	1070.8
2012	--	--	1347.2	--	1347.2	--	1347.2
2013	--	--	1464.2	--	1464.2	--	1464.2
2014	--	--	1785.2	--	1785.2	--	1785.2
2015	--	--	1757.2	--	1757.2	--	1757.2
2016	--	--	1489.2	--	1489.2	--	1489.2
2017	--	--	988.5	--	988.5	--	988.5
2018	--	--	1390.7	--	1390.7	--	1390.7
2019	--	--	1499.5	--	1499.5	--	1499.5
2020	--	--	1618.0	--	1618.0	--	1618.0
2021	--	--	1781.8	--	1781.8	--	1781.8
Subtotal	--	--	17234.6	--	17234.6	--	17234.6

Annual Funding 0300 Procurement Procurement, Defense-Wide							
Fiscal Year	Quantity	BY 2002 \$M					
		End Item Recurring Flyaway	Non End Item Recurring Flyaway	Non Recurring Flyaway	Total Flyaway	Total Support	Total Program
2009	--	--	174.6	--	174.6	--	174.6
2010	--	--	703.9	--	703.9	--	703.9
2011	--	--	892.1	--	892.1	--	892.1
2012	--	--	1106.0	--	1106.0	--	1106.0
2013	--	--	1165.5	--	1165.5	--	1165.5
2014	--	--	1388.3	--	1388.3	--	1388.3
2015	--	--	1337.9	--	1337.9	--	1337.9
2016	--	--	1123.2	--	1123.2	--	1123.2
2017	--	--	737.2	--	737.2	--	737.2
2018	--	--	1017.3	--	1017.3	--	1017.3
2019	--	--	1075.4	--	1075.4	--	1075.4
2020	--	--	1137.6	--	1137.6	--	1137.6
2021	--	--	1228.2	--	1228.2	--	1228.2
Subtotal	--	--	13087.2	--	13087.2	--	13087.2

Annual Funding 0500 MILCON Military Construction, Defense-Wide	
Fiscal Year	TY \$M
	Total Program
2002	8.2
2003	24.9
2004	24.4
2005	22.3
2006	4.9
2007	0.8
2008	--
2009	18.2
2010	96.7
2011	1.2
2012	67.1
2013	138.7
2014	177.1
2015	60.7
2016	184.2
2017	178.6
2018	9.4
2019	159.4
2020	10.6
2021	10.8
Subtotal	1198.2

Annual Funding 0500 MILCON Military Construction, Defense-Wide	
Fiscal Year	BY 2002 \$M
	Total Program
2002	7.9
2003	23.7
2004	23.2
2005	21.0
2006	4.4
2007	0.7
2008	--
2009	15.3
2010	80.9
2011	1.0
2012	54.3
2013	108.4
2014	134.2
2015	45.1
2016	135.3
2017	129.7
2018	6.7
2019	111.3
2020	7.3
2021	7.2
Subtotal	917.6

Low Rate Initial Production

There is no LRIP for this program.

Foreign Military Sales

Country	Date of Sale	Quantity	Total Cost \$M	Description
South Korea	12/24/2015	0	0.5	FMS Case KS-I-YOA: International Simulation (I-SIM) software and training. Deliveries: No major deliveries.
Japan	12/1/2015	0	6.1	FMS Case JA-P-FWV: SM-3 Follow-on Technical Support (FOTS), Spares and Equipment. No major deliveries.
Japan	12/1/2015	0	12.5	FMS Case JA-P-FXU: Standard Missile-3 (SM-3) Cooperative Development (SCD) Flight Test Mission (FTM) Execution. No major deliveries.
Japan	6/1/2015	0	8.0	FMS Case JA-P-FXY: SCD Pre-Flight Readiness Test (PFRT) for Third Stage Rocket Motor (TSRM). No major deliveries.
Japan	1/2/2015	0	2.8	FMS Case JA-P-FUN: IM Inspection and Testing of SM-3 BLK IIA Second Stage Rocket Motors (SSRMs) and TSRMs. No major deliveries.
Saudi Arabia	12/14/2014	0	2.7	FMS Case SR-I-WIA: United States Government (USG) technical assistance. Deliveries: no major deliveries.
Japan	11/3/2014	0	5.3	FMS Case JA-P-FUV: SM-3 FOTS and Return, Repair, Reshipment (RRR) of SM-3 All Up Rounds (AURs). No major deliveries.
Japan	10/7/2014	0	12.7	FMS Case JA-P-FVG: SCD Flight Test Mission (FTM) Preparation. No major deliveries.
Japan	8/22/2014	0	2.4	FMS Case JA-P-FWD: SCD Pre-Flight Readiness Test (PFRT) Preparation for TSRM. No major deliveries.
Japan	6/9/2014	0	8.8	FMS Case JA-P-FVO: Transportation of SCD SM-3 BLK IIA components. No major deliveries.
Japan	8/5/2013	0	7.5	FMS Case JA-P-FTZ: SM-3 SCD Propulsion Test Vehicle / Control Test Vehicle Test Execution. No major deliveries.
Japan	11/5/2012	0	2.4	FMS Case JA-P-FUE: SCD Insensitive Munitions Testing. No major deliveries.
Japan	9/27/2012	0	1.9	FMS Case JA-P-FUD: SM-3 SCD Ground Flight Testing. No major deliveries.
United Arab Emirates	12/25/2011	2	4904.8	FMS Case AE-B-UAF: Two Terminal High Altitude Area Defense (THAAD) Batteries, consisting of 192 interceptors, 2 Army Navy/Transportable Radar Surveillance Model 2 (AN/TPY-2) Radars, 12 Launchers, 8 Missile Round Pallets, 7 Multifunctional Information Distribution System (MIDS) Terminals, 4 AMMPS, 10 PR4G TRC-9105 Radios, 6 PR4G TRC-9301C Radios, various tactical vehicles, trucks, training aids & devices, spare parts, training, government and contractor technical assistance, Tracking Exercise, books &

publications, and repair & return. [Quantity is 2 batteries]

