MDA RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)

DATE: February 2002

BUDGET ACTIVITY: 4 - Program Definition and Risk Reduction

PE NUMBER AND TITLE: 0603882C Midcourse Defense Segment

COST (*In Thousands*)	FY 2001 Actual	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	FY 2006 Estimate	FY 2007 Estimate	Cost to Complete	Total Cost
Total Program Element (PE) Cost	0	3762250	3192594	3071581	3016343	2969142	2595708	Continuing	Continuing
3011 Block 2004 Test Bed	0	786485	533947	554098	348000	0	0	Continuing	Continuing
3012 Ground-Based Midcourse Defense (GMD) Development and Test Bed Upgrades	0	2393736	2072516	1837908	1668617	1758102	1638155	Continuing	Continuing
3020 Sea-Based Midcourse Defense (SMD)	0	468220	426601	456100	742800	824000	791500	Continuing	Continuing
3050 Segment Common Systems Engineering and Integration	0	44000	95000	150000	192000	322000	100000	Continuing	Continuing
3090 Program Operations	0	69809	64530	73475	64926	65040	66053	Continuing	Continuing

NOTE: This Program Element (PE) R-2 does not match the earlier R-1 submission for FY 2003. There was a net zero sum transfer of funds between Ground Based Midcourse, PE 0603882C, Project 3012, (-$2510K), and THAAD, PE 0604861C, Project 2011, (+$2510K), which is correctly reflected in this R-2 but not in the R-1.

A. Mission Description and Budget Item Justification

The Midcourse Defense Segment (MDS) provides a "hit-to-kill" capability to counter ballistic missiles in the midcourse stage of flight. In this capacity, the MDS provides the midcourse defense layer of the overall Ballistic Missile Defense System (BMDS) (via a ground-based system element (referred to as Ground-based Midcourse Defense (GMD)) and a sea-based system element (referred to as Sea-based Midcourse Defense (SMD)). Additionally, the MDS provides for the initial development and construction of a multi-part Ballistic Missile Defense System (BMDS) Test Bed, each part having independent utility, to demonstrate midcourse capabilities. The test bed could also be used to test the capabilities of other defense layers (i.e., boost and terminal phases) as they develop and the integration of those layers in the BMDS. The flow down of BMD System capability specifications resulting from Missile Defense National Team efforts in BM/C2 and Systems Engineering & Integration will guide the integration of MDS into the BMD System, the BMDS BMC/C2 architecture, and the BMDS Test Bed.

The MDS develops and demonstrates increasingly robust technologies and capabilities in order to enable incremental improvements and block upgrades to the BMDS over time, and incorporates: 1) countermeasures mitigation; 2) use of a Combined Test Force; 3) expanded engagement conditions; 4) additional target and interceptor test launch sites; 5) multiple engagement scenarios; 6) expanded test range/engagement areas; and 7) improved test infrastructure. Implementation of these improvements will enhance realism in test scenarios, improve test communications/data handling and enable multiple engagement test flight scenarios, intercept possibilities over a larger area, and higher speed Exoatmospheric Kill Vehicle (EKV) engagements.

MDA RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)	DATE February 2002
BUDGET ACTIVITY 4 - Program Definition and Risk Reduction	PE NUMBER AND TITLE 0603882C Midcourse Defense Segment

The MDS Program Element contains the following projects: 1) 3011 – Block 2004 Test Bed (the GMD parts of the BMDS); 2) 3012 – GMD Development; 3) 3020 – SMD Development; 4) 3050 – Systems Engineering and Integration; and 5) 3090 – Program Operations. Projects 3011 and 3012 are successors to the National Missile Defense (NMD) program (previously captured under PE 0603871C), and Project 3020 is the successor to the Navy Theater Wide (NTW) Program (previously captured under PE 0603868C). Projects 3050 and 3090 provide technical support to both the GMD Projects (3011 and 3012) and the SMD Project (3020).

Under the GMD Projects, the focus of MDS in the near term is to enhance testing via the development and construction of the, GMD parts of the BMDS Test Bed by 2004 (see detailed discussion under Project 3011, Block 2004). Although initial development of the test bed occurs within GMD, this test bed will have the flexibility to provide a future test infrastructure for other BMDS elements (i.e., boost and terminal phase) to use. It provides a near-operational environment for verifying component hardware and software integration under varying and stressing conditions; allows evaluation in a geographically dispersed environment; and permits testing of multiple simultaneous engagements. The BMDS Test Bed will provide unprecedented near term capabilities to 1) demonstrate BMDS improvements and the feasibility of a layered missile defense, and 2) provide a contingency capability (if and when directed).

The Block 2004 Test Bed will also verify construction, transportation and certification procedures and validate logistics support concepts and system data. This includes maintenance procedures; loading and unloading operations; supply activities and databases; technical manuals; and reliability, availability, and maintainability data.

Both the GMD Development project (3012) and the SMD project (3020), include development of technical improvements to system components; development of replacement components resembling more operationally realistic units (e.g., radars), enhanced and more robust command, control, and communications elements; and advanced interceptors. These more operationally realistic improvements will also be used to upgrade the missile defense test bed over time.

Under Project 3012, key technologies will be matured in logical stages to allow for the initial test bed by 2004 and a more robust test bed over time using more operationally realistic hardware and software in block upgrades. The GMD will develop and demonstrate a wide range of technologies supporting a ground-based “hit-to-kill” capability through the use of advanced kill vehicles, improved launch vehicles, a robust launch and command, control and communications (C3) infrastructure, and advanced sensors. The complementary development program will support a robust ground and flight test program capable of validating the technologies and components being developed.

The Sea-based Midcourse Defense (SMD) element of the Ballistic Missile Defense System (BMDS) will provide the capability for U.S. Navy Surface Combatants to intercept and destroy Medium Range to Inter-Continental Ballistic Missiles (ICBM) in the midcourse ascent phase of the exoatmospheric battlespace while forward deployed or on Fleet Missile Defense Patrol in defense of the nation, deployed U.S. forces, friends, and allies. The SMD element builds upon the existing Aegis Weapons System (AWS) and the Standard Missile (SM) infrastructure. The SMD element objectives include: 1) continue testing and complete the Navy Aegis Light-weight ExoAtmospheric Projectile (LEAP) Intercept (ALI) Flight Demonstration Project (FDP) to demonstrate that LEAP technologies can be successfully integrated with the Navy’s Standard Missile and the AWS; 2) design and develop a Block 2004 ship-based component to be integrated with BMDS test bed; and, 3) initiate, in FY 2002, a Block 2006, 2008, 2010 sea-based midcourse capability against Intermediate Range Ballistic Missiles (IRBMs) and ICBMs in concert with the Missile Defense National Team efforts as defined by the concept definition.

BMDO RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)

DATE: February 2002

BUDGET ACTIVITY: 4 - Program Definition and Risk Reduction

PE NUMBER AND TITLE: 0603882C Midcourse Defense Segment

Japan / U. S. Cooperative BMD Research Project. The Department of Defense signed a Memorandum of Agreement with the Japan Defense Agency in 1999 to conduct cooperative research to enhance the capabilities of the STANDARD Missile-3. The focus of research is on four components: sensor, advanced kinetic warhead, second stage propulsion, and lightweight nosecone. The project plans to flight test a jointly-developed component (lightweight nosecone) on a STANDARD Missile-3 in FY 2005.

B. Program Change Summary	FY 2001	FY 2002	FY 2003
Previous President's Budget (FY 2002 PB)	0	3940534	
Appropriated Value	0		
Adjustments to Appropriated Value			
a. Congressional General Reductions		178284	
b. SBIR / STTR			
c. Omnibus or Other Above Threshold Reductions			
d. Below Threshold Reprogramming			
e. Rescissions			
Adjustments to Budget Years Since FY 2002 PB		178284	
Current Budget Submit (FY 2003 Budget Estimates)	0	3762250	3192594

Change Summary Explanation:
This PE was created as part of an approved program restructure starting in FY 2002. Previously, the FY 2001 funding for the MDS was included in Project 2400, Program Element 0603871C (for ground-based), and Project 1266, Program Element 0603868C (for sea-based.)

FY 2003 Funding was not included during the FY 2002 Amended President's Budget Submission

MDA RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)

DATE: February 2002

BUDGET ACTIVITY: 4 - Program Definition and Risk Reduction

PE NUMBER AND TITLE: 0603882C Midcourse Defense Segment

PROJECT: 3011

COST (*In Thousands*)	FY 2001 Actual	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	FY 2006 Estimate	FY 2007 Estimate	Cost to Complete	Total Cost
3011 Block 2004 Test Bed	0	786485	533947	554098	348000	0	0	Continuing	Continuing

A. Mission Description and Budget Item Justification

The Ground-based Midcourse Defense (GMD) System Element of the Midcourse Defense Segment (MDS) consists of two (2) major efforts: 1) early development and construction of the initial GMD parts of the BMDS Test Bed (covered under Project 3011), and 2) development of capabilities to detect, track, intercept, and defeat ballistic missile threats to the U.S. during the midcourse phase of flight as well as GMD improvements to the BMDS Test Bed (covered under Project 3012). This exhibit addresses efforts under Project 3011, Block 2004 Test Bed.

Project 3011 provides an early BMDS test bed capability to add realism to test and evaluation efforts and improve demonstration capabilities. This multi-part test bed will use initial developmental hardware and software assets to provide two different types of testing functions. Portions of the test bed are intended to validate the GMD operational concept. Other components of the test bed will provide increased realism for GMD interception testing with various locations for flight testing. Together, the initial GMD parts of the BMDS Test Bed will provide:

1) More realistic test and evaluation through geographically dispersed assets and an operationally representative environment to check out component hardware and software integration,
2) Distributed, integrated ground testing,
3) Accelerates initial GMD Battle Management Command, Control and Communications (GBMC3) to support the Test Bed.
4) Sensor assets including the upgraded COBRA DANE radar in Shemya and initial development of a Test X-Band Radar (XBR),
5) Proof of construction, transportation, site activation, and validated logistics,
6) Leverages ongoing basic development program activities in Project 3012 such as currently planned upgrades to the Beale EWR and continuation of development for other Test Bed components (GBMC3 and GBI),
7) Incorporate Aegis Weapon System (AWS) sensors to support GMD Integrated Flight Test Program as soon as practicable,
8) Full spectrum of testing to demonstrate system performance including multiple simultaneous engagements (MSEs),
9) Common test infrastructure (for ground- and sea-based elements) that is expandable to boost and terminal segments, and
10) Adds launch capabilities including Kodiak Island, Alaska.

