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Missile Defense Agency (MDA) Exhibit R-2 RDT&E Budget Justification					Date May 2009			
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APPROPRIATION/BUDGET ACTIVITY			R-1 NOMENCLATURE					
RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)			0603892C Ballistic Missile Defense Aegis					

COST (\$ in Thousands)	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015
Total PE Cost	1,214,067	1,113,655	1,690,758					
BX09 AEGIS BMD Block 2.0	270,694	248,623	53,752					
EX09 AEGIS BMD Block 5.0	695,197	579,404	1,011,223					
XX09 AEGIS BMD Sustainment	43,800	40,030	46,019					
BX18 Sea-Based Terminal BMD Block 2.0	64,965	23,444	5,694					
WX18 Far Term Sea Based Terminal Capability Development	13,000	0	0					
WX09 AB Capability Development	111,364	191,738	522,445					
ZX40 Program-Wide Support	15,047	30,416	51,625					

A. Mission Description and Budget Item Justification

A.1 System Element Description

The Aegis Ballistic Missile Defense (Aegis BMD) mission is to deliver an enduring, operationally effective and supportable Ballistic Missile Defense Capability on Aegis cruisers and destroyers to defend the nation, deployed forces, friends and allies, and to increase this capability by delivering evolutionary spiral improvements as part of Ballistic Missile Defense System (BMDS) block upgrades. The Aegis BMD element of the BMDS builds upon the existing U.S. Navy Aegis Weapons System (AWS) and Standard Missile (SM) infrastructures. Aegis BMD provides a forward-deployable, mobile capability to detect and track Ballistic Missiles of all ranges, and the ability to destroy Short-Range Ballistic Missile (SRBM), Medium-Range Ballistic Missile (MRBM), Intermediate-Range Ballistic Missile (IRBM), and selected long-range class threats in the midcourse phase of flight. Spiral upgrades to both the Aegis BMD Weapon System and the SM-3 configurations will enable Aegis BMD to provide effective, supportable defensive capability against more difficult threats in all phases of flight, including Long Range Ballistic Missiles (LRBMs).

Aegis BMD demonstrated its flexibility to address additional threats in the February 2008 intercept of a satellite. The operation, known as Burnt Frost, demonstrated the precision, effectiveness and robustness of the Aegis BMD capability, even when employed in a manner clearly beyond its design parameters.

In support of BMDS Block 1.0 objectives to defend the U.S. from limited long-range threats, Aegis BMD provided a Long Range Surveillance and Track (LRS&T) capability to the BMDS against Ballistic Missile threats of all ranges, supporting GMD engagements.

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<p>In support of BMDS Block 2.0 objectives to defend allies and deployed forces from short- to medium-range threats in one region or theater, Aegis BMD provided initial engagement capability against SRBM to MRBM-class threats. Aegis BMD fielded the Block 2.0 capability in two spirals: The first spiral provided an initial engagement capability against SRBMs and MRBMs on Aegis BMD cruisers with the BMD 3.0 Weapon System and SM-3 Blk I missile that could be used for emergency activation; Spiral two provided an operationally certified Long Range Surveillance and Track (LRS&T) and engagement capability on Aegis BMD cruisers and destroyers configured with the BMD 3.6 Weapon System, capable of firing SM-3 Blk I and IA missiles using organic and external sensors.</p> <p>In response to Real World Events, Aegis BMD has developed and is fielding an integrated Near-Term Sea Based Terminal (SBT) capability against a finite set of Short Range Ballistic Missiles. Also as part of BMDS Block 2.0., BMD 3.6.1 incorporates a fuze-modified SM-2 Block IV missile provided by a separate Navy sponsored effort and builds on BMD 3.6 to provide a capability (BMD 3.6.1) against additional threats. The updated BMD 3.6.1 improves Aegis BMD Launch on AN/TPY-2 and bridges the gap between the operational deployment of BMD 3.6 and BMD 4.0.1.</p> <p>In support of Block 5.0 objectives to expand defense of allies and deployed forces from short- to intermediate-range threats in two regions or theaters, Aegis BMD is providing several capabilities: BMD 4.0.1 improves engagement performance against an expanded threat set and surveillance and track performance against some IRBMs and long-range threats. This will be achieved by modifications to the Weapon System (BMD 4.0.1) for new RF discrimination and tracking capability, and an upgraded SM-3 guided missile. The Aegis BMD 4.0.1 Weapon System includes the Aegis BMD Signal Processor (BSP), and integrates an updated variant of the SM-3 (SM-3 Blk IB) to improve overall system performance and discrimination capability. The SM-3 Blk IB configuration includes a performance-enhancing two-color IR seeker, and a Throttleable Divert and Attitude Control System (TDACS), which provides performance and manufacturing improvements at a lower per-unit cost. BMD 4.0.1 will be an operationally certified system firing either the SM-3 Blk IA or IB missile. The BMD 5.0 upgrade will integrate the BMD mission with the Navy-developed Open Architecture system to preserve the sea-based BMD capability as Navy ship modernization plans are executed. The new configuration of the Aegis BMD Weapon System will transition from older, MIL-standard computers to new Commercial Off The Shelf (COTS) computing plants. This will allow ships' operators to conduct combat missions with a single set of tactical computer programs running on the same computing plant and enhanced displays, enabling Aegis BMD to maintain compatibility with Surface Navy ships while also expanding the number of ships available to serve as potential candidates for the BMD mission.</p>		

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Future Capabilities:

Aegis BMD and the Japan Ministry of Defense (JMOD) have undertaken an SM-3 Cooperative Development (SCD) program, which consists of a spiral upgrade of the SM-3 Blk IB missile to a 21-inch diameter SM-3 missile (SM-3 Blk IIA). Missile development will be covered under the SCD project prior to the SM-3 Blk IIA incorporation into the BMD 5.1 upgrade to the Aegis Ballistic Missile Defense system.

The BMD 5.1 upgrade will integrate and test the SM-3 Blk IIA missile with the Aegis BMD weapons system in Open Architecture. The addition of the SM-3 Blk IIA missile will expand available battlespace to include IRBM and selected longer-range threats, and when combined with additional weapon system modifications, will enable an Engage-on-Remote capability. That capability will further extend Aegis BMD by capitalizing on globally-deployed BMDS sensor assets.

Additionally, Aegis BMD will provide for a more robust, long-term integrated Sea Based Terminal (SBT) capability. Aegis BMD will initiate a BMD 3.6.2 capability in FY10 and, in BMD 5.2, Aegis BMD will incorporate a new missile type (to be determined) and build on the BMD 3.6.1 near-term SBT capability.

MDA will also begin concept development of a land based variant of the Standard Missile-3 (SM-3). If deployed, this will provide a land launched SM-3 exoatmospheric defense against short/medium and some intermediate range ballistic missiles in the later stages of flight. This would broaden the BMDS use of the SM-3 from current sea based application in Aegis BMD ships in the near/mid-term. Future variants of SM-3 will be considered in trade-space for LBSM-3.

A.2 System Element Budget Justification and Contribution to the Ballistic Missile Defense System (BMDS)

Aegis BMD provides a mobile, forward-deployable LRS&T capability to the BMDS against ballistic missile threats of all ranges. In Block 2.0, Aegis BMD also provides an engagement capability against short to medium range threats (BMD 3.6 and the SM-3 Blk IA missile). Aegis BMD will also introduce a near-term Sea-Based Terminal capability (BMD 3.6.1) to engage limited short range threats in the terminal phase of flight. In Block 5.0, a new fielded configuration will expand both LRS&T and engagement capability to include more complex threats including limited IRBM threats (BMD 4.0.1 and the SM-3 Blk IB missile). Future capability developments such as the 21-inch diameter missile currently under development in the SM-3 Cooperative Development (SCD) program with Japan will be integrated with the Aegis BMD Weapon System in Open Architecture in BMD 5.1. This will further expand engagement capability against selected long-range threats, to include some ICBM-class threats, and will broaden

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<p>program application for both U.S. and international ships. Another future capability development will introduce a more robust Sea Based Terminal capability.</p> <p>Aegis BMD will deliver the following:</p> <ul style="list-style-type: none">• Sixteen (16) Aegis Destroyers equipped with the Aegis BMD Weapon System to conduct the LRS&T and engagement missions• Five (5) Aegis Cruisers equipped with the Aegis BMD Weapon System to conduct the LRS&T and engagement missions• Six (6) additional ships will be upgraded for BMD operations, configuration TBD.• SM-3 Missile Deliveries - To Be Used for Testing and/or Deployment:<ul style="list-style-type: none">• Eleven (11) SM-3 Blk I missiles• One (1) ``Pathfinder`` SM-3 Blk IA Flight Test Round (FTR)• Four (4) ``Pathfinder`` SM-3 Blk IB Flight Test Rounds (FTR)• Fifty nine (59) SM-3 Blk IA missiles with RDT&E• An additional thirty five (35) SM-3 Blk IA missiles will be procured under a Procurement Defense-Wide appropriation. This procurement was begun under an RDT&E appropriation; the change is authorized by statutory language as part of the FY09 Defense Appropriation.• Thirty (30) SM-3 Blk IB missiles with RDT&E• An additional 123 SM-3 Blk IB missiles will be procured under a Procurement-Defense Wide appropriation.• In response to continued Warfighter demand, Aegis BMD will procure an additional 66 SM-3 Blk IB missiles.• Land-based SM-3 concept will be delivered for consideration. <p>BMD Systems Engineering:</p> <p>BMD Systems Engineering provides System Description Documents and System Specifications for elements to design, build, integrate and test BMDS components. These products optimize performance at the system level and further ensure that the assessment of the designed BMD System is based on sufficient ground and flight testing. Aegis BMD compliance with BMD System level requirements is monitored in a series of requirements and design reviews both at the system and element levels.</p> <p>Unifying Missile Defense Functions:</p>		

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<p>MDA has a set of Unifying Missile Defense Functions (UMDFs), which increase the effectiveness of the BMD System (including probability of engagement success, increase in defended area and raid size capacity, additional redundancy of architecture, unity of command) through the integration of MDA developed capabilities. These UMDF efforts are Sensor Registration (reporting of sensor errors / biases), Correlation (ensuring the information from multiple sensors seeing a threat relates to the same object), System Track (creating a single engageable track of a threat from multiple reports provided by different land, sea, and space based multiple sensors), Discrimination (identifying object details to determine the target from debris or decoys), Battle Management (combining the best sensors and shooters to ensure the highest probability of a kill), Hit / Kill Assessment (determining if the target selected was destroyed after missile impact), and Communications (providing the worldwide connection of sensors and shooters to command authorities). UMDFs are implemented across the BMDS elements to create and utilize system level data and decisions that allow Combatant Commanders the ability to automatically and manually optimize sensor coverage and interceptor inventory to defend against all ranges of ballistic threats.</p> <p>Common Threat Engineering:</p> <p>Common threat engineering produces common and consistent adversary trajectory and signature data to enable Ballistic Missile Defense (BMD) System and sub-system concept and requirements, design, verification, and assessment. Common Threat data is contained in the Adversary Capability Document (ACD) and Adversary Data Packages (ADP) and drives BMDS ground tests, flight tests, digital simulations, and pre-mission analysis activities. It is also used to develop the BMD System Description Document and BMD System Specification.</p> <p>Modeling & Simulation:</p> <p>Modeling and simulation (M&S) activities support all phases of Aegis BMD's development, including development of Aegis Weapon System (AWS) and Standard Missile -3 (SM-3) variants, flight test missions, ground tests, wargames, exercises, and performance assessment. Models and simulations are tailored to the specific need of a component in its current phase of development, ranging from low-to-medium fidelity analyses supporting concept definition studies, to high-fidelity models used to support engineering development, or testing and are integrated into the BMD Digital Simulations Architecture. Digital simulations support Program Assessment events, which provide critical system level performance data relative to all elements, the system engineer, M&S developers, OTA and Warfighter. Further, the M&S Digital tools are accredited for each application and for specific objectives; tools are put through a rigorous verification and validation process, reviewing coding and specifications, and comparing analyses against actual flight test results. Planning support is required to assist in the V&V plan development, test execution, analysis for V&V reports and PO M&S Certification. The Digital End-to-End simulation of the BMDS requires a PA Integrated V&V Plan and Report (both element and system level), a PA-system level Accreditation Plan and Report, and support to PA Non-MDA Elements. BMDS Hardware In The Loop</p>		

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<p>(HWIL): Aegis BMD will support the BMDS HWIL Modeling and Simulation Program by providing and integrating into the BMDS system-level HWIL single stimulation framework to support full-envelope BMDS ground test, flight test, and training events based upon Agency and warfighter needs.</p> <p>System Pre and Post Flight Reconstruction:</p> <p>Aegis BMD will support System Pre Flight predictions for each system level flight test using the test framework set up with the BMDS configuration for a particular flight test. This provides the confidence in Flight Test execution by predicting element performance and exercising element interfaces. This work is also used to proof out the construct of the flight test to ensure if the required data and data management plan will support System Post Flight Reconstruction objectives. System Post Flight Reconstruction (SPFR) will use a HWIL and/or a Digital M&S Environment to replicate the day of flight for the BMDS configuration, modified to represent the actual environmental conditions and target dynamics observed in flight. The results of this testing are used to increase confidence in the models and simulations by anchoring the results with emphasis on the critical engagement conditions (CECs) and empirical measurement events (EMEs) back to the real world event. SPFR is used for validation (anchoring) of models and simulations.</p> <p><u>A.3 Major System Element Goals</u></p> <ul style="list-style-type: none">• Block 1.0:<ul style="list-style-type: none">• BMD 3.0E/3.0 - Deliver a Long Range Surveillance and Track (LRS&T) capability against ballistic missile threats of all ranges in support of GMD engagements.• Block 2.0:<ul style="list-style-type: none">• BMD 3.6 - Deliver an LRS&T capability against ballistic missile threats of all ranges. Deliver an engagement capability against SRBM to MRBM-class threats.• SM-3 Blk IA missile.• BMD 3.6.1: Introduce a Near-Term Sea Based Terminal capability against SRBMs (with OPNAV-modified SM-2 Blk IV missile).• Block 5.0:<ul style="list-style-type: none">• BMD 4.0.1 - Improve the Weapon System capability to identify and classify Ballistic Missile threat objects from debris and introduce the Aegis BMD BSP. Improve BMDS BMC4I performance, to include engagement coordination with THAAD and Patriot, kill assessment; and missile downlink upgrades for improved kill assessment. Increase battlespace through enhanced Launch on Remote (via TADIL), Aegis to		

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- Aegis engagement coordination, and automated planning data exchange with the C2BMC Planner and Maritime Integrated Air and Missile Defense Planning System (MIPS).
- SM-3 Blk IB - Improve missile capability to identify and target the threat object through the All Reflective Optics (ARO), Advanced Signal Processor (ASP), and two-color missile seeker. Improve missile kinetic warhead (KW) kinematic performance via the Throttleable Divert and Attitude Controls System (TDACS).
 - BMD 5.0 - Broaden program application for U.S. and international Aegis ship population by implementing Open Architecture to improve BMDS interoperability, integrate improved BMC4I capabilities, including Navy Multi Band Terminal (NMT) and Advanced EHF (AEHF) Capability.
 - Future Capability Developments:
 - SCD - Continue U.S./Japan SM-3 Cooperative Development (SCD) of the SM-3 Blk IIA Missile (21-inch diameter SM-3 missile).
 - BMD 5.1 - Integrate the SM-3 Blk IIA missile into the Aegis BMD Weapon System to enable Ascent-phase operations and Engage on Remote, and improve track correlation and feature data exchange, as well as BMDS sensor data fusion in order to increase battlespace.
 - BMD 5.2 - Introduce a more robust Sea Based Terminal capability. This capability transfers to program element (PE) 0603891C, Special Programs.
 - Land-based SM-3 - Develop the capability to fire an SM-3 missile from a land-base launcher.
 - BMD 3.6.2 - Develop improvements to the Near-Term SBT capability deployed in 2008 to keep pace with the evolving threat.

A.4 Major Events Schedule and Description

Major Event	Project	Timeframe	Description
Critical Design Review			
Development Milestones			
BMD 3.6.1 Engineering Assessment (EA)	BX18	2Q FY 2008	<ul style="list-style-type: none"> • Conduct Engineering Assessment for the BMD 3.6.1 computer program update, to include a Near Term Sea-Based Terminal capability.
BMD 3.6.1 Certification	BX18	1Q FY 2009	<ul style="list-style-type: none"> • Certification of BMD 3.6.1 computer program.
BMD 5.0 System Design Review	EX09	1Q FY 2008	<ul style="list-style-type: none"> • Conduct System Design Review for the BMD 5.0 computer program with Open Architecture.
BMD 4.0.1 Critical Design Review (CDR)	EX09	1Q FY 2009	<ul style="list-style-type: none"> • Conduct a Critical Design Review of the BMD 4.0.1 computer program.
BMD 5.0 Preliminary Design Review	EX09	1Q FY 2009	<ul style="list-style-type: none"> • Conduct a PDR of BMD 5.0 with Open Architecture.
BMD 4.0.1 Engineering Assessment	EX09	3Q FY 2009	<ul style="list-style-type: none"> • Perform an EA of BMD 4.0.1 program to support At-Sea Testing..
BMD 5.0 Critical Design Review	EX09	1Q FY 2010	<ul style="list-style-type: none"> • Conduct a CDR of BMD 5.0 with Open Architecture.
SM-3 Blk IIA Development Milestones			

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Major Event	Project	Timeframe	Description
SM-3 Blk IIA System Requirements Review (SRR)	WX09	1Q FY 2008	<ul style="list-style-type: none"> Conduct SM-3 Blk IIA SRR.
SM-3 Blk IIA SRR-2	WX09	3Q FY 2008	<ul style="list-style-type: none"> Conduct a second SRR for the SM-3 Blk IIA missile configuration.
SM-3 Blk IIA System Design Review (SDR)	WX09	1Q FY 2009	<ul style="list-style-type: none"> Conduct an SDR for the SM-3 Blk IIA missile configuration.
SM-3 Blk II Preliminary Design Review	WX09	3Q FY 2010	<ul style="list-style-type: none"> Conduct a PDR for the SM-3 Blk IIA missile.