United Arab Emirates	4/30/2010	0	13.8	FMS Case AE-B-UAE: Technical Assistance & Site Survey. Deliveries: no major deliveries.
Japan	3/22/2010	2	20.0	FMS Case JA-P-FON: SM-3 BLK IA Spares and RRR. Deliveries: SM-3 Kinetic Warhead (KW); MK72 Rocket Booster Motor.
Japan	1/15/2010	0	7.8	FMS Case JA-P-FPX: Japan Hardware in the Loop (HWIL). No major deliveries.
Japan	11/19/2008	0	21.0	FMS Case JA-P-CAM: Japan Computer Program Test Site Japan Aegis BMD (JABMD) Upgrade. No major deliveries.
Japan	9/11/2008	0	12.1	FMS Case JA-P-FQV: SM-3 BLK IA Spares. No major deliveries.
Japan	8/19/2008	0	59.4	FMS Case JA-P-CAN: JS KIRISHIMA (DDG 174) Firing Event. No major deliveries.
Japan	3/3/2008	9	202.4	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.
Japan	1/18/2008	0	53.0	FMS Case JA-P-CAE: JS MYOKO (DDG 175) Firing Event. No major deliveries.
Netherlands	8/31/2006	0	14.8	FMS Case NE-P-GLK: Participation in ABMD Test Events and NATO BMD Trade Studies. No major deliveries.
Japan	8/21/2006	0	55.5	FMS Case JA-P-BIR: JS CHOKAI (DDG 176) Firing Event. No major deliveries.
Japan	8/21/2006	9	209.7	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.
Japan	10/12/2005	9	167.1	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.
Japan	9/9/2005	0	55.4	FMS Case JA-P-BIN: JS KONGO (DDG 173) Firing Event. No major deliveries.
Japan	8/17/2004	9	309.1	FMS Case JA-P-LUH: JABMD Block 2004 Upgrade of JS KONGO (DDG 173). Deliveries: 1 JBMD BLK 04 Computer Program, Peripherals, and SM-3 BLK IA Missiles.
Japan	8/13/2004	0	21.3	FMS Case JA-P-BGQ: Proof of Principle (PoP) Flight Tests. No major deliveries.
Netherlands	9/28/2000	0	3.9	FMS Case NE-P-GJS: Theater Ballistic Missile Defense Concept Validation Phase. No major deliveries.

Notes

Nuclear Costs

None

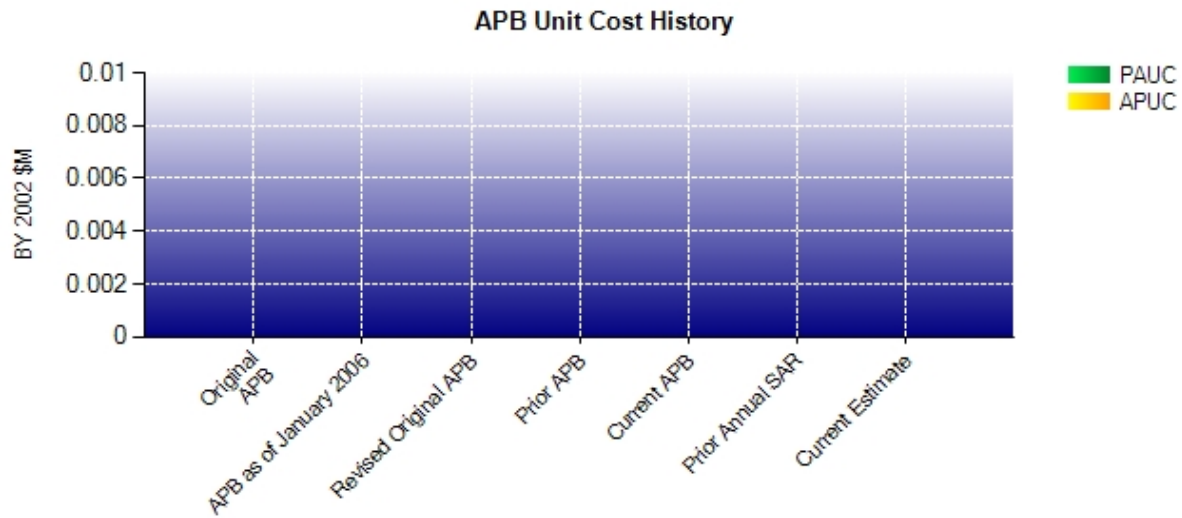
Unit Cost

Unit Cost Report

Item	BY 2002 \$M	BY 2002 \$M	% Change
	Current UCR Baseline	Current Estimate (Dec 2015 SAR)	
Program Acquisition Unit Cost			
Cost	--	128560.8	
Quantity	--	0	
Unit Cost	--	--	--
Average Procurement Unit Cost			
Cost	--	13087.2	
Quantity	--	0	
Unit Cost	--	--	

For Major Defense Acquisition Programs, DoD requires an 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, Missile Defense Agency 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 BAR includes unit cost baselines for key assets (e.g. Ground-Based Interceptors and AN/TPY-2 radars) comprising the BMDS.