Project 3012 will provide for the development, test conduct, and improve upon and expand these early BMDS test bed capabilities.

If necessary, this test bed will also be capable of providing a contingency capability, if directed, that offers rudimentary protection of the United States.

MDA RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)	DATE February 2002
BUDGET ACTIVITY 4 - Program Definition and Risk Reduction	PE NUMBER AND TITLE 0603882C Midcourse Defense Segment	PROJECT 3011

FY 2001 Accomplishments:

•	0	This PE was created as part of an approved program restructure starting in FY 2002. Previously, the FY 2001 funding for the MDS was included in Project 2400, Program Element 0603871C (for ground-based), and Project 1266, Program Element 0603868C (for sea-based.)
Total	0	

FY 2002 Planned Program:

•	**481964**	**Block 2004 Test Bed Development** Initiate efforts for the Block 2004 Test Bed with five Ground-Based Interceptors (GBI), "common" silos with sparing, Command Launch Equipment (CLE). Accelerate In-Flight Inceptor Communication System (IFICS) and GBMC3 software development. Enhance ground test capability by accelerating a long haul communications fiber network to provide data assurance and speed up the data collection and reduction effort. Initiate COBRA DANE radar hardware and software upgrades. Initiate upgrade of range assets to the Ronald Reagan Test Site (RTS) and other locations to enhance launch capabilities and range safety. This will add intercept areas, reduce artificiality in testing, and add realism to test scenarios. Upgrades will allow for flight test scenarios featuring multiple engagements. Begin integration effort to provide for AWS sensors to participate in GMD flight test program.
•	**21700**	**Kodiak Test Site** Initiate efforts for the Kodiak Test Site in support of the increased realism of GMD interception testing function of the Block 2004 Test Bed. The attached DD Form 1391 identifies $2.8M of this amount for construction at the Kodiak Test Site and is included in the construction section of the MDA FY 2002 budget submission. The remainder is for equipment installation, design and environmental documentation.
•	**273121**	**RDT&E Test Bed Facility Construction** Provides funding for design and construction efforts in support of the validation of the operational concept function of the Block 2004 Test Bed. The DD Form 1391, which details these efforts, is included in the construction section of the MDA FY 2002 budget submission.
•	**9700**	**Block 2004 Community Impacts** Provides funding for mitigating community impacts. These efforts include an additional fire station, off post landfill, school assistance, and a communications/TV tower.
Total	**786485**	**Block 2004 Test Bed**

FY 2003 Planned Program:

•	**368947**	**Block 2004 Test Bed**

MDA RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)	DATE February 2002
BUDGET ACTIVITY 4 - Program Definition and Risk Reduction	PE NUMBER AND TITLE 0603882C Midcourse Defense Segment	PROJECT 3011

Continue efforts for Block 2004 Test Bed with five Ground-Based Interceptors (GBI), "common" silos with sparing, and CLE. Continue to accelerate IFICS and GBMC3. Continue COBRA DANE radar hardware, software and power plant upgrades. Continue to enhance ground test capability by adding the long haul communications fiber network to provide data assurance and speed up the data collection and reduction effort. Continue AWS integration effort. Initiate the Test XBR development effort. Continue with upgrades of range assets to the RTS and other locations to enhance launch capabilities and range safety. This will add intercept areas, reduce artificiality in testing and add realism to test scenarios. Upgrades will allow for flight test scenarios featuring multiple engagements.

- **121800** **RDT&E Test Bed Facility Construction**
  Provides funding for design and construction efforts in support of the validation of the operational concept function of the Block 2004 Test Bed. The DD Form 1391, which details these efforts, is included in the construction section of the MDA FY 2003 budget submission.
- **8600** **Block 2004 Community Impacts**
  Provides funding to mitigate community impacts. FY 2003 efforts include continued school assistance, an additional fire truck and ambulance, plus upgrades to recreation center, library, and city hall. FY 2003 funding will also provide for social service grants, business grants and loans, and education programs.
- **34600** **Kodiak Test Site**
  Continue efforts for the Kodiak Test Site in support of the increased realism of GMD interception testing function of the Block 2004 Test Bed. The attached DD Form 1391 identifies $13.9M of this amount for construction at the Kodiak Test Site and is included in the construction section of the MDA FY 2003 budget submission. The remaining $20.7M is for test equipment.

Total **533947** **Block 2004 Test Bed**

B. Other Program Funding Summary	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	To Compl	Total Cost
PE 0603871C, NMD-PDRR	1819688								
PE 0208865C, PAC-3 Proc	440930	731455							
PE 0603868C, NTW-PDRR	456372								
PE 0604861C THAAD – EMD	530432	866530	934681	714679	830204	920988	1131109	Cont	Cont
PE 0603875C International Cooperative Program	125805								
PE 0603880C BMD System		807993	1065982	1208546	1157025	1139885	1176979	Cont	Cont
PE 0603881C Terminal Defense Segment		200119	169974	200171	234318	228443	367744	Cont	Cont
PE 0603883C Boost Defense Segment		599835	796927	1389817	1399902	1591160	2274654	Cont	Cont
PE 0603884C Sensors		335338	373447	489181	1145680	899806	1007660	Cont	Cont
PE 0603175C Technology		139340	121751	155056	130299	142785	147457	Cont	Cont
PE 0604865C PAC-3 RDT&E		128199							
PE 0604867C Navy Area (Termination)	267453	99302							

MDA RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)	DATE February 2002
BUDGET ACTIVITY: 4 - Program Definition and Risk Reduction	PE NUMBER AND TITLE: 0603882C Midcourse Defense Segment / PROJECT: 3011

C. Acquisition Strategy: GMD will follow the Missile Defense Agency's capability-based acquisition strategy that emphasizes testing, spiral development, and evolutionary acquisition through the use of two-year capability blocks. The Department has restructured the missile defense acquisition strategy into a multi-path approach to assure that the most effective missile defense is available at the earliest possible time. The GMD project has adopted an acquisition approach that supports evolutionary projects development under the overall technical management of Boeing as the Prime Contractor. The strategy is to build the initial GMD parts of the BMDS Test Bed NLT 4th Quarter FY 2004 as an early BMDS Test Bed and deliver capability block upgrades as early as practical, adopting a spiral development methodology in recognition of the rapidly changing technology environment and the need to satisfy requirements that are defined in general terms within an evolving technology base. This process will (1) allow early implementation of a capability while supporting an evolving requirement/threat definition process, (2) minimize the risks of obsolescence posed by the rapid pace of technology development, (3) provide opportunities to update the project to a changing set of standards, and (4) allow informed trades between cost, schedule, and performance while exploring operational possibilities. The development approach has been enhanced to include (1) initiating a countermeasures mitigation program and developing capabilities to resolve issues with likely countermeasures, (2) adding test infrastructure and improving test management to allow more operationally challenging representative flight tests and providing for increased testing against more challenging targets, and (3) increasing the fidelity of the project simulations.

D. Schedule Profile	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007
Drill 5 silo holes with sparing - Greely		4Q					
Deliver 5 EKVs				1Q			
Deliver 5 Boosters				2Q			
5 Interceptors installed – Greely				4Q			
5 Silos with sparing I&CO				4Q			
Extended test range Environmental Impact Statement (EIS) Record of Decision (ROD)			2Q				
Initiate Test XBR Planning			2Q				
Drill 2 silo holes – Kodiak			3Q				
2 silos I&CO – Kodiak				4Q			
Aegis Interface			3Q				
COBRA DANE Upgrades				2Q			
IFICS – Greely			4Q	1Q/3Q			
IFICS – Kodiak Support				4Q			
IFICS – Shemya				1Q			
GCN – Alaska Ring				2Q			
GBMC2 Nodes - Greely				2Q			
GBMC2 Nodes – JNIC/CMOC				2Q			
Initiate Test Bed Testing					1Q		
Test Bed Block Upgrade Decision Points (see Project 3012)				3Q		3Q	

MDA RDT&E COST ANALYSIS (R-3)

DATE: February 2002

BUDGET ACTIVITY: 4 - Program Definition and Risk Reduction

PE NUMBER AND TITLE: 0603882C Midcourse Defense Segment

PROJECT: 3011

I. Product Development	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2002 Cost	FY 2002 Award Date	FY 2003 Cost	FY 2003 Award Date	Cost To Complete	Total Cost	Target Value of Contract
PRIME CONTRACTOR										
Block 2004 Test Bed:	CPAF	Boeing/Various						CONT		CONT
SE&I	CPAF	Boeing/Various		18195	2Q	42338	2Q		60533	
GBI	CPAF	Boeing/Various		237733	2Q	49193	2Q		286926	
UEWR	CPAF	Boeing/Various		34490	2Q	29032	2Q		63522	
GBMC3	CPAF	Boeing/Various		114468	2Q	86390	2Q		200858	
T&E	CPAF	Boeing/Various		17295	2Q	36290	2Q		53585	
D&S	CPAF	Boeing/Various		52985	2Q	88003	2Q		140988	
TTEC	CPAF	Boeing/Various		6798	2Q	13004	2Q		19802	
XBR	CPAF	Boeing/Various				24697	2Q		24697	
Kodiak Test Site	TBD	TBD/Various		21700	2Q	34600	2Q	CONT	56300	CONT
Subtotal Product Development:				503664		403547			907211	

Remark:

The funding specific breakouts within the Prime Contractor/Boeing section of the R-3 are an estimate. At the time of the FY03 Budget Estimate Submission, the contract was not definitized for the restructured Ground-based Midcourse Defense capability-based acquisition strategy. In addition, even when definitized, the Prime Contractor has the responsibility to balance resources across the GMD program and allocate component funding according to program progress. This may require the Prime Contractor to reallocate funding, which would change the components' estimates, provided in this R-3 document.