Other

Milestones			
Requirements Analysis	WX18	1Q FY 2008 - 2Q FY 2009	

B. Program Change Summary	FY 2008	FY 2009	FY 2010	FY 2011
Previous President's Budget (FY2009 PB)	1,126,337	1,157,783	1,234,220	
Current President's Budget (FY2010 PB)	1,214,067	1,113,655	1,690,758	
Total Adjustments	87,730	-44,128	456,538	
Congressional Program Reductions	0	-44,128	0	
Congressional Rescissions	0	0	0	
Total Congressional Increases	103,542	0	0	
Total Reprogrammings	2,672	0	0	
SBIR/STTR Transfer	-18,484	0	0	
Adjustments to Budget Years	0	0	456,538	

In FY09, Aegis BMD delta is related to funds transferred to a Procurement, Defense Wide PE per Congressional direction.

In FY10, Aegis BMD's top line increases to support the following:

- Transition of mature SM-3 missile purchases to the Procurement PE
- Addition of Land-based SM-3 and BMD 3.6.2 upgrade efforts
- Initiation of six (6) additional ship sets

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COST (\$ in Thousands)	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015
BX09 AEGIS BMD Block 2.0	270,694	248,623	53,752					
RDT&E Articles Qty	35	11	17					

Note:

A. Mission Description and Budget Item Justification

Aegis BMD supports the BMDS Block 2.0 with the BMD 3.6 Combat System, comprised of the BMD 3.6 computer systems coupled with the SM-3 Blk IA missile, and with BMD 3.6.1, an upgrade to BMD 3.6 that includes a terminal phase capability. BMD 3.6.1 will be fully discussed in project BX18.

Aegis BMD 3.6 and 3.6.1 support the BMDS mission of intercepting ballistic missiles in all regions, in all phases, and of all ranges, as follows:

- In all regions: Provide sea-based surveillance, tracking, and engagement capabilities in international waters.
- In all phases of ballistic missile flight:
 - Long Range Surveillance and Track (LRS&T) capability against missile threats in all flight stages (BMD 3.6);
 - Engagement capability against missile threats in the midcourse flight stage (BMD 3.6);
 - Engagement capability against missile threats in the terminal phase of flight (BMD 3.6.1).
- Against all ranges:
 - Against long-range ballistic missiles by providing surveillance and tracking support as part of the Limited Defensive Capability (LDC) (Block 1.0).
 - Against short and medium range ballistic missiles by providing engagement support as part of BMD 3.6 and BMD 3.6.1.

Aegis BMD supported initial BMDS operations by providing LRS&T data to other elements of the BMDS. Aegis BMD will further improve both national and international security with its ability to launch Standard Missile 3 (SM-3) missiles based upon autonomous data and upon data received via the Tactical Digital Information Link Joint (TADIL-J) network. The BMD 3.6 program:

- Defeats unitary and simple separating threats (Short Range Ballistic Missiles (SRBMs) and Medium Range Ballistic Missiles (MRBMs)) with Aegis BMD configured cruisers and destroyers using SM-3 Blk I or IA guided missiles.

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<ul style="list-style-type: none"> • Provides Long Range Ballistic Missile (LRBM) surveillance and track data through the BMDS to the GMD element to cue and initiate fire control Weapons Task Plans. • Provides Aegis BMD surveillance and track data to the BMDS to support Combatant Commander situational awareness. • Expands the engagement battle space by using remote (Aegis AN/SPY-1) sensor data delivered via the TADIL-J network. • Supplies Aegis BMD operational data to the BMDS C2BMC Element to support Combatant Commander situational awareness. • Provides an operational, engagement-capable system. <p>The BMD 3.6 computer program has been fielded on a total of eighteen (18) U.S. Navy Aegis Cruisers and Destroyers, along with SM-3 Blk IA missiles.</p> <p>With BMD 3.6.1, Aegis BMD is providing a follow-on capability to BMD 3.6 in response to recent Real World Events. Near-Term Sea Based Terminal (BMD 3.6.1) provides for an integrated SBT capability against a finite set of Short Range Ballistic Missiles. BMD 3.6.1 incorporates a fuze modified SM-2 Block IV missile provided by a separate Navy sponsored effort and builds on BMD 3.6 to provide a terminal phase capability. BMD 3.6.1 continues efforts to refine Aegis Launch on AN/TPY-2 and bridges the gap between the operational deployment of BMD 3.6 and BMD 4.0.1.</p> <p>Aegis BMD is fielding a near-term Sea-Based Terminal capability beginning in FY 2009. In addition to the near-term SBT capability, Aegis BMD is performing various upgrades to BMD 3.6 in BMD 3.6.1; updates include early integration efforts for Aegis BMD launch on AN/TPY-2 capability. Aegis BMD 3.6.1 also provides enhanced capabilities within the areas of engagement coordination, system track, and communications in order to support the BMDS Unifying Missile Defense Functions (UMDF).</p> <p>Aegis BMD demonstrated its robustness and flexibility to address additional threats in the February 2008 intercept of a satellite. The operation, known as Burnt Frost, demonstrated the precision and effectiveness of the Aegis BMD capability, even when employed in a manner clearly beyond its design parameters.</p> <p>In collaboration with the MDA Systems Engineer, Aegis BMD is contributing to the BMDS in development of engagement sequence groups (ESGs). Aegis BMD supports an autonomous engagement against SRBMs and MRBMs without requiring external cueing. BMD 3.6 and BMD 3.6.1 support SM-3 Engage on AN/SPY-1, SM-3 Launch on Remote (AN/SPY-1), GBI Engage on AN/SPY-1, and GBI Launch on AN/SPY-1.</p> <p><u>B. Accomplishments/Planned Program</u></p>		

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	FY 2008	FY 2009	FY 2010	FY 2011
BMD 3.6 Weapon System Development	13,898	738	0	
RDT&E Articles (Quantity)	0	0	0	

The Weapon System Engineering team will continue to support flight testing of BMD 3.6, and address engineering issues with the computer program.

FY08 Accomplishments:

- Participated in the shutdown of an errant U.S. satellite in Operation Burnt Frost.
- Participated in FTM-13.
- Participated in on-going testing: FTM-14, TOO tests.
- Continued to monitor for obsolescence issues.

FY09 Planned Program:

- Participate in on-going testing: FTM-15.

	FY 2008	FY 2009	FY 2010	FY 2011
Aegis BMD Testing	59,905	77,239	0	
RDT&E Articles (Quantity)	0	0	0	

This effort provides funding for Aegis BMD test and evaluation missions, as well as other system-wide BMDS tests to support the development of the BMDS.

FY08 Accomplishments:

- Conducted FTM-13 Campaign:
 - Completed pre-flight analysis to verify mission scenarios and to predict flight performance.
 - Prepared and completed missile delivery package for the Mission Control Panel reviews.
 - Conducted a simultaneous launch of two (2) ARAV-A targets for BMD 3.6 engagement with two (2) SM-3 Blk IA missiles.

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<ul style="list-style-type: none"> • Performed post-flight analysis to validate high fidelity models and simulations. • Conducted post-flight analysis to support Weapon System Performance Reviews (WSPRs). • Conducted Burnt Frost mission: <ul style="list-style-type: none"> • Destroyed hydrazine tank aboard an errant satellite which might have hit land and posed a threat to civilians. • Conducted FTM-14 (full write up in project BX18, Near Term Sea-Based Terminal). • Participated in GMD mission to track and pass tracking data via TADIL-J for the creation of sensor/weapons task plans • Participated as a sensor element in BMDS tests to include the FTX-3, FTT-9, and FTT-10 missions. • Participated as a sensor element in GT-197 target of opportunity. • Began test planning for FY09 Aegis BMD flight test missions: prepare target, develop models and simulations, and ready the range for test. FY09 Planned Program: <ul style="list-style-type: none"> • Conduct FTM-15 mission: <ul style="list-style-type: none"> • Complete pre-flight analysis to verify mission scenarios and to predict flight performance. • Prepare and complete missile delivery package for the Mission Control Panel reviews. • Conduct a BMD 3.6 Launch on TADIL engagement and intercept of a Group F IRBM target with a SM-3 Blk IA missile. • Perform post-flight analysis to validate high fidelity models and simulations. • Conduct post-flight analysis to support WSPRs. (MDRs).Participate as a sensor element in BMDS missions. • Participate as a sensor element in BMDS and TOO tests. • Conduct BMD 4.0.1 At-Sea Demonstration: <ul style="list-style-type: none"> • Complete pre-flight analysis to verify mission scenarios and to predict flight performance. • Prepare and complete missile delivery package for the Mission Control Panel reviews. • Conduct BMD 4.0.1 (CG) simulated engagements of ARAV-B and ARAV-C targets. • Perform post-flight analysis to validate high fidelity models and simulations. • Conduct post-flight analysis to support WSPRs · Conduct PACBLITZ 08 • Conduct a BMD 3.6 (DDG) simulated engagement of an ARAV-B target with an SM-3 Blk I missile • Begin test planning for FY10 Aegis BMD flight test missions: prepare target, develop models and simulations, and ready the range for test. 		

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APPROPRIATION/BUDGET ACTIVITY RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)		R-1 NOMENCLATURE 0603892C Ballistic Missile Defense Aegis		
	FY 2008	FY 2009	FY 2010	FY 2011
Targets	63,395	0	0	
RDT&E Articles (Quantity)	6	0	0	
<p>This effort provides the Missile Defense Agency with ballistic missile target hardware, target range support, logistics support, target integration, and associated launch services to support Aegis BMD flight tests, as well as other system wide tests to support the development of the Ballistic Missile Defense System.</p> <p>FY 2008 Accomplishments:</p> <p>RDT&E Articles: 6 ARAVs</p> <ul style="list-style-type: none"> • Launched two (2) ARAV-A's as part of FTM-13 mission • Launched two (2) ARAV-B's as part of FTM-14 (Event 2 - FTX-4) mission • Continued design, manufacture and delivery of a LV-2 launch vehicle in support of FTM-15. • Continued the design and manufacturing of SRBMs, MBRV-3s and payloads in support of FTM-15 and FTM-16. • Continued design of an ARAV-C vehicle. <p>FY 2009 Planned Program:</p> <p>Funding and content transfers to the Test and Targets PE, per Congressional direction.</p>				
	FY 2008	FY 2009	FY 2010	FY 2011
SE&I and BMDS Integration	6,496	0	0	
RDT&E Articles (Quantity)	0	0	0	
<p>This effort provides funding to work in collaboration with the BMDS System Engineer to develop requirements flowdown for Aegis BMD 3.6 and participate in definition of appropriate Engagement Sequence Groups to best utilize Aegis BMD capability in the overall BMDS.</p> <p>FY08 Accomplishments:</p>				

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<ul style="list-style-type: none"> Supported system integration efforts with other BMDS elements to reflect the overall BMDS. Supported the MDA System Engineering's Update of the Test Bed System Specification (TBSS) to reflect BMD 4.0.1 and BMDS requirements. 				
	FY 2008	FY 2009	FY 2010	FY 2011
BMC3	15,700	11,804	693	
RDT&E Articles (Quantity)	0	0	0	
<p>This effort provides funding for BMC3 improvements, including establishment of alternate BMD data paths and enhancements, supporting increased interoperability with other BMDS elements.</p> <p>FY08 Accomplishments:</p> <ul style="list-style-type: none"> Completed establishment of a ship-to-shore redundant BMD data path. Continued support for BMD data path enhancements aboard ship and at land-based communications sites. Began evaluation of External Sensors Lab (ESL) spade cue impacts on Aegis BMD performance. Provided ongoing support for contingency operations. Provided subject matter expert support for the fielded BMD 3.6 baseline. <p>FY09 Planned Program:</p> <ul style="list-style-type: none"> Continue evaluation and support for BMD data path enhancements aboard ship and at land-based communications sites. Continue evaluation of External Sensors Lab (ESL) spade cue impacts on Aegis BMD performance. Provide ongoing support for contingency operations. Provide subject matter expert support for the fielded BMD 3.6 baseline. <p>FY10 Planned Program:</p> <ul style="list-style-type: none"> Complete evaluation of External Sensors Lab (ESL) space cue impacts on Aegis BMD performance. Provide ongoing support for contingency operations. 				

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<ul style="list-style-type: none"> • Provide subject matter expert support for the fielded BMD 3.6 baseline. 				
	FY 2008	FY 2009	FY 2010	FY 2011
BMD Weapon System Fielding	25,800	63,889	2,200	
RDT&E Articles (Quantity)	9	1	0	
<p>This effort provides funding for the continued fielding of BMD 3.6 shipsets.</p> <p>FY08 Accomplishments:</p> <p>RDT&E Articles: Nine (9) BMD 3.6 DDG shipset deliveries</p> <ul style="list-style-type: none"> • Installed BMD 3.6 computer program on nine (9) U.S. Navy destroyers to provide BMD 3.6 LRS&T and engagement capability. <p>FY09 Planned Program:</p> <p>RDT&E Articles: One (1) BMD 4.0.1 EDM installation on a CG.</p> <ul style="list-style-type: none"> • Complete checkout and evaluation of BMD 3.6 ship installs. • Continue to monitor BMD 3.6 performance. • Install BMD 4.0.1 Engineering Development Model (EDM) to support flight testing. • Begin procurement of BMD 4.0.1 suites, to include BMD Signal Processor (BSP) units. <p>FY10 Planned Program:</p> <ul style="list-style-type: none"> • Continue to monitor BMD 3.6 performance. • Conduct crew training with the BMD 3.6 capability. 				

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	FY 2008	FY 2009	FY 2010	FY 2011
SM-3 Blk IA Fielding - Missiles 45-71	85,500	94,953	50,859	
RDT&E Articles (Quantity)	20	10	17	

This effort provides funding for the procurement of additional SM-3 Blk IA missiles.

FY08 Accomplishments:

RDT&E Articles: Twenty (20) SM-3 Blk IA Missiles

- Deliver twenty (20) SM-3 Blk IA missiles.
- Continue procurement of twenty seven (27) SM-3 Blk IA missiles.

FY09 Planned Program:

RDT&E Articles: Ten (10) SM-3 Blk IA Missiles

- Deliver ten (10) SM-3 Blk IA missiles.
- Continue procurement of remaining seventeen (17) SM-3 Blk IA missiles.

FY10 Planned Program:

RDT&E Articles: Seventeen (17) SM-3 Blk IA Missiles

- Deliver remaining seventeen (17) SM-3 Blk IA missiles.

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APPROPRIATION/BUDGET ACTIVITY RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE 0603892C Ballistic Missile Defense Aegis
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C. Other Program Funding Summary

	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	Total Cost
PE 0603175C Ballistic Missile Defense Technology	106,437	119,308	109,760						-
PE 0603881C Ballistic Missile Defense Terminal Defense Segment	1,034,478	956,686	719,465						-
PE 0603882C Ballistic Missile Defense Midcourse Defense Segment	2,198,664	1,507,481	982,922						-
PE 0603883C Ballistic Missile Defense Boost Defense Segment	503,475	400,751	186,697						-
PE 0603884C Ballistic Missile Defense Sensors	574,231	777,693	636,856						-
PE 0603886C Ballistic Missile Defense System Interceptors	330,874	385,493	0						-
PE 0603888C Ballistic Missile Defense Test and Targets	619,137	919,956	996,752						-
PE 0603890C Ballistic Missile Defense Enabling Programs	416,937	402,778	369,145						-
PE 0603891C Special Programs – MDA	193,157	175,712	301,566						-
PE 0603893C Space Tracking & Surveillance System	226,499	208,923	180,000						-
PE 0603894C Multiple Kill Vehicle	223,084	283,481	0						-
PE 0603895C BMD System Space Program	16,237	24,686	12,549						-
PE 0603896C BMD C2BMC	439,997	288,287	340,014						-
PE 0603897C BMD Hercules	51,387	55,764	48,186						-
PE 0603898C BMD Joint Warfighter Support	45,400	69,743	60,921						-
PE 0603904C Missile Defense Integration & Operations Center (MDIOC)	77,102	106,040	86,949						-
PE 0603906C Regarding Trench	1,945	2,968	3,164						-
PE 0603907C Sea Based X-Band Radar (SBX)	155,244	146,895	174,576						-
PE 0603908C BMD Europ Intercep Site	0	362,007	0						-
PE 0603909C BMD Europ Midcourse Radar	0	76,537	0						-
PE 0603911C BMD European Capability	0	0	50,504						-
PE 0603912C BMD European Comm Support	0	27,008	0						-
PE 0603913C Israeli Cooperative	0	0	119,634						-
PE 0605502C Small Business Innovative Research BMDO	137,409	0	0						-
PE 0901585C Pentagon Reservation	5,971	19,667	19,709						-
PE 0901598C Management Headquarters – MDA	83,907	81,174	57,403						-

*Note:
The Ballistic Missile Defense System (BMDS) is an integrated, interoperable, global defense system. The programs which comprise the BMDS are interdependent.*

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D. Acquisition Strategy

The Aegis BMD element acquisition approach supports evolutionary development, continuously building upon demonstrated capabilities to advance overall BMDS capability. After considering all the technical and management aspects of the program and to meet the requirements presented by an evolving ballistic missile threat, the Aegis BMD program awarded sole source contracts to Raytheon and Lockheed Martin to continue development of the SM-3 missile and the Aegis BMD Weapon System, respectively.