Unit Cost History



Item	Date	BY 2002 \$M		TY \$M	
		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 2014	N/A	N/A	N/A	N/A
Current Estimate	Dec 2015	N/A	N/A	N/A	N/A

SAR Unit Cost History

Current SAR Baseline to Current Estimate (TY \$M)									
Initial PAUC Planning Estimate	Changes								PAUC Current Estimate
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
0.000	--	--	--	--	--	--	--	--	0.000

A PAUC Unit Cost History is not available, since no Initial PAUC Estimate had been calculated due to a lack of defined quantities.

Current SAR Baseline to Current Estimate (TY \$M)									
Initial APUC Planning Estimate	Changes								APUC Current Estimate
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
0.000	--	--	--	--	--	--	--	--	0.000

An APUC Unit Cost History is not available, since no Initial APUC Estimate had been calculated due to a lack of defined quantities.

SAR Baseline History				
Item	SAR Planning Estimate	SAR Development Estimate	SAR Production Estimate	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	153881.4
Total Quantity	0	N/A	N/A	0
PAUC	N/A	N/A	N/A	N/A

Cost Variance

Summary TY \$M				
Item	RDT&E	Procurement	MILCON	Total
SAR Baseline (PlanningRDTE Estimate)	47217.1	--	--	47217.1
Previous Changes				
Economic	-249.7	-138.6	-31.9	-420.2
Quantity	--	--	--	--
Schedule	-1684.3	-124.7	--	-1809.0
Engineering	+51410.5	-1296.1	-31.8	+50082.6
Estimating	-8828.1	-1130.9	+1056.0	-8903.0
Other	--	--	--	--
Support	--	--	--	--
Subtotal	+40648.4	-2690.3	+992.3	+38950.4
Current Changes				
Economic	+220.5	+60.7	+3.8	+285.0
Quantity	--	+15.0	--	+15.0
Schedule	--	--	--	--
Engineering	+411.0	--	--	+411.0
Estimating	+117.8	-874.2	+42.6	-713.8
Other	--	--	--	--
Support	--	--	--	--
Subtotal	+749.3	-798.5	+46.4	-2.8
Adjustments	+46833.8	+20723.4	+159.5	+67716.7
Total Changes	+88231.5	+17234.6	+1198.2	+106664.3
CE - Cost Variance	135448.6	17234.6	1198.2	153881.4
CE - Cost & Funding	135448.6	17234.6	1198.2	153881.4

Summary BY 2002 \$M				
Item	RDT&E	Procurement	MILCON	Total
SAR Baseline (PlanningRDTE Estimate)	44740.1	--	--	44740.1
Previous Changes				
Economic	--	--	--	--
Quantity	--	--	--	--
Schedule	-1417.0	-91.5	--	-1508.5
Engineering	+43304.7	-977.2	-24.3	+42303.2
Estimating	-7274.6	-851.7	+798.1	-7328.2
Other	--	--	--	--
Support	--	--	--	--
Subtotal	+34613.1	-1920.4	+773.8	+33466.5
Current Changes				
Economic	--	--	--	--
Quantity	--	+12.8	--	+12.8
Schedule	--	--	--	--
Engineering	+294.4	--	--	+294.4
Estimating	+86.4	-634.2	+30.1	-517.7
Other	--	--	--	--
Support	--	--	--	--
Subtotal	+380.8	-621.4	+30.1	-210.5
Adjustments	+34822.0	+15629.0	+113.7	+50564.7
Total Changes	+69815.9	+13087.2	+917.6	+83820.7
CE - Cost Variance	114556.0	13087.2	917.6	128560.8
CE - Cost & Funding	114556.0	13087.2	917.6	128560.8

Previous Estimate: December 2014

Cost Variance Notes

Adjustments made in prior SARs:

SAR	Then Year \$M				Base-Year 2002 \$M			
	RDT&E	PROC	MILCON	Total	RDT&E	PROC	MILCON	Total
Dec 2009	14,302.0	9,520.3	38.1	23,860.4	11,204.2	7,582.5	29.4	18,816.1
Dec 2010	6,279.4	2,191.1	10.1	8,480.6	4,805.2	1,662.4	7.6	6,475.2
Dec 2011	5,895.6	1,533.8	10.5	7,439.9	4,368.4	1,126.6	7.6	5,502.6
Dec 2012	5,164.3	1,890.0	10.6	7,064.9	3,715.1	1,347.4	7.4	5,069.9
Dec 2013	4,791.0	1,964.8	68.7	6,824.5	3,406.6	1,382.3	47.2	4,836.1
Dec 2014	5,112.1	1,841.6	10.7	6,964.4	3,641.9	1,299.6	7.3	4,948.8
Dec 2015	5289.4	1781.8	10.8	7082.0	3,680.6	1,228.2	7.2	4,916.0
Total	46,833.8	20,723.4	159.5	67,716.7	34,822.0	15,629.0	113.7	50,564.7