II. Support Costs	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2002 Cost	FY 2002 Award Date	FY 2003 Cost	FY 2003 Award Date	Cost To Complete	Total Cost	Target Value of Contract
Block 2004 Test Bed Facility Construction	TBD	TBD/Various		273121	3Q	121800	3Q	CONT	394921	CONT
Block 2004 Test Bed Community Impacts	TBD	TBD/Various		9700	2Q-4Q	8600	2Q-4Q	CONT	18300	CONT
Subtotal Support Costs:				282821		130400			413221	

Remark:

MDA RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)	DATE February 2002
BUDGET ACTIVITY: 4 - Program Definition and Risk Reduction	PE NUMBER AND TITLE: 0603882C Midcourse Defense Segment / PROJECT: 3011

III. Test and Evaluation	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2002 Cost	FY 2002 Award Date	FY 2003 Cost	FY 2003 Award Date	Cost To Complete	Total Cost	Target Value of Contract
N/A										
Subtotal Test and Evaluation:										

Remark:

IV. Management Services	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2002 Cost	FY 2002 Award Date	FY 2003 Cost	FY 2003 Award Date	Cost To Complete	Total Cost	Target Value of Contract
a. N/A										
Subtotal Management Services:										

Remark:

Project Total Cost:				786485		533947			1320432	

Remark:

MDA RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)	DATE February 2002
BUDGET ACTIVITY 4 - Program Definition and Risk Reduction	PE NUMBER AND TITLE 0603882C Midcourse Defense Segment PROJECT 3012

COST (*In Thousands*)	FY 2001 Actual	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	FY 2006 Estimate	FY 2007 Estimate	Cost to Complete	Total Cost
3012 Ground-Based Midcourse Defense (GMD) Development and Test Bed Upgrades	0	2393736	2072516	1837908	1668617	1758102	1638155	Continuing	Continuing

See R-2 Note.

A. Mission Description and Budget Item Justification

The Ground-based Midcourse Defense (GMD) System Element of the Midcourse Defense Segment (MDS) consists of two (2) major efforts: 1) early development and construction of the initial GMD parts of the BMDS Test Bed (covered under Project 3011), and 2) development of capabilities to detect, track, intercept, and defeat ballistic missile threats to the U.S. during the midcourse phase of flight as well as GMD improvements to the BMDS Test Bed (covered under Project 3012, GMD Development and Test Bed Upgrades). This exhibit addresses efforts under Project 3012, GMD Development and Test Bed Upgrades

The GMD Development and Test Bed Upgrades project provides hardware, planning, mission support and execution of the GMD test program. It also provides a broad range of development activities and technologies and components for the ground-based element of BMDS. This development effort will mature key technologies in logical stages to allow for an initial capability, an enhanced and more robust BMDS Test Bed (using operationally representative hardware and software vice developmental hardware and software), and a continuing program to develop and demonstrate a wide range of technologies supporting a ground-based "Hit-to-Kill" capability. This project requires infrastructure support for the GMD program at Redstone Arsenal, Alabama.

The GMD Development program provides a robust development and test program of more capable interceptors (both launch and kill vehicles), targets, sensors, and C3 systems and infrastructure.

- The Objective Boost Vehicle (OBV) will be the primary delivery system for the Exoatmospheric Kill Vehicle (EKV). The OBV is still in development with flight tests planned in FY 2002 and 2003. Until the OBV has completed testing and is certified for use in the MDS flight test program, the Payload Launch Vehicle (PLV) will be used.
- The EKV is a "Hit-to-Kill" payload designed to acquire, discriminate, track, and intercept targets in the midcourse phase of flight. The key components and technologies of the EKV include the acquisition and tracking sensors, the on-board maneuvering system, and the on-board vehicle C3 systems. Component development is on-going and is demonstrated as part of the block improvement process in the Integrated Flight Test program.
- The sensor development program is a mix of enhancements to existing radar assets and development of new radar capabilities. The program will continue the upgrades to the Early Warning Radar system at Beale to support the Test Bed. It also continues planning for upgrades to other EWR sites. The key elements of the upgrades are the software builds to improve the effectiveness of the radars. A broad range of X-Band Radar (XBR) technologies will continue in development. The Ground-Based Radar Prototype (GBR-P) is a X-Band prototype located at the Ronald Reagan Test Site (RTS) at Kwajalein and is being used as part of the Integrated Flight Test program. The GBR-P will serve as a demonstration platform for these evolving technologies.
- The Ground-Based Battle Management Command, Control, and Communications (GBMC3) component is an integrated network of nodes supporting the full spectrum of GMD C3 requirements. This includes a) various communications links (e.g., CONUS and Alaska rings and Satellite Communications (SATCOM) to

Shemya, Ft Greely, and In-Flight Interceptor Communication System (IFICS) Data Terminals (IDTs); b) GBMC2 (command and control) Nodes (Ft Greely and Joint National Integration Center (JNIC) at Cheyenne Mountain Operations Center (CMOC); and c) IDTs at various locations. Block development initiatives continue on these technologies and components meeting future block capability requirements. This effort will be developed to be consistent with the BMDS BMC/C2 architecture.

- The GMD Development program supports the full test article requirements of the Integrated Flight Test program. The typical yearly profile includes four (4) flight tests. This profile includes multiple launches against multiple threat targets as the Block capability matures. This support includes targets, launch vehicles, EKVs, launch infrastructure, test range assets, and other mission support. Additionally, incorporate Aegis Weapon System (AWS) sensors to support GMD integrated flight test program as soon as practicable.
- Pre-deployment planning continues in order to provide a capability to respond to a future deployment order in the shortest time possible. This includes site surveys and activation planning, silo design and planning, facility planning, environmental impact studies and assessments, logistics planning, and operational procedures.
- In FY 2003, SE&I activities will initiate the planning for future capability improvement efforts.

These initiatives will support a robust ground and flight test program capable of validating the technologies and components being developed.

FY 2001 Accomplishments:

•	0	This PE was created as part of an approved program restructure starting in FY 2002. Previously, the FY 2001 funding for the MDS was included in Project 2400, Program Element 0603871C (for ground-based), and Project 1266, Program Element 0603868C (for sea-based.)
Total	0	

MDA RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)	DATE February 2002
BUDGET ACTIVITY 4 - Program Definition and Risk Reduction	PE NUMBER AND TITLE 0603882C Midcourse Defense Segment
	PROJECT 3012

FY 2002 Planned Program:

- **2393736 Ground-Based Midcourse Development**

  Support continued evolution of the BMDS Test Bed as well as support continued upgrade of deployment capability. Initiate Design Review process Block 2004 Test Bed. Evaluate production alternatives. Continue booster development and investigate booster alternatives as part of risk mitigation. Conduct Booster Verification (BV) tests. Design common silo. Continue EKV development, including algorithm upgrades. Develop GBI support projects, including CLE. Support T&E engineering, simulations, ground tests and conduct IFTs-7 through 9. Begin the increasing prototype manufacturing rate capability to support increased flight test frequency and required test bed assets. Deliver basic XBR software. Develop and release BMC2 software increment BI-2. Initiate Northern tier SATCOM and fiber optic communications links to provide reliable communications to BMC2 nodes. Continue development of high fidelity simulations. Begin planning for simultaneous engagements to assess project operational performance. Complete UEWR software builds 3 and 4. Conduct software / algorithm Verification and Validation (V&V), logistics / configuration support, and installation planning. Continue development of project deployment and sustainment strategy planning to include maintenance and supply support. Continue development and testing of incremental XBR and UEWR software. Continue program management, technical and testing oversight of the GBI, XBR, UEWR and GBMC3 projects. Support IFTs-7 through 10. Provide targets and conduct target launches. Conduct post test data reduction activities. Continue requirements refinement for System Capabilities Document (SCD). Support major program milestones, project requirements and design reviews, internal and external interface development/implementation cost assessment, elevation of deployment readiness, and project deployment. Conduct C2Sim exercise and tabletops. Continue integration with the Space Based InfraRed System (SBIRS) Program Office to ensure the satisfaction of project requirements. Perform nuclear environment calculations/requirements verification. Conduct data fusion/project discrimination development. Coordinate project Verification, Validation and Accreditation (VV&A) and maintain Independent Verification and Validation (IV&V) capability to perform project VV&A. Support Common System Engineering with Sea-based Midcourse Defense (SMD) element. Continue development of project sustainment program planning. Conduct facilities design. Continue project RAM and supportability/testability data and issue analysis reports. Develop plan for employing the Test, Training and Exercise Capability (TTEC). Review Manpower, Personnel and Training (MPT) issues and ensure MPT is on track to provide trained personnel for Block capabilities. Develop and issue project Producibility and Manufacturing (P&M) plans. Continue Environmental, Safety, and Health (ESH) documentation, including associated siting and National Environmental Policy Act (NEPA) analysis and ESH compliance documentation required for continued project development and deployment. Continue Programmatic Environmental Safety and Health Evaluation (PESHE).

Total 2393736 Ground-Based Midcourse Development

MDA RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)	DATE February 2002
BUDGET ACTIVITY 4 - Program Definition and Risk Reduction	PE NUMBER AND TITLE 0603882C Midcourse Defense Segment
	PROJECT 3012

FY 2003 Planned Program:

- **2072516 Ground-Based Midcourse Development**

  Support continued evolution of the BMDS Test Bed as well as support continued upgrade of deployment capability. Continue Design Review process for Block 2004 Test Bed. Continue evaluating production alternatives. Support T&E engineering, simulations, ground tests and conduct IFTs-10 through 13. Conduct BV tests. Continue development of selected Alternate Booster and common silo. Continue development of GBI support projects, including CLE. Continue development and testing of XBR and UEWR software. Complete UEWR software builds 5 and 6. Continue increasing prototype manufacturing rate capability to support increased flight test frequency and required test bed assets. Continue EKV development, including algorithm upgrades. Continue communications network in Northern tier SATCOM links. Lay fiber to provide reliable communications to BMC2 nodes. Continue development of high fidelity simulations. Continue planning for simultaneous engagements to assess the project operational performance. Conduct software / algorithm V&V, logistics / configuration support, and installation planning. Continue development of project deployment and sustainment strategy planning to include maintenance and supply support. Continue program management, technical and testing oversight of the GBI, XBR, UEWR and GBMC3 projects. Provide targets and conduct target launches. Conduct post test data reduction activities. Continue to support major program milestones, project requirements and design reviews, internal and external interface development/implementation cost assessment, elevation of deployment readiness, and project deployment. Continue to conduct C2Sim exercise and tabletops. Continue integration with the SBIRS Program Office to ensure the satisfaction of project requirements. Continue to perform nuclear environment calculations / requirements verification. Continue to conduct data fusion/project discrimination development. Continue to coordinate project VV&A. Maintain IV&V capability to perform project VV&A. Continue development of project sustainment program planning. Continue to conduct facilities design. Continue project RAM and development of supportability / testability data and issue analysis reports. Develop plan for employing the TTEC. Continue to review MPT issues and ensure MPT is on track to provide trained personnel for Block capabilities. Continue to develop and issue project P&M plans. Continue ESH documentation, including associated siting and NEPA analysis and ESH compliance documentation required for continued project development and deployment. Continue PESHE