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APPROPRIATION/BUDGET ACTIVITY RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)					R-1 NOMENCLATURE 0603892C Ballistic Missile Defense Aegis					
I. Product Development Cost (\$ in Thousands)										
Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2009 Cost	FY 2009 Award/ Oblg Date	FY 2010 Cost	FY 2010 Award/ Oblg Date	FY 2011 Cost	FY 2011 Award/ Oblg Date	Total Cost
BMD 3.6 Weapon System Development										
	SS/CPAF	Lockheed Martin/ NJ	5,846	738	1/2Q	0	N/A			6,584
	MIPR	NSWC/DD/ VA	7,227	0	N/A	0	N/A			7,227
	FPI	VA Sites/ VA	825	0	N/A	0	N/A			825
SE&I and BMDS Integration										
	CPFF	JHU/APL/ MD	422	0	N/A	0	N/A			422
	MIPR	NSWC/Corona/ CA	510	0	N/A	0	N/A			510
	MIPR	NSWC/DD/ VA	3,775	0	N/A	0	N/A			3,775
	MIPR	NSWC/PHD/ CA	840	0	N/A	0	N/A			840
	Various	Various	949	0	N/A	0	N/A			949
BMC3										
	CPFF	JHU/APL/ MD	2,650	2,646	1Q	142	N/A			5,438
	FPI	MIT/ MA	1,845	845	1Q	45	N/A			2,735
		MITRE	772	672	1Q	36	N/A			1,480
	MIPR	NSWC/PHD/ CA	934	834	1Q	45	N/A			1,813

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Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2009 Cost	FY 2009 Award/Oblg Date	FY 2010 Cost	FY 2010 Award/Oblg Date	FY 2011 Cost	FY 2011 Award/Oblg Date	Total Cost
	MIPR	SPAWAR/CA	7,742	6,152	1Q	384	N/A			14,278
	Various	Various	1,757	655	1/2Q	41	N/A			2,453
BMD Weapon System Fielding										
	SS/CPAF	Lockheed Martin/NJ	13,793	53,445	1Q	1,268	N/A			68,506
	MIPR	NAVSEA/VA	2,139	420	1Q	155	N/A			2,714
	MIPR	NSWC/DD/VA	2,152	2,424	1Q	156	N/A			4,732
	MIPR	NSWC PHD/CA	3,149	3,687	1Q	253	N/A			7,089
	MIPR	SPAWAR/CA	937	886	1Q	68	N/A			1,891
	MIPR	SUPSHIP/BATH / ME	922	611	1Q	78	N/A			1,611
	FPI	SUPSHIP/MS	1,368	623	1Q	115	N/A			2,106
	Various		1,340	1,793	1/3Q	107	N/A			3,240
SM-3 Blk IA Fielding - Missiles 45-71										
	SS/CPIF	Raytheon/AZ	55,960	78,743	1Q	39,357	N/A			174,060
	SS/CPIF	JHU/APL/MD	10,876	4,100	1Q	2,909	N/A			17,885
	FFRDC	MIT/LL/MA	11,050	800	1Q	568	N/A			12,418

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Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2009 Cost	FY 2009 Award/ Oblg Date	FY 2010 Cost	FY 2010 Award/ Oblg Date	FY 2011 Cost	FY 2011 Award/ Oblg Date	Total Cost
	MIPR	NSWC/DD/VA	6,867	4,110	1Q	2,916	N/A			13,893
	MIPR	NSWC/PHD/CA	2,697	2,000	1Q	1,419	N/A			6,116
	MIPR	NAWC/CL/CA	1,100	800	1Q	568	N/A			2,468
	MIPR	NSWC/IH/MD	1,100	800	1Q	568	N/A			2,468
	Various	Various	2,200	3,200	1Q	2,270	N/A			7,670
	MIPR	NSWC/Corona/CA	550	400	1Q	284	N/A			1,234
Subtotal Product Development			154,294	171,384		53,752				379,430

Remarks

II. Support Costs Cost (\$ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2009 Cost	FY 2009 Award/ Oblg Date	FY 2010 Cost	FY 2010 Award/ Oblg Date	FY 2011 Cost	FY 2011 Award/ Oblg Date	Total Cost
Subtotal Support Costs										

Remarks

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III. Test and Evaluation Cost (\$ in Thousands)										
Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2009 Cost	FY 2009 Award/ Oblg Date	FY 2010 Cost	FY 2010 Award/ Oblg Date	FY 2011 Cost	FY 2011 Award/ Oblg Date	Total Cost
Aegis BMD Testing										
	MIPR	PMRF/ HI	4,000	4,825	1Q	0	N/A			8,825
	MIPR	SMDC/ AL	1,500	1,500	1Q	0	N/A			3,000
	MIPR	NSWC/DD/ VA	5,000	5,465	1Q	0	N/A			10,465
	CPFF	JHU/APL/ MD	9,000	8,967	1Q	0	N/A			17,967
	CPAF	Lockheed Martin/ NJ	11,433	9,750	1Q	0	N/A			21,183
	MIPR	NSWC/PHD/ CA	3,500	4,500	1Q	0	N/A			8,000
	CPFF	MIT/LL/ MA	2,500	2,500	1Q	0	N/A			5,000
	MIPR	AIRPAC/ HI	1,500	1,500	1Q	0	N/A			3,000
	MIPR	SPAWAR/ CA	2,500	2,500	1Q	0	N/A			5,000
	Various	Various	10,867	13,732	1Q	0	N/A			24,599
Targets										
		MDA/ VA	66,799	0	N/A	0	N/A			66,799
Subtotal Test and Evaluation			118,599	55,239		0				173,838
Remarks										

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IV. Management Services Cost (\$ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2009 Cost	FY 2009 Award/ Oblg Date	FY 2010 Cost	FY 2010 Award/ Oblg Date	FY 2011 Cost	FY 2011 Award/ Oblg Date	Total Cost
Aegis BMD Testing										
	CPFF	General Dynamics/ NJ	11,050	7,650	1Q	0	N/A			18,700
	CPFF	Paradigm/ VA	500	500	1Q	0	N/A			1,000
	CPFF	Gryphon/ MD	500	500	1Q	0	N/A			1,000
	CPAF	Lockheed Martin/ NJ	250	500	1Q	0	N/A			750
	CPAF	Raytheon/ AZ	250	500	1Q	0	N/A			750
	MIPR	NAVSEA/ DC	2,300	2,500	1Q	0	N/A			4,800
	MIPR	MDA/ VA	6,450	9,850	1Q	0	N/A			16,300
Subtotal Management Services			21,300	22,000		0				43,300

Remarks

Project Total Cost			294,193	248,623		53,752				596,568
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Remarks

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Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail						Date May 2009		
APPROPRIATION/BUDGET ACTIVITY RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)				R-1 NOMENCLATURE 0603892C Ballistic Missile Defense Aegis				
Schedule Profile	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015
Fielding Deliveries/Ships								
BMD 3.6 Fielding (DDGs and CGs)	1Q-4Q	1Q						
Fielding Deliveries/Missiles								
SM-3 Blk IA Deliveries	1Q-4Q	1Q-4Q	1Q-2Q					
<p>All tests shown on BMDS Test schedule in the Test and Targets PE.</p>								

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APPROPRIATION/BUDGET ACTIVITY				R-1 NOMENCLATURE				
RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)				0603892C Ballistic Missile Defense Aegis				

COST (\$ in Thousands)	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015
EX09 AEGIS BMD Block 5.0	695,197	579,404	1,011,223					
RDT&E Articles Qty	0	1	2					

Note:

A. Mission Description and Budget Item Justification

Aegis BMD program development in Block 5.0 supports the BMDS mission of intercepting ballistic missiles in all regions, in all phases, and of all ranges as follows:

- In all regions: Provide enhanced, sea-based Long Range Surveillance and track (LRS&T) and engagement capabilities.
- In all phases of ballistic missile flight: LRS&T capability against missile threats in all stages; engagement capability against missile threats in all phases of flight.
- Against all ranges:
 - LRS&T capability against ballistic missile threats of all ranges
 - Enhanced engagement capability (BMD 4.0.1 and the SM-3 Blk IB missile): battlespace expanded to include Intermediate-Range Ballistic Missile (IRBM)-class threats

Aegis BMD supported LDC by providing Long Range Surveillance and Track (LRS&T) data to other elements of the BMDS. Aegis BMD will further improve both national and international security with its ability to launch Standard Missile 3 (SM-3) missiles based upon data received via the Tactical Digital Information Link (TADIL) network. Through development and fielding of the Aegis BMD Signal Processor and upgrades to the SM-3 Blk IA missile (SM-3 Blk IB), Aegis BMD will improve discrimination capability and performance against more diverse and longer range threats.

The BMD 4.0.1 Combat System will expand Aegis BMD effectiveness against the threat base. It will provide a full upgrade to the Aegis BMD Weapon System (BMD 4.0.1) and an upgraded SM-3 missile, SM-3 Blk IB. BMD 4.0.1 will be capable of Launch-on-TADIL and Launch-on-Remote operations leveraging the BMDS Sensor network.

Missile upgrades for the SM-3 Blk IB include improvements to the kinetic warhead's seeker and Divert and Attitude Control System (DACS). Seeker improvements will include the introduction of seeker All-Reflective-Optics (ARO) to improve optics performance, and a Kinetic Warhead Advanced

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<p>Signal Processor (ASP) to mitigate diminished manufacturing source issues in SM-3 Blk IA missiles. Additionally, the increased processing capability of the ASP will support new discrimination algorithms. The optics and processing improvements will enhance the Aegis BMD contribution to the BMDS missions by providing greater sensitivity and seeker discrimination capability. Other missile improvements include the integration of a two-color seeker and development of the Throttleable Divert and Attitude Control System (TDACS). These enhancements will be tested and verified for the SM-3 Block IB configuration.</p> <p>BMD 4.0.1 will deliver in two spirals:</p> <ul style="list-style-type: none">• Spiral one (BMD 4.0.1 Testbed) will deliver an initial engagement system capability with the SM-3 Blk IA missile. It will build on BSP enhancements to the LRS&T mission by adding mission capability for flight missions.• Spiral two (BMD 4.0.1) will continue through the System Engineering Development and Testing in process and culminate as an operationally-certified system capable of firing the SM-3 Blk IA or IB missile. <p>Other capability enhancements include:</p> <ul style="list-style-type: none">• Improvements in BMDS Command and Control, Battle Management, and Communications (C2BMC) to ensure future BMDS sensor enhancements and the resulting discrimination capabilities are able to be communicated, correlated, and acted upon.• Improved engagement coordination capability with THAAD and PATRIOT to conserve upper tier missiles.• Analysis for planned upgrades to the SM-3 missile to expand battlespace and improve discrimination, divert, and probability of mission success. <p>BMD 5.0 will integrate BMD 4.0.1 and the BMD mission with the Navy-developed Open Architecture system. This effort will transition Aegis BMD from older, MIL-standard computers to newer Commercial Off The Shelf (COTS) computing plants. This change is necessary for Aegis BMD to remain compatible with Navy assets as Navy ship modernization plans are executed. This change will improve human-systems interface through display enhancements and eliminate the need for a separate computing system specific to the BMD mission. This will also enable more ships to serve as candidates for the BMD mission as the threat projection changes. Open architecture will be included in future fielded BMD system improvements.</p> <p>Aegis BMD 4.0.1/5.0 will provide enhanced capabilities within the areas of engagement coordination, system track, hit/kill assessment, sensor registration, and communications in order to support the BMDS Unifying Missile Defense Functions (UMDF).</p>		

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In collaboration with the MDA Systems Engineer, Aegis BMD is contributing to the BMDS in development of engagement sequence groups (ESGs). Aegis BMD supports an autonomous engagement against Short Range Ballistic Missiles (SRBMs) and Medium Range Ballistic Missiles (MRBMs) without requiring external cueing. It supports an engagement against SRBMs and MRBMs using data from other BMDS elements and external sensors. Aegis BMD will also provide target track data to support Ground Based Interceptor Launch and Engagement against Long Range Ballistic Missiles (LRBMs) and Intermediate Range Ballistic Missiles (IRBMs) via input for the Ground-based Midcourse Defense (GMD) Sensor Task Plan (STP) and Weapons Task Plan (WTP).

B. Accomplishments/Planned Program

	FY 2008	FY 2009	FY 2010	FY 2011
BMD 4.0.1 Weapon System Development	287,727	234,264	305,876	
RDT&E Articles (Quantity)	0	1	0	

The Aegis BMD Weapon System Engineering group will develop BMD 4.0.1 to provide an operationally-certified system with significant improvements in discrimination capability, configured to operate with either the SM-3 Block IA or IB.

FY08 Accomplishments:

- Continued development of BMD 4.0.1 Testbed, leading to an Engineering Assessment in FY09.
- Conducted additional performance analyses to study evolving threats and identify design modifications.
- Conducted the BMD 4.0.1 Critical Design Review (CDR), to review the contractor's design to meet engineering requirements and approval to proceed with MEIT leading to a BMD 4.0.1 demonstration and certification.
- Conduct performance analysis to analyze the threat and identify design modifications.
- Study event timelines, kinematics and signature feature, and engage ability options

FY09 Planned Program:

RDT&E Articles: BMD 4.0.1 Testbed Computer Program (1)

- Conduct BMD 4.0.1 Testbed Engineering Assessment (EA)
- Complete development of BSP Engineering Development Model (EDM).
- Conduct BMD 4.0.1 At-Sea Demo of the computer program

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- Continue development and testing of BMD 4.0.1, leading to an Engineering Assessment in FY10.
- Conduct In-Process Review (IPR) of design changes for incorporating Weapons System modifications
- Design and develop computer program functionality changes
- Incorporate the functional capability into BMD 4.0.1 baseline development
- Participate in At-Sea Demo of BMD 4.0.1 computer program functionality
- Participate in TOO testing.
- Support systems engineering efforts to incorporate interoperability enhancements including: Navy Multi Band Terminal and Advance EHF

FY10 Planned Program:

- Conduct BMD 4.0.1 Demo.
- Conduct BMD 4.0.1 Engineering Assessment
- Support FTM-16, using BMD 4.0.1 Testbed and the BSP EDM.
- Participate in TOO testing.
- Support systems engineering efforts to incorporate interoperability enhancements including: Navy Multi Band Terminal and Advance EHF

	FY 2008	FY 2009	FY 2010	FY 2011
SM-3 Blk IB Development	278,748	203,286	292,573	
RDT&E Articles (Quantity)	0	0	1	

In this project Aegis BMD will continue the development of the SM-3 Block IB missile. SM-3 Blk IB missile improvements include improvements to the kinetic warhead's seeker and Divert and Attitude Control System (DACS). Seeker improvements will include the introduction of seeker All-Reflective-Optics (ARO) to improve optics performance, and a Kinetic Warhead Advanced Signal Processor (ASP). Other missile improvements include the two-color seeker and development of the Throttleable Divert and Attitude Control System (TDACS).

FY08 Accomplishments:

- Continued SM-3 Blk IB All-Reflective Optics (ARO) engineering for improved missile discrimination capabilities.
- Continued SM-3 Blk IB Advanced Signal Processor (ASP) design efforts for improved missile discrimination.

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<ul style="list-style-type: none">• Conducted testing of SM-3 Blk IB two-color seeker upgrade.• Continued SM-3 Blk IB TDACS development.• Conducted SM-3 Blk IB CDR (4Q FY08). <p>FY09 Planned Program:</p> <ul style="list-style-type: none">• Complete SM-3 Blk IB All-Reflective Optics (ARO) engineering for improved missile discrimination capabilities.• Complete SM-3 Blk IB Advanced Signal Processor (ASP) design efforts for improved missile discrimination.• Complete testing of SM-3 Blk IB two-color seeker upgrade.• Complete SM-3 Blk IB TDACS development.• Begin element integration of the SM-3 Blk IB missile.• Begin acquisition of four (4) SM-3 Blk IB Pathfinder rounds.• Participate in TOO testing. <p>FY10 Planned Program:</p> <p>RDT&E Articles: One (1) SM-3 Blk IB Pathfinder Round</p> <ul style="list-style-type: none">• Complete SM-3 Blk IB qualification testing.• Complete SM-3 Blk IB element integration.• Complete acquisition of one (1) SM-3 Blk IB Pathfinder missile.• Conduct FTM-16 initial flight test of SM-3 Blk IB Pathfinder missile.• Complete kinetic warhead (KW) System Integration Testing (SIT).• Conduct SM-3 Blk IB Manufacturing Readiness Reviews (MRR).• Deliver one (1) SM-3 Blk IB Pathfinder round for use in FTM-16• Begin manufacturing of missile canisters.• Participate in TOO testing.		

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	FY 2008	FY 2009	FY 2010	FY 2011
BMD 5.0 Weapon System Development	80,922	93,054	84,214	
RDT&E Articles (Quantity)	0	0	0	
<p>The Aegis BMD Weapon System Development team will develop BMD 5.0 to integrate BMD capability into the U.S. Navy's modernization program and Open Architecture configuration.</p> <p>FY08 Accomplishments:</p> <ul style="list-style-type: none"> • Completed BMD 5.0 ECS. • Conducted BMD 5.0 System Requirements Review (SRR). • Drafted BMD 5.0 A-Spec, System B-1 & B-2 Specs. • Conducted BMD 5.0 System Design Review (SDR). <p>FY09 Planned Program:</p> <ul style="list-style-type: none"> • Draft System B-5 Specs (some in Unified Modeling Language), update A-Spec & B-1s from SDR. • Conduct BMD 5.0 Preliminary Design Review (PDR), to review and gain approval for the contractor's approach to meeting the BMD 5.0 requirements. • Conduct initial Engage-on-Remote in BMD 5.0 System Requirements Review (SRR) to review proposed EoR requirements for feasibility in BMD 5.0. <p>FY10 Planned Program:</p> <ul style="list-style-type: none"> • Update technical specifications (some in Unified Modeling Language), update A-Spec & B-1 from PDR, Baseline Master Test and Evaluation Program Plan (MTEPP) • Conduct BMD 5.0 Critical Design Review to review and gain approval for the contractor's approach and progress towards meeting the BMD 5.0 requirements. 				

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- Conduct BMD 5.0 Test Planning Review to review contractor's plan (MTEPP) and assess program readiness to commence computer program testing at the development and test sites (CSEDS).
- Conduct BMD 5.0 Near-Term SBT / EoR PDR to review and approve the contractor's approach and initial design to meet requirements.
- Conduct BMD 5.0 In-Process Review (IPR)

	FY 2008	FY 2009	FY 2010	FY 2011
Flight Testing	0	0	97,880	
RDT&E Articles (Quantity)	0	0	0	

This task provides funding for Aegis BMD flight testing, as well as Aegis BMD participation in BMDS-level testing. Each of these test opportunities provides valuable system performance information in support of Critical Engagement Conditions (CECs) and Empirical Measurement Events (EMEs).