RDT&E	\$M	
Current Change Explanations	Base Year	Then Year
Revised escalation indices. (Economic)	N/A	+220.5
Adjustment for current and prior escalation. (Estimating)	-105.9	-138.4
Realigned SM-3 IIA initial procurement to RDT&E for test rounds, SPY-1 modernization, and Aegis Weapon System (AWS) 6.x; other Aegis adjustments. (Estimating)	+362.2	+488.5
Funding transferred from Procurement for Redesigned Kill Vehicle (RKV) recap and Reboost activities; other Midcourse and Improved Homeland Defense Interceptor adjustments. (Engineering)	+294.4	+411.0
FY 2016 Congressional adds for Short Range Ballistic Missile Defense, Israeli Arrow program, and Israeli Upper Tier. (Estimating)	+125.6	+164.8
Revised estimate for the Long Range Discrimination Radar (LRDR) to reflect a 2-Faced radar and to accommodate split of MILCON into two separate fully funded projects. (Estimating)	+90.6	+122.0
Revised estimate for the Integrated Master Test Plan. (Estimating)	-109.8	-148.5
Revised the Terminal High Altitude Area Defense (THAAD) development cost estimate. (Estimating)	-46.8	-62.7
Revised estimate for Special Programs. (Estimating)	-33.8	-43.3
Refined cost estimates and other adjustments. (Estimating)	-195.7	-264.6
RDT&E Subtotal	+380.8	+749.3

Procurement	\$M	
Current Change Explanations	Base Year	Then Year
Revised escalation indices. (Economic)	N/A	+60.7
Adjustment for current and prior escalation. (Estimating)	-27.5	-36.2
Increase for additional THAAD interceptors starting in FY 2018. (Quantity)	+247.5	+345.0
FY 2016 Congressional adds for David's Sling and Arrow Weapon System. (Estimating)	+124.4	+165.0
FY 2017 funding added for co-produced U.S.-Israel Iron Dome air defense systems. (Estimating)	+31.3	+42.0
Changed future GBI fleet upgrade plan by transferring All-Up-Rounds funding to RDT&E. (Estimating)	-329.9	-460.4
Shifted Aegis SM-3 IB Multi-Year Procurement to Single Year Procurement and reduced quantities to fund SPY-1 refurbishment and modernization. (Quantity)	-234.7	-330.0
Realigned SM-3 IIA missile funding to RDT&E for test rounds. (Estimating)	-189.0	-250.5
Other Aegis adjustments (including FY 2016 Congressional adjustments). (Estimating)	-159.7	-216.7
Realigned AN/TPY-2 spares procurement. (Estimating)	-52.5	-74.0
Refined cost estimates and other adjustments. (Estimating)	-31.3	-43.4
Procurement Subtotal	-621.4	-798.5

MILCON	\$M	
Current Change Explanations	Base Year	Then Year
Revised escalation indices. (Economic)	N/A	+3.8
Adjustment for current and prior escalation. (Estimating)	-2.0	-2.7

Funding added for Wake Island Test Support facility and Fort Greely Switchgear building. (Estimating)	+15.4	+21.2
Revised estimate for the Long Range Discrimination Radar (LRDR) to reflect split into two separate fully funded projects. (Estimating)	+13.4	+19.9
FY 2016 Congressional increase for Missile Site Planning and Design. (Estimating)	+11.0	+15.0
Refined cost estimates and other adjustments. (Estimating)	-7.7	-10.8
MILCON Subtotal	+30.1	+46.4

Contracts

Contract Identification	
Appropriation:	RDT&E
Contract Name:	Development and Sustainment Contract
Contractor:	The Boeing Co., Missile Defense Systems
Contractor Location:	499 Boeing Blvd., SW Huntsville, AL 35824-3001
Contract Number:	HQ0147-12-C-0004
Contract Type:	Cost (CR), Cost Plus Fixed Fee (CPFF), Cost Plus Incentive Fee (CPIF), Cost Plus Award Fee (CPAF), Fixed Price Incentive(Firm Target) (FPIF)
Award Date:	December 30, 2011
Definitization Date:	December 30, 2011

Contract Price							
Initial Contract Price (\$M)			Current Contract Price (\$M)			Estimated Price At Completion (\$M)	
Target	Ceiling	Qty	Target	Ceiling	Qty	Contractor	Program Manager
2816.8	2816.8	N/A	3912.1	4141.1	N/A	4161.3	4143.3

Target Price Change Explanation

The difference between the Initial Contract Price Target and the Current Contract Price Target is due to the following contract actions:

2012

- o Options Exercised: Clear Radar Integration and Development; Cape Cod Radar Integration and Development; Distributed Multi-echelon Training System (DMETS) Support.
- o Engineering Change Proposals (ECPs): Additional Warfighter Training; Capability Enhancement (CE) II Exo-atmospheric Kill Vehicle (EKV) Software for Flight Test Ground-Based Interceptor (GBI) (FTG-06b); CE-I FTG-07 execution.
- o Task Instructions: Signature Measurement Test Article; Ground-Based Interceptor (GBI) Probabilistic Risk Assessment; Integrated System Test Capability (ISTC 2) Ballistic Missile Defense System (BMDS) Integrated Lab Concept and associated extension; BMDS System Specifications; Shoot Assess Shoot (SAS); In-flight Interceptor Communications System (IFICS) Data Terminal Technical Refresh; Increment 2 Probabilistic Risk Assessment (PRA) approach for GBI.