Total 2072516 Ground-Based Midcourse Development

B. Other Program Funding Summary	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	To Compl	Total Cost
PE 0603871C, NMD-PDRR	1819688								
PE 0208865C, PAC-3 Proc	440930	731455							
PE 0603868C, NTW-PDRR	456372								
PE 0604861C THAAD – EMD	530432	866530	934681	714679	830204	920988	1131109	Cont	Cont
PE 0603875C International Cooperative Program	125805								
PE 0603880C BMD System		807993	1065982	1208546	1157025	1139885	1176979	Cont	Cont
PE 0603881C Terminal Defense Segment		200119	169974	200171	234318	228443	367744	Cont	Cont
PE 0603883C Boost Defense Segment		599835	796927	1389817	1399902	1591160	2274654	Cont	Cont

PE 0603884C Sensors		335338	373447	489181	1145680	899806	1007660	Cont	Cont
PE 0603175C Technology		139340	121751	155056	130299	142785	147457	Cont	Cont
PE 0604865C PAC-3 RDT&E		128199							
PE 0604867C Navy Area (Termination)	267453	99302							

C. Acquisition Strategy: GMD will follow the Missile Defense Agency's capability-based acquisition strategy that emphasizes testing, spiral development, and evolutionary acquisition through the use of two-year capability blocks. The Department has restructured the missile defense acquisition strategy into a multi-path approach to assure that the most effective missile defense is available at the earliest possible time. The GMD project has adopted an acquisition approach that supports evolutionary projects development under the overall technical management of Boeing as the Prime Contractor. The strategy is to build the intitial GMD parts of the BMDS Test Bed NLT 4th Quarter FY 2004 and deliver capability block upgrades as early as practical, adopting a spiral development methodology in recognition of the rapidly changing technology environment and the need to satisfy requirements that are defined in general terms within an evolving technology base. This process will (1) allow early implementation of a capability while supporting an evolving requirement/threat definition process, (2) minimize the risks of obsolescence posed by the rapid pace of technology development, (3) provide opportunities to update the project to a changing set of standards, and (4) allow informed trades between cost, schedule, and performance while exploring operational possibilities. The development approach has been enhanced to include (1) initiating a countermeasures mitigation program and developing capabilities to resolve issues with likely countermeasures, (2) adding test infrastructure and improving test management to allow more operationally challenging representative flight tests and providing for increased testing against more challenging targets, and (3) increasing the fidelity of the project simulations.

D. Schedule Profile	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007
Production Decision Points (NET)		3Q	3Q	3Q	3Q	3Q	3Q
Test Bed Block Upgrade Decision Points				3Q		3Q	
Integrated Flight Tests (IFT)							
IFT – 7		1Q					
IFT – 8		2Q					
IFT – 9		4Q					
IFT – 10			1Q				
IFT – 11			2Q				
IFT – 12			3Q				
IFT – 13			4Q				
IFT – 14				1Q			
IFT – 15				2Q			
IFT – 16				3Q			
IFT – 17				4Q			

MDA RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)			DATE: February 2002
BUDGET ACTIVITY: 4 - Program Definition and Risk Reduction	PE NUMBER AND TITLE: 0603882C Midcourse Defense Segment		PROJECT: 3012

IFT – 18					1Q		
IFT – 19					2Q(MSE)		
IFT – 20					2Q(MSE)		
IFT – 21					3Q		
IFT – 22					4Q		
IFT – 23						1Q(MSE)	
IFT – 24						1Q(MSE)	
IFT – 25						2Q	
IFT – 26						3Q	
IFT – 27							1Q
IFT – 28							2Q
IFT – 29							3Q
IFT – 30							4Q
Other Tests							
IGT – 7		1Q					
IGT – 8			1Q				
IGT – 9			2Q				
IMT – 1		3Q					
IMT – 2			2Q				
IMT – 3				2Q			
IMT – 4					1Q		
IMT – 5						1Q	
IST – 1			3Q				
IST – 2				1Q			
IST – 3					1Q		
IST – 4					4Q		
IST – 5						4Q	
IST – 6							4Q
Ground-Based Interceptor (GBI)							
Boost Vehicle - 3		1Q					
OBV Test Flights		4Q	2/3Q				
OBV PDR		3Q					
OBV CDR		4Q					
GBI Delta CDR			1Q				

MDA RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)		DATE: February 2002
BUDGET ACTIVITY: 4 - Program Definition and Risk Reduction	PE NUMBER AND TITLE: 0603882C Midcourse Defense Segment	PROJECT: 3012

EKV Processor Upgrades				4Q			
Early Warning Radars (EWR)							
EWR Hardware Upgrades CDR		1Q					
Complete Hardware Upgrades – Beale				3Q			
Software Upgrades – Build 3		1Q					
Software Upgrades – Build 4		2Q					
Software Upgrades – Build 5			1Q				
Software Upgrades – Build 6			3Q				
Software Upgrades – Functional Qual. Test			4Q				
Software Upgrades – Build 7					4Q		
XBR							
XBR CRD		3Q					
XBR Delta CDR			1Q				
GBR – P Upgrade CDR		2Q					
GBR – P Complete Array Refurbishment				3Q			
GBP – P Complete							4Q
XBR Software – Build 2		2Q					
XBR Software – Build 3			2Q				
XBR Software – Build 4				2Q			
XBR Software – Build 5					2Q		
GBMC3							
GCN CDR		2Q					
GCN – SATCOM				2Q			
GCN – CONUS				2Q			
IFICS – CDR		1Q					
IFICS - FQT		3Q					
IFICS – I&CO Complete						4Q	
Software – DI-A			3Q				
Software – DI-B				3Q			
Software – DI-C						1Q	
GBMC3 FQT			4Q				

MDA RDT&E COST ANALYSIS (R-3)

DATE: February 2002

BUDGET ACTIVITY: 4 - Program Definition and Risk Reduction

PE NUMBER AND TITLE: 0603882C Midcourse Defense Segment

PROJECT: 3012

I. Product Development	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2002 Cost	FY 2002 Award Date	FY 2003 Cost	FY 2003 Award Date	Cost To Complete	Total Cost	Target Value of Contract
PRIME CONTRACTOR										
SE&I	CPAF	Boeing/Various		131111	2Q	111044	2Q	CONT	242155	CONT
GBI	CPAF	Boeing/Various		851817	2Q	840503	2Q	CONT	1692320	CONT
UEWR	CPAF	Boeing/Various		128812	2Q	118359	2Q	CONT	247171	CONT
GBMC3	CPAF	Boeing/Various		252569	2Q	141263	2Q	CONT	393832	CONT
T&E	CPAF	Boeing/Various		112381	2Q	94735	2Q	CONT	207116	CONT
D&S	CPAF	Boeing/Various		19305	2Q	14990	2Q	CONT	34295	CONT
TTEC	CPAF	Boeing/Various		42861	2Q	30579	2Q	CONT	73440	CONT
XBR	CPAF	Boeing/Various		120309	2Q	97973	2Q	CONT	218282	CONT
Program Management	CPAF			102958	2Q	96893	2Q		199851	CONT
GBI	TM	CSC/Various		7500	2/3Q	7725	2/3Q	CONT	15225	CONT
	CPFF	Sparta/Various		1720	2/3Q	1772	2/3Q	CONT	3492	CONT
	TM	Mevatec /Various		7612	2/3Q	7840	2/3Q	CONT	15452	CONT
	TM	TSI/Various		6028	2/3Q	6209	2/3Q	CONT	12237	CONT
	CPFF	Stone Engineer/Various		1751	2/3Q	1803	2/3Q	CONT	3554	CONT
	CPFF	Colsa/Various		6	2/3Q	5	2/3Q	CONT	11	CONT
	MITRE	Eng/Tech Spt/Various		263	2/3Q	271	2/3Q	CONT	534	CONT
	MIPR	OGAs/Various		8514	2/3Q	5255	2/3Q	CONT	13769	CONT
	N/A	Misc Contracts/Various		740	2/3Q	762	2/3Q	CONT	1502	CONT
GBMC3	N/A	NWSC/Various		2200	2/3Q	2059	2/3Q	CONT	4259	CONT
	CPAF	TRW/Various		3800	2/3Q	3700	2/3Q	CONT	7500	CONT
	FFRDC	MITRE Corp. /Various		1353	2/3Q	1200	2/3Q	CONT	2553	CONT
	CPFF	Sparta/Various		4500	2/3Q	4250	2/3Q	CONT	8750	CONT
	CPFF	CST/Various		109	2/3Q	100	2/3Q	CONT	209	CONT
	MIPR	QRI/Various		1750	2/3Q	1500	2/3Q	CONT	3250	CONT
	CPAF	CSC/Various		3600	2/3Q	3300	2/3Q	CONT	6900	CONT
	MIPR	AMCOM/Various		159	2/3Q	150	2/3Q	CONT	309	CONT
	CPAF	Vanguard Research		200	2/3Q	180	2/3Q	CONT	380	CONT
	BPA (ITSP)	TECOLOTE/Various		582	2/3Q	550	2/3Q	CONT	1132	CONT
	MIPR	USAF ESC/Various		67	2/3Q	60	2/3Q	CONT	127	CONT
	N/A	Misc Contracts/Various		45	2/3Q	0	2/3Q	CONT	45	CONT
	MIPR	ARL/Various		350	2/3Q	300	2/3Q	CONT	650	CONT

BMDO RDT&E COST ANALYSIS (R-3)