FY10 Planned Program:

- Conduct FTM-16 flight test mission:
 - Complete pre-flight analysis to verify mission scenarios and to predict flight performance
 - Prepare and complete missile delivery package for the Mission Control Panel reviews
 - Conduct simulated engagement and intercept of an ARAV-C using BMD 4.0.1 weapon system
 - Conduct engagement and intercept of an Group B MRBM using BMD 4.0.1 weapon system with a SM-3 Blk IB missile
 - Perform post-flight analysis to validate high fidelity models and simulations
 - Conduct post-flight analysis to support Mission Data Reviews (MDR)
- Participate in FMS flight mission JFTM-3 campaign consisting of 2 ARAV-B tracking exercises (TRACKEX), anti-air warfare (AAW) TRACKEX, and engagement of a Medium Range Target (MRT) with an SM-3 Blk IA.
- Participate in TOO testing: GT-200 LRS&T tracking and detection of an ICBM from a BMD 4.0.1 cruiser
- Participate as a sensor in BMD System testing:
 - FTX-06: four tracking events demonstrating BMD 4.0.1 functionality and conducting multiple simulated engagements with the SM-3 Blk IB
 - GTX-04a: ground test campaign consisting of GTX-04a, GTI-04, and GTD-04
 - FTT-12: support THAAD dual-air-launched intercept test with one BMD 3.6.1 ship.
 - FTG-07: simulated SM-3 engagement with an IRBM target

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- FTT-13: support THAAD dual-air-launched intercept test with one BMD 3.6.1 ship.
- GTD-04: distributed test that employs BMDS hardware and labs to test operational communications and provide a training opportunity for the warfighter.

	FY 2008	FY 2009	FY 2010	FY 2011
BMC4I	0	0	5,146	
RDT&E Articles (Quantity)	0	0	0	

This effort provides funding for BMC3 improvements, including increased interoperability with other BMDS elements, automated mission planner data exchange with C2BMC and MIPS, utilization of improved space cue track data, and real world operations.

FY10 Planned Program:

- Provide interoperability subject matter expertise supporting execution of flight test mission plan development and data analysis.
- Conduct Navy and Joint Service-level communications testing to evaluate interoperability with the overall BMDS and Navy elements.
- Complete development of C4I web services in GCCS-M to support Aegis BMD mission planning and satellite ephemeris data updates.
- Continue evaluation and support for BMD data path enhancements aboard ship and at land-based communications sites.
- Continue evaluation of External Sensors Lab (ESL) space cue impacts on Aegis BMD performance.

	FY 2008	FY 2009	FY 2010	FY 2011
SE&I and BMDS Integration	0	0	3,495	
RDT&E Articles (Quantity)	0	0	0	

This effort provides funding to work in collaboration with the BMDS System Engineer to develop requirements tracing for BMD 4.0.1 and 5.0, participate in definition of appropriate Engagement Sequence Groups to maximize leverage of Aegis BMD capability within the BMDS, and to support systems engineering efforts to incorporate additional interoperability enhancements.

FY10 Planned Program:

- Continue to support system integration efforts with other BMDS elements to maximize interoperability with the overall BMDS
- Continue collaboration within MDA to maximize Aegis BMD support for current and developing Engagement Sequence Groups (ESGs).
- Support system integration efforts with BMDS space cues provided by new Overhead Non-Imaging Radar (ONIR) sensors and the ESL

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<ul style="list-style-type: none"> • Support systems engineering efforts to incorporate interoperability enhancements, including Navy Multi Band Terminal and Advanced EHF. • Support at-sea experiments to improve utilization of legacy ONIR space cues. 				
	FY 2008	FY 2009	FY 2010	FY 2011
BMD 4.0.1 Fielding	22,800	0	160,200	
RDT&E Articles (Quantity)	0	0	1	
<p>This project funds the installation of the BMD 4.0.1 computer program on U.S. Navy Cruisers and destroyers.</p> <p>FY08 Accomplishments:</p> <ul style="list-style-type: none"> • Continued procurement of Aegis BMD BSP Engineering Development Model (EDM). <p>FY09 Planned Program:</p> <ul style="list-style-type: none"> • BMD 4.0.1 Fielding accounted for in project BX09. <p>FY10 Planned Program:</p> <p>RDT&E Articles: One (1) upgrade to the BSP EDM.</p> <ul style="list-style-type: none"> • Install BMD 4.0.1 Engineering Development Model (EDM) upgrade to support flight testing. • Continue procurement of BMD 4.0.1 suites, to include BMD Signal Processor (BSP) units. • Begin procurement of upgrades for six (6) additional ships. 				
	FY 2008	FY 2009	FY 2010	FY 2011
SM-3 Blk IA Missile Fielding - Missiles 72-94	25,000	3,800	0	
RDT&E Articles (Quantity)	0	0	0	

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FY08 Accomplishments:

- Begin procurement of twenty three (23) SM-3 Blk IA missiles.

FY09 Planned Program:

- Per Congressional direction, funding for missiles 72-94 transferred to Procurement PE.

	FY 2008	FY 2009	FY 2010	FY 2011
SM-3 Blk IB Missile Fielding - Missiles 111-128	0	45,000	61,839	
RDT&E Articles (Quantity)	0	0	0	

This activity initiates purchase of SM-3 Blk IB missiles for the purposes of flight testing and delivery to the fleet as operational assets.

FY09 Planned Program:

- Funding appropriated to initiate procurement of twenty four (24) SM-3 Blk IB missiles. Reprogramming action is pending to transfer FY09 funds to Procurement in order to begin purchase of twelve (12) SM-3 Blk IA missiles.

FY10 Planned Program:

- Continue procurement of eighteen (18) SM-3 Blk IB missiles.

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C. Other Program Funding Summary

	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	Total Cost
PE 0603175C Ballistic Missile Defense Technology	106,437	119,308	109,760						-
PE 0603881C Ballistic Missile Defense Terminal Defense Segment	1,034,478	956,686	719,465						-
PE 0603882C Ballistic Missile Defense Midcourse Defense Segment	2,198,664	1,507,481	982,922						-
PE 0603883C Ballistic Missile Defense Boost Defense Segment	503,475	400,751	186,697						-
PE 0603884C Ballistic Missile Defense Sensors	574,231	777,693	636,856						-
PE 0603886C Ballistic Missile Defense System Interceptors	330,874	385,493	0						-
PE 0603888C Ballistic Missile Defense Test and Targets	619,137	919,956	996,752						-
PE 0603890C Ballistic Missile Defense Enabling Programs	416,937	402,778	369,145						-
PE 0603891C Special Programs – MDA	193,157	175,712	301,566						-
PE 0603893C Space Tracking & Surveillance System	226,499	208,923	180,000						-
PE 0603894C Multiple Kill Vehicle	223,084	283,481	0						-
PE 0603895C BMD System Space Program	16,237	24,686	12,549						-
PE 0603896C BMD C2BMC	439,997	288,287	340,014						-
PE 0603897C BMD Hercules	51,387	55,764	48,186						-
PE 0603898C BMD Joint Warfighter Support	45,400	69,743	60,921						-
PE 0603904C Missile Defense Integration & Operations Center (MDIOC)	77,102	106,040	86,949						-
PE 0603906C Regarding Trench	1,945	2,968	6,164						-
PE 0603907C Sea Based X-Band Radar (SBX)	155,244	146,895	174,576						-
PE 0603908C BMD Europ Intercep Site	0	362,007	0						-
PE 0603909C BMD Europ Midcourse Radar	0	76,537	0						-
PE 0603911C BMD European Capability	0	0	50,504						-
PE 0603912C BMD European Comm Support	0	27,008	0						-
PE 0603913C Israeli Cooperative	0	0	119,634						-
PE 0605502C Small Business Innovative Research BMDO	137,409	0	0						-
PE 0901585C Pentagon Reservation	5,971	19,667	19,709						-
PE 0901598C Management Headquarters – MDA	83,907	81,174	57,403						-

Note: The Ballistic Missile Defense System (BMDS) is an integrated, interoperable, global defense system. The programs which comprise the BMDS are interdependent.

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D. Acquisition Strategy

The Aegis BMD element acquisition approach supports evolutionary development, continuously building upon demonstrated capabilities to advance overall BMDS capability. After considering all the technical and management aspects of the program and to meet the requirements presented by an evolving ballistic missile threat, the Aegis BMD program has awarded sole source contracts to Raytheon and Lockheed Martin to continue development of the SM-3 missile and the Aegis BMD Weapon System, respectively.

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I. Product Development Cost (\$ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2009 Cost	FY 2009 Award/ Oblg Date	FY 2010 Cost	FY 2010 Award/ Oblg Date	FY 2011 Cost	FY 2011 Award/ Oblg Date	Total Cost
BMD 4.0.1 Weapon System Development										
	SS/CPAF	Lockheed Martin/ NJ	180,386	162,074	1Q	220,651	1Q			563,111
	MIPR	NSWC/DD/ VA	15,576	12,560	1Q	17,099	1Q			45,235
	MIPR	NSWC/PHD/ CA	4,322	1,951	1Q	2,656	1Q			8,929
	MIPR	JHU/APL/ MD	6,546	3,538	1Q	4,817	1Q			14,901
	MIPR	SPAWAR/ CA	2,629	1,171	1Q	1,594	1Q			5,394
	MIPR	VA Sites/ VA	5,080	2,732	1Q	3,719	1Q			11,531
	Various	Various	4,972	2,051	1Q	2,793	1Q			9,816
	MIPR	Aegis Techrep/ NJ	2,095	869	1Q	1,183	1Q			4,147
SM-3 Blk IB Development										
	CPAF	Raytheon/ AZ	162,584	140,556	1Q	191,471	N/A			494,611
	MIPR	NSWC DD/ VA	6,500	6,185	1Q	8,425	N/A			21,110
	MIPR	JHU/APL/ MD	6,500	6,386	1Q	8,699	N/A			21,585
	MIPR	NSWC/CR/ MD	1,900	2,012	1Q	2,741	N/A			6,653
	MIPR	NSWC/CL/ CA	1,850	2,012	1/2Q	2,741	N/A			6,603

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Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2009 Cost	FY 2009 Award/ Oblg Date	FY 2010 Cost	FY 2010 Award/ Oblg Date	FY 2011 Cost	FY 2011 Award/ Oblg Date	Total Cost
	MIPR	NSWC IH/ MD	2,800	2,916	1Q	3,972	N/A			9,688
	MIPR	NSWC Corona/ CA	2,800	2,916	1Q	3,972	N/A			9,688
	MIPR	MIT/LL/ MA	3,600	3,446	1Q	4,694	N/A			11,740
	MIPR	NSWC/PHD/ CA	1,850	2,012	1Q	2,741	N/A			6,603
	Various	Various	2,100	3,388	1/3Q	4,617	N/A			10,105
BMD 5.0 Weapon System Development										
	CPAF	Lockheed Martin/ NJ	47,622	55,861	1Q	55,435	1Q			158,918
	MIPR	NSWC/DD/ VA	3,063	3,187	1Q	3,163	1Q			9,413
	CPFF	JHU/APL/ MD	3,042	3,438	1Q	3,412	1Q			9,892
	CPFF	MIT/LL/ MA	2,022	828	1Q	822	1Q			3,672
	CPAF	VA Sites/ VA	1,394	745	1Q	739	1Q			2,878
	Various	Various	466	601	1Q	596	1Q			1,663
	MIPR	Aegis Techrep/ NJ	957	937	1Q	930	1Q			2,824
BMC4I										
	CPFF	JHU/APL/ MD	0	0	N/A	1,055	1Q			1,055
	FPI	MIT/MA	0	0	N/A	337	1Q			337
		MITRE	0	0	N/A	268	1Q			268

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Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2009 Cost	FY 2009 Award/ Oblg Date	FY 2010 Cost	FY 2010 Award/ Oblg Date	FY 2011 Cost	FY 2011 Award/ Oblg Date	Total Cost
	MIPR	NSWC/PHD/ CA	0	0	N/A	333	1Q			333
	MIPR	SPAWAR/ CA	0	0	N/A	2,852	1Q			2,852
	Various	Various	0	0	N/A	301	1/2Q			301
SE&I and BMDS Integration										
	CPFF	JHU/APL/ MD	0	0	N/A	236	1Q			236
	MIPR	NSWC./Corona/ CA	0	0	N/A	281	1Q			281
	MIPR	NSWC/DD/ VA	0	0	N/A	2,057	1Q			2,057
	MIPR	NSWC/PHD/ CA	0	0	N/A	491	1Q			491
	Various	Various	0	0	N/A	430	1/2Q			430
BMD 4.0.1 Fielding										
	SS/CPAF	Lockheed Martin/ NJ	11,174	0	N/A	78,514	1/2Q			89,688
	MIPR	NAVSEA/ VA	1,921	0	N/A	13,500	1Q			15,421
	MIPR	NSWC/DD/ VA	1,939	0	N/A	13,625	1/2Q			15,564
	MIPR	NSWC PHD/ CA	3,136	0	N/A	22,035	1Q			25,171
	MIPR	SPAWAR/ CA	850	0	N/A	5,973	1Q			6,823
	MIPR	SUPSHIP/BATH / ME	965	0	N/A	6,777	1/2Q			7,742

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Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2009 Cost	FY 2009 Award/ Oblg Date	FY 2010 Cost	FY 2010 Award/ Oblg Date	FY 2011 Cost	FY 2011 Award/ Oblg Date	Total Cost
	FPI	SUPSHIP/PASC/MS	1,427	0	N/A	10,023	1/2Q			11,450
	Various	Various	1,388	0	N/A	9,753	1/2Q			11,141
SM-3 Blk IA Missile Fielding - Missiles 72-94										
	CPAF	Raytheon/AZ	22,177	3,800	1Q	0	N/A			25,977
	MIPR	NSWC/IH/MD	335	0	N/A	0	N/A			335
	MIPR	NSWC/DD/VA	559	0	N/A	0	N/A			559
	MIPR	NSEC/PHD/CA	508	0	N/A	0	N/A			508
	CPAF	JHU/APL/MD	287	0	N/A	0	N/A			287
	MIPR	NSWC/Corona/CA	47	0	N/A	0	N/A			47
	MIPR	MDA/VA	800	0	N/A	0	N/A			800
	Various	Various	287	0	N/A	0	N/A			287
SM-3 Blk IB Missile Fielding - Missiles 111-128										
	CPAF	Raytheon/AZ	0	40,000	1Q	54,968	1Q			94,968
	MIPR	NSWC/IH/MD	0	499	1Q	686	1Q			1,185
	MIPR	NSWC/DD/VA	0	866	1Q	1,190	1Q			2,056
	MIPR	NSWC/PHD/CA	0	672	1Q	923	1Q			1,595

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Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2009 Cost	FY 2009 Award/ Oblg Date	FY 2010 Cost	FY 2010 Award/ Oblg Date	FY 2011 Cost	FY 2011 Award/ Oblg Date	Total Cost
	CPAF	JHU/APL/ MD	0	599	1/2Q	823	1/2Q			1,422
	MIPR	NSWC/Corona/ CA	0	100	1Q	137	1Q			237
	MIPR	MDA/ VA	0	1,667	1Q	2,291	1Q			3,958
	Various	Various	0	597	1/3Q	821	1/3Q			1,418
Subtotal Product Development			520,456	473,172		784,362				1,777,990

Remarks

II. Support Costs Cost (\$ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2009 Cost	FY 2009 Award/ Oblg Date	FY 2010 Cost	FY 2010 Award/ Oblg Date	FY 2011 Cost	FY 2011 Award/ Oblg Date	Total Cost
BMD 4.0.1 Weapon System Development										
	CPFF	General Dynamics/ NJ	18,458	23,161	1Q	25,141	1Q			66,760
	CPFF	Paradigm/ VA	4,543	5,552	1Q	6,027	1Q			16,122
	CPFF	Gryphon/ MD	1,043	1,192	1Q	1,294	1Q			3,529
	CPAF	Lockheed Martin/ NJ	522	596	1Q	647	1Q			1,765

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APPROPRIATION/BUDGET ACTIVITY RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE 0603892C Ballistic Missile Defense Aegis
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Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2009 Cost	FY 2009 Award/ Oblg Date	FY 2010 Cost	FY 2010 Award/ Oblg Date	FY 2011 Cost	FY 2011 Award/ Oblg Date	Total Cost
	CPAF	Raytheon/ AZ	522	596	1Q	647	1Q			1,765
	MIPR	NAVSEA/ DC	4,694	5,362	1Q	5,820	1Q			15,876
	MIPR	MDA/ VA	11,944	10,859	1Q	11,788	1Q			34,591
SM-3 Blk IB Development										
	CPFF	General Dynamics/ NJ	16,926	15,398	1Q	28,636	1Q			60,960
	CPFF	Paradigm/ VA	4,471	3,691	1Q	6,864	1Q			15,026
	CPFF	Gryphon/ MD	970	792	1Q	1,473	1Q			3,235
	CPAF	Lockheed Martin/ NJ	485	396	1Q	736	1Q			1,617
	CPAF	Raytheon/ AZ	485	396	1Q	736	1Q			1,617
	MIPR	NAVSEA/ DC	4,367	3,565	1Q	6,630	1Q			14,562
	MIPR	MDA/ VA	11,111	7,219	1Q	13,425	1Q			31,755
BMD 5.0 Weapon System Development										
	CPFF	Lockheed Martin/ NJ	4,554	8,563	1Q	5,962	1Q			19,079
	CPFF	Paradigm/ VA	845	2,053	1Q	1,429	1Q			4,327

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Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis							Date May 2009			
APPROPRIATION/BUDGET ACTIVITY RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)					R-1 NOMENCLATURE 0603892C Ballistic Missile Defense Aegis					
Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2009 Cost	FY 2009 Award/ Oblg Date	FY 2010 Cost	FY 2010 Award/ Oblg Date	FY 2011 Cost	FY 2011 Award/ Oblg Date	Total Cost
	CPFF	Gryphon/ MD	245	441	1Q	307	1Q			993
	CPAF	Lockheed Martin/ NJ	122	220	1Q	153	1Q			495
	CPAF	Raytheon/ AZ	122	220	1Q	153	1Q			495
	MIPR	NAVSEA/ DC	1,102	1,982	1Q	1,380	1Q			4,464
	MIPR	MDA/ VA	2,803	4,015	1/3Q	2,796	1/3Q			9,614
	Various	Various	0	9,963	1/2Q	6,937	1/2Q			16,900
Flight Testing										
	CPFF	General Dynamics/ NJ	0	0	N/A	6,598	1Q			6,598
	CPAF	Paradigm/ VA	0	0	N/A	1,582	1Q			1,582
	CPFF	Gryphon/ MD	0	0	N/A	340	1Q			340
	CPAF	Lockheed Martin/ NJ	0	0	N/A	170	1Q			170
	CPAF	Raytheon/ AZ	0	0	N/A	170	1Q			170
	MIPR	NAVSEA/ DC	0	0	N/A	1,528	1Q			1,528
	MIPR	MDA/ VA	0	0	N/A	3,093	1Q			3,093
Subtotal Support Costs			90,334	106,232		142,462				339,028