2013

- o Options Exercised: Manufacture of Operational Interceptors; Distributed Multi-Echelon Training (DMETS) Support.
- o ECPs: Joint Ground-Based Midcourse Defense Training and Exercise Center (JGTEC) Relocation; Conversion of Launch Facility (LF23) Switch Hitter; Boeing High Frequency Test Bed (HFTB) Support to Common Inertial Measurement Unit (IMU) Low Noise (LN200) Development; CE-11 Upgrade; and Alternate Divert Thruster Phase IV.
- o Task Instructions: EKV Design Turn Options; GBI Fleet Reliability Assessment Training; Independent Fleet Assessment; FTG-07 Separation Identification for EKV; GBI EKV Laser Initiation Device for Service Life Extension (SLE); Stockpile Reliability Program (SRP) Asset #1 Phase 2; Peterson Air Force Base (PAFB) NORAD & U.S. Northern Command (N-NC) Bldg 2; Arm/Disarm Switch Diode; and Installation of Encryption Keys.

2014

- o Options Exercised: Ground System Tech Refresh, Distributed Multi-Echelon Training Support, National Security Agency Encryptor.
- o CCPs: CY14-16 Test Baseline Schedule, Alternate Divert Thruster Phase IV, Modeling and Simulation Hardware, CE-1 FTG-07, FTG-09, FTG-15. GS Product SW Dot Builds, BMDS SPEC 12.2/GM-SN Interface, MF1 Integration and Check-out,

FTG-07 Risk Mitigations, DSC Systems Ops 24/7 Coverage, Power Control Monitoring System, Phase 3 GMD Vehicle Transportation Plan, GMD Program Re-plan, Booster Receiving and Storage, Request for Equitable Adjustment (RFEA) for GBI Motor Storage, Integrated System Test Capability Phase 2 BMDS Integration Development Lab.

o Task Instructions: Separation Study, Orbital Sneak Circuit Analysis, Time Server Replacement, Tactical 2 Stage Booster Trade Study, Mid-Range Coverage of 24-7 Maintenance, Discrimination Improvements for Homeland Defense (DIHD), Test and Installation Security Patch, Boeing Support of Independent Verification and Validation, Support of Single Stimulation Framework KIV Maintenance, Replace Inertial Measurement Unit (IMU) in EKV SN004, BMDS Situational Awareness, Ft Greely Power Plant Cybersecurity Vulnerability, MILSATCOM Tail Circuit Interface, Command Launch Equipment (CLE) Re-architecture, GMD Infrastructure Reliability, Availability & Maintainability Analysis and Electrical Power Study, Missile Transporter Trailer Structural Modification, EKV Software Version 22.2, BMDS Situational Awareness Tool, Probability Risk Assessment, Stockpile Reliability Program (SRP) Asset #1 and GBI EKV Laser Initiation Devices.

2015

o Options Exercised: Test Control System, Clear Radar Integration & Development and Cape Cod Radar Integration & Development.

o CCPs: CY14-16 Test Baseline Schedule, GMD Program Re-Plan, FTG-07 Risk Mitigation, CLE GMD Fire Control (GFC) Research, Parts, Materials and Processes Mission Assurance Plan (PMAP) Revision B,

o Task Instructions: KIV (Encryption Device), Enterprise Cybersecurity Range Environment (ECRE 4), Missile Defense Complex (MDC) Power, Supply Chain Risk Management Criticality Analysis Re-designed Kill Vehicle (RKV) Path to System Requirement Review, Balanced Magnetic Switches Installation, Mid-Range Coverage for 24-7 Maintenance, Fort Greely Alaska (FGA) Cybersecurity Vulnerability Mitigations, SRP Asset #1 Phase 2 & 3, Improved Booster Reliability Energetics Testing, Testing & Analysis of GBI SRP Asset #1 Phase 2, Procurement Orbital Boost Vehicle (OBV), Integrated Boost Vehicle (IBV)-18 Booster Avionics Module (BAM) Cable, IMU TB11 Repair-PLD 004 Re-Integration and Block 2 Upgrades.

Contract Variance		
Item	Cost Variance	Schedule Variance
Cumulative Variances To Date (12/31/2015)	-57.6	-43.5
Previous Cumulative Variances	-30.2	-53.5
Net Change	-27.4	+10.0

Cost and Schedule Variance Explanations

The unfavorable net change in the cost variance is due to Ground Based Interceptor (GBI) technical challenges associated with the upgraded Exoatmospheric Kill Vehicle (EKV) and Consolidated Booster Avionics Upgrade (CBAU). The EKV Alternate Propellant Tank (APT) cost will continue to degrade until the development effort is complete. CBAU parts and material cost more than planned due to minimum buy requirements and is not recoverable. The program office is working jointly with the Prime Contractor to determine a path forward to include cost reduction initiatives and streamlining of acceptance and qualification tests.

The favorable net change in the schedule variance is due to replan associated with Contract Line Item Number (CLIN) consolidation.

Contract Identification

Appropriation: RDT&E
Contract Name: SM-3 Technology Development of Production Missiles
Contractor: Raytheon Missile Systems
Contractor Location: PO Box 11337
 1151 East Hermans Rd
 Tucson, AZ 85745-1337
Contract Number: N00024-07-C-6119
Contract Type: Cost Plus Incentive Fee (CPIF)
Award Date: May 14, 2007
Definitization Date: February 15, 2008

Contract Price							
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	1552.0	N/A	N/A	1422.0	1433.0

Target Price Change Explanation

The difference between the Initial Contract Price Target and the Current Contract Price Target is due to the award of an additional Missile Development CLINs.