DATE: February 2002

BUDGET ACTIVITY: 4 - Program Definition and Risk Reduction

PE NUMBER AND TITLE: 0603882C Midcourse Defense Segment

XBR	CPAF	TBE/Various		3550	2/3Q	3000	2/3Q	CONT	6550	CONT
	CPAF	CSC/Various		1200	2/3Q	1100	2/3Q	CONT	2300	CONT
	MIPR	MIT (Lincoln Labs)		1800	2/3Q	1700	2/3Q	CONT	3500	CONT
	CPAF	Ga Tech/Georgia		1550	2/3Q	1400	2/3Q	CONT	2950	CONT
	TM	Mevatec/Various		5503	2/3Q	5297	2/3Q	CONT	10800	CONT
	N/A	OGA Other Spt/Various		2449	2/3Q	2383	2/3Q	CONT	4832	CONT
UEWR	MIPR	MITRE/Massachusetts		4873	2/3Q	5244	2/3Q	CONT	10117	CONT
	BPA (ITSP)	SENCOM/ Massachusetts		2952	2/3Q	2702	2/3Q	CONT	5654	CONT
	MIPR	MIT Lincoln Lab/Massachusetts		100	2/3Q	0	2/3Q	CONT	100	CONT
	CPAF	TRW @ JNIC/Massachusetts		600	2/3Q	255	2/3Q	CONT	855	CONT
	GSA	AFRL/Massachusetts		175	2/3Q	0	2/3Q	CONT	175	CONT
	BPA (ITSP)	Tecolote/Massachusetts		264	2/3Q	277	2/3Q	CONT	541	CONT
	GSA	Xontech/Massachusetts		569	2/3Q	0	2/3Q	CONT	569	CONT
	N/A	Misc Contracts/Massachusetts		167	2/3Q	514	2/3Q	CONT	681	CONT
TTEC	CPFF	SY Technology/Various		4116	2/3Q	3815	2/3Q	CONT	7931	CONT
	CPFF	CST/Various		195	2/3Q	181	2/3Q	CONT	376	CONT
	CPFF	Mevatec/Various		190	2/3Q	176	2/3Q	CONT	366	CONT
	CPFF	Jaycor/Various		455	2/3Q	422	2/3Q	CONT	877	CONT
	GSA	Aegis/Various		500	2/3Q	463	2/3Q	CONT	963	CONT
	GSA	Tec-Masters/Various		151	2/3Q	140	2/3Q	CONT	291	CONT
	MIPR	SED/Various		1000	2/3Q	927	2/3Q	CONT	1927	CONT
	CPFF	Sparta/Various		500	2/3Q	463	2/3Q	CONT	963	CONT
	MIPR	STRICOM/Various		728	2/3Q	675	2/3Q	CONT	1403	CONT
	MIPR	MRDEC/Various		106	2/3Q	98	2/3Q	CONT	204	CONT
	MIPR	MITRE/Various		240	2/3Q	222	2/3Q	CONT	462	CONT
	MIPR	User Lab/Various		500	2/3Q	465	2/3Q	CONT	965	CONT
Subtotal Product Development:				1849405		1627249			3476654	

Remark:

The funding specific breakouts within the Prime Contractor/Boeing section of the R-3 are an estimate. At the time of the FY03 Budget Estimate Submission, the contract was not definitized for the restructured Ground-based Midcourse Defense capability-based acquisition strategy. In addition, even when definitized, the Prime Contractor has the responsibility to balance resources across the GMD program and allocate component funding according to program progress. This may require the Prime Contractor to reallocate funding, which would change the components' estimates, provided in this R-3 document.

MDA RDT&E COST ANALYSIS (R-3)

DATE: February 2002

BUDGET ACTIVITY: 4 - Program Definition and Risk Reduction

PE NUMBER AND TITLE: 0603882C Midcourse Defense Segment

PROJECT: 3012

II. Support Costs	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2002 Cost	FY 2002 Award Date	FY 2003 Cost	FY 2003 Award Date	Cost To Complete	Total Cost	Target Value of Contract
SYSTEM ENGINEERING	CPFF	BMD/CSC/Various		17400	2/3Q	18868	2/3Q	CONT	36268	CONT
	MIPR	JNIC/Various		6580	2/3Q	4850	2/3Q	CONT	11430	CONT
	MIPR	DTRA/Various		1810	2/3Q	1810	2/3Q	CONT	3620	CONT
	MIPR	USAF/SMC/SBIRS/ Various		2900	2/3Q	2900	2/3Q	CONT	5800	CONT
	MIPR	NSWC/Various		5170	2/3Q	5600	2/3Q	CONT	10770	CONT
	MIPR	MIT/Lincoln Lab		4943	2/3Q	3380	2/3Q	CONT	8323	CONT
	MIPR	Misc/POET/Various		3457	2/3Q	1621	2/3Q	CONT	5078	CONT
	MIPR	Threat & CM/Various		2000	2/3Q	2000	2/3Q	CONT	4000	
	TBD	MDA/SE/Comm/Various		64000	2/3Q	0	2/3Q	CONT	64000	CONT
PRODUCTION & QUALITY; LOGISTICS; SITE ACTIVATION COMMAND; PROGRAM PROTECTIONS	CPFF	CSC		14930	2/3Q	14183	2/3Q	CONT	29113	CONT
	CPFF	Nichols/Various		5185	2/3Q	5019	2/3Q	CONT	10204	CONT
	CPFF	Colsa/Various		721	2/3Q	620	2/3Q	CONT	1341	CONT
	CPFF	Mevatec/Various		420	2/3Q	1332	2/3Q	CONT	1752	CONT
	CPFF	Tybrin/Various		50	2/3Q	50	2/3Q	CONT	100	CONT
	CPFF	Boeing Support/Various		800	2/3Q	750	2/3Q	CONT	1550	CONT
	MIPR	SMDC/Various		2453	2/3Q	2375	2/3Q	CONT	4828	CONT
	MIPR	AMCOM/Various		4657	2/3Q	4508	2/3Q	CONT	9165	CONT
	MIPR	USACE/Various		10143	2/3Q	9819	2/3Q	CONT	19962	CONT
	MIPR	USA War College		1454	2/3Q	1408	2/3Q	CONT	2862	CONT
	MIPR	Schreiver AFB		525	2/3Q	508	2/3Q	CONT	1033	CONT
	MIPR	HQ AFCEE		1065	2/3Q	1079	2/3Q	CONT	2144	CONT
	MIPR	OGAs/Various		3200	2/3Q	3000	2/3Q	CONT	6200	CONT
	MIPR	Site Activation Cmd		16175	2/3Q	14995	2/3Q	CONT	31170	CONT
	MIPR	611th ASG/FMA		4726	2/3Q	4500	2/3Q	CONT	9226	CONT
	MIPR	System GFX		59621	2/3Q	52772	2/3Q	CONT	112393	CONT
MANAGEMENT AND OPERATIONAL SUPPORT	CPAF/CPFF	CSC/Various		67456	2/4Q	62532	2/4Q	CONT	129988	CONT
	N/A	GOVT PERS (DC)		22619	2/4Q	20968	2/4Q	CONT	43587	CONT
	N/A	TSM (SMDC)		20000	2/4Q	18540	2/4Q	CONT	38540	CONT
	N/A	GOVT PER (HSV)		37506	2/4Q	34768	2/4Q	CONT	72274	CONT

MDA RDT&E COST ANALYSIS (R-3)

DATE: February 2002

BUDGET ACTIVITY: 4 - Program Definition and Risk Reduction

PE NUMBER AND TITLE: 0603882C Midcourse Defense Segment

PROJECT: 3012

Subtotal Support Costs:				381966		294755			676721	

Remark:

III. Test and Evaluation	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2002 Cost	FY 2002 Award Date	FY 2003 Cost	FY 2003 Award Date	Cost To Complete	Total Cost	Target Value of Contract
SUPPORT FOR GND/FLT TESTS	CPFF	Colsa/Various		7871	2/3Q	7296	2/3Q	CONT	15167	CONT
	CPFF	Boeing/Various		1437	2/3Q	1332	2/3Q	CONT	2769	CONT
	CPAF	Nichols/Various		2465	2/3Q	2285	2/3Q	CONT	4750	CONT
	MIPR	USAKA		22872	2/3Q	21202	2/3Q	CONT	44074	CONT
	FFRDC/MIPR	Sandia		353	2/3Q	327	2/3Q	CONT	680	CONT
	OGA/MIPR	USASMDC		1078	2/3Q	999	2/3Q	CONT	2077	CONT
	OGA/MIPR	JNIC		341	2/3Q	316	2/3Q	CONT	657	CONT
	MIPR	VAFB		1006	2/3Q	932	2/3Q	CONT	1938	CONT
	TM	Mevatec/Various		5408	2/3Q	5013	2/3Q	CONT	10421	CONT
	CPFF	CAS/Various		1335	2/3Q	1238	2/3Q	CONT	2573	CONT
	CPFF	SY TECH/Various		18	2/3Q	17	2/3Q	CONT	35	CONT
	OGA/MIPR	SBIRS SPO		259	2/3Q	240	2/3Q	CONT	499	CONT
	MIPR	USARSPACE		539	2/3Q	499	2/3Q	CONT	1038	CONT
	MIPR	Eglin AFB		3130	2/3Q	2901	2/3Q	CONT	6031	CONT
	N/A	SATCOM/Various		180	2/3Q	166	2/3Q	CONT	346	CONT
	OGA/MIPR	OGAs/Various		734	2/3Q	680	2/3Q	CONT	1414	CONT
	N/A	RTTC		521	2/3Q	483	2/3Q	CONT	1004	CONT
OPERATIONAL TEST AGENCIES	N/A	DYNETC/Various		742	2/3Q	688	2/3Q	CONT	1430	CONT
	N/A	VRC/Various		3367	2/3Q	3121	2/3Q	CONT	6488	CONT
	N/A	SLAD/Various		200	2/3Q	185	2/3Q	CONT	385	CONT
	N/A	CEI/Various		738	2/3Q	684	2/3Q	CONT	1422	CONT
	CPFF	Colsa/Various		479	2/3Q	444	2/3Q	CONT	923	CONT
	CPFF	TRW/Various		2660	2/3Q	2466	2/3Q	CONT	5126	CONT

MDA RDT&E COST ANALYSIS (R-3)

DATE: February 2002

BUDGET ACTIVITY: 4 - Program Definition and Risk Reduction

PE NUMBER AND TITLE: 0603882C Midcourse Defense Segment

PROJECT: 3012

	N/A	Various OGAs/Various		1688	2/3Q	1564	2/3Q	CONT	3252	CONT
	CPFF	SAIC/Various		1078	2/3Q	999	2/3Q	CONT	2077	CONT
LETHALITY	MIPR	MIT		2921	2/3Q	2708	2/3Q	CONT	5629	CONT
	CPFF	ITT/Various		1142	2/3Q	1059	2/3Q	CONT	2201	CONT
	OGA/MIPR	AEDC		312	2/3Q	290	2/3Q	CONT	602	CONT
	N/A	Sandia		3577	2/3Q	3316	2/3Q	CONT	6893	CONT
	N/A	Mevatec/Various		90	2/3Q	83	2/3Q	CONT	173	CONT
	N/A	TBE/Various		1216	2/3Q	1130	2/3Q	CONT	2346	CONT
	N/A	SMDC		87	2/3Q	81	2/3Q	CONT	168	CONT
	N/A	SMDC		2640	2/3Q	2447	2/3Q	CONT	5087	CONT
TARGETS	FFRDC/MIPR	Sandia		44534	2/3Q	41283	2/3Q	CONT	85817	CONT
	OGA/MIPR	SMDC		13463	2/3Q	12481	2/3Q	CONT	25944	CONT
	MIPR	SMDC		27045	2/3Q	25071	2/3Q	CONT	52116	CONT
	MIPR	LLNL		1556	2/3Q	1443	2/3Q	CONT	2999	CONT
	CPFF	SY TECH/Various		3283	2/3Q	3043	2/3Q	CONT	6326	CONT
Subtotal Test and Evaluation:				162365		150512			312877	