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Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date May 2009
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APPROPRIATION/BUDGET ACTIVITY RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE 0603892C Ballistic Missile Defense Aegis
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Remarks

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

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2009 Cost	FY 2009 Award/ Oblg Date	FY 2010 Cost	FY 2010 Award/ Oblg Date	FY 2011 Cost	FY 2011 Award/ Oblg Date	Total Cost
Flight Testing										
	MIPR	PMRF/ HI	0	0	N/A	6,442	1Q			6,442
	MIPR	SMDC/ AL	0	0	N/A	2,418	1Q			2,418
	MIPR	NSWC/DD/ VA	0	0	N/A	16,497	1Q			16,497
	CPFF	JHU/APL/ MD	0	0	N/A	13,696	1Q			13,696
	CPAF	Lockheed Martin/ NJ	0	0	N/A	16,115	1Q			16,115
	MIPR	NSWC/PHD/ CA	0	0	N/A	5,639	1Q			5,639
	CPFF	MIT/LL/ MA	0	0	N/A	4,033	1Q			4,033
	MIPR	AIRPAC/ HI	0	0	N/A	2,418	1Q			2,418
	MIPR	SPAWAR/ CA	0	0	N/A	4,033	1Q			4,033
	Various		0	0	N/A	13,108	1Q			13,108
Subtotal Test and Evaluation			0	0		84,399				84,399

Remarks

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Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile	Date May 2009
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APPROPRIATION/BUDGET ACTIVITY RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE 0603892C Ballistic Missile Defense Aegis
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Fiscal Year	2008				2009				2010				2011				2012				2013				2014				2015			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Development Milestones																																
BMD 4.0.1 Development	▲————▲				▲————▲																											
BMD 4.0.1 Testbed EE	▲																															
BMD 4.0.1 In-Process Review		▲																														
BMD 4.0.1 Critical Design Review (CDR)				▲																												
BMD 4.0.1 Engineering Assessment							▲																									
BMD 4.0.1 Demo												▲																				
BMD 5.0 Development	▲————▲				▲————▲																											
BMD 5.0 System Design Review	▲																															
BMD 5.0 Preliminary Design Review				▲																												
BMD 5.0 Critical Design Review								▲																								
Fielding Deliveries/Ships																																
BMD 4.0.1 Ship Installations																																

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

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Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail						Date May 2009		
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APPROPRIATION/BUDGET ACTIVITY RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)				R-1 NOMENCLATURE 0603892C Ballistic Missile Defense Aegis				
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Schedule Profile	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015
Development Milestones								
BMD 4.0.1 Development	1Q-4Q	1Q-4Q	1Q-4Q					
BMD 4.0.1 Testbed EE	1Q							
BMD 4.0.1 In-Process Review	2Q							
BMD 4.0.1 Critical Design Review (CDR)		1Q						
BMD 4.0.1 Engineering Assessment		3Q						
BMD 4.0.1 Demo			3Q					
BMD 5.0 Development	1Q-4Q	1Q-4Q	1Q-4Q					
BMD 5.0 System Design Review	1Q							
BMD 5.0 Preliminary Design Review		1Q						
BMD 5.0 Critical Design Review			1Q					
Fielding Deliveries/Ships								
BMD 4.0.1 Ship Installations		2Q-4Q	1Q-4Q					

All tests shown on BMDS Test schedule in the Test and Targets PE 0603888C.

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Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification						Date May 2009		
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APPROPRIATION/BUDGET ACTIVITY RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)				R-1 NOMENCLATURE 0603892C Ballistic Missile Defense Aegis				
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COST (\$ in Thousands)	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015
XX09 AEGIS BMD Sustainment	43,800	40,030	46,019					
RDT&E Articles Qty	0	0	0					

Note:

A. Mission Description and Budget Item Justification

Aegis BMD has negotiated agreements with the U.S. Navy for the operations and maintenance of BMD systems on-board U.S. Navy ships. Support efforts are leveraged off of already-existing contracts and infrastructure, maintained by the Navy.

B. Accomplishments/Planned Program

	FY 2008	FY 2009	FY 2010	FY 2011
AWS Maintenance	20,000	17,940	22,919	
RDT&E Articles (Quantity)	0	0	0	

This effort provides funding for operator and maintenance training, engineering support, and logistics support and maintenance of Aegis BMD fielded assets.

FY08 Accomplishments:

- Provided In-service Engineering support to Aegis BMD: Weapon System and Vertical Launching System.
- Provided operational and maintenance training for Aegis BMD ship crews.
- Provided logistics support (including technical manuals, spares, and Reliability, Maintainability, and Availability analysis and products) for Aegis BMD: Weapon System and Vertical Launching System.
- Provided leadership and engineering/technical support to conduct Aegis Combat Systems Assessments.
- Responded to Fleet issues related to Aegis BMD installations, BMD operations and BMD events.
- Participated in the shutdown of an errant U.S. satellite in Operation Burnt Frost.

FY09 Planned Program:

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Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date May 2009
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APPROPRIATION/BUDGET ACTIVITY RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE 0603892C Ballistic Missile Defense Aegis
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- Provide In-service Engineering support to Aegis BMD: Weapon System and Vertical Launching System.
- Provide operational and maintenance training for Aegis BMD ship crews.
- Provide logistics support (including technical manuals, spares, and Reliability, Maintainability, and Availability analysis and products) for Aegis BMD: Weapon System and Vertical Launching System.
- Provide leadership and engineering/technical support to conduct Aegis Combat Systems Assessments.
- Respond to Fleet issues related to Aegis BMD installations, BMD operations and BMD events.

FY10 Planned Program:

- Provide In-service Engineering support to Aegis BMD: Weapon System and Vertical Launching System.
- Provide operational and maintenance training for Aegis BMD ship crews.
- Provide logistics support (including technical manuals, spares, and Reliability, Maintainability, and Availability analysis and products) for Aegis BMD: Weapon System and Vertical Launching System.
- Provide leadership and engineering/technical support to conduct Aegis Combat Systems Assessments.
- Respond to Fleet issues related to Aegis BMD installations, BMD operations and BMD events.

	FY 2008	FY 2009	FY 2010	FY 2011
SM-3 Missile Maintenance	23,800	22,090	23,100	
RDT&E Articles (Quantity)	0	0	0	

This effort provides funding for operator and maintenance training, engineering support, and logistics support and maintenance of Aegis BMD fielded assets.

FY08 Accomplishments:

- Provided In-service Engineering support to Aegis BMD: SM-3 missile.
- Provided operational and maintenance training for Aegis BMD ship crews.
- Provided logistics support (including technical manuals, spares, and Reliability, Maintainability, and Availability analysis and products) for Aegis BMD: SM-3 missile.
- Provided leadership and engineering/technical support to conduct Aegis Combat Systems Assessments.
- Responded to Fleet issues related to Aegis BMD operations and BMD events.

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Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification		Date May 2009
APPROPRIATION/BUDGET ACTIVITY RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE 0603892C Ballistic Missile Defense Aegis	
<ul style="list-style-type: none">Participated in the shutdown of an errant U.S. satellite in operation Burnt Frost. <p>FY09 Planned Program:</p> <ul style="list-style-type: none">Provide In-service Engineering support to Aegis BMD: SM-3 missile.Provide operational and maintenance training for Aegis BMD ship crews.Provide logistics support (including technical manuals, and spares) for Aegis BMD: SM-3 missile.Respond to Fleet issues related to Aegis BMD operations and BMD events. <p>FY10 Planned Program:</p> <ul style="list-style-type: none">Provide In-service Engineering support to Aegis BMD: SM-3 missile.Provide operational and maintenance training for Aegis BMD ship crews.Provide logistics support (including technical manuals, and spares) for Aegis BMD: SM-3 missile.Respond to Fleet issues related to Aegis BMD operations and BMD events.		

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Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date May 2009
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APPROPRIATION/BUDGET ACTIVITY RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE 0603892C Ballistic Missile Defense Aegis
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C. Other Program Funding Summary

	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	Total Cost
PE 0603175C Ballistic Missile Defense Technology	106,437	119,308	109,760						-
PE 0603881C Ballistic Missile Defense Terminal Defense Segment	1,034,478	956,686	719,465						-
PE 0603882C Ballistic Missile Defense Midcourse Defense Segment	2,198,664	1,507,481	982,922						-
PE 0603883C Ballistic Missile Defense Boost Defense Segment	503,475	400,751	186,697						-
PE 0603884C Ballistic Missile Defense Sensors	574,231	777,693	636,856						-
PE 0603886C Ballistic Missile Defense System Interceptors	330,874	385,493	0						-
PE 0603888C Ballistic Missile Defense Test and Targets	619,137	919,956	996,752						-
PE 0603890C Ballistic Missile Defense Enabling Programs	416,937	402,778	369,145						-
PE 0603891C Special Programs – MDA	193,157	175,712	301,566						-
PE 0603893C Space Tracking & Surveillance System	226,499	208,923	180,000						-
PE 0603894C Multiple Kill Vehicle	223,084	283,481	0						-
PE 0603895C BMD System Space Program	16,237	24,686	12,549						-
PE 0603896C BMD C2BMC	439,997	288,287	340,014						-
PE 0603897C BMD Hercules	51,387	55,764	48,186						-
PE 0603898C BMD Joint Warfighter Support	45,400	69,743	60,921						-
PE 0603904C Missile Defense Integration & Operations Center (MDIOC)	77,102	106,040	86,949						-
PE 0603906C Regarding Trench	1,945	2,968	6,164						-
PE 0603907C Sea Based X-Band Radar (SBX)	155,244	146,895	174,576						-
PE 0603908C BMD Europ Intercep Site	0	362,007	0						-
PE 0603909C BMD Europ Midcourse Radar	0	76,537	0						-
PE 0603911C BMD European Capability	0	0	50,504						-
PE 0603912C BMD European Comm Support	0	27,008	0						-
PE 0603913C Israeli Cooperative	0	0	119,634						-
PE 0605502C Small Business Innovative Research BMDO	137,409	0	0						-
PE 0901585C Pentagon Reservation	5,971	19,667	19,709						-
PE 0901598C Management Headquarters – MDA	83,907	81,174	57,403						-

Note: The Ballistic Missile Defense System (BMDS) is an integrated, interoperable, global defense system. The programs which comprise the BMDS are interdependent.

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APPROPRIATION/BUDGET ACTIVITY RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE 0603892C Ballistic Missile Defense Aegis	

D. Acquisition Strategy

Support contracts for U.S. Navy ships, including those designated as BMD-ships, are designated and maintained by the U.S. Navy. This includes support for assets being deployed on U.S. Navy ships, such as the SM-3 missile.

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APPROPRIATION/BUDGET ACTIVITY RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE 0603892C Ballistic Missile Defense Aegis
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I. Product Development Cost (\$ in Thousands)										
Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2009 Cost	FY 2009 Award/ Oblg Date	FY 2010 Cost	FY 2010 Award/ Oblg Date	FY 2011 Cost	FY 2011 Award/ Oblg Date	Total Cost
Subtotal Product Development										

Remarks

II. Support Costs Cost (\$ in Thousands)										
Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2009 Cost	FY 2009 Award/ Oblg Date	FY 2010 Cost	FY 2010 Award/ Oblg Date	FY 2011 Cost	FY 2011 Award/ Oblg Date	Total Cost
AWS Maintenance										
Weapon System	MIPR	JHU/APL/ MD	450	354	1Q	425	1Q			1,229
Weapon System	MIPR	CSCS (ATRC)/ VA	1,975	1,764	1Q	2,157	1Q			5,896
Weapon System	MIPR	NSWC Corona/ CA	1,060	869	1Q	1,045	1Q			2,974
Weapon System	MIPR	NSWC/DD/ VA	795	703	1Q	844	1Q			2,342
Weapon System	MIPR	NSWC/PHD/ CA	3,881	3,584	1Q	4,427	1Q			11,892
Weapon System	Various	Various/ Various	839	646	1/2Q	776	1/2Q			2,261
Weapon System	CPAF	Lockheed Martin/ NJ	11,000	10,020	1Q	13,245	1Q			34,265
SM-3 Missile Maintenance										

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Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2009 Cost	FY 2009 Award/ Oblg Date	FY 2010 Cost	FY 2010 Award/ Oblg Date	FY 2011 Cost	FY 2011 Award/ Oblg Date	Total Cost
Missile	CPAF	Raytheon/ AZ	14,000	12,682	1Q	13,589	1Q			40,271
Missile	MIPR	NSWC/PHD/ CA	2,500	2,361	1Q	2,426	1Q			7,287
Missile	MIPR	NSWC/DD/ VA	2,500	2,421	1Q	2,426	1Q			7,347
Missile	MIPR	NSWC Corona/ CA	2,000	1,869	1Q	1,941	1Q			5,810
Missile	MIPR	NSWC IH/ MD	1,000	984	1Q	971	1Q			2,955
Missile	Various	Various/ Various	1,800	1,773	1/2Q	1,747	1/2Q			5,320
Subtotal Support Costs			43,800	40,030		46,019				129,849

Remarks

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

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2009 Cost	FY 2009 Award/ Oblg Date	FY 2010 Cost	FY 2010 Award/ Oblg Date	FY 2011 Cost	FY 2011 Award/ Oblg Date	Total Cost
Subtotal Test and Evaluation										

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IV. Management Services Cost (\$ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2009 Cost	FY 2009 Award/ Oblg Date	FY 2010 Cost	FY 2010 Award/ Oblg Date	FY 2011 Cost	FY 2011 Award/ Oblg Date	Total Cost
Subtotal Management Services										

Remarks

Project Total Cost			43,800	40,030		46,019				129,849
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APPROPRIATION/BUDGET ACTIVITY				R-1 NOMENCLATURE				
RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)				0603892C Ballistic Missile Defense Aegis				

COST (\$ in Thousands)	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015
BX18 Sea-Based Terminal BMD Block 2.0	64,965	23,444	5,694					
RDT&E Articles Qty	3	20	0					

Note:

A. Mission Description and Budget Item Justification

The Near-Term Sea-Based Terminal (SBT) project supports the BMDS mission of intercepting ballistic missiles in all regions, in all phases, and of all ranges, as follows:

- In all regions: provide enhanced engagement capability.
- In all phases of ballistic missile flight: engagement capability against missile threats in the terminal flight stage.
- All ranges: Near-Term SBT provides capability against SRBM and limited IRBM targets.

Aegis BMD supported Limited Defensive Capability (LDC) by providing Long Range Surveillance and Track (LRS&T) data to other elements of the BMDS. Aegis BMD further improved both national and international security with its ability to launch Standard Missile-3 Block IA (SM-3 Blk IA) missiles based upon data received via the Tactical Digital Information Link (TADIL) network in the final configuration, BMD 3.6.

Aegis BMD is providing a follow-on capability to BMD 3.6, in response to recent Real World Events. Near-Term SBT (BMD 3.6.1) provides for an integrated Sea Based Terminal capability against a finite set of Short Range Ballistic Missiles. BMD 3.6.1 incorporates a fuze modified SM-2 Block IV missile provided by a separate OPNAV sponsored effort and builds on BMD 3.6 to provide a terminal phase capability. The BMD 3.6.1 continues efforts to refine Aegis Launch on AN/TPY-2 and bridges the gap between the operational deployment of BMD 3.6 and BMD 4.0.1.

Aegis BMD is fielding the near-term Sea-Based Terminal capability beginning in FY 2009 on 21 U.S. Navy Cruisers and Destroyers. In addition to the near-term SBT capability, Aegis BMD is performing various upgrades to BMD 3.6 in BMD 3.6.1; updates include early integration efforts for Aegis BMD launch on AN/TPY-2 capability. Aegis BMD 3.6.1 also provides enhanced capabilities within the areas of engagement coordination, system track, and communications in order to support the BMDS Unifying Missile Defense Functions (UMDF).

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B. Accomplishments/Planned Program				
	FY 2008	FY 2009	FY 2010	FY 2011
Weapon System Development	38,000	10,263	0	
RDT&E Articles (Quantity)	2	0	0	

In this project, Weapon System funding will focus on the development of the BMD 3.6.1 computer program, providing a Near Term Sea-Based Terminal capability.

RDT&E Articles: BMD 3.6.1 Computer Program (1), installation of BMD 3.6.1 computer program on one (1) U.S. Navy Cruiser

FY08 Accomplishments:

- Conducted the Test Readiness Review (TRR) for BMD 3.6.1 to ensure modifications meet the Sea-Based Terminal requirements.
- Completed Element Test & Evaluation (ETE) and Multi-Element Integration Test (MEIT).
- Conducted Engineering Assessment (EA) for BMD 3.6.1.
- Installed BMD 3.6.1 computer program on one (1) CG to support system testing.
- Participated in FTM-14.

FY09 Accomplishments/Planned Program:

- Achieved BMD 3.6.1 Certification for installation and operational use on Aegis BMD cruisers and destroyers.
- Complete Mission Assurance and Safety reviews of operational system.

	FY 2008	FY 2009	FY 2010	FY 2011
Test & Evaluation	14,900	9,531	0	
RDT&E Articles (Quantity)	0	0	0	

Test and Evaluation funding supports the analysis and execution of the FTM-14 campaign.

FY08 Accomplishments:

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APPROPRIATION/BUDGET ACTIVITY RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE 0603892C Ballistic Missile Defense Aegis
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- Conducted FTM-14 Campaign:
 - Completed pre-flight analysis to verify mission scenarios and to predict flight performance.
 - Prepared and completed missile delivery package for the Mission Control Panel reviews.
 - Conducted a BMD 3.6 simulated engagement of two (2) ARAV-B MRBM targets.
 - Tested interoperability with other BMDS elements.
 - Conducted a BMD 3.6.1 engagement and intercept of an FMA SRBM using the near-term SBT functionality with the fuze- modified SM-2 Blk IV missile.
 - Performed post-flight analysis to validate high fidelity models and simulations.
 - Conducted post-flight analysis to support Mission Data Reviews (MDRs).

FY09 Planned Program:

- Participate in FTM-15 (described in project BX09).

	FY 2008	FY 2009	FY 2010	FY 2011
BMD 3.6.1 Deployment	0	3,650	3,200	
RDT&E Articles (Quantity)	0	20	0	

This efforts accounts for the installation of the BMD 3.6.1 computer program on Aegis Cruisers and Destroyers.