Contract Variance		
Item	Cost Variance	Schedule Variance
Cumulative Variances To Date (12/31/2015)	-31.0	0.0
Previous Cumulative Variances	-20.0	-2.0
Net Change	-11.0	+2.0

Cost and Schedule Variance Explanations

The unfavorable net change in the cost variance is due to manufacture readiness efforts at suppliers. This is primarily due to the cost of labor to manufacture and assemble components of the Guidance Unit.

The favorable net change in the schedule variance is due to all work being complete on the N00024-07-C-6119 contract as of April 2015.

Notes

The contract completed two CLINs (25, 26) during the past year at or under plan.

Contract Identification

Appropriation: RDT&E
Contract Name: Block IIA AUR Development & Integration
Contractor: Raytheon Company
Contractor Location: PO Box 11337
 1151 East Hermans Rd
 Tucson, AZ 85745-1337
Contract Number: HQ0276-10-C-0005
Contract Type: Cost Plus Incentive Fee (CPIF), Cost Plus Award Fee (CPAF)
Award Date: September 08, 2010
Definitization Date: September 08, 2010

Contract Price							
Initial Contract Price (\$M)			Current Contract Price (\$M)			Estimated Price At Completion (\$M)	
Target	Ceiling	Qty	Target	Ceiling	Qty	Contractor	Program Manager
160.0	N/A	N/A	1478.0	N/A	N/A	1643.0	1697.0

Target Price Change Explanation

The difference between the Initial Contract Price Target and the Current Contract Price Target is due to the award of an additional Missile Development effort.

Contract Variance			
Item	Cost Variance	Schedule Variance	
Cumulative Variances To Date (12/31/2015)	-185.7	-8.0	
Previous Cumulative Variances	-114.0	-8.0	
Net Change	-71.7	+0.0	

Cost and Schedule Variance Explanations

The unfavorable net change in the cost variance is due to additional effort and resources required to support CTV-1 and CTV-2 test events.

Notes

This is the fourth year reporting the Raytheon Aegis Ballistic Missile Defense effort for the SM-3 Block IIA in the MDA SAR submission.

Contract Identification

Appropriation: RDT&E
Contract Name: Targets and Countermeasures Prime Contract
Contractor: Lockheed Martin Corporation Space Systems Company
Contractor Location: 4800 Bradford Drive NW
Huntsville, AL 35805-1930
Contract Number: HQ0006-04-D-0006
Contract Type: Cost Plus Award Fee (CPAF)
Award Date: December 09, 2003
Definitization Date: April 19, 2004

Contract Price							
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	2600.3	N/A	N/A	2709.8	2713.6

Target Price Change Explanation

The difference between the Initial Contract Price Target and the Current Contract Price Target is due to evolving BMDS test requirements. These requirements, documented through semi-annual changes to the Integrated Master Test Plan, drive modifications to the Targets and Countermeasures Lockheed Martin Prime Contract. The modifications have resulted in additional costs which increased the current contract price target.

Contract Variance			
Item	Cost Variance		Schedule Variance
Cumulative Variances To Date (12/31/2015)	-137.1		-4.9
Previous Cumulative Variances	-131.6		-4.4
Net Change	-5.5		-0.5

Cost and Schedule Variance Explanations

The unfavorable net change in the cost variance is due to the following:

- DO29 – Modified Ballistic Re-entry Vehicle (MBRV)-5 CV = (\$3.1M)
 - LM labor overruns to complete Command Enabled Antenna (CEA) Phase II and Valley Forge Force 5 qual testing.
 - Overrun for LM to manage General Electric (GE) Enhanced Multifunction Interface Unit (EMIU) effort.
 - Continued overruns in Finance & Business Operations, Contract and Data Management (CM/DM), Subcontract Management & Procurement.
 - Program Operations manpower was increased and continues in support of Cure Notice corrective actions.
 - Overtime required to retain the best estimated test date (BETD) on Ship Set (SS) #3 effort.
 - Additional material costs associated with the Compact Antenna work scope
 - Costs associated with the Combined Multi-Band Antenna (CMBA) Redesign.
 - Unplanned support to Courtland for SS #3 Re-entry Vehicle (RV)/Attitude Control Module (ACM) Functional anomalies, developing and testing Mission Simulation procedures and preparing support hardware for shipment to Courtland for mission simulation on SS #3.
- DO29 MBRV-8 CV = (\$1.4M)
 - Lockheed Martin United Kingdom (LMUK) overruns due to The Weld Institute (TWI) cost increase, continued engineering updates, non-conformances and additional level of effort (LOE) support. Implementation of corrective actions resulting from failures in prior periods.
 - Engineering at Courtland Integration facility: 1) unforeseen hardware defects on hardware “as delivered” to Courtland, which required additional resources to rectify; 2) inefficiencies related to not having released engineering in time to support the production schedule, which drove multiple revisions of manufacturing work instructions that were not originally planned for 3) Radio Frequency (RF) component issues identified during the assembly integration and test driving additional demand for production labor resources to rectify and 4) Engineering discoveries found during the course of the first time integration effort driving additional unplanned demand for labor.
 - Subcontract management labor supporting 11 minor subcontracts and LMUK has higher than originally estimated. Ball Aerospace, LMUK, Battelle and Space Information Labs (SIL) design/environmental changes, have required additional support and expediting. LMUK has required added support related to cost and schedule reporting.
- DO30 CV = (\$1.1M)
 - Additional effort required to meet modified Flight Test Patriot (FTP)-08 Pre-ship Readiness Review (PSRR) date.
- DO22 CV = (\$0.9M)
 - Accounting material transfer from MBRV-7
 - Material Borrow/Payback: MBRV-5 Common Avionics Section/Nth Stage Avionics Multi-Interface Unit (CAS/NAS MIU), MBRV-8 Safe/Arm Device, Encoder and Flight Termination Receiver from Material Inventory
- DO8 CV = (\$0.7M)
 - Additional cost realized related to Launch Vehicle (LV) 2 ACM assembly. Delay in charging to DO8 because prime took additional time to verify charges were accurate.
- DO27- T3 CV = +\$1.8M
 - Lower program management labor and program travel expenses this period than the LOE budget due to delays in the delivery dates for SS #2 hardware.
 - Underrun in Logistics Support activity driven by a delay in SS #3 shipments to both Hill Air Force Base (HAFB) and Courtland. - Less LOE hours needed in Program Business Operations due to the partial Stop Work.
 - Test efforts were less than expected in Courtland due to the booster stack testing that was done at the initial integration facility before shipment to Courtland.
 - No non-conformances were taken during the assembly and test efforts for SS #2 which contributed to the under run.