Remark:

IV. Management Services	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2002 Cost	FY 2002 Award Date	FY 2003 Cost	FY 2003 Award Date	Cost To Complete	Total Cost	Target Value of Contract
N/A										
Subtotal Management Services:										

Remark:

Project Total Cost:				2393736		2072516			4466252	

Remark:

MDA RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)	DATE February 2002
BUDGET ACTIVITY 4 - Program Definition and Risk Reduction	PE NUMBER AND TITLE 0603882C Midcourse Defense Segment PROJECT 3020

COST (*In Thousands*)	FY 2001 Actual	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	FY 2006 Estimate	FY 2007 Estimate	Cost to Complete	Total Cost
3020 Sea-Based Midcourse Defense (SMD)	0	468220	426601	456100	742800	824000	791500	Continuing	Continuing

A. Mission Description and Budget Item Justification

The Sea-based Midcourse Defense (SMD) element of the Ballistic Missile Defense System (BMDS) will provide the capability for U.S. Navy Surface Combatants to intercept and destroy Medium Range to Inter-Continental Ballistic Missiles (ICBM) in the midcourse ascent phase of the exoatmospheric battlespace while forward deployed or on Fleet Missile Defense Patrol in defense of the nation, deployed U.S. forces, friends, and allies. The SMD element builds upon the existing Aegis Weapons System (AWS) and the Standard Missile (SM) infrastructure. The SMD element objectives include: 1) continue testing and complete the Navy Aegis Light-weight ExoAtmospheric Projectile (LEAP) Intercept (ALI) Flight Demonstration Project (FDP) to demonstrate that LEAP technologies can be successfully integrated with the Navy's Standard Missile and the AWS; 2) design and develop a Block 2004 ship-based component to be integrated with BMDS Test Bed; and, 3) initiate, in FY 2002, a Block 2006, 2008, 2010 sea-based midcourse capability against Intermediate Range Ballistic Missiles (IRBMs) and ICBMs in concert with the Missile Defense National Team efforts as defined by the concept definition work.

System development and testing will be integrated with the BMDS Test bed and BMDS architecture and fully support the Missile Defense Agency's (MDA) capability based acquisition approach for BMD. Each technological advance in SMD will be evaluated for upgrades to the BMDS testbed/architecture in accordance with annual MDA decision reviews. The overall program execution strategy will be to rely on the government and industry team while concurrently selecting combat system engineering agents for the Block 2004 and Block 2008-2010 SMD capabilities.

ALI Block 2004 Test bed – The ALI FDP currently consists of a series of near-term flight tests with the primary objective of demonstrating that LEAP technologies can be integrated with a modified Standard Missile and the AWS to successfully intercept a ballistic missile in the exoatmosphere. ALI successfully executed Flight Test Round (FTR) -1A in Jan 2001, and Flight Mission (FM) -2, A Kinectic Warhead (KW) characterization flight, in Jan 2002. Although not one of the test objectives, FM-2 resulted in an intercept of a ballistic missile in the exoatomosphere. Two additional flight missions, FM-3-4, are scheduled for completion in FY 2002. The primary objective of these flight missions is to demonstrate exoatomshpere intercept repeatability. FM-5-7 are scheduled to be completed in FY 2003 and will provide for opportunities to: 1) flight test SDACS improvements, 2) conduct intercept engagements in varying portions of the ballistic missile trajectory, or 3) transition to more stressing targets/target scenarios based upon technological advances in associated risk reduction areas.

Block 2006, 2008, 2010 – This effort provides for development of the Sea-based Midcourse Defense Block 2006-2010 midcourse ascent phase intercept capability. In FY 2002, the Capability Definition phase will confirm technical objectives and goals and the program will conduct concept definition work encouraging the best use of known, deployed technologies, and technologies expected to be available in the 2006, 2008, 2010 timeframe. In FY 2002 and FY 2003, risk reduction activities will be conducted to increase the readiness levels of key technologies. The Department of Defense signed a Memorandum of Agreement with the Japan Defense Agency in 1999 to conduct cooperative research to enhance the capabilities of the Standard Missile-3. The focus of research is on four components: sensor, advanced kinetic warhead, second stage propulsion, and lightweight nosecone. The Japan Cooperative project plans to flight test a jointly-developed component (lightweight nosecone) on a Standard Missile-3 in

MDA RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)	DATE February 2002
BUDGET ACTIVITY 4 - Program Definition and Risk Reduction	PE NUMBER AND TITLE 0603882C Midcourse Defense Segment
	PROJECT 3020

FY 2005 (Joint Control Test Vehicle (JCTV)-1 and Joint Flight Mission (JFM)-1). To assure midcourse segment BMDS meet the capability specifications across the full range of midcourse engagements, the program will conduct a structured concept definition effort leading to re-allocation of system capabilities among ground-based and sea-based products to achieve the best integrated segment performance at the lowest overall cost.

FY 2001 Accomplishments:

- This PE was created as part of an approved program restructure starting in FY 2002. Previously, the FY 2001 funding for the MDS was included in Project 2400, Program Element 0603871C (for ground-based), and Project 1266, Program Element 0603868C (for sea-based.)

Total 0

FY 2002 Planned Program:

- **200000 ALI Block 2004 Test Bed**
  Continue planning and execution of the ALI FDP, FM-2, FM-3, and FM-4 test events. Perform data reduction, analysis and modifications as necessary to support each follow-on test. Develop and manage the SDACS replan consisting of three parallel Solid Divert Attitude Control System (SDACS) developments ensuring each development is fully ground and flight-tested. Complete the developmental changes necessary to incorporate the new SDACS into the Standard Missile and the Aegis Weapon System. Begin the system engineering and development of the Block 2004 Sea-based Midcourse Defense parts of the BMDS expanded test infrastructure. Initiate procurement of test rounds and targets for threat representative testing.

- **233792 Block 2006, 2008, 2010**
  Initiate the concept definition work for the Block 2006, 2008, 2010 Sea-based Midcourse Defense capabilities. Award, monitor and support contractor studies and the Missile Defense National Team with SMD engineering team. Support Common System Engineering with GMD element. Continue to perform key technology risk reduction activities in the areas of ship and weapon system integration, ship equipment integrations, weapons control, radar development, and radar system integration, missile / launcher improvements and Battle Management Command and Control upgrades.

- **34428 Japan Cooperative Research**
  Continue the management of the Japan Cooperative Research project to enhance the capablilites of the Standard Missile through research in sensor, advanced kinetic warhead, second stage propulsion, and lightweight nosecone.

Total 468220 Sea-based Midcourse

MDA RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)	DATE February 2002
BUDGET ACTIVITY 4 - Program Definition and Risk Reduction	PE NUMBER AND TITLE 0603882C Midcourse Defense Segment
	PROJECT 3020

FY 2003 Planned Program:

- **200000 ALI Block 2004 Test Bed**
  Continue planning and execution of the ALI FDP, FM-5, FM-6, and FM-7 test events. Perform data reduction, analysis and modifications as necessary to support each follow-on test. Continue the development and testing of the parallel SDACS efforts. Continue engineering to support missile and Aegis Weapon System changes required by different SDACS. Continue the system engineering and development of the Block 2004 Sea-based Midcourse Defense parts of the BMDS expanded test bed. Continue procurement of test rounds and targets for threat representative testing.

- **147901 Block 2006, 2008, 2010**
  Complete the concept definition work for the Block 2006, 2008, 2010 Sea-based Midcourse Defense capabilities. Select SMD concepts for Block 2006, 2008, 2010 in concert with the Missile Defense National Team. Development and award competitive contracts for the development of SMD test beds in support of the capability Blocks. Focus key ongoing risk reduction activities, including radar development work, to support Block 2006, 2008, 2010 Sea-based Midcourse Defense capability test beds selected for development. Incorporate Common System Engineering activities (SMD/GMD) into the concepts selected for development and test.

- **78700 Japan Cooperative Research**
  Continue development and system engineering support for the four U.S. / Japan cooperative research components. Begin procuring test articles and ship modifications for JCTV-1 and JFM-1.

Total 426601 Sea-based Midcourse

B. Other Program Funding Summary	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	To Compl	Total Cost
PE 0603871C, NMD-PDRR	1819688								
PE 0208865C, PAC-3 Proc	440930	731455							
PE 0603868C, NTW-PDRR	456372								
PE 0604861C THAAD – EMD	530432	866530	934681	714679	830204	920988	1131109	Cont	Cont
PE 0603875C International Cooperative Program	125805								
PE 0603880C BMD System		807993	1065982	1208546	1157025	1139885	1176979	Cont	Cont
PE 0603881C Terminal Defense Segment		200119	169974	200171	234318	228443	367744	Cont	Cont
PE 0603883C Boost Defense Segment		599835	796927	1389817	1399902	1591160	2274654	Cont	Cont
PE 0603884C Sensors		335338	373447	489181	1145680	899806	1007660	Cont	Cont
PE 0603175C Technology		139340	121751	155056	130299	142785	147457	Cont	Cont

MDA RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)	DATE February 2002
BUDGET ACTIVITY 4 - Program Definition and Risk Reduction	PE NUMBER AND TITLE 0603882C Midcourse Defense Segment	PROJECT 3020

PE 0604865C PAC-3 RDT&E		128199							
PE 0604867C Navy Area (Termination)	267453	99302							

C. Acquisition Strategy: Sea-based Midcourse Defense will follow the Missile Defense Agency's (MDA) capability-based acquisition strategy that emphasizes testing, spiral development, and evolutionary acquisition through the use of two-year capability blocks. This multi-path approach provides assurance that the most effective missile defense is available at the earliest possible time. The best approach (competitive or selected source) will be determined after considering all the technical and management aspects of the program. Current development activities supporting the ALI could be used to provide a limited capability to protect deployed U.S. and allied forces.