FY09 Planned Program:

RDT&E Articles: Installation of BMD 3.6.1 on four (4) Cruisers and sixteen (16) Destroyers.

- Complete installation of BMD 3.6.1 computer program on four (4) Cruisers and sixteen (16) Destroyers.
- Begin crew training for BMD 3.6.1 upgrade.

FY10 Planned Program:

- Complete checkout of BMD 3.6.1 -capable Cruisers and Destroyers.

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Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification			Date May 2009	
APPROPRIATION/BUDGET ACTIVITY		R-1 NOMENCLATURE		
RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)		0603892C Ballistic Missile Defense Aegis		
<ul style="list-style-type: none"> Complete crew training. 				
	FY 2008	FY 2009	FY 2010	FY 2011
Targets	12,065	0	0	
RDT&E Articles (Quantity)	1	0	0	
<p>This effort provides the Missile Defense Agency with ballistic missile target hardware, target range support, logistics support, target integration, and associated launch services.</p> <p>FY08 Accomplishments:</p> <p>RDT&E Articles: One (1) FMA Target</p> <ul style="list-style-type: none"> Provided an FMA SRBM target for FTM-14 Launched target from the Mobile Launch Platform (MLP) 				
	FY 2008	FY 2009	FY 2010	FY 2011
BMC4I	0	0	1,686	
RDT&E Articles (Quantity)	0	0	0	
<p>This task provides funding to support C4I efforts related to the BMD 3.6.1 baseline.</p> <p>FY10 Planned Program:</p> <ul style="list-style-type: none"> Evaluate External Sensors Lab (ESL) space cue impacts in Aegis BMD performance. Provide on-going support for contingency operations Provide subject matter expertise support for the fielded BMD 3.6.1 baseline. Support systems engineering efforts to incorporate interoperability enhancements including: <ul style="list-style-type: none"> Navy Multi Band Terminal Advanced EHF 				

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Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification			Date May 2009	
APPROPRIATION/BUDGET ACTIVITY		R-1 NOMENCLATURE		
RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)		0603892C Ballistic Missile Defense Aegis		
	FY 2008	FY 2009	FY 2010	FY 2011
SE&I & BMDS Integration	0	0	808	
RDT&E Articles (Quantity)	0	0	0	

This effort provides funding to work in collaboration with the BMDS System Engineer to develop requirements flowdown for Aegis BMD 3.6.1 and participate in definition of appropriate Engagement Sequence Groups to best utilize Aegis BMD capability in the overall BMDS.

FY10 Planned Program:

- Continue support of system integration efforts with other BMDS elements to maximize interoperability within the overall BMDS
- Continue collaboration within MDA to maximize Aegis BMD support for current and developing ESGs.

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Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date May 2009
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APPROPRIATION/BUDGET ACTIVITY RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE 0603892C Ballistic Missile Defense Aegis
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C. Other Program Funding Summary

	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	Total Cost
PE 0603175C Ballistic Missile Defense Technology	106,437	119,308	109,760						-
PE 0603881C Ballistic Missile Defense Terminal Defense Segment	1,034,478	956,686	719,465						-
PE 0603882C Ballistic Missile Defense Midcourse Defense Segment	2,198,664	1,507,481	982,922						-
PE 0603883C Ballistic Missile Defense Boost Defense Segment	503,475	400,751	186,697						-
PE 0603884C Ballistic Missile Defense Sensors	574,231	777,693	636,856						-
PE 0603886C Ballistic Missile Defense System Interceptors	330,874	385,493	0						-
PE 0603888C Ballistic Missile Defense Test and Targets	619,137	919,956	996,752						-
PE 0603890C Ballistic Missile Defense Enabling Programs	416,937	402,778	369,145						-
PE 0603891C Special Programs – MDA	193,157	175,712	301,566						-
PE 0603893C Space Tracking & Surveillance System	226,499	208,923	180,000						-
PE 0603894C Multiple Kill Vehicle	223,084	283,481	0						-
PE 0603895C BMD System Space Program	16,237	24,686	12,549						-
PE 0603896C BMD C2BMC	439,997	288,287	340,014						-
PE 0603897C BMD Hercules	51,387	55,764	48,186						-
PE 0603898C BMD Joint Warfighter Support	45,400	69,743	60,921						-
PE 0603904C Missile Defense Integration & Operations Center (MDIOC)	77,102	106,040	86,949						-
PE 0603906C Regarding Trench	1,945	2,968	6,164						-
PE 0603907C Sea Based X-Band Radar (SBX)	155,244	146,895	174,576						-
PE 0603908C BMD Europ Intercep Site	0	362,007	0						-
PE 0603909C BMD Europ Midcourse Radar	0	76,537	0						-
PE 0603911C BMD European Capability	0	0	50,504						-
PE 0603912C BMD European Comm Support	0	27,008	0						-
PE 0603913C Israeli Cooperative	0	0	119,634						-
PE 0605502C Small Business Innovative Research BMDO	137,409	0	0						-
PE 0901585C Pentagon Reservation	5,971	19,667	19,709						-
PE 0901598C Management Headquarters – MDA	83,907	81,174	57,403						-

Note: The Ballistic Missile Defense System (BMDS) is an integrated, interoperable, global defense system. The programs which comprise the BMDS are interdependent.

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Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification		Date May 2009
APPROPRIATION/BUDGET ACTIVITY RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE 0603892C Ballistic Missile Defense Aegis	

D. Acquisition Strategy

The Aegis BMD element acquisition approach supports evolutionary development, continuously building upon demonstrated capabilities to advance overall BMDS capability. After considering all technical and management aspects of the program and to meet the requirements presented by an evolving ballistic missile threat, the Aegis BMD program has awarded a sole source contract to Lockheed Martin to continue development of the Aegis BMD Weapon System. The U.S. Navy is performing modifications to the 100 SM-2 Blk IV missiles.

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Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis							Date May 2009			
APPROPRIATION/BUDGET ACTIVITY RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)					R-1 NOMENCLATURE 0603892C Ballistic Missile Defense Aegis					
I. Product Development Cost (\$ in Thousands)										
Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2009 Cost	FY 2009 Award/ Oblg Date	FY 2010 Cost	FY 2010 Award/ Oblg Date	FY 2011 Cost	FY 2011 Award/ Oblg Date	Total Cost
Weapon System Development										
	CPAF	Lockheed Martin/ NJ	29,500	8,225	1/2Q	0	N/A			37,725
	MIPR	NSWCDD/ VA	4,650	0	N/A	0	N/A			4,650
	CPFF	JHU/APL/ MD	930	1,244	1Q	0	N/A			2,174
	Various	Various	400	794	1/2Q	0	N/A			1,194
	FPI	MDA/ VA	1,170	0	N/A	0	N/A			1,170
	MIPR	Aegis Techrep/ NJ	700	0	4Q	0	N/A			700
BMD 3.6.1 Deployment										
	SS/CPAF	Lockheed Martin/ NJ	0	2,015	1Q	1,844	1Q			3,859
	MIPR	NAVSEA/ VA	0	271	1Q	225	1Q			496
	MIPR	NSWC/Dahlgren / VA	0	274	1Q	227	1Q			501
	MIPR	NSWC/PHD/ CA	0	443	1Q	368	1Q			811
	Various	Various	0	647	1/3Q	536	1/3Q			1,183
BMC4I										
	CPFF	JHU/APL/ MD	0	0	N/A	346	1Q			346

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Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis							Date May 2009			
APPROPRIATION/BUDGET ACTIVITY RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)					R-1 NOMENCLATURE 0603892C Ballistic Missile Defense Aegis					
Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2009 Cost	FY 2009 Award/ Oblg Date	FY 2010 Cost	FY 2010 Award/ Oblg Date	FY 2011 Cost	FY 2011 Award/ Oblg Date	Total Cost
	FPI	MIT/ MA	0	0	N/A	110	1Q			110
		MITRE	0	0	N/A	88	1Q			88
	MIPR	NSWC/PHD/ CA	0	0	N/A	109	1Q			109
	MIPR	SPAWAR/ CA	0	0	N/A	934	1Q			934
	Various	Various	0	0	N/A	99	1/2Q			99
SE&I & BMDS Integration										
	CPFF	JHU/APL/ MD	0	0	N/A	55	1/2Q			55
	MIPR	NSWC/Corona/ CA	0	0	N/A	65	1/2Q			65
	MIPR	NSWC/Dahlgren / VA	0	0	N/A	475	1/2Q			475
	MIPR	NSWC/PHD/ CA	0	0	N/A	113	1/2Q			113
	Various	Various	0	0	N/A	100	1/2Q			100
Subtotal Product Development			37,350	13,913		5,694				56,957
Remarks										

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Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date May 2009
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APPROPRIATION/BUDGET ACTIVITY RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE 0603892C Ballistic Missile Defense Aegis
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II. Support Costs Cost (\$ in Thousands)										
Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2009 Cost	FY 2009 Award/ Oblg Date	FY 2010 Cost	FY 2010 Award/ Oblg Date	FY 2011 Cost	FY 2011 Award/ Oblg Date	Total Cost
Subtotal Support Costs										

Remarks

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

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2009 Cost	FY 2009 Award/ Oblg Date	FY 2010 Cost	FY 2010 Award/ Oblg Date	FY 2011 Cost	FY 2011 Award/ Oblg Date	Total Cost
Test & Evaluation										
	MIPR	PMRF/ HI	2,206	627	1Q	0	N/A			2,833
	MIPR	NSWC/DD/ VA	3,200	1,280	1Q	0	N/A			4,480
	CPFF	JHU/APL/ MD	5,597	1,880	1Q	0	N/A			7,477
	MIPR	NSEC/PHD/ CA	2,444	1,258	1Q	0	N/A			3,702
	CPAF	Lockheed Martin/ NJ	5,888	3,286	1Q	0	N/A			9,174
	Various	Various	500	500	1Q	0	N/A			1,000
	MIPR	MDA/ VA	1,265	700	1Q	0	N/A			1,965
Targets										
	MIPR	MDA/ VA	12,314	0	N/A	0	N/A			12,314
Subtotal Test and Evaluation			33,414	9,531		0				42,945

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Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date May 2009
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APPROPRIATION/BUDGET ACTIVITY RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE 0603892C Ballistic Missile Defense Aegis
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Remarks

IV. Management Services Cost (\$ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2009 Cost	FY 2009 Award/ Oblg Date	FY 2010 Cost	FY 2010 Award/ Oblg Date	FY 2011 Cost	FY 2011 Award/ Oblg Date	Total Cost
Subtotal Management Services										

Remarks

Project Total Cost			70,764	23,444		5,694				99,902
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Remarks

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Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail						Date May 2009		
APPROPRIATION/BUDGET ACTIVITY RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)				R-1 NOMENCLATURE 0603892C Ballistic Missile Defense Aegis				
Schedule Profile	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015
Development Milestones								
BMD 3.6.1 Engineering Assessment (EA)	2Q							
BMD 3.6.1 Certification		1Q						
Fielding Deliveries/Ships								
BMD 3.6.1 Ship Installations	2Q-4Q	1Q-4Q	1Q-2Q					
<p>All tests shown on BMDS Test schedule in the Test and Targets PE.</p>								

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Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification						Date May 2009		
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APPROPRIATION/BUDGET ACTIVITY				R-1 NOMENCLATURE				
RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)				0603892C Ballistic Missile Defense Aegis				

COST (\$ in Thousands)	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015
WX18 Far Term Sea Based Terminal Capability Development	13,000	0	0					
RDT&E Articles Qty	0	0	0					

A. Mission Description and Budget Item Justification

The Far-Term Sea Based Terminal (FTSBT) project (BMD 5.2), is an Aegis BMD future capability development, with a projected fielding date of 2014. FTSBT will expand the Near-Term Sea Based Terminal capability developed and delivered as baseline BMD 3.6.1 in Block 2.0, providing a more capable and robust SBT capability and expanding the battlespace to enable the system against a greater range of targets. BMD 5.2 will be built with the Aegis BMD Weapon System in Open Architecture.

B. Accomplishments/Planned Program

	FY 2008	FY 2009	FY 2010	FY 2011
Weapon System Development	13,000	0	0	
RDT&E Articles (Quantity)	0	0	0	

This projects provides funding for the development of the weapon system position of the FTSBT effort within the U.S. Navy's Open Architecture system.

FY08 Accomplishments:

- Began SBT weapon system requirements definition and modeling & simulation efforts.

	FY 2008	FY 2009	FY 2010	FY 2011
Missile Development	0	0	0	
RDT&E Articles (Quantity)	0	0	0	

Funding transitioned to program element (PE) 0603891C, Special Programs: Details provided through appropriate classified channels

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Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification						Date May 2009			
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APPROPRIATION/BUDGET ACTIVITY			R-1 NOMENCLATURE						
RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)			0603892C Ballistic Missile Defense Aegis						

C. Other Program Funding Summary									
	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	Total Cost
PE 0603175C Ballistic Missile Defense Technology	106,437	119,308	109,760						-
PE 0603881C Ballistic Missile Defense Terminal Defense Segment	1,034,478	956,686	719,465						-
PE 0603882C Ballistic Missile Defense Midcourse Defense Segment	2,198,664	1,507,481	982,922						-
PE 0603883C Ballistic Missile Defense Boost Defense Segment	503,475	400,751	186,697						-
PE 0603884C Ballistic Missile Defense Sensors	574,231	777,693	636,856						-
PE 0603886C Ballistic Missile Defense System Interceptors	330,874	385,493	0						-
PE 0603888C Ballistic Missile Defense Test and Targets	619,137	919,956	996,752						-
PE 0603890C Ballistic Missile Defense Enabling Programs	416,937	402,778	369,145						-
PE 0603891C Special Programs – MDA	193,157	175,712	301,566						-
PE 0603893C Space Tracking & Surveillance System	226,499	208,923	180,000						-
PE 0603894C Multiple Kill Vehicle	223,084	283,481	0						-
PE 0603895C BMD System Space Program	16,237	24,686	12,549						-
PE 0603896C BMD C2BMC	439,997	288,287	340,014						-
PE 0603897C BMD Hercules	51,387	55,764	48,186						-
PE 0603898C BMD Joint Warfighter Support	45,400	69,743	60,921						-
PE 0603904C Missile Defense Integration & Operations Center (MDIOC)	77,102	106,040	86,949						-
PE 0603906C Regarding Trench	1,945	2,968	6,164						-
PE 0603907C Sea Based X-Band Radar (SBX)	155,244	146,895	174,576						-
PE 0603908C BMD Europ Intercep Site	0	362,007	0						-
PE 0603909C BMD Europ Midcourse Radar	0	76,537	0						-
PE 0603911C BMD European Capability	0	0	50,504						-
PE 0603912C BMD European Comm Support	0	27,008	0						-
PE 0603913C Israeli Cooperative	0	0	119,634						-
PE 0605502C Small Business Innovative Research BMDO	137,409	0	0						-
PE 0901585C Pentagon Reservation	5,971	19,667	19,709						-
PE 0901598C Management Headquarters – MDA	83,907	81,174	57,403						-

Note: The Ballistic Missile Defense System (BMDS) is an integrated, interoperable, global defense system. The programs which comprise the BMDS are interdependent.

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Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification		Date May 2009
APPROPRIATION/BUDGET ACTIVITY RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE 0603892C Ballistic Missile Defense Aegis	
<u>D. Acquisition Strategy</u>		

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Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis								Date May 2009		
APPROPRIATION/BUDGET ACTIVITY RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)					R-1 NOMENCLATURE 0603892C Ballistic Missile Defense Aegis					
II. Support Costs Cost (\$ in Thousands)										
Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2009 Cost	FY 2009 Award/ Oblg Date	FY 2010 Cost	FY 2010 Award/ Oblg Date	FY 2011 Cost	FY 2011 Award/ Oblg Date	Total Cost
Subtotal Support Costs										
Remarks										
III. Test and Evaluation Cost (\$ in Thousands)										
Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2009 Cost	FY 2009 Award/ Oblg Date	FY 2010 Cost	FY 2010 Award/ Oblg Date	FY 2011 Cost	FY 2011 Award/ Oblg Date	Total Cost
Subtotal Test and Evaluation										
Remarks										
IV. Management Services Cost (\$ in Thousands)										
Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2009 Cost	FY 2009 Award/ Oblg Date	FY 2010 Cost	FY 2010 Award/ Oblg Date	FY 2011 Cost	FY 2011 Award/ Oblg Date	Total Cost
Subtotal Management Services										
Remarks										
Project Total Cost			13,000	0		0				13,000
Remarks										

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Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail						Date May 2009		
APPROPRIATION/BUDGET ACTIVITY RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)				R-1 NOMENCLATURE 0603892C Ballistic Missile Defense Aegis				
Schedule Profile	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015
Development Milestones								
BMD 5.2/FTSBT System Requirements Review		1Q						
Milestones								
Requirements Analysis	1Q-4Q	1Q-2Q						

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Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification						Date May 2009		
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APPROPRIATION/BUDGET ACTIVITY				R-1 NOMENCLATURE				
RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)				0603892C Ballistic Missile Defense Aegis				

COST (\$ in Thousands)	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015
WX09 AB Capability Development	111,364	191,738	522,445					
RDT&E Articles Qty	0	0	0					

Note:

A. Mission Description and Budget Item Justification

The U.S./Japan Joint Cooperative Research (JCR) program conducted cooperative research in Ballistic Missile Defense. The research focused on the development of advanced missile technologies in four components of the SM-3 guided missile: sensor, advanced kinetic warhead, second stage propulsion and lightweight nosecone. In FY06, the JCR project concluded with the flight testing of the lightweight nosecone in Joint Control Test Vehicle-1 (JCTV-1).

In addition, the U.S. and Japan have a mutual interest in the evolutionary development of improvements to the Standard Missile-3 (SM-3). In FY06 the two countries signed a Memorandum of Understanding (MOU) for the co-development of an upgraded, 21-inch diameter SM-3 missile (SM-3 Blk IIA). The objective of the SM-3 Cooperative Development (SCD) project is the development and initial at-sea flight test of the SM-3 Blk IIA missile. The SM-3 Blk IIA missile development will build upon established joint research investments by both the U.S. and Japan. The analysis approaches, system trade methodologies, and BMD system performance established in the U.S./Japan BMD Joint Analysis (JAWS) completed in March 2005 are the foundation for developing the SM-3 Blk IIA missile. Key technology improvements over the current SM-3 Blk IA missile planned for the SM-3 Blk IIA missile include a significant increase in velocity and range provided by a 21-inch diameter rocket motor propulsion stack, and increased seeker sensitivity and divert capability incorporated in an advanced kinetic warhead. Key component technologies to be developed under this Annex include, but are not limited to: Lightweight nosecone, advanced kinetic warhead, 21-inch second stage rocket motor, and 21-inch third stage rocket motor.