The unfavorable net change in the schedule variance is due to the following:

- DO27- T3 SV = (\$2.1M)

-Delayed delivery of the MBRV-5 Front End from Delivery Order 29 because of the late delivery of the EMIU. Flight Booster #2 Assembly and Soft-Mate and Booster Vehicle #2 System Test were planned for October and November 2015, but are delayed due to the delayed delivery of the MBRV-5 Front End.

-Delays also encountered due to issues with connectors found during the RV hard mate activities.

- DO29- MBRV-5 SV = +\$2.1M

-Software replanned to match new BETDs.

-Completion and Delivery of 4 of the 5 Small Re-entry Inertial Measurement Unit (SRIMU) units by subcontractor GE.

-Completion of Software Functional Test (SFT) tasks that were scheduled to be completed in prior months.

-Subcontractor Invocon completion of Front Section (FS) 4 integration activities.

-Subcontractor GE and the delivery of the FS3 EMIU.

-Completion of SS #4 tasks ahead of baseline schedule. These tasks include completing the Integrated Electronics Module (IEM) 1 buildup, completion of Invocon Hit Detection System (HDS) Sensor Installations, the ACM Avionics bulkhead build up completion, the integrated Avionics Bulkhead installation into the ACM, starting the IEM 2 Aft Avionics Build Up ahead of schedule.

-SS #3 tasks that were behind schedule that completed. These tasks include install the IEM 1 into Section 2 Aeroshell, transferring the RV and ACM from Integration Building (IB) 2 to Missile Assembly Building (MAB) 1, Section 1,2, 3 & IEM 2, ACM Softmate, start of the RV ACM (Softmate) Functional Checkout.

- DO29-MBRV-8 SV = (\$0.5M)

-At the end of CY2014 MBRV-8 component deliveries for seven vendors were significantly ahead of schedule. During this CY2015 period, those deliveries are now "on" schedule resulting in loss of portion of the previous period's favorable schedule variance.

Notes

The following actions have added scope to this contract over the course of CY 2015:

Delivery Order	Amount	Description
022 – Hardware	\$11.5M	Additional Scope
027 – Medium Range Ballistic Missile (MRBM) T-3	\$10.6M	Additional Scope
029 – Re-Entry Vehicles	\$50.3M	Additional Scope
Total	\$72.4M	

Contract Identification

Appropriation: RDT&E
Contract Name: THAAD Advanced Capability Development
Contractor: Lockheed Martin Corporation
Contractor Location: 4800 Bradford Drive NW
Huntsville, AL 35805-1930
Contract Number: HQ0147-12-D-0001
Contract Type: Cost Plus Fixed Fee (CPFF), Firm Fixed Price (FFP)
Award Date: February 01, 2012
Definitization Date: February 01, 2012

Contract Price							
Initial Contract Price (\$M)			Current Contract Price (\$M)			Estimated Price At Completion (\$M)	
Target	Ceiling	Qty	Target	Ceiling	Qty	Contractor	Program Manager
961.2	N/A	N/A	1236.0	N/A	N/A	1236.0	1236.0

Target Price Change Explanation

The difference between the Initial Contract Price Target and the Current Contract Price Target is due to an increase to an amount previously approved by the MDA Director in order to support continuing THAAD development and test activities.

Contract Variance			
Item	Cost Variance	Schedule Variance	
Cumulative Variances To Date (12/31/2015)	-0.6	-4.0	
Previous Cumulative Variances	-2.3	-1.9	
Net Change	+1.7	-2.1	

Cost and Schedule Variance Explanations

The favorable net change in the cost variance is due to recovery from the prior year and primarily the result of personnel being reprioritized onto other activities including the System Development Support & Integration (SDSI) proposal effort and flight tests. Additionally, fewer obsolescence activities were required than planned resulting in labor cost savings benefitting contract performance. Slightly offsetting this favorable performance was a no-cost period of performance extension on Task Order 1 issued May 22, 2015.