D. Schedule Profile	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007
ALI Block 2004 Test Bed							
Flight Mission 2		2Q					
Flight Mission 3		3Q					
Flight Mission 4		4Q					
Flight Mission 5			1Q				
Flight Mission 6			2Q				
Flight Mission 7			3Q				
ALI Flight Test Program							
PDR			1Q				
CDR			3Q				
Flight Mission 8				1Q			
Flight Mission 9				2Q			
Flight Mission 10				3Q			
Flight Mission 11					1Q		
Flight Mission 12					2Q		
Flight Mission 13					3Q		
Flight Mission 14					4Q		
Flight Mission 15						1Q	
Flight Mission 16						2Q	
Flight Mission 17						3Q	
Flight Mission 18						4Q	

MDA RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)							DATE: February 2002
BUDGET ACTIVITY: 4 - Program Definition and Risk Reduction			PE NUMBER AND TITLE: 0603882C Midcourse Defense Segment				PROJECT: 3020

Japan Cooperative Research							
JCTV-1					2Q		
JFM-1					4Q		
Block 2006							
Decision Point			1Q				
PDR			4Q				
CDR				4Q			
System Level Ground-based Test						3Q	
At-sea Test							4Q
Block 2008, 2010							
Decision Point				1Q			
PDR					4Q		
CDR						4Q	

MDA RDT&E COST ANALYSIS (R-3)

DATE: February 2002

BUDGET ACTIVITY: 4 - Program Definition and Risk Reduction

PE NUMBER AND TITLE: 0603882C Midcourse Defense Segment

PROJECT: 3020

I. Product Development	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2002 Cost	FY 2002 Award Date	FY 2003 Cost	FY 2003 Award Date	Cost To Complete	Total Cost	Target Value of Contract
ALI Block 2004 Test Bed										
	CPAF	Lockheed Martin/NJ		17263	3Q	17500	2Q	CONT	34763	CONT
	CPIF/AF	Raytheon/AZ		99350	2Q	100200	1Q	CONT	199550	CONT
	CPAF	United Defense/MN		350	3Q	400	2Q	CONT	750	CONT
	CPFF	JHU/APL/MD		5551	3Q	5600	2Q	CONT	11151	CONT
	WR	NSWC/DD/VA		3141	2Q	3200	3Q	CONT	6341	CONT
	WR	NSWC/PHD/CA		2634	2Q	2650	2Q	CONT	5284	CONT
	MIPR	MIT/LL/MA		1000	3Q	1000	3Q	CONT	2000	CONT
	WR	WSMR/NM		553	3Q	600	2Q	CONT	1153	CONT
	WR	NWAS/CA		320	2Q	350	2Q	CONT	670	CONT
	Various	Various		488	2Q	500	2Q	CONT	988	CONT
Block 2006, 2008, 2010										
Concept Definition Work	TBD	MDA/SE/Comm/Various		10000	3Q	9000	3Q	CONT	19000	CONT
Risk Reduction Activity	CPAF	Lockheed Martin/NJ & MD		93134	3Q	61120	2Q	CONT	154254	CONT
Risk Reduction Activity	CPAF	Raytheon/AZ & MA		70515	2Q	44680	2Q	CONT	115195	CONT
Risk Reduction Activity	CPAF	United Defense/MN		900	3Q	500	2Q	CONT	1400	CONT
Risk Reduction Activity	CPFF	JHU/APL/MD		7120	3Q	5000	2Q	CONT	12120	CONT
Risk Reduction Activity	WR	NSWC/DD/VA		4756	2Q	2500	1Q	CONT	7256	CONT
Risk Reduction Activity	WR	NAWC/CL/CA		1495	2Q	1000	1Q	CONT	2495	CONT
Risk Reduction Activity	WR	NSWC/PHD/CA		624	2Q	500	1Q	CONT	1124	CONT
Risk Reduction Activity	MIPR	MIT/LL/MA		5175	3Q	1000	3Q	CONT	6175	CONT
Risk Reduction Activity	WR	NSWC/IH/MD		331	2Q	300	2Q	CONT	631	CONT
Risk Reduction Activity	WR	NRL/DC		470	2Q	400	2Q	CONT	870	CONT
Risk Reduction Activity	CPAF	TSC/Various		850	3Q	700	3Q	CONT	1550	CONT
Risk Reduction Activity	CPAF	Aerojet/CA		450	3Q	400	3Q	CONT	850	CONT
Risk Reduction Activity	CPAF	Northrop Grumman/Various		400	3Q	350	3Q	CONT	750	CONT
Risk Reduction Activity	Various	Various		2598	2Q	670	2Q	CONT	3268	CONT

MDA RDT&E COST ANALYSIS (R-3)

DATE: February 2002

BUDGET ACTIVITY: 4 - Program Definition and Risk Reduction

PE NUMBER AND TITLE: 0603882C Midcourse Defense Segment

PROJECT: 3020

Japan Cooperative Research										
	CPAF	Lockheed Martin/NJ & MD		4000	3Q	11000	2Q	CONT	15000	CONT
	CPAF	Raytheon/AZ & MA		20000	2Q	46000	2Q	CONT	66000	CONT
	CPFF	JHU/APL/MD		900	3Q	2000	2Q	CONT	2900	CONT
	WR	NSWC/DD/VA		1100	2Q	2500	1Q	CONT	3600	CONT
	MIPR	MIT/LL/MA		2200	3Q	5000	3Q	CONT	7200	CONT
	Various	Various		1000	2Q	700	2Q	CONT	1700	CONT
Subtotal Product Development:				358668		327320			685988	

Remark:

II. Support Costs	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2002 Cost	FY 2002 Award Date	FY 2003 Cost	FY 2003 Award Date	Cost To Complete	Total Cost	Target Value of Contract
ALI Block 2004 Test Bed										
	CPFF	JHU/APL/MD		2124	3Q	2200	2Q	CONT	4324	CONT
	CPAF	TSC/Various		400	3Q	400	3Q	CONT	800	
	MIPR	MIT/LL/MA		1500	3Q	1500	3Q	CONT	3000	CONT
	WR	NSWC/DD/VA		5415	2Q	5500	1Q	CONT	10915	CONT
	WR	NSWC/CD/MD		2000	2Q	2000	1Q	CONT	4000	CONT
	WR	NSWC/IH/MD		359	2Q	350	1Q	CONT	709	CONT
	WR	NSWC/PHD/CA		1467	2Q	1500	1Q	CONT	2967	CONT
	Various	PEO TSC/Various		2700	3Q	1885	2Q	CONT	4585	CONT
	Various	Various		1505	2Q	900	2Q	CONT	2405	CONT
	MIPR	BMPCOE/NJ		1000	3Q	1000	2Q	CONT	2000	CONT
	TBD	MDA/Various		5594	3Q	5000	3Q	CONT	10594	CONT
Block 2006, 2008, 2010										
	CPFF	JHU/APL/MD		6110	3Q	2400	2Q	CONT	8510	CONT
	MIPR	MIT/LL/MA		1950	3Q	500	3Q	CONT	2450	CONT
	WR	NSWC/DD/VA		4737	2Q	3000	1Q	CONT	7737	CONT
	CPFF	SEG/CA		2280	3Q	2000	2Q	CONT	4280	CONT
	WR	NSWC/PHD/CA		1246	2Q	1000	1Q	CONT	2246	CONT

MDA RDT&E COST ANALYSIS (R-3)

DATE: February 2002

BUDGET ACTIVITY: 4 - Program Definition and Risk Reduction

PE NUMBER AND TITLE: 0603882C Midcourse Defense Segment

PROJECT: 3020

	CPAF	TSC/Various		850	3Q	800	3Q	CONT	1650	CONT
	Various	PEO TSC/Various		5490	3Q	0		CONT	5490	CONT
	Various	Various		1972	2Q	1000	2Q	CONT	2972	CONT
Japan Cooperative Research										
	CPFF	JHU/APL/MD		2700	3Q	6000	2Q	CONT	8700	CONT
	WR	NSWC/DD/VA		1100	2Q	2500	1Q	CONT	3600	CONT
	MIPR	MIT/LL/MA		1000	3Q	2000	3Q	CONT	3000	CONT
	Various	Various		428	2Q	1000	2Q	CONT	1428	CONT
Subtotal Support Costs:				53927		44435			98362	

Remark:

III. Test and Evaluation	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2002 Cost	FY 2002 Award Date	FY 2003 Cost	FY 2003 Award Date	Cost To Complete	Total Cost	Target Value of Contract
ALI Block 2004 Test Bed										
DT&E	WR	PMRF/HI		3927	2Q	4000	1Q	CONT	7927	CONT
DT&E	CPFF	Integrits/CA		481	2Q	500	2Q	CONT	981	
DT&E	WR	NAWC/PM/CA		1867	2Q	1900	1Q	CONT	3767	CONT
DT&E	WR	NSWC/DD/VA		2325	2Q	2400	1Q	CONT	4725	CONT
DT&E	WR	NSWC/PHD/CA		3414	2Q	3500	1Q	CONT	6914	CONT
DT&E	WR	NWAS/CA		460	2Q	460	1Q	CONT	920	CONT
DT&E	MIPR	NAIC/OH		538	3Q	550	2Q	CONT	1088	CONT
DT&E	MIPR	HTS/CA		1160	3Q	1200	2Q	CONT	2360	CONT
DT&E	CPFF	JHU/APL/MD		2500	3Q	2500	2Q	CONT	5000	CONT
DT&E	MIPR	SMDC/AL		11095	3Q	11100	3Q	CONT	22195	CONT
DT&E	WR	CINPACFLT/HI		700	2Q	700	1Q	CONT	1400	CONT
DT&E	WR	AIRPAC/CA		360	3Q	360	2Q	CONT	720	CONT
DT&E	WR	COMOPTEVFOR/VA		250	2Q	250	2Q	CONT	500	CONT
DT&E	Various	Various		544	2Q	580	2Q	CONT	1124	CONT
Block 2006, 2008, 2010										
Lethality	WR	NSWC/DD/VA		700	1Q	0		CONT	700	CONT
Subtotal Test and Evaluation:				30321		30000			60321	

MDA RDT&E COST ANALYSIS (R-3)

DATE: February 2002

BUDGET ACTIVITY: 4 - Program Definition and Risk Reduction

PE NUMBER AND TITLE: 0603882C Midcourse Defense Segment

PROJECT: 3020

Remark:

IV. Management Services	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2002 Cost	FY 2002 Award Date	FY 2003 Cost	FY 2003 Award Date	Cost To Complete	Total Cost	Target Value of Contract
ALI Block 2004 Test Bed										
Program Management	CPFF	Anteon		6680	2Q	6680	1Q	CONT	13360	CONT
Program Management	CPFF	Paradigm		2025	2Q	2025	1Q	CONT	4050	CONT
Program Management	CPAF	Logicon		710	2Q	710	1Q	CONT	1420	CONT
Program Management	CPFF	JHU/APL		1000	3Q	1000	2Q	CONT	2000	CONT
Program Management	WR	NSWC/DD		750	2Q	750	2Q	CONT	1500	CONT
Internal Operating		Govt Salary		4000	2Q	4100	1Q	CONT	8100	CONT
Internal Operating		Operating Funds		500	2Q	500	2Q	CONT	1000	CONT
Block 2006, 2008, 2010										
Program Management	CPFF	Anteon		4670	2Q	4500	1Q	CONT	9170	CONT
Program Management	CPAF	Logicon		1200	3Q	1000	1Q	CONT	2200	CONT
Program Management	CPAF	PCI		1625	3Q	1500	1Q	CONT	3125	CONT
Program Management	CPAF	BAE		2144	3Q	2081	1Q	CONT	4225	CONT
Subtotal Management Services:				25304		24846			50150	

Remark:

Project Total Cost:				468220		426601			894821	

Remark:

MDA RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)	DATE February 2002
BUDGET ACTIVITY 4 - Program Definition and Risk Reduction	PE NUMBER AND TITLE 0603882C Midcourse Defense Segment PROJECT 3050

COST (*In Thousands*)	FY 2001 Actual	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	FY 2006 Estimate	FY 2007 Estimate	Cost to Complete	Total Cost
3050 Segment Common Systems Engineering and Integration	0	44000	95000	150000	192000	322000	100000	Continuing	Continuing

A. Mission Description and Budget Item Justification

This project provides for engineering risk management for the ground and sea based elements. Initially the focus will be on the ground-based segment. The primary activity is the countermeasures mitigation activity addressing a few reentry vehicles with simple countermeasure capabilities and expanding to complex countermeasures mitigation with several reentry vehicles. In addition, engineering management activities for risk reduction are provided in this project.