The U.S. and Japan will equitably share both work and cost.

The Scope of Work of the SCD project can be defined in three phases:

Phase I implements the SCD scope of work as it was defined in the original annex, taking the program through completion of the System Design Review (SDR). Aegis BMD will execute risk reduction efforts for the propulsion, nosecone, seeker and DACS development efforts and test plans,

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Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification		Date May 2009
APPROPRIATION/BUDGET ACTIVITY RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE 0603892C Ballistic Missile Defense Aegis	
<p>and conduct requirements definition for the SM-3 Blk IIA missile configuration. Phase I will also initiate information exchange related to production and maintenance of the SM-3 Blk IIA missile and introduce the phased engineering approach. Upon completion of requirements definition, a schedule for development and testing, and work share and cost share for development and testing will be refined.</p> <p>Phase II will capture program changes as set out in the first planned amendment, and refine the scope of work from SDR to completion of the Critical Design Review (CDR). Aegis BMD will refine requirements and define the performance allocation and component configuration for the development and testing of the SM-3 Blk IIA missile, and both parties will design, fabricate, test, and evaluate the SM-3 Block IIA missile. Both parties will continue the information exchanges related to production and maintenance in Phase II.</p> <p>Phase III will capture program changes as set out in the second planned amendment, and refine the scope of work from CDR to the completion of the SCD flight test program as defined in the Agreement. This phase defines developmental cost share agreements between the United States and the Government of Japan, completes component engineering and integration, executes cooperative flight tests, and continues discussions on production and maintenance options.</p> <p>The SM-3 Blk IIA missile will increase the area that can be defended by Aegis BMD and increase the probability of kill against a larger threat set. It will leverage enhanced capability provided by BMDS sensor upgrades.</p> <p>The SCD project will:</p> <ul style="list-style-type: none">• Develop components for the SM-3 Blk IIA missile and integrate them into an All Up Round (AUR).<ul style="list-style-type: none">• 21st 2nd and 3rd stage components:• 21st nosecone• Advanced kinetic warhead• Advanced Seeker• Improved Large Diameter Divert and Attitude Control System• Begin engineering of the Aegis Weapon System to exploit the capability of the SM-3 Blk IIA missile and use of threat track data from BMDS sensors.• Integrate the SM-3 Blk IIA missile and VLS with Aegis ship systems<ul style="list-style-type: none">• Includes development of a light weight VLS canister		

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Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification		Date May 2009
APPROPRIATION/BUDGET ACTIVITY RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE 0603892C Ballistic Missile Defense Aegis	
<ul style="list-style-type: none"> Conduct test and evaluation using ground and flight tests <ul style="list-style-type: none"> SM-3 Blk IIA missile Aegis BMD ship systems Aegis BMD weapon system <p>BMD 5.1 will integrate the SM-3 Blk IIA missile with the Aegis BMD Weapon System in Open Architecture, incorporating other Weapon System improvements:</p> <ul style="list-style-type: none"> Defeat a wide variety of ballistic missiles in the presence of counter countermeasures (Short Range Ballistic Missiles (SRBMs), Medium Range Ballistic Missiles (MRBMs), Intermediate Range Ballistic Missiles (IRBMs), Long Range Ballistic Missiles (LRBMs), including limited Inter-Continental Ballistic Missiles (ICBMs). Feature Aided Track Correlation (FATC) Forcenet/GIG Compliance Improvements to BMDS Multi-Element Sensor Data Fusion. Engage on Remote (EoR) <p>Land-Based SM-3:</p> <p>The land based variant of the Standard Missile-3 (SM-3) is a new capability initiative for the BMDS. If deployed, this will provide a land launched SM-3 exoatmospheric defense against short/medium and some intermediate range ballistic missiles in the later stages of flight. This would broaden the BMDS use of the SM-3 from current sea based application in Aegis BMD ships in the near/mid-term.</p> <p>In recognition of the difficulty in predicting our adversaries or future battlefields, land based SM-3 is envisioned to be able to use a variety of off board sensors to support fire control operations. The Land-Based SM-3 will add additional depth of fire for those nations that already posses terminal phase defenses, allow for more sophisticated engagement strategies, reduce vulnerability to countermeasures forcing an enemy to alter or abandon tactics to penetrate the defensive system.</p>		

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Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date May 2009
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APPROPRIATION/BUDGET ACTIVITY RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE 0603892C Ballistic Missile Defense Aegis
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The Land-Based SM-3 will build upon information contained in the AoA conducted in 2007 - 2008. MDA plans to complete a concept study effort to flesh out the system's technical and operational feasibility leading to a near-term demonstration. To support this effort, MDA tasked Aegis BMD to oversee the execution of this study and associated analysis. MDA anticipates a Land-Based SM-3 acquisition strategy to be approved in FY2010.

In collaboration with the MDA systems engineer, Aegis BMD is contributing to the BMDS in development of engagement sequence groups (ESGs). Aegis BMD 5.1 will support an autonomous engagement against SRBMs, MRBMs, IRBMs, LRBMs and some ICBMs without requiring external cueing. It will also support an engagement against SRBMs, MRBMs, IRBMs and LRBMs using data from other BMDS elements and external sensors. Aegis BMD will also provide target track data to support Ground Based Interceptor Launch and Engagement against IRBMs and ICBMs via input for the Ground-based Midcourse Defense (GMD) Sensor Task Plan (STP) and Weapons Task Plan (WTP).

B. Accomplishments/Planned Program

	FY 2008	FY 2009	FY 2010	FY 2011
SCD Missile Development	72,450	101,802	257,395	
RDT&E Articles (Quantity)	0	0	0	

FY08 Accomplishments:

- Completed risk reduction of SM-3 Blk IIA components:
 - 21-inch diameter missile 2nd and 3rd stage components:
 - 21-inch diameter nosecone
 - Advanced Seeker
- Continued risk reduction of SM-3 Blk IIA components:
 - Advanced kinetic warhead
 - Improved Large Diameter Divert and Attitude Control System
- Continued requirements development of SM-3 Blk IIA and components:
 - 21-inch diameter missile 2nd and 3rd stage components:
 - 21-inch diameter nosecone
 - Advanced kinetic warhead
 - Advanced Seeker
 - Improved Large Diameter Divert and Attitude Control System

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Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification		Date May 2009
APPROPRIATION/BUDGET ACTIVITY RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE 0603892C Ballistic Missile Defense Aegis	
<ul style="list-style-type: none">Developed system specifications to support flight testing of SM-3 Blk IIA missile.Participated in the System Requirements Review (SRR) for the SCD effort.Began initial performance analysis for the flight test program. <p>FY09 Planned Program:</p> <ul style="list-style-type: none">Continue risk reduction efforts for SM-3 Blk IIA components:<ul style="list-style-type: none">Advanced kinetic warheadImproved Large Diameter Divert and Attitude Control SystemContinue development of SM-3 Blk IIA including the following components:<ul style="list-style-type: none">21-inch diameter missile 2nd and 3rd stage components:<ul style="list-style-type: none">21-inch diameter noseconeAdvanced kinetic warheadAdvanced SeekerImproved Large Diameter Divert and Attitude Control SystemLightweight Composite CanisterComplete missile system requirementsConduct the SM-3 Blk IIA System Design Review (SDR) for the SCD effort.Continue requirements definition and analysis for lightweight canister and vertical launch system integration.Develop system specifications to support flight testing of SM-3 Blk IIA missile. <p>FY10 Planned Program:</p> <ul style="list-style-type: none">Complete risk reduction efforts for SM-3 Blk IIA components:<ul style="list-style-type: none">Advanced kinetic warheadImproved Large Diameter Divert and Attitude Control SystemContinue development of SM-3 Blk IIA including the following components:<ul style="list-style-type: none">21-inch diameter missile 2nd and 3rd stage components:<ul style="list-style-type: none">21-inch diameter noseconeAdvanced kinetic warhead		

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Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification			Date May 2009	
APPROPRIATION/BUDGET ACTIVITY RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)		R-1 NOMENCLATURE 0603892C Ballistic Missile Defense Aegis		
<ul style="list-style-type: none"> Advanced Seeker Improved Large Diameter Divert and Attitude Control System Lightweight Composite Canister Develop Prime Item Development Specifications (PIDS), Critical Item Development Specifications (CIDs) and Interface Control Documents (ICDs) 				
	FY 2008	FY 2009	FY 2010	FY 2011
SCD Weapon System Development	18,450	38,824	0	
RDT&E Articles (Quantity)	0	0	0	
<p>Weapon System efforts within this project are centered on AWS modifications necessary to test the SM-3 Blk IIA missile (BMD 4.0.1 Engineering Release (ENG REL)).</p> <p>FY08 Accomplishments:</p> <ul style="list-style-type: none"> Participated in the System Requirements Review (SRR) for the SCD effort Continued requirements definition and analysis for lightweight canister and vertical launch system integration. Supported performance requirements analysis. Continued requirements definition for BMD 4.0.1 ENG REL. <p>FY09 Planned Program:</p> <ul style="list-style-type: none"> Participate in the System Design Review (SDR) for the SCD effort. Support performance requirements analysis. Continue requirements definition for BMD 4.0.1 ENG REL. Conduct a System Design Review (SDR) for the BMD 4.0.1 ENG REL 				
	FY 2008	FY 2009	FY 2010	FY 2011
BMD 5.1 Weapon System Development	20,464	34,470	5,200	
RDT&E Articles (Quantity)	0	0	0	

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Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification		Date May 2009
APPROPRIATION/BUDGET ACTIVITY RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE 0603892C Ballistic Missile Defense Aegis	
<p>BMD 5.1 will integrate SM-3 Blk IIA missile improvements with the Aegis BMD Weapon System, leveraging on improvements achieved in BMD 4.0.1 ENG REL and BMD 5.0, to include Open Architecture.</p> <p>FY08 Accomplishments:</p> <ul style="list-style-type: none">• Began model development for BMD 5.1 performance.• Conducted analyses of BMD 5.1 threat set.• Drafted the BMD 5.1 Engineering Capability Specification (ECS).• Began performance predictions for the weapon system.• Analyzed VLS changes.• Began collaboration with MDA Systems Engineering for development of a BMD Capabilities Planning Document (CPD).• Conducted BMD 5.1 In-Process Review (IPR)• Conducted experiments, developed prototypes, and recommended deployment options for an integrated asymmetric missile defense capability<ul style="list-style-type: none">• Performed detailed analyses of options/needs for wide area surveillance, combat identification and command and control, battle management and communications• Developed a recommended architecture for homeland asymmetric missile defense to include progressions for spiral technology upgrades that would enhance missile defense capabilities over time• Reported the results of efforts to date along with a recommended plan for further development, to include recommended knowledge points to guide further investments in this capability. <p>FY09 Planned Program:</p> <ul style="list-style-type: none">• Conduct System Requirements Review (SRR), Review ECS and provide requirements to the contractor for BMD 5.1.• Draft A-Spec based on requirements from ECS and guidance from SRR.• Continue system performance evaluation and develop performance analysis plan.• Develop modeling and simulation plan for BMD 5.1.• Continue to refine the weapon system requirements in the ECS.• Continue collaboration with MDA DEE for development of the BMD CPS.• Begin preparations for a BMD 5.1 SDR.• Support development of BMD 5.1 Mission Planning requirements.		

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Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification			Date May 2009	
APPROPRIATION/BUDGET ACTIVITY RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)		R-1 NOMENCLATURE 0603892C Ballistic Missile Defense Aegis		
<ul style="list-style-type: none"> • Provide Dedicated Information Technology services for mission specific research and test efforts to include classified and unclassified networks, software licenses, sustainment and information assurance certification. • Provide Common Threat Engineering data to support BMDS test and assessment planning to include (trajectory and signature data to directly support system and sub-system requirements). <p>FY10 Planned Program:</p> <ul style="list-style-type: none"> • Continue revising BMD 5.1 A-Specs and draft System B-1 and B-2 Specs. • Continue development of BMD 5.1 Mission Planning requirements. 				
	FY 2008	FY 2009	FY 2010	FY 2011
BMD 5.0 Development	0	0	131,623	
RDT&E Articles (Quantity)	0	0	0	
<p>This task funds the BMD 5.0 development effort, importing BMD capability into the Navy's Open Architecture system. Funding for this task is provided in project EX09</p> <p>FY10 Planned Program:</p> <ul style="list-style-type: none"> • Update technical specifications (some in Unified Modeling Language), update A-Spec & B-1 from PDR, Baseline Master Test and Evaluation Program Plan (MTEPP) • Conduct BMD 5.0 Critical Design Review to review and gain approval for the contractor's approach and progress towards meeting the BMD 5.0 requirements. • Conduct BMD 5.0 Test Planning Review to review contractor's plan (MTEPP) and assess program readiness to commence computer program testing at the development and test sites (CSEDS). • Conduct BMD 5.0 Near-Term SBT / EoR PDR to review and approve the contractor's approach and initial design to meet requirements. • Conduct BMD 5.0 In-Process Review (IPR) 				
	FY 2008	FY 2009	FY 2010	FY 2011
System Engineering & Integration	0	16,642	47,834	
RDT&E Articles (Quantity)	0	0	0	

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Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification		Date May 2009
APPROPRIATION/BUDGET ACTIVITY RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE 0603892C Ballistic Missile Defense Aegis	
<p>This task provides funding to support Mission Assurance, Safety, and Integration support for BMD 4.0.1 Engineering Release and BMD 5.1 development efforts, as well as BMDS efforts such as Hardware In The Loop (HWIL).</p> <p>FY09 Planned Program:</p> <ul style="list-style-type: none">• Perform studies on weapon system modification for remote sensor usage:<ul style="list-style-type: none">• Characterize current performance of AEGIS BMD against regional threat scenarios; develop options for operational mode modifications to improve that performance; identify required software modifications• Continue collaboration within MDA to maximize Aegis BMD support for current and developing ESGs.• Support BMDS initiative to enable Early Intercept, Flexible Upper Stage:<ul style="list-style-type: none">• Begin studies for a flexible upper stage• Plan, develop, integrate and test a common BMDS HWIL stimulation framework with the Elements for the GTX-10a, GTX-10b, GTX-10c, GTI-10, GTD-10 ground tests, ALTBMD exercises, AR10 exercises, JC-10 exercises, Near-Term Discrimination (NTD) excursions tests, and CTTO demos.• Continue efforts at the Advanced Research Center (ARC) in Huntsville, Alabama. The ARC supplies computational resources, infrastructure, and IT subject matter experts who support both system and element-level flight and ground testing.• Continue efforts at the Simulation Center in Huntsville, Alabama. The Sim-Center supplies computational resources and infrastructure for support of MDA distributed High Performance Computing Requirements.• Provide development, O&M, and IV&V of phenomenology and lethality tools and models to include active and passive signatures codes of threat objects and their kinematics and operational behaviors, relevant natural and perturbed battlespace environments, and a common way of dealing with the consequences of missile defense engagements.• Upgrade the BMDS stimulation framework to support wideband debris for BMDS sensors.• Initial integration of the BMDS stimulation framework with the additional MDA sensors.• Integrate BMDS HWIL Framework to the Digital Simulation Architecture (DSA)• Provide common threat representations and scenarios to met specific event and customer requirements for BMDS HWIL Framework• Participate in BMDS Performance Assessment 09 (PA 09) <p>FY10 Planned Program:</p>		

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Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification			Date May 2009	
APPROPRIATION/BUDGET ACTIVITY		R-1 NOMENCLATURE		
RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)		0603892C Ballistic Missile Defense Aegis		
<ul style="list-style-type: none"> • Perform studies on weapon system modification for remote sensor usage: <ul style="list-style-type: none"> • Characterize current performance of AEGIS BMD against regional threat scenarios; develop options for operational mode modifications to improve that performance; identify required software modifications • Execute initial planning and coordination for high-fidelity engagement simulations to confirm performance of mode changes and to identify additional required software capabilities • Continue collaboration within MDA to maximize Aegis BMD support for current and developing ESGs. • Plan, develop, integrate and test a common BMDS HWIL stimulation framework with the Elements for the GTX-10a, GTX-10b, GTX-10c, GTI-10, GTD-10 ground tests, ALTBMD exercises, AR10 exercises, JC-10 exercises, Near-Term Discrimination (NTD) excursions tests, and CTTO demos. • Conduct BMDS HWIL stimulation framework V&V for BMDS GTX-10a, GTI-10 and GTD-10 ground tests, ALTBMD, AR10, JC-10 exercises, and CTTO demos. • Derive and design the BMDS HWIL stimulation framework for use in domestic and international BMDS M&S venues. • Participate in Element integration and development testing in support of GTX-10a and GTI-10 ground tests. • Continue efforts at the Advanced Research Center (ARC) in Huntsville, Alabama. The ARC supplies computational resources, infrastructure, and IT subject matter experts who support both system and element-level flight and ground testing. • Continue efforts at the Simulation Center in Huntsville, Alabama. The Sim-Center supplies computational resources and infrastructure for support of MDA distributed High Performance Computing Requirements. • Provide development, O&S, and IV&V of phenomenology and lethality tools and models to include active and passive signatures codes of threat objects and their kinematics and operational behaviors, relevant natural and perturbed battlespace environments, and a common way of dealing with the consequences of missile defense engagements. • Upgrade the BMDS stimulation framework to support wideband debris for BMDS sensors. • Initial integration of the BMDS stimulation framework with the additional MDA sensors. • Integrate BMDS HWIL Framework to the Digital Simulation Architecture (DSA) • Provide common threat representations and scenarios to met specific event and customer requirements for BMDS HWIL Framework • Participate in BMDS Performance Assessment 10 (PA 10) 				
	FY 2008	FY 2009	FY 2010	FY 2011
BMD 5.1 BMC4I	0	0	5,393	
RDT&E Articles (Quantity)	0	0	0	

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Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification			Date May 2009	
APPROPRIATION/BUDGET ACTIVITY RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)		R-1 NOMENCLATURE 0603892C Ballistic Missile Defense Aegis		
<p>This task provides funding for Command, Control, Battle Management and Communications tasks related to the development of the BMD 5.1 weapon system.</p> <p>FY10 Planned Program:</p> <ul style="list-style-type: none"> • Support generation of ONIR requirements to incorporate advanced algorithm and new sensor capabilities. • Continue systems engineering efforts to develop advanced track discrimination, correlation, and data fusion improvements. • Support system integration efforts with other BMDS elements to maximize interoperability with the overall BMDS. • Collaborate within MDA to maximize Aegis BMD support for current and developing ESGs. 				
	FY 2008	FY 2009	FY 2010	FY 2011
BMD 3.6.2	0	0	25,000	
RDT&E Articles (Quantity)	0	0	0	
<p>This task funds the development of a BMD 3.6.2 configuration as an upgrade to the initial Sea-based Terminal capability (BMD 3.6.1) currently being fielded.</p> <p>FY10 Planned Program:</p> <ul style="list-style-type: none"> • Conduct studies and update threat set. • Conduct SRR and SDR. 				
	FY 2008	FY 2009	FY 2010	FY 2011
Land-based SM-3 Development	0	0	50,000	
RDT&E Articles (Quantity)	0	0	0	
<p>This task provides funding for the development of a land-based capability using an SM-3 variant missile.</p>				

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APPROPRIATION/BUDGET ACTIVITY RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE 0603892C Ballistic Missile Defense Aegis	
<p>FY10 Planned Program:</p> <ul style="list-style-type: none">• Begin Analysis of Alternatives.• Update threat set and conduct security assessment for a land-based option.• Conduct SRR.		