The unfavorable net change in the schedule variance is due to the incorporation of congressional reductions (funding restrictions) in FY 2015 into the Task Order 2 performance measurement baseline. The newly baselined tasks had previously been stretched or shifted to the right as a result of funding restrictions. The overall impact of the funding restrictions (\$6.6M) moved the planned effort out 12 months during FY 2015. However, reprioritized remaining work and personnel helped to reduce the impact of unfavorable schedule variances on the overall ACD contract to an unfavorable (\$2.1M). Additionally, Task Order 35 flight test changes and the postponement of FTT-18 caused unfavorable cost and schedule variances. Offsetting these variances was the early receipt and consumption of Institutional Conduct of Fire Trainer Hardware on Task Order 6 Phase 2.

Contract Identification

Appropriation: RDT&E
Contract Name: SM-3 Technology Development of Block IB/IA Missiles
Contractor: Raytheon Missile Systems
Contractor Location: PO Box 11337
 1151 East Hermans Rd
 Tucson, AZ 85745-1337
Contract Number: HQ0276-11-C-0002
Contract Type: Cost Plus Award Fee (CPAF)
Award Date: January 15, 2011
Definitization Date: March 15, 2011

Contract Price							
Initial Contract Price (\$M)			Current Contract Price (\$M)			Estimated Price At Completion (\$M)	
Target	Ceiling	Qty	Target	Ceiling	Qty	Contractor	Program Manager
594.0	N/A	N/A	671.0	N/A	N/A	574.0	581.0

Target Price Change Explanation

The difference between the Initial Contract Price Target and the Current Contract Price Target is due to Flight Test Support, continued verification of technology insertion, discrimination improvement and service life extension to September 30, 2015.

Contract Variance			
Item	Cost Variance	Schedule Variance	
Cumulative Variances To Date (12/31/2015)	+15.1	-3.0	
Previous Cumulative Variances	+13.0	-3.0	
Net Change	+2.1	+0.0	

Cost and Schedule Variance Explanations

The favorable net change in the cost variance is due to strong performance on Flight Test pedigree evaluation and under-plan on Service Life Evaluation (SLEP), these efforts resulted in positive cost savings.

Notes

Effort remaining includes Flight Test Support, continued verification of technology insertion, discrimination improvement and service life evaluation to end of Period of Performance August 30, 2015.

Contract Identification

Appropriation: RDT&E
Contract Name: Long Range Discrimination Radar (LRDR)
Contractor: Lockheed Martin
Contractor Location: 199 Borton Martin Road
 Moorestown, NJ 08057
Contract Number: HQ0147-16-C-0011
Contract Type: Fixed Price Incentive(Firm Target) (FPIF)
Award Date: October 21, 2015
Definitization Date: October 21, 2015

Contract Price							
Initial Contract Price (\$M)			Current Contract Price (\$M)			Estimated Price At Completion (\$M)	
Target	Ceiling	Qty	Target	Ceiling	Qty	Contractor	Program Manager
667.6	732.0	N/A	667.6	732.0	N/A	667.6	667.6

Cost and Schedule Variance Explanations

Cost and Schedule Variance reporting is not required on this (FPIF) contract.

Notes

This is the first time this contract is being reported.

The LRDR contract was awarded on October 21, 2015 and is pre-baseline as of December 31, 2015. The Integrated Baseline Review (IBR) is scheduled for the 3QFY16, after which earned value data will be measurable and relevant.

Deliveries and Expenditures

Deliveries				
Delivered to Date	Planned to Date	Actual to Date	Total Quantity	Percent Delivered
Development	0	0	0	--
Production	0	0	0	--
Total Program Quantity Delivered	0	0	0	--

Expended and Appropriated (TY \$M)				
Total Acquisition Cost	153881.4	Years Appropriated		15
Expended to Date	108130.0	Percent Years Appropriated		75.00%
Percent Expended	70.27%	Appropriated to Date		119016.4
Total Funding Years	20	Percent Appropriated		77.34%

The above data is current as of January 28, 2016.

Operating and Support Cost

Cost Estimate Details

Date of Estimate:

Source of Estimate:

Quantity to Sustain:

Unit of Measure:

Service Life per Unit:

Fiscal Years in Service:

Sustainment Strategy

None

Antecedent Information

None

Annual O&S Costs BY2002 \$K			
Cost Element	BMDS		No Antecedent (Antecedent)
Unit-Level Manpower		0.000	0.000
Unit Operations		0.000	0.000
Maintenance		0.000	0.000
Sustaining Support		0.000	0.000
Continuing System Improvements		0.000	0.000
Indirect Support		0.000	0.000
Other		0.000	0.000
Total		--	--

Item	Total O&S Cost \$M			
	BMDS			No Antecedent (Antecedent)
	APB Objective/Threshold		Current Estimate	
Base Year	N/A	N/A	N/A	N/A
Then Year	N/A	N/A	N/A	0.0

O&S Cost Variance		
Category	BY 2002 \$M	Change Explanations
Prior SAR Total O&S Estimates - Dec 2014 SAR	0.0	
Programmatic/Planning Factors	0.0	
Cost Estimating Methodology	0.0	
Cost Data Update	0.0	
Labor Rate	0.0	

Energy Rate	0.0
Technical Input	0.0
Other	0.0
Total Changes	0.0
Current Estimate	0.0

Disposal Estimate Details

Date of Estimate:
Source of Estimate:
Disposal/Demilitarization Total Cost (BY 2002 \$M):