Counter/Countermeasures – The counter/countermeasures effort identifies, develops, and demonstrates solutions to improve the performance of missile defense projects against countermeasure suites. This requires a process to identify and prioritize solutions to credible countermeasures for integration into the program, and requires increased robustness in the test program to incorporate testing against a broader range of credible threats. Results of the testing program will result in the development of additional algorithms to mitigate credible threats. To minimize the programmatic impacts resulting from intelligence estimates, the program is transitioning from threat point-designs to a capability-based approach. Solutions with potential to improve the capabilities against countermeasures will be incorporated through Block upgrades into the Midcourse segment (both ground and sea) and will be provided to the overall BMDS through the MDA Red-White-Blue team process.

Risk Reduction – The complementary EKV program started in FY 2002 will continue in FY 2003. The complementary EKV is an effort to develop a kill vehicle utilizing latest technology to provide risk mitigation. This will allow for a potential common EKV for Ground and Sea-based Midcourse Defense. Development will be based on insertion of new technology and lessons learned from existing EKV development. The program is planned to include design, testing and project insertion, where appropriate, into the block development approach. Additional risk reduction and integration activities will be performed as necessary.

FY 2001 Accomplishments:

- This PE was created as part of an approved program restructure starting in FY 2002. Previously, the FY 2001 funding for the MDS was included in Project 2400, Program Element 0603871C (for ground-based), and Project 1266, Program Element 0603868C (for sea-based.)

Total 0

FY 2002 Planned Program:

- **30000 Risk Reduction**
  Initiate complementary EKV effort to reduce susceptibility to countermeasures and protect the program from potential threat technological advances. Perform risk reduction and integration activities as necessary

MDA RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)	DATE February 2002
BUDGET ACTIVITY 4 - Program Definition and Risk Reduction	PE NUMBER AND TITLE 0603882C Midcourse Defense Segment
	PROJECT 3050

- **14000 Counter/Countermeasures**
  Initiate counter/countermeasures effort. The program is responsible for determining the capability of the baseline projects against credible countermeasure suites; identifying candidate solutions to address performance shortfalls; conducting ground tests against digital models of countermeasure suites; planning the integration of successful improvements into program block upgrades; and identifying candidate ground and sea-based midcourse solutions to credible countermeasures.

Total 44000 Systems Engineering & Integration

FY 2003 Planned Program:

- **65000 Risk Reduction**
  Continue complementary EKV effort. Perform risk reduction and integration activities as necessary.
- **30000 Counter/Countermeasures**
  Continue counter/countermeasures effort.

Total 95000 Systems Engineering & Integration

B. Other Program Funding Summary	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	To Compl	Total Cost
PE 0603871C, NMD-PDRR	1819688								
PE 0208865C, PAC-3 Proc	440930	731455							
PE 0603868C, NTW-PDRR	456372								
PE 0604861C THAAD – EMD	530432	866530	934681	714679	830204	920988	1131109	Cont	Cont
PE 0603875C International Cooperative Program	125805								
PE 0603880C BMD System		807993	1065982	1208546	1157025	1139885	1176979	Cont	Cont
PE 0603881C Terminal Defense Segment		200119	169974	200171	234318	228443	367744	Cont	Cont
PE 0603883C Boost Defense Segment		599835	796927	1389817	1399902	1591160	2274654	Cont	Cont
PE 0603884C Sensors		335338	373447	489181	1145680	899806	1007660	Cont	Cont
PE 0603175C Technology		139340	121751	155056	130299	142785	147457	Cont	Cont
PE 0604865C PAC-3 RDT&E		128199							
PE 0604867C Navy Area (Termination)	267453	99302							

Acquisition Strategy: GMD will follow the Missile Defense Agency's capability-based acquisition strategy that emphasizes testing, spiral development, and evolutionary acquisition through the use of two-year capability blocks. The SE&I project will include risk reduction activities for Ground- and Sea-based Midcourse Defense projects and counter/countermeasures that are capability rather than threat based. Midcourse Defense Segment will participate in a MDA countermeasures program that will focus on identifying threat countermeasures that may not yet be evident, but are physically plausible and technically feasible. The program will then identify and develop solutions to

improve the capability of ballistic missile defense projects to defeat those countermeasures. Solutions that successfully demonstrate an improvement in MDS project performance will be integrated into the block development program. For the complementary EKV, multiple EKV design efforts will be initially funded with down select to the most promising design. A complementary EKV will allow the program to take advantage of the performance capability strengths of the multiple EKVs, and structure follow-on acquisition of EKVs to give the GMD project the most effective missile defense capability.

D. Schedule Profile	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007
Complementary EKV (CEKV):							
System Requirements Review (SRR)		4Q					
Concept Development Start (No Earlier Than (NET))		4Q					
Concept Development Completion (NET)			4Q				
Follow-on Contract Award (NET)				1Q			

MDA RDT&E COST ANALYSIS (R-3)

DATE: February 2002

BUDGET ACTIVITY: 4 - Program Definition and Risk Reduction

PE NUMBER AND TITLE: 0603882C Midcourse Defense Segment

PROJECT: 3050

I. Product Development	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2002 Cost	FY 2002 Award Date	FY 2003 Cost	FY 2003 Award Date	Cost To Complete	Total Cost	Target Value of Contract
b. N/A										
Subtotal Product Development:										

Remark:

II. Support Costs	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2002 Cost	FY 2002 Award Date	FY 2003 Cost	FY 2003 Award Date	Cost To Complete	Total Cost	Target Value of Contract
SYSTEM ENGINEERING										
Risk Reduction	TBD	TBD		30000	2/3Q	65000	2/3Q	CONT	CONT	CONT
Counter/Countermeasures	TBD	TBD		14000	2/3Q	30000	2/3Q	CONT	CONT	CONT
Subtotal Support Costs:				44000		95000				

Remark:

III. Test and Evaluation	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2002 Cost	FY 2002 Award Date	FY 2003 Cost	FY 2003 Award Date	Cost To Complete	Total Cost	Target Value of Contract
c. N/A										
Subtotal Test and Evaluation:										

Remark:

MDA RDT&E COST ANALYSIS (R-3)

DATE: February 2002

BUDGET ACTIVITY: 4 - Program Definition and Risk Reduction

PE NUMBER AND TITLE: 0603882C Midcourse Defense Segment

PROJECT: 3050

IV. Management Services	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2002 Cost	FY 2002 Award Date	FY 2003 Cost	FY 2003 Award Date	Cost To Complete	Total Cost	Target Value of Contract
a.	N/A									
Subtotal Management Services:										

Remark:

Project Total Cost:				44000		95000				

Remark:

MDA RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)	DATE February 2002
BUDGET ACTIVITY 4 - Program Definition and Risk Reduction	PE NUMBER AND TITLE 0603882C Midcourse Defense Segment PROJECT 3090

COST (*In Thousands*)	FY 2001 Actual	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	FY 2006 Estimate	FY 2007 Estimate	Cost to Complete	Total Cost
3090 Program Operations	0	69809	64530	73475	64926	65040	66053	Continuing	Continuing

A. Mission Description and Budget Item Justification

This project covers personnel and related facility support costs, statutory and fiscal requirements, support service contracts and the MDA Data Centers Programs.

Personnel covers government civilians performing program-wide oversight functions such as financial management, contracting, security, information systems support, and legal services at the Missile Defense Agency (MDA) located in Washington D.C., as well as MDA's Executing Agents within the US Army Space & Missile Defense Command (USASMDC), US Army Program Executive Officer (PEO) Air and Missile Defense, US Navy PEO for Theater Surface Combatants (TSC), US Air Force and the Joint National Integration Center (JNIC), formerly known as Joint National Test Facility (JNTF). Related facility costs include rents, utilities, supplies, automated data processing equipment, and all the associated operation and maintenance activities.

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

Assistance required to support BMD program-wide management functions is also contained in this project. This assistance ranges from operational contracts to support functions such as automated data processing operations, access control offices and graphics support, to efforts required to supplement MDA and Executing Agent government personnel. Typical efforts include cost estimating, security management, information management, technology integration across MDA projects and assessment of schedule, cost and performance, with attendant documentation of the many related programmatic issues. The requirements for this area are based on most economical and efficient utilization of contractors versus government personnel.

FY 2001 Accomplishments:

- 0 This PE was created as part of an approved program restructure starting in FY 2002. Previously, the FY 2001 funding for the MDS was included in Program Element 0603871C (for ground-based), and Program Element 0603868C (for sea-based.)

Total 0

FY 2002 Planned Program:

MDA RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)	DATE February 2002
BUDGET ACTIVITY 4 - Program Definition and Risk Reduction	PE NUMBER AND TITLE 0603882C Midcourse Defense Segment
	PROJECT 3090

- **69809 Program Operations**
  Provides management and support for overhead/indirect fixed costs such as civilian payroll, travel, rents & utilities, supplies and the data centers programs.

Total 69809 Program Operations

FY 2003 Planned Program:

- **64530 Program Operations**
  Continue providing management and support for overhead / indirect fixed costs.

Total 64530 Program Operations

B. Other Program Funding Summary	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	To Compl	Total Cost

C. Acquisition Strategy:

D. Schedule Profile	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007
N/A							