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Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date May 2009
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APPROPRIATION/BUDGET ACTIVITY RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE 0603892C Ballistic Missile Defense Aegis
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C. Other Program Funding Summary

	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	Total Cost
PE 0603175C Ballistic Missile Defense Technology	106,437	119,308	109,760						-
PE 0603881C Ballistic Missile Defense Terminal Defense Segment	1,034,478	956,686	719,465						-
PE 0603882C Ballistic Missile Defense Midcourse Defense Segment	2,198,664	1,507,481	982,922						-
PE 0603883C Ballistic Missile Defense Boost Defense Segment	503,475	400,751	186,697						-
PE 0603884C Ballistic Missile Defense Sensors	574,231	777,693	636,856						-
PE 0603886C Ballistic Missile Defense System Interceptors	330,874	385,493	0						-
PE 0603888C Ballistic Missile Defense Test and Targets	619,137	919,956	996,752						-
PE 0603890C Ballistic Missile Defense Enabling Programs	416,937	402,778	369,145						-
PE 0603891C Special Programs – MDA	193,157	175,712	301,566						-
PE 0603893C Space Tracking & Surveillance System	226,499	208,923	180,000						-
PE 0603894C Multiple Kill Vehicle	223,084	283,481	0						-
PE 0603895C BMD System Space Program	16,237	24,686	12,549						-
PE 0603896C BMD C2BMC	439,997	288,287	340,014						-
PE 0603897C BMD Hercules	51,387	55,764	48,186						-
PE 0603898C BMD Joint Warfighter Support	45,400	69,743	60,921						-
PE 0603904C Missile Defense Integration & Operations Center (MDIOC)	77,102	106,040	86,949						-
PE 0603906C Regarding Trench	1,945	2,968	6,164						-
PE 0603907C Sea Based X-Band Radar (SBX)	155,244	146,895	174,576						-
PE 0603908C BMD Europ Intercep Site	0	362,007	0						-
PE 0603909C BMD Europ Midcourse Radar	0	76,537	0						-
PE 0603911C BMD European Capability	0	0	50,504						-
PE 0603912C BMD European Comm Support	0	27,008	0						-
PE 0603913C Israeli Cooperative	0	0	119,634						-
PE 0605502C Small Business Innovative Research BMDO	137,409	0	0						137,409
PE 0901585C Pentagon Reservation	5,971	19,667	19,709						25,638
PE 0901598C Management Headquarters - MDA	83,907	81,174	57,403						165,081

Note: The Ballistic Missile Defense System (BMDS) is an integrated, interoperable, global defense system. The programs which comprise the BMDS are interdependent.

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Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification		Date May 2009
APPROPRIATION/BUDGET ACTIVITY RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE 0603892C Ballistic Missile Defense Aegis	
<p><u>D. Acquisition Strategy</u></p> <p>The SM-3 Cooperative Development program for the SM-3 Blk IIA missile will utilize a performance-based approach that ties program decision milestones to the performance of development prototypes, as well as Control Test Vehicle and Guidance Test Vehicle flight test article performance. Acquisition of hardware, software modifications and required services will occur in conjunction with contractual and tasking efforts to U.S. Navy work and events, and as defined by signed agreements between the Governments of the United States and Japan.</p> <p>If a decision is made to do so, the Land-Based SM-3 project will follow MDA's capability-based acquisition strategy that emphasizes testing, spiral development and evolutionary acquisition. The details of this plan will be approved in FY2010.</p>		

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Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis							Date May 2009			
APPROPRIATION/BUDGET ACTIVITY RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)					R-1 NOMENCLATURE 0603892C Ballistic Missile Defense Aegis					
I. Product Development Cost (\$ in Thousands)										
Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2009 Cost	FY 2009 Award/ Oblg Date	FY 2010 Cost	FY 2010 Award/ Oblg Date	FY 2011 Cost	FY 2011 Award/ Oblg Date	Total Cost
SCD Missile Development										
	SS/CPAF	Raytheon/ AZ	60,309	83,963	1Q	212,291	1/2Q			356,563
	MIPR	NSWC DD/ VA	2,425	3,564	1Q	9,011	1Q			15,000
	CPFF	JHU/APL/ MD	2,772	4,073	1Q	10,298	1Q			17,143
		MIT/ MA	1,039	1,527	1Q	3,861	1Q			6,427
	MIPR	MSWC PHD/ CA	2,425	3,564	1Q	9,011	1Q			15,000
	MIPR	NSWC IH/ MD	2,079	3,054	1Q	7,722	1Q			12,855
	Various	Various	1,400	2,057	1Q	5,201	1/3Q			8,658
SCD Weapon System Development										
	CPAF	Lockheed Martin/ NJ	14,208	29,899	1Q	0	N/A			44,107
	CPFF	JHU/APL/ MD	1,014	2,133	1Q	0	N/A			3,147
	MIPR	NSCW/DD/ VA	669	1,407	1Q	0	N/A			2,076
		MIT/ MA	1,206	2,537	1Q	0	N/A			3,743
	Various	MDA	822	1,730	1/2Q	0	N/A			2,552
	Various	Various/	230	484	1/2Q	0	N/A			714

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Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis							Date May 2009			
APPROPRIATION/BUDGET ACTIVITY RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)					R-1 NOMENCLATURE 0603892C Ballistic Missile Defense Aegis					
Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2009 Cost	FY 2009 Award/Oblg Date	FY 2010 Cost	FY 2010 Award/Oblg Date	FY 2011 Cost	FY 2011 Award/Oblg Date	Total Cost
	MIPR	Techrep/ NJ	301	634	N/A	0	N/A			935
			0	0	1/3Q	0	N/A			
BMD 5.1 Weapon System Development										
	CPAF	Lockheed Martin/ NJ	16,014	26,974	1Q	4,070	1Q			47,058
	CPAF	JHU/APL/ MD	1,138	1,918	1Q	289	1Q			3,345
	MIPR	NSWCDD/ VA	1,005	1,692	1Q	255	1Q			2,952
	MIPR	SPAWAR/ CA	268	451	1Q	68	1Q			787
	MIPR	VA Sites/ VA	502	846	1Q	128	1Q			1,476
	Various	MDA	1,249	2,104	1/2Q	317	1/2Q			3,670
	Various	Various/	100	169	1/2Q	25	1/2Q			294
	MIPR	Aegis Techrep/ NJ	188	316	1Q	48	1Q			552
BMD 5.0 Development										
	CPAF	Lockheed Martin/NJ	0	0	N/A	112,087	1/2Q			112,087
		NSWC/DD/VA	0	0	N/A	6,395	1Q			6,395
		JHU/APL/MD	0	0	N/A	6,898	1Q			6,898
	CPFF	MIT/LL/MA	0	0	N/A	1,661	1/2Q			1,661
		VA SITES/VA	0	0	N/A	1,495	1Q			1,495
		VARIOUS	0	0	N/A	1,206	1/3Q			1,206

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Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis							Date May 2009			
APPROPRIATION/BUDGET ACTIVITY RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)					R-1 NOMENCLATURE 0603892C Ballistic Missile Defense Aegis					
Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2009 Cost	FY 2009 Award/ Oblg Date	FY 2010 Cost	FY 2010 Award/ Oblg Date	FY 2011 Cost	FY 2011 Award/ Oblg Date	Total Cost
		AEGIS TECH REP/	0	0	N/A	1,881	1Q			1,881
System Engineering & Integration										
	CPFF	JHU/APL/ MD	0	2,290	1Q	6,582	1Q			8,872
	Various	MDA	0	9,542	1Q	27,427	1Q			36,969
	MIPR	NSWC/DD/ VA	0	3,640	1Q	10,462	1Q			14,102
	MIPR	NSWC/PHD/ CA	0	0	N/A	0	N/A			
	Various	Various	0	1,170	1/2Q	3,363	1/2Q			4,533
BMD 5.1 BMC4I										
	CPFF	JHU/APL/ MD	0	0	N/A	1,106	1Q			1,106
	FPI	MIT/ MA	0	0	N/A	353	1Q			353
		MITR	0	0	N/A	281	1Q			281
		NSWC/PHD/ CA	0	0	N/A	349	1Q			349
	MIPR	SPAWAR/ CA	0	0	N/A	2,989	1Q			2,989
	Various	Various	0	0	N/A	315	1/2Q			315
BMD 3.6.2										
	CPAF	Lockheed Martin/NJ	0	0	N/A	19,746	1Q			19,746
		NSWC/DD/VA	0	0	N/A	3,112	1Q			3,112
	CPFF	JHU/APL/MD	0	0	N/A	622	1Q			622
		VARIOUS	0	0	N/A	268	1/3Q			268

Project: WX09 AB Capability Development

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Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date May 2009
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APPROPRIATION/BUDGET ACTIVITY RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE 0603892C Ballistic Missile Defense Aegis
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Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2009 Cost	FY 2009 Award/ Oblg Date	FY 2010 Cost	FY 2010 Award/ Oblg Date	FY 2011 Cost	FY 2011 Award/ Oblg Date	Total Cost
	FPI	MDA/VA	0	0	N/A	783	1Q			783
		AEGIS TECHREP/NJ	0	0	N/A	469	1Q			469
Land-based SM-3 Development										
	CPAF	Lockheed Martin/NJ	0	0	N/A	30,000	1Q			30,000
	CPFF	JHU/APL/MD	0	0	N/A	5,500	1/3Q			5,500
		NSWC/PHD/CA	0	0	N/A	2,000	1Q			2,000
		NSWC/DD/VA	0	0	N/A	4,500	1Q			4,500
	FPI	MIT/MA	0	0	N/A	1,500	1Q			1,500
	SS/CPAF	RAYTHEON/AZ	0	0	N/A	5,000	1Q			5,000
		VARIOUS	0	0	N/A	1,500	1/3Q			1,500
Subtotal Product Development			111,363	191,738		522,445				825,546

Remarks

II. Support Costs Cost (\$ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2009 Cost	FY 2009 Award/ Oblg Date	FY 2010 Cost	FY 2010 Award/ Oblg Date	FY 2011 Cost	FY 2011 Award/ Oblg Date	Total Cost
BMD 5.0 Development										
Land-based SM-3 Development										
Subtotal Support Costs			0	0		0				0

Remarks

Project: WX09 AB Capability Development

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Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date May 2009
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APPROPRIATION/BUDGET ACTIVITY RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE 0603892C Ballistic Missile Defense Aegis
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III. Test and Evaluation Cost (\$ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2009 Cost	FY 2009 Award/ Oblg Date	FY 2010 Cost	FY 2010 Award/ Oblg Date	FY 2011 Cost	FY 2011 Award/ Oblg Date	Total Cost
Subtotal Test and Evaluation										

Remarks

IV. Management Services Cost (\$ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2009 Cost	FY 2009 Award/ Oblg Date	FY 2010 Cost	FY 2010 Award/ Oblg Date	FY 2011 Cost	FY 2011 Award/ Oblg Date	Total Cost
Subtotal Management Services										

Remarks

Project Total Cost			111,363	191,738		522,445				825,546
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Remarks

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Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile	Date May 2009
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APPROPRIATION/BUDGET ACTIVITY RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE 0603892C Ballistic Missile Defense Aegis
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Fiscal Year	2008				2009				2010				2011				2012				2013				2014				2015			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
SM-3 Blk IIA Development Milestones																																
SM-3 Blk IIA System Requirements Review (SRR)	▲																															
SM-3 Blk IIA SRR-2			▲																													
SM-3 Blk IIA System Design Review (SDR)				▲																												
SM-3 Blk II Preliminary Design Review											▲																					
Development Milestones																																
BMD 4.0.1 ENG REL Development	▲	—	—	—	▲	▲	—	—	—	▲																						
BMD 5.1 / 5.X Development	▲	—	—	—	▲	▲	—	—	—	▲																						

Legend	
<ul style="list-style-type: none"> ▲ Significant Event (complete) ★ Milestone Decision (complete) ◆ Element Test (complete) ▽ System Level Test (complete) ▲— Complete Activity 	<ul style="list-style-type: none"> ▲ Significant Event (planned) ★ Milestone Decision (planned) ◆ Element Test (planned) ▽ System Level Test (planned) ▲— Planned Activity

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Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail						Date May 2009		
APPROPRIATION/BUDGET ACTIVITY RDTE&E, DW/04 Advanced Component Development and Prototypes (ACD&P)				R-1 NOMENCLATURE 0603892C Ballistic Missile Defense Aegis				
Schedule Profile	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015
SM-3 Blk IIA Development Milestones								
SM-3 Blk IIA System Requirements Review (SRR)	1Q							
SM-3 Blk IIA SRR-2	3Q							
SM-3 Blk IIA System Design Review (SDR)		1Q						
SM-3 Blk II Preliminary Design Review			3Q					
Development Milestones								
BMD 4.0.1 ENG REL Development	1Q-4Q	1Q-4Q	1Q-4Q					
BMD 5.1 / 5.X Development	1Q-4Q	1Q-4Q	1Q-4Q					
All tests shown on BMDS Test schedule in the Test and Targets PE.								

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Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification						Date May 2009		
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APPROPRIATION/BUDGET ACTIVITY				R-1 NOMENCLATURE				
RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)				0603892C Ballistic Missile Defense Aegis				

COST (\$ in Thousands)	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015
ZX40 Program-Wide Support	15,047	30,416	51,625					
RDT&E Articles Qty	0	0	0					

A. Mission Description and Budget Item Justification

Program-Wide Support provides funding for common non-headquarters support functions across the entire program. Includes costs for both government civilians performing these functions, as well as outside services and support contractors that augment government staff in these areas. Other costs included provide facility capabilities for MDA Executing Agent locations, such as physical and technical security, legal services, travel and training, office and equipment leases, utilities and communications, supplies and maintenance, and similar operating expenses. Also includes funding for charges on canceled appropriations in accordance with Public Law 101-510, legal settlements, and foreign currency fluctuations on a limited number of foreign contracts.

B. Accomplishments/Planned Program

	FY 2008	FY 2009	FY 2010	FY 2011
Civilian Salaries and Support	15,047	30,416	51,625	
RDT&E Articles (Quantity)	0	0	0	

See Section A: Mission Description and Budget Item Justification

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Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification						Date May 2009			
APPROPRIATION/BUDGET ACTIVITY RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)					R-1 NOMENCLATURE 0603892C Ballistic Missile Defense Aegis				

C. Other Program Funding Summary

	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	Total Cost
PE 0603175C Ballistic Missile Defense Technology	106,437	119,308	109,760						
PE 0603881C Ballistic Missile Defense Terminal Defense Segment	1,034,478	956,686	719,465						
PE 0603882C Ballistic Missile Defense Midcourse Defense Segment	2,198,664	1,507,481	982,922						-
PE 0603883C Ballistic Missile Defense Boost Defense Segment	503,475	400,751	186,697						-
PE 0603884C Ballistic Missile Defense Sensors	574,231	777,693	636,856						-
PE 0603886C Ballistic Missile Defense System Interceptors	330,874	385,493	0						-
PE 0603888C Ballistic Missile Defense Test and Targets	619,137	919,956	996,752						-
PE 0603890C Ballistic Missile Defense Enabling Programs	416,937	402,778	369,145						-
PE 0603891C Special Programs – MDA	193,157	175,712	301,566						-
PE 0603893C Space Tracking & Surveillance System	226,499	208,923	180,000						-
PE 0603894C Multiple Kill Vehicle	223,084	283,481	0						-
PE 0603895C BMD System Space Program	16,237	24,686	12,549						-
PE 0603896C BMD C2BMC	439,997	288,287	340,014						-
PE 0603897C BMD Hercules	51,387	55,764	48,186						-
PE 0603898C BMD Joint Warfighter Support	45,400	69,743	60,921						-
PE 0603904C Missile Defense Integration & Operations Center (MDIOC)	77,102	106,040	86,949						-
PE 0603906C Regarding Trench	1,945	2,968	6164						-
PE 0603907C Sea Based X-Band Radar (SBX)	155,244	146,895	174,576						-
PE 0603908C BMD Europ Intercep Site	0	362,007	0						-
PE 0603909C BMD Europ Midcourse Radar	0	76,537	0						-
PE 0603911C BMD European Capability	0	0	50,504						-
PE 0603912C BMD European Comm Support	0	27,008	0						-
PE 0603913C Israeli Cooperative	0	0	119,634						-
PE 0605502C Small Business Innovative Research BMDO	137,409	0	0						-
PE 0901585C Pentagon Reservation	5,971	19,667	19,709						-
PE 0901598C Management Headquarters – MDA	83,907	81,174	57,403						-

Note: The Ballistic Missile Defense System (BMDS) is an integrated, interoperable, global defense system. The programs which comprise the BMDS are interdependent.

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Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification		Date May 2009
APPROPRIATION/BUDGET ACTIVITY RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE 0603892C Ballistic Missile Defense Aegis	